WRH Supporting Documentation for
CRT286 Penarth Feeder

Documents included are:

- 4.2 CRT286_Penarth Feeder Access Map
- Canal & River Trust Generic Map Key
- 7.1 CRT286_Penarth Feeder Location Map
- 8.4 CRT286_Penarth Feeder Abstraction Details
- 8.5 CRT286_Penarth Feeder Evidence of Abstraction
- 13.1 CRT286_Penarth Feeder - Other Abstractions
- Montgomery Canal Operating Agreement 1987

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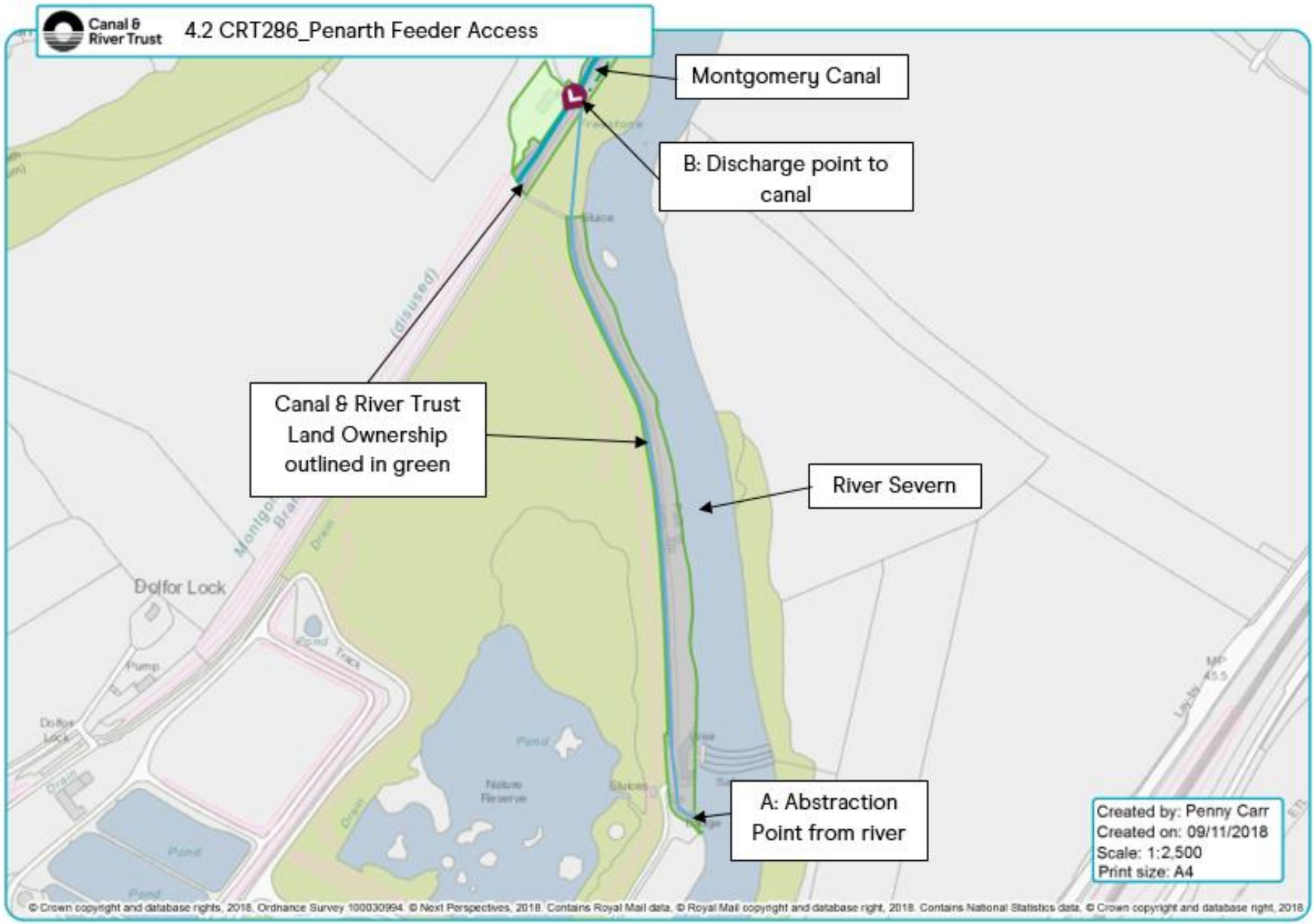
Canal & River Trust
4.2 CRT286_Penarth Feeder Access
Montgomery Canal
B: Discharge point to canal
Canal & River Trust Land Ownership outlined in green
River Severn
A: Abstraction Point from river
Dolfor Lock
Created by: Penny Carr
Created on: 09/11/2018
Scale: 1:2,500
Print size: A4
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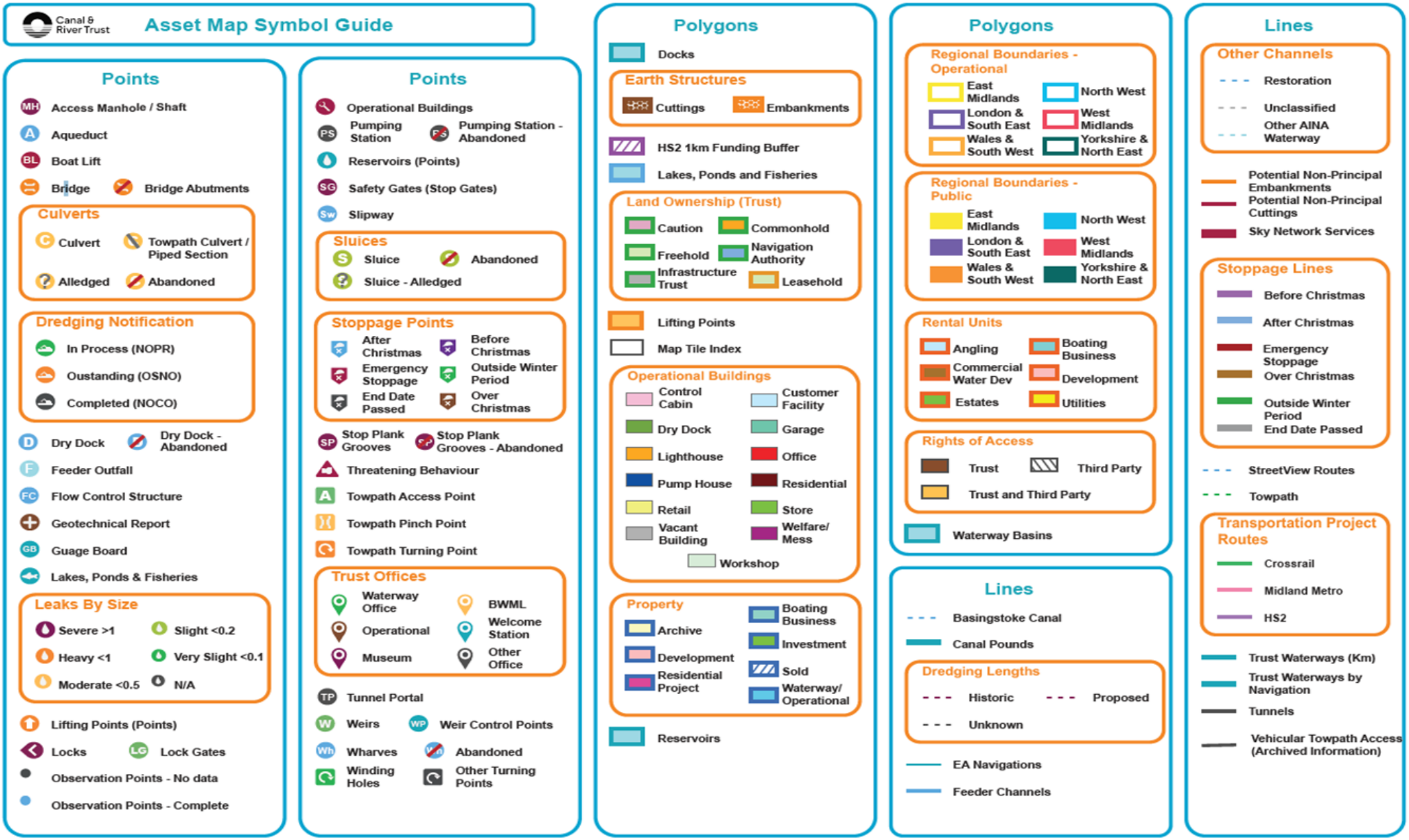
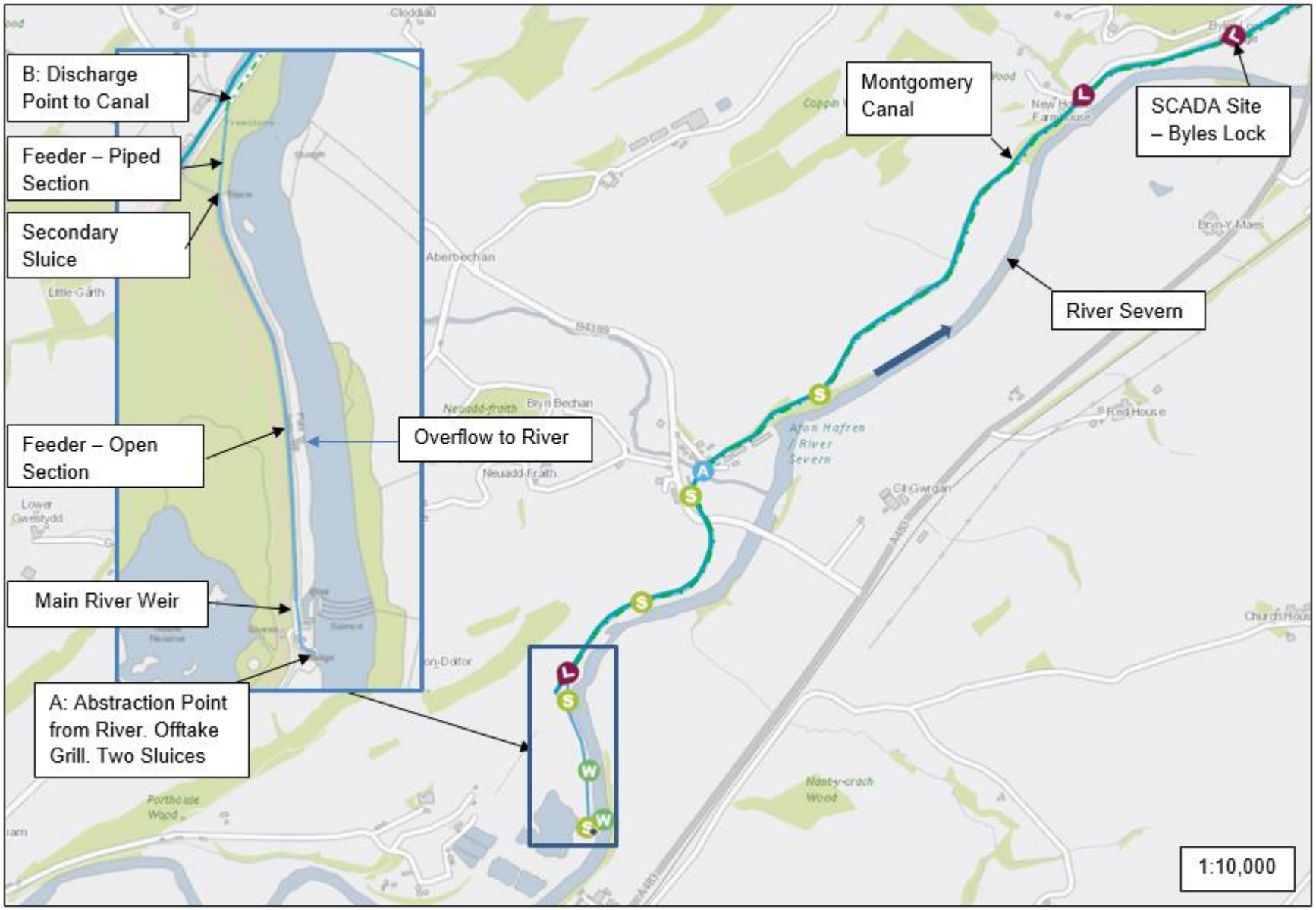
Canal & River Trust Generic Map Key:



7.1 CRT286_Penarth Feeder Location Map

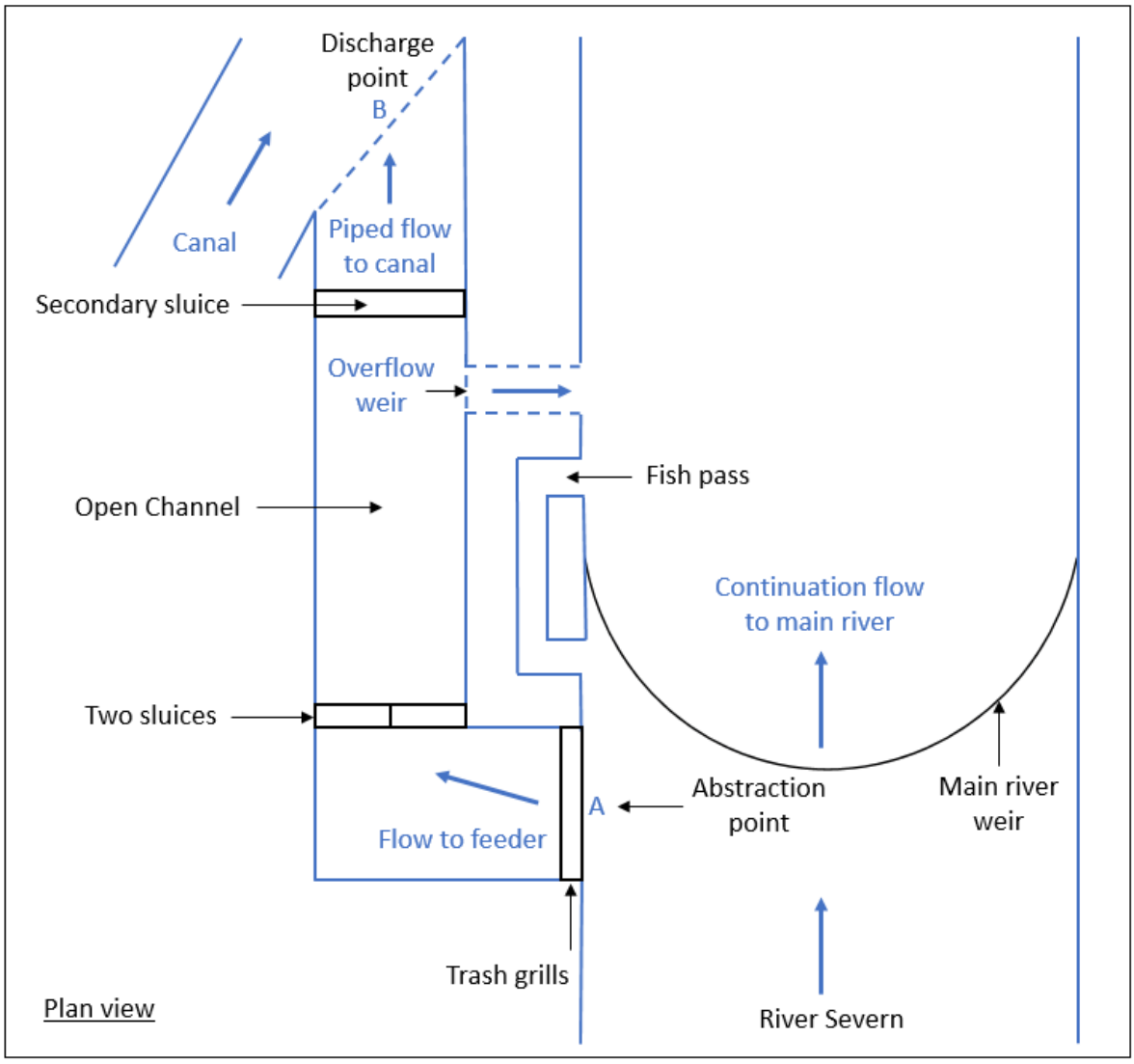


8.4 CRT286_Penarth Feeder Abstraction Details

**General Description:**

Penarth Feeder is a Scenario 2a feeder (as detailed in Navigation Scenario Workbook), with variable structures. The abstraction is from the main River Severn at Penarth which is diverted into the feeder channel via a main river weir. Flow into the feeder is then controlled by two adjacent sluices. The abstraction discharges into an open channel where it then flows to a secondary sluice used to discharge to the Montgomery Canal. The section between this secondary sluice and the canal is culverted. Please see schematic of abstraction arrangement.

**Schematic of Abstraction Arrangement:**




**Details of the Structures:**

Flow is diverted to the canal via a main river weir (with fish pass). Flow enters the head of the feeder channel, via trash grilles. Flow continues to two adjacent 0.6m x 0.6m sluices which are generally operated alternately to feed water into the open channel downstream. Flow then continues down this open channel to a further 1.2m x 0.6m sluice used as a secondary and final control to feed water through a piped section to the canal. Excess flow can be discharged back to the River Severn via an overflow weir in the open channel.

Please refer to photographic record in section 8.5 CRT286_Penarth Feeder Evidence of Abstraction below for photographs of the abstraction arrangement.

**Means of Measurement/Assessment of Abstraction Quantities Method:**

The abstraction is monitored via the Trust's telemetry/SCADA (Supervisory Control and Data Acquisition) system approximately 2.5km downstream of the abstraction on the Montgomery Canal at Byles Lock. Bypass flow and lockage are monitored at this location. A thin plate weir is installed at the downstream end of the bypass channel around the lock. Head over weir is recorded over the weir crest at this location. The flow is then calculated from the recorded head over weir using the standard weir equation for thin plate weirs as follows:

$$Q_B = Cd \times (2/3 \times \sqrt{2g}) \times b \times (h^{3/2})$$

where $Q_B$ is the bypass flow in $m^3/s$, $Cd$ is the coefficient of discharge, $g$ is acceleration due to gravity in $m/s^2$, $b$ is the breadth of the weir in m and $h$ is the recorded head of water over the weir in m. Lockage can be defined as the filling and emptying of a lock chamber and is monitored using a lock counter at this location. Lockage flow is derived from these data as follows:

$$Q_L = L \times V$$

where $Q_L$ is the lockage flow in $m^3$, $L$ is the recorded lockage and $V$ is the lock volume in $m^3$. Abstraction quantities have then been calculated as follows:

$$Q = Q_B + Q_L$$

where $Q$ is the total flow/abstraction in $m^3$, $Q_B$ is the bypass flow in $m^3/s$ and $Q_L$ is the lockage flow in $m^3$.

**General principles of maintaining a level on Canal & River Trust Navigations:**

The purpose of water control at the Canal & River Trust (the Trust) is to keep the water level within a Normal Operating Zone (NOZ) to minimise business risks. The business risks associated with high water levels include overtopping, which could lead to canal infrastructure damage ranging from towpath surfacing to catastrophic embankment failure or breach. Low levels can lead to damage to canal lining and in cases of rapid drawdown collapse of canal bank, in addition to insufficient navigable depth which can lead to disruption and inconvenience to our customers, damage to reputation, loss of income and/or environmental/ ecological damage such as algal blooms, fish distress, kills etc. and/or impact on water sales (hands off flows, commercial agreements, intake structures exposed).

Generally, canals operate within the NOZ (Figure 8.41 below), which is a zone of tolerance around a Normal Water Level (NWL); NWL is usually determined by refining a given level based on unobstructed passage for navigation and efficient use of available resources (water and manpower).

Across the Trust's canal network, NWL may or may not be the same as 'level', 'pound datum' or 'zero' and slight variations between NWL and 'level' exist across the network i.e. in some areas NWL is equivalent to 'level', whereas in other areas 'level' maybe the bywash cill and NWL is 25 to 50mm above this to maintain a flow and level throughout the lower pounds in the canal.

The lower limit of the NOZ is generally governed by the minimal navigable depth of the section of canal in question, below NWL. Assuming pound datum and NWL are the same, then typical values of the lower limit of NOZ are in the region of - 200mm from pound datum. Depending on location, this can vary between -450mm and -100mm.

The upper limit of the NOZ is generally governed by the available freeboard of the section of canal and then subtracting a 'margin' from this. The freeboard enables the canal to have a degree of passive control, by the waste and bywash weirs (and in some areas the top beam of the lock gates), before requiring active intervention/flood control activities to avoid overtopping of the canal. In some locations on the network, the upper limits of NOZ is governed by the air draft under a bridge, i.e. the point below NWL beyond which navigational issues occur due to restricted head room.

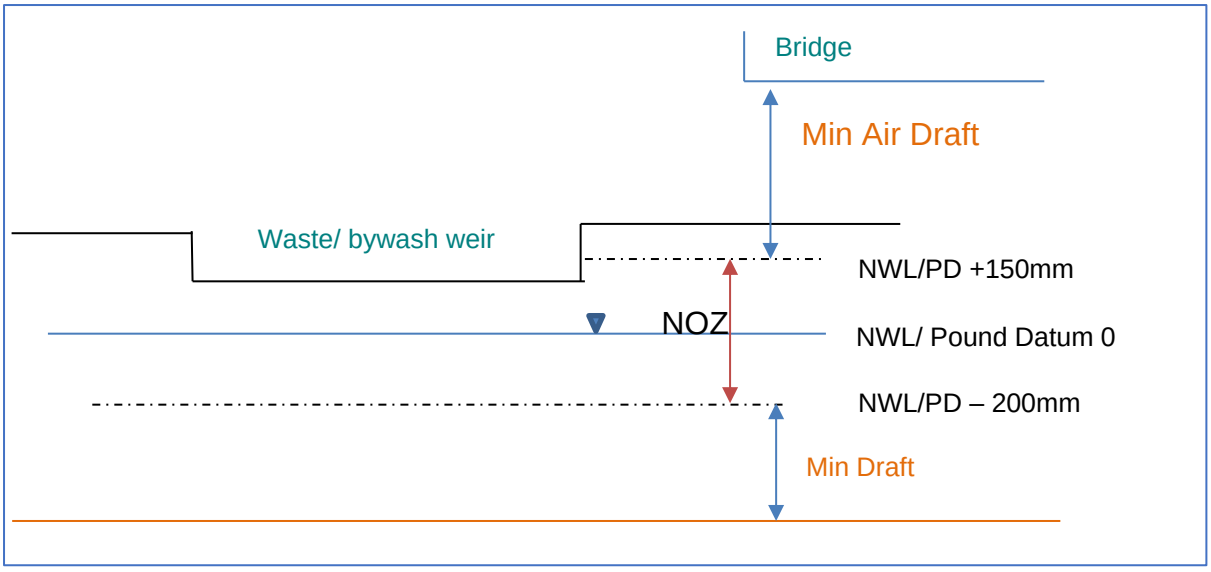



Figure 8.41: Example of Normal Operating Level on Canal & River Trust Navigations

8.5 CRT286_Penarth Feeder Evidence of Abstraction

**Telemetry/SCADA data:**

The abstraction is measured and recorded via the Trust's telemetry/SCADA system. Figure 8.51 below shows the daily mean abstraction quantities for the period 2011-2017 inclusive.

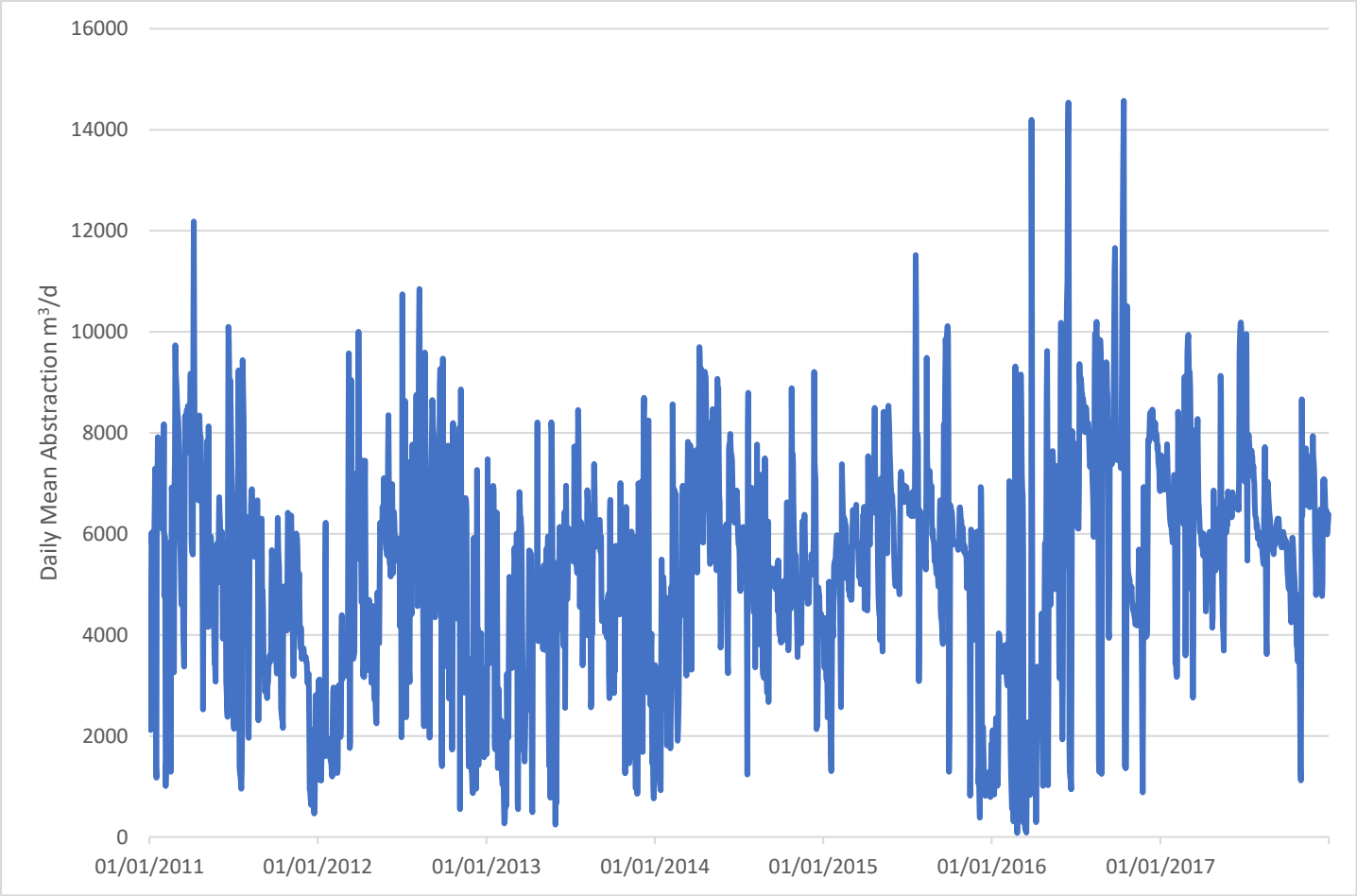



Figure 8.51 Daily mean abstraction 2011-2017

**Photographic Record:**

Photo 1: Penarth – main river weir looking upstream & direction of flow to the canal

Photo 2: Penarth – main river weir looking downstream & direction of flow to the canal 29.06.17

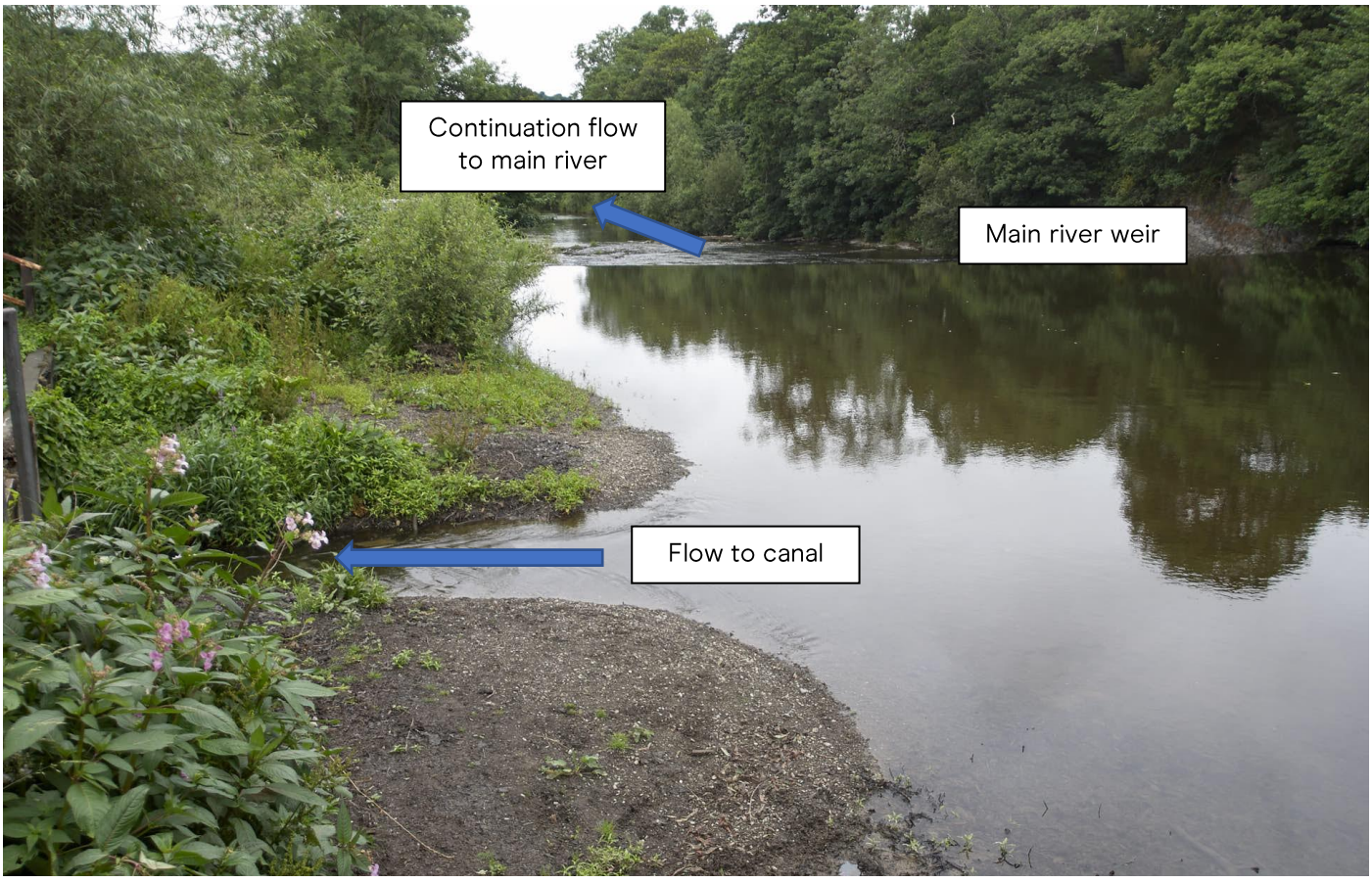


Photo 3: Flow to the canal downstream of grilles and upstream of two adjacent sluices

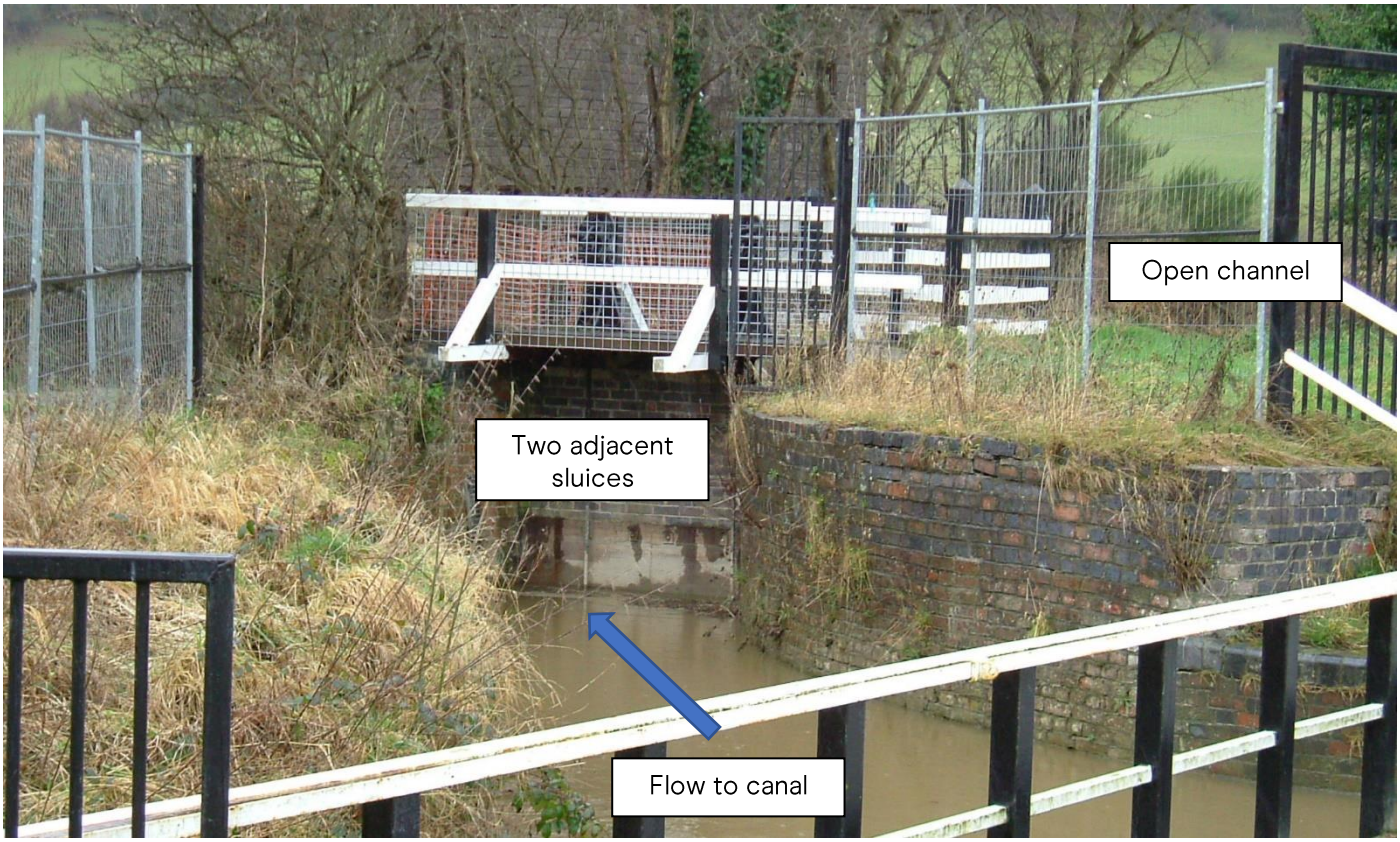



Photo 4: Two adjacent sluice gates 29.06.17

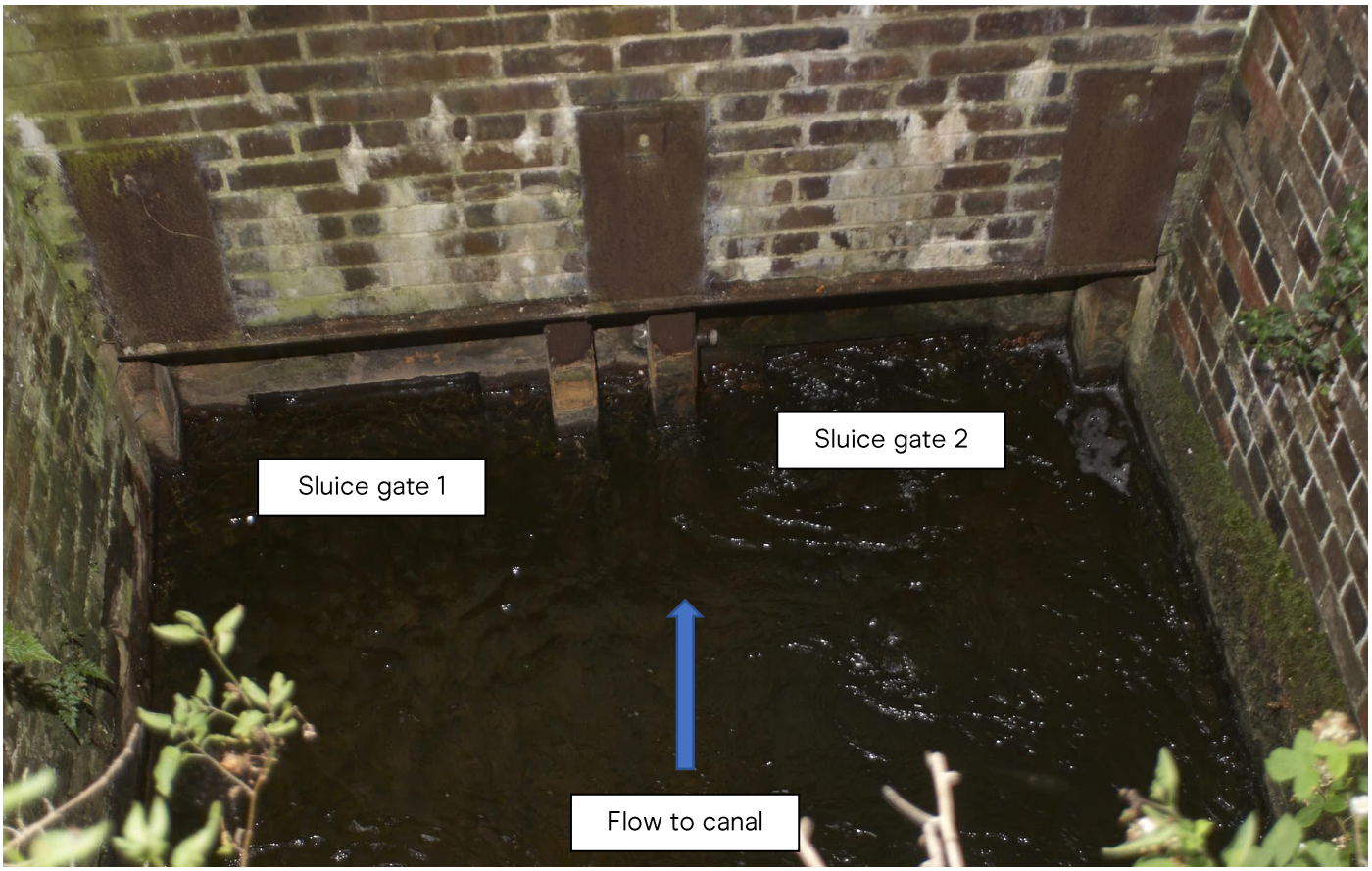
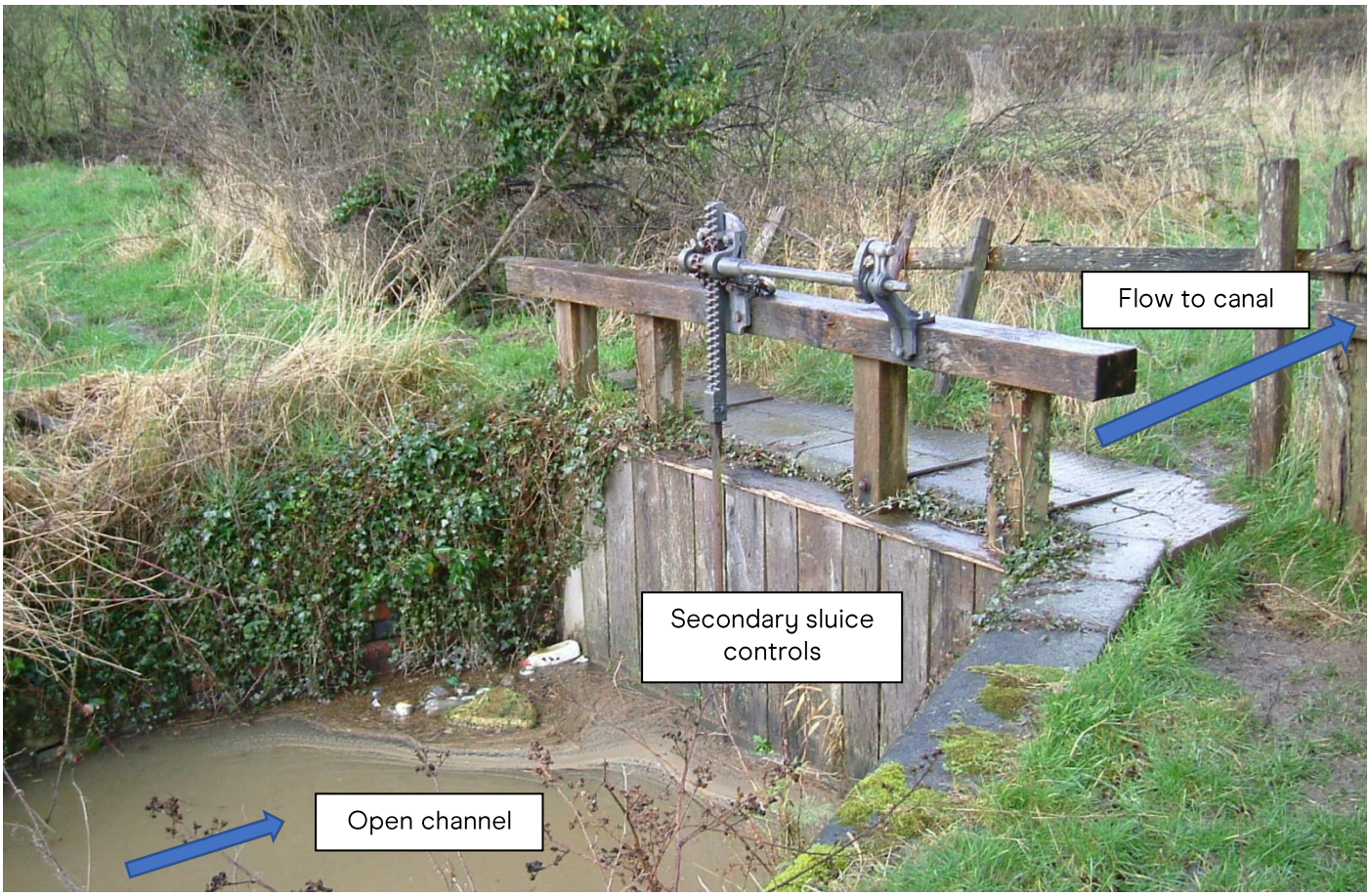


Photo 5: Open channel downstream of two adjacent sluices 29.06.17

Photo 6: Overflow from open channel back to main River Severn

Photo 7: Secondary sluice controls to canal



13.1 CRT286_Penarth Feeder - Other Abstractions

Penarth Feeder is one of three controlled feeders included within the Montgomery Canal Operating Agreement 1987 between the Trust, Natural Resources Wales and the Environment Agency, along with Tanat Feeder and Maesbury Mill. A separate application has been submitted for Tanat Feeder (CRT141).

An application will not be submitted for Maesbury Mill as we have not used the feeder during the qualifying period 2011-17. We do not own the existing sluice on site nor the land on which it is located. The sluice is owned and operated primarily by a third party, and any water transferred into the Montgomery Canal during the qualifying period has been done so by the third party and not by the Trust to support navigation. The existing infrastructure is currently in disrepair and temporary measures have been put in place to stop any feed from entering the canal.

Please see attached Operating Agreement and below for the requirements of this Operating Agreement relevant to this application:

- Section 9 (b) – 'The Board *[now the Canal & River Trust]* shall limit the amount of water entering the canal during any river regulation period to such extent that the maximum flows specified in paragraphs (c), (d) and (e) below are not exceeded and shall not cause or permit any water to enter the canal by means of the 'Penarth'……'Feeder'……'during any such period of time when the storage of water in Llyn Clywedog is less than 25% of its capacity at the date of this agreement.'
- Section 9 (c) – 'The maximum flow passing down the canal at Byles Lock including any flow in any bypass channel at that point during any river regulation period shall be –
    - (i) 150Ml in any period of 7 days when no order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged by the water authority from Llyn Clywedog and the amount of water released from Llyn Clywedog exceeds 300Ml per day but does not attain 500Ml per day;
    - (ii) 115Ml in any period of 7 days when such releases attain 500Ml per day; and;
    - (iii) 50Ml in any period of 7 days during which an order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged by the water authority from Llyn Clywedog.

BRITISH WATERWAYS BILL

AGREEMENT RESPECTING THE

MONTGOMERY CANAL

IN PARLIAMENT

SESSION 1987-88

# BRITISH WATERWAYS BILL

## AGREEMENT RESPECTING THE MONTGOMERY CANAL

**THIS AGREEMENT** is made the 19th day of October 1987 **BETWEEN** the **BRITISH WATERWAYS BOARD** (hereinafter called "the Board" which expression shall include their successors in title and persons deriving title under them) and the **SEVERN-TRENT WATER AUTHORITY** (hereinafter called "the water authority" which expression shall include their successors in title and persons deriving title under them).

**WHEREAS** the Board have deposited in Parliament in the Session 1986-87 a Bill (hereinafter called "the Bill") intituled "A Bill to empower the British Waterways Board to construct works and to acquire lands for the restoration of the canal from Newtown to Frankton Junction; to make further provision with respect to such restoration; and for other purposes":

**AND WHEREAS** the water authority have agreed to refrain from opposition to the Bill in consideration of the terms of the agreement herein set forth:

**IT IS HEREBY AGREED** between the Board and the water authority that in consideration of the water authority

refraining from all further opposition to the Bill and subject to the Bill becoming law in substantially its present form, the following provisions shall, unless otherwise agreed between the Board and the water authority, apply and have effect:-

INTERPRETATION

1. In this agreement and unless the context otherwise requires, words and phrases have the same meaning as in the Bill as enacted provided that, for the avoidance of doubt, any reference to "the canal" shall be deemed to include a reference to any feeder maintained by the Board in connection with the canal.

2. This agreement shall apply and have effect to supplement the protection to be conferred upon the water authority under the provisions of the Bill as enacted and nothing in this agreement shall be construed as derogating from the rights and powers of the water authority under those provisions or otherwise.

3. To the intent that it shall be fully binding upon the Board and its successors, this agreement is made inter alia pursuant to section 40 of the Severn-Trent Water Authority Act 1983 and in connection with so much of the canal the legal estate whereof is vested in the Board at the date of this agreement.

THE NEWTOWN SEWER

4. (a) The Board shall not under the powers of the Bill as enacted except so far as may be permitted pursuant to paragraph (b) below -

(i) enter upon, use or acquire any interest in land lying, at whatever level, within 3 metres, measured horizontally, of the centre line of the Newtown sewer ("the regulated land");

(ii) use, strengthen, widen, improve, remove, alter or otherwise interfere with the Newtown sewer.

(b) The Board may with the consent in writing of the water authority which shall not be unreasonably refused, subject to such reasonable conditions as the water authority may specify and, subject thereto, pursuant to the provisions of the intended substitute clause 34 (For protection of drainage authorities) of the Bill as enacted -

(i) enter upon, use or acquire interests in or rights over the regulated land so far as may be reasonably required for or in connection with the following purposes:-

(A) Work No.1 generally;

(B) Work No.1, on a convenient alignment (to be agreed between the parties or, in default of agreement, determined by arbitration) at the point where it passes under Rock Farm Bridge and between the said bridge and Rock Lock;

(C) a towpath to be provided in connection with Work No.1;

(D) the stopping up and diversion of the footpath and vehicular access in the manner

shown on sheet No.1 of the deposited plans;

(E) the intended crossing of the canal over the Newtown sewer at National Grid Reference S013439252;

(F) accommodation access works in relation to Rock Lock and Rock Farm and the provision of swing or lift bridges at -

(a) Port House; and

(b) at a point between Port House and the Newtown Water Reclamation works at National Grid Reference S013269255;

(G) a winding hole or turning point for vessels to be provided between Rock Farm and the Old Pumping Station at Newtown; and

(H) an accommodation bridge over the canal at a point between Rock Farm and the said Old Pumping Station together with a way for pedestrians and vehicles between the B4568 road and the car park and mooring basin to be provided in the field adjacent to the river Severn; and

(ii) make, maintain, alter, replace or relay works within the regulated land for or in connection with the aforesaid purposes.

(c) The water authority shall not be required to give their consent under this agreement to -

(i) the construction of any permanent works within the regulated land, other than

permanent works for or in connection with the purposes mentioned in paragraphs (b)(i)(B) to (H) above; or

(ii) the removal or alteration of the Newtown sewer except for -

(A) such removal or alteration as may be required as part of the realignment of the sewer for or in connection with the purpose mentioned in paragraph (b)(i)(B) above; and

(B) the alteration of the upper levels of manhole shafts and covers forming part of the sewer for or in connection with the purpose mentioned in paragraph (b)(i)(C) above.

(d) The reasonable conditions subject to which the water authority may grant their consent under paragraph (b) above may include conditions requiring the submission to and approval by the water authority prior to the commencement of work of the details of the proposed method of working and requiring the Board to carry out or pay to the water authority the cost of carrying out works for the protection of the Newtown sewer.

(e) The Board shall from time to time pay to the water authority

(i) any additional expense to which the water authority may be put in the maintenance, management, repair or renewal of the Newtown sewer (including the cost of providing and

maintaining protective works such as are referred to in paragraph (d) above in connection therewith) as a result of the construction of any works authorised by the Bill as enacted; and

(ii) all costs, charges and expenses which the water authority may reasonably incur or have to pay or which they may sustain in watching over or inspecting any specified works (within the meaning of the intended substitute clause 34 (For protection of drainage authorities) of the Bill as enacted) affecting the Newtown sewer.

(f) In this clause "the Newtown sewer" means that length of public sewer draining from the upstream limit of Work No.1 at National Grid Reference S011829227 to the Newtown Water Reclamation Works at National Grid Reference S013439251.

**FLOOD PLAIN COMPENSATORY WORKS**

5. (a) In order to preserve the flood plain storage capacity of the lands adjoining the river Severn existing prior to the execution of the works, the Board shall prior to the construction of those parts of Work No.1 and Works Nos.3 and 3A respectively which encroach on the flood plain carry out in respect thereof adequate flood plain compensatory works and thereafter maintain the same at their own expense and to the reasonable satisfaction of the water authority -

(i) from the upstream limit of Work No.1, down

as far as the upstream limit of the flood argae of the Newtown Water Reclamation Works at National Grid Reference SO13419249 within the lands in the community of Newtown and Llanllwchaiarn numbered 26 on the deposited plans; and

(ii) adjacent to Works Nos. 3 and 3A within the lands in the community of Berriew numbered 6A, 8A, 15A, 15B and 15C on the deposited plans.

(b) Each of the flood plain compensatory works referred to in paragraph (a) above shall be a "specified work" for the purposes of the intended substitute clause 34 (For protection of ~~Severn Trent Water Authority~~ drainage authorities) of the Bill as enacted.

**WERN OVERFLOW**

6 (a) The Board shall (unless its construction is shown by the Board to the reasonable satisfaction of the water authority to be unnecessary for the purpose of securing so far as practicable that water from the canal is returned to the river Severn) at their own expense and within 2 years of the commencement of the works specified in Schedule 1 to the Bill (other than highway works) between Carreghofa lock and the Wern overflow and in any event prior to the completion of those works, construct and thereafter maintain in connection with those works and to the reasonable satisfaction of the water authority an adequate overflow pipe to the river Severn from the Wern overflow point on the canal at National Grid Reference SJ26041298.

(b) The said pipe shall be a "specified work" for the purposes of the intended substitute clause 34 (For protection of ~~Severn Trent Water Authority~~ drainage authorities) of the Bill as enacted.

ACCESS TO SEWER

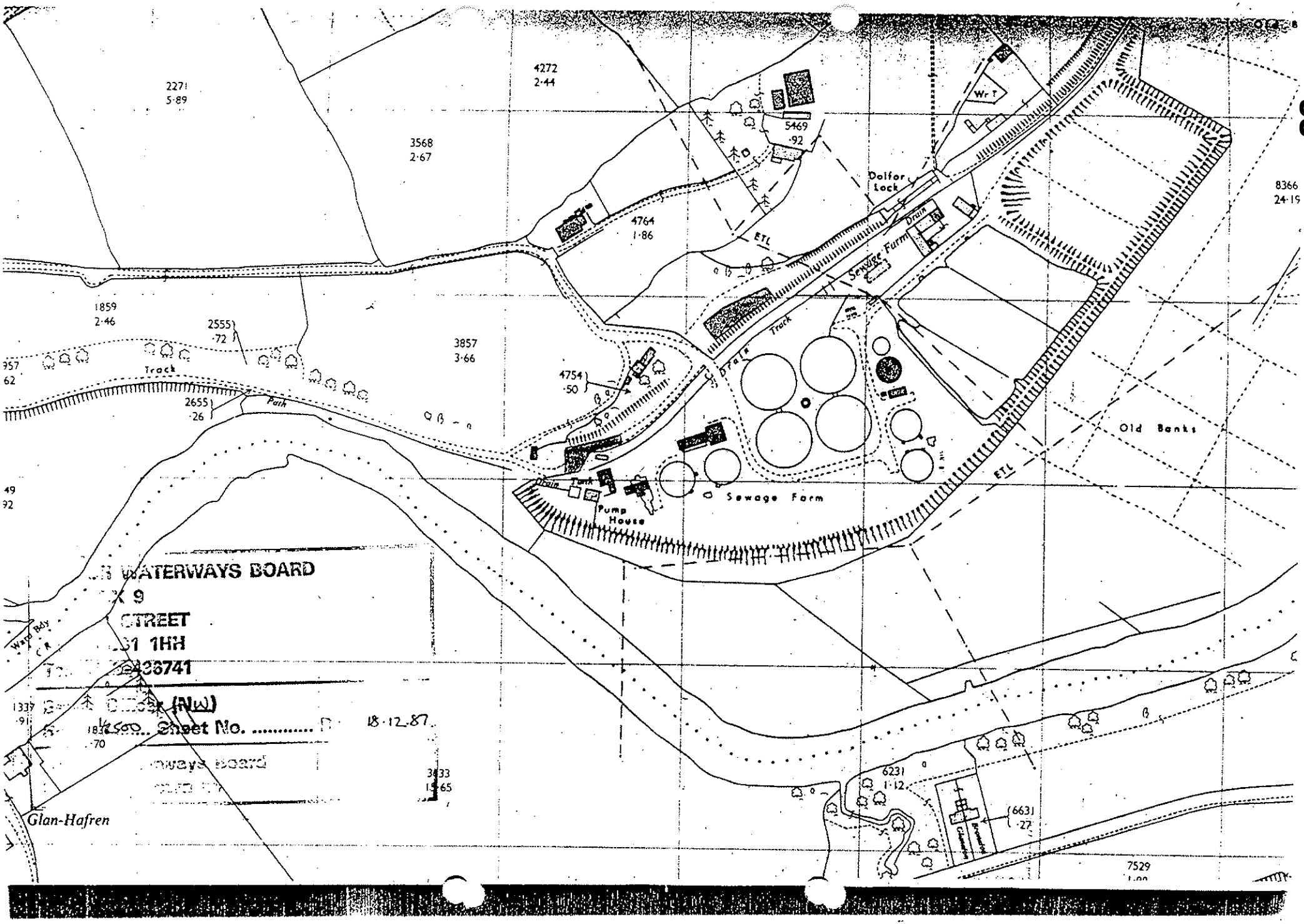
7. Any rights acquired by the Board under subsection (3)(g) of clause 22 (Purchase of rights over land - access to water authority's sewer) of the Bill as enacted shall be conveyed by the Board to the water authority free of charge.

NEWTOWN WATER RECLAMATION WORKS

8. (a) The Board shall not, prior to the completion of Work No.1B, temporarily stop up, divert or interfere with the existing means of access to and egress from the property of the water authority known as Newtown Water Reclamation Works (hereinafter referred to as "NWRW") without providing alternative means of access thereto and egress therefrom for all purposes for persons, equipment, plant, machinery and vehicles to the reasonable satisfaction of the water authority.

(b) Work No.1B shall be constructed and subject to paragraph (c) below thereafter maintained by and at the expense of the Board so as to provide such reasonable means of access to and egress from NWRW as the water authority may reasonably require and the Board shall on request by the water authority execute such deed of grant in favour of the water authority and its successors and assigns as the water authority may reasonably require to confirm all such requirements.

(c) Upon the completion of Work No.1B to the

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reasonable satisfaction of the water authority, the maintenance of the road forming part of that work (including so much of it as is carried by the bridge) shall be the responsibility of the water authority.

(d) Having regard to the requirements of paragraphs (b) and (c) above, the Board shall submit to the water authority a plan, section and description of Work No.1B for their reasonable approval and shall not construct that work except in accordance with the plan, section and description submitted and approved as aforesaid or settled by arbitration and in accordance with such reasonable requirements as may be made by the water authority for securing access to and egress from NWRW.

(e) In the event of their proceeding to execute any part of Works Nos.1, 1A and 1B and immediately prior to the closure in connection with those works of the existing parking area shown coloured green on the attached plan the Board shall make such reasonable provision for the parking of vehicles by fishermen as the water authority may require on the land shown coloured pink on the said plan in order to prevent or avoid obstruction of access to and egress from NWRW.

(f) Clause 35 (For protection of electricity, gas and water undertakers) of the Bill as enacted, shall apply to the submission and approval of plans under this paragraph.

REGULATION OF FLOWS

9. (a) This clause shall have effect as from the //

date of the commencement of any of the works.

(b) The Board shall limit the amount of water entering the canal during any river regulation period to such extent that the maximum flows specified in paragraphs (c), (d) and (e) below are not exceeded and shall not cause or permit any water to enter the canal by means of the Penarth Tanat and Maesbury Feeders or from the proposed Newtown pumping station during any such period at a time when the storage of water in Llyn Clywedog is at less than 25% of its capacity at the date of this agreement.

(c) The maximum flow passing down the canal at Byles Lock including any flow in any bypass channel at that point during any river regulation period shall be -

(i) 150 Ml in any period of 7 days when no order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged by the water authority from Llyn Clywedog and the amount of water released from Llyn Clywedog exceeds 300 Ml per day but does not attain 500 Ml per day;

(ii) 115 Ml in any period of 7 days when such releases attain 500 Ml per day; and

(iii) 50 Ml in any period of 7 days during which an order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged by the water authority from Llyn Clywedog.

(d) The maximum flow passing down the feeder

channel from the river Tanat to the Canal at Carreghofa lock during any river regulation period shall be -

(i) 49 Ml in any period of 7 days; or

(ii) such lesser amount as may be specified by the water authority in order to maintain at any time a residual flow of 15 Ml per day downstream of the weir known as the Carreghofa or Tanat Weir, to be calculated by reference to the water authority's river gauge at Llanyblodwell and by reference to gaugings taken by the water authority below such weir.

(e) The maximum flow to be taken from the river Morda at Maesbury Mill during any river regulation period shall be 14 Ml in any period of 7 days.

(f) To ensure minimum loss of water from the canal via overflow weirs, the Board shall secure during any river regulation period that the maximum water storage level at Trwstllewellyn except during flood conditions is not higher than 25mm below the lowest sill of the existing overflow weir at that point.

(g) The Board shall not during any river regulation period take water into the canal except in flood conditions from any source other than -

(i) the Newtown pumping station;

(ii) Penarth Feeder;

(iii) Lledan Brook Feeder;

(iv) Tanat Feeder;

(v) Maesbury Mill (from the Morda Brook); and

(vi) Frankton,

without the consent of the water authority which consent shall not be unreasonably withheld but this clause shall not apply to the flow of existing streams and drains which at the date of this agreement discharge into the canal: Provided that nothing in this clause shall entitle the Board to cause or permit any material increase in the flow or capacity of any of those sources.

(h) The Board shall maintain for the purposes of this clause the gauges fixed in the bypass channels at Byles Lock and Carreghofa Lock on the canal and the gauges which are fixed at the existing Wern overflow (at National Grid Reference SJ25171407) or such other gauges as may be agreed between the parties.

(i) If any gauge is reasonably required by the Board or the water authority in order to measure or record flows of water for the purposes of this clause and it is agreed in writing between them or, in default of agreement, settled by arbitration that such a gauge should be provided, that gauge shall be provided and maintained by and at the expense of the Board in the case of a gauge to be installed on the canal and by the water authority in the case of a gauge to be installed on a watercourse for which they are responsible.

(j) The Board shall permit the water authority and the water authority shall permit the Board to inspect any gauges which may be maintained or operated by the other

party and so far as may be reasonably required for the purposes of this agreement and the Board shall afford to the water authority such facilities as the water authority may reasonably require for the placing, maintenance and operation of their own gauges to measure and record the flow and level of water in the canal.

(k) Operating rules shall be agreed between the Board and the water authority or in default of agreement settled by arbitration to provide for the giving and exchange of any necessary information by the Board and the water authority for the purposes of the provisions of this ~~paragraph~~ clause including the provision by one party of such information as the other may reasonably require including -

(i) inflows to the canal at the proposed Newtown Pumping Station, at the Penarth, Tanat and Maesbury Feeders and at Frankton Lock;

(ii) storage volumes and levels in the canal;

(iii) outflows from the canal at Wern and other sites;

(iv) predicted daily abstractions for the next week at the proposed Newtown Pumping Station and the Penarth and Tanat Feeders;

(v) lockage records;

(vi) releases from Llyn Clywedog;

(vii) storage volumes in Llyn Clywedog; and

(viii) flows at Llanyblodwell River Gauge.

(l) The provisions of paragraphs (b) and (g) of this clause shall be reviewed and revised as may be agreed

between the parties or, in default of agreement, settled by arbitration -

(i) in the event of any proposal being made by the water authority for the amendment of the operating rules for regulation of the river Severn, as published by the water authority in October 1985, or for the making of any further rules to supplement, vary or replace those rules or any rules replacing them which may significantly affect,adversely to the Board's interests, the flow regime in the river Severn at the Penarth Feeder through the operation of Llyn Clywedog; or

(ii) if, 7 years after the completion of the works by the Board (which date shall be agreed between the Board and the water authority or, failing agreement, settled by arbitration) or on any seventh anniversary thereafter, it is shown by the Board that excessive restraints as to the taking of water by the Board have been imposed under this clause regard being had to the requirements of the water authority to provide resources to support the abstraction of water from the river Severn for the purposes of public water supply.

(m) In this and the next two following clauses "river regulation period" means any period of time in

respect of which the water authority notify the Board in writing that water is being or is about to be released by the water authority from Llyn Clywedog to support the flow in the river Severn.

**OVERFLOWS**

10. (a) No existing overflow from the canal shall be lowered or otherwise altered and no new overflow or sluice on the canal shall be constructed by the Board without the prior approval in writing of the water authority as to its ~~level~~ and as to the arrangements for returning flow to the river Severn.

(b) Paragraph (a) above shall not apply with respect to the temporary removal of any capping on an overflow provided that all such cappings shall be reinstated prior to and maintained during any river regulation period.

(c) Any work to which paragraph (a) above applies shall be a "specified work" for the purpose of the intended Substitute clause 34 (For protection of ~~Severn Trent Water Authority~~ drainage authorities) of the Bill as enacted.

**PUMPING FROM CANAL**

11. (a) The Board shall not without the consent of the water authority pump from the canal to the Llangollen Canal -

(i) during any period of 7 days comprised in any river regulation period and/or the period not exceeding 14 days prior to any river regulation period following notice by the water authority to the Board of the intended

commencement of the river regulation period, a quantity of water exceeding that which passes from the Llangollen Canal into the canal during the said period of 7 days;

(ii) in any period of 8 months, a quantity of water exceeding that which passes from the Llangollen Canal into the canal during that period.

(b) The Board shall notify the water authority immediately and by the most convenient means available of the commencement of pumping in accordance with paragraph (a) of this clause and the water authority shall from time to time provide to the Board the name, address and telephone number of their officer to whom such notification is to be given.

(c) The Board shall maintain and make available for inspection by the water authority records of the quantities of water which pass every day from the Llangollen Canal to the canal or which are pumped from the canal to the Llangollen Canal.

(d) The records maintained in accordance with paragraph (c) of this clause shall be in such form as to indicate clearly the difference between the quantities passing to or pumped from the canal in any day.

**SURFACE WATER SUPPLY**

12. Without prejudice to the conferment of and subject to the exercise by the water authority of any powers which may be conferred upon the water authority under any public

general legislation enacted after the date of this agreement, the water authority will not seek to charge the Board in respect of surface water taken into the canal from existing feeders.

**DISCHARGES BY WATER AUTHORITY**

13. (1) The water authority shall be entitled, subject to any necessary statutory consents, to discharge surface water from their public sewers (other than those used in whole or in part for foul water drainage) into the canal free of charge from any existing discharge point.

(2) The water authority's entitlement under this paragraph shall cease to apply in respect of any discharge point where the capacity at that discharge point is enlarged.

(3) Nothing in this clause shall prejudice or affect the operation of any agreement in existence at the date of this agreement regulating the relations between the Board and the water authority in respect of any discharge.

**ARBITRATION**

14. Any difference arising between the Board and the water authority under this agreement (other than a difference as to the construction of this agreement) shall be settled by arbitration in the manner provided by the Bill as enacted.

**CYNGOR CEFN GWLAD CYMRU**
**COUNTRYSIDE COUNCIL FOR WALES**

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

**POWYS** **MONTGOMERY CANAL**

**Dates of Notification:** 1959, 1986, 1988, 2000

**National Grid Reference:** SJ 220058

**O.S. Maps:** 1:50,000 Sheet number: 126, 136
1:10,000 Sheet number: SJ22, SJ21, SJ20, SO19.

**Site Area:** 55.7 ha

**Description:**

The Montgomery Canal is of special interest because it supports aquatic, emergent and marginal plant communities of exceptional richness, including a large population of the internationally rare and threatened floating water plantain *Luronium natans* and a several other rare and scarce water plants. An important aquatic invertebrate assemblage is also present. The Canal is situated in East Montgomeryshire and extends from Llanymynech at the border with England to Freestone Locks near Newtown. An eastern section of the Guilsfield Arm is also included within the site, as are several off-line canal nature reserves.

The Canal is fed by two rivers; the River Severn enters at Pennarth near Newtown and the River Tanat enters via the Tanat feeder at Carreghoffa. The present nature of the plant and animal communities depends upon a complex interaction between factors such as water chemistry, water flow and management regimes.

The aquatic plant communities of the canal are unusually species-rich. The submerged vegetation is characterised by pondweeds *Potamogeton spp*., including perfoliate pondweed *P.perfoliatus* and lesser pondweed *P.pusillus* and the nationally scarce grass-wrack pondweed *P. compressus*. Other notable aquatic plant species include autumnal water-starwort *Callitriche hermaphroditica*, flat-stalked pondweed *Potamogeton friesii* and long-stalked pondweed *P. praelongus*, which are rare in mid Wales. Floating plants are prominent locally, including yellow water-lily *Nuphar lutea* and various species of duckweed *Lemna spp*. The locally rare greater duckweed *Spirodela polyrhiza* occurs in places and floating water plantain is found along the entire length of the canal in Wales.

The emergent and marginal vegetation is also diverse and well-developed. Dominant marginal species include reed sweet-grass *Glyceria maxima*, bullrush *Typha latifolia* and branched bur-reed *Sparganium erectum*, with a wide range of associated species, including yellow iris *Iris pseudacorus* and the locally rare flowering-rush *Butomus umbellatus*, sweet flag *Acorus calamus* and tubular water-dropwort *Oenanthe fistulosa*.

The canal supports a wide range of dragonfly and damselfly species, including the nationally scarce club-tailed dragonfly *Gomphus vulgatissimus* as well as the white-legged damselfly

*Platycnemis pennipes* and red-eyed damselfly *Erythromma najas*, which are uncommon species in Wales.

Willow and alder carr have developed in association with former borrow pits alongside Wern embankment and these provide habitat for species such as kingfisher *Alcedo atthis* and grass snake *Natrix natrix*.

Otters *Lutra lutra* frequently use the canal for feeding purposes particularly where close to major rivers.

**Remarks:**

The Montgomery Canal is owned by British Waterways.

Floating water-plantain *Luronium natans* is listed on Schedule 8 of the Wildlife and Countryside Act 1981 (Quinquennial Review 1990) and is protected under Annexes IIb and IVb of the EC Habitats and Species Directive.

The Otter *Lutra lutra* is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is protected under Annexes IIa and IVa of the EC Habitats and Species Directive.

*This document is **NOT** a definitive legal version and has been formatted, updated and partially edited for use on the CCW Web site. This document should not be used in any legal proceedings, public enquiry or any other hearing or appeal. If you require a full legal copy of the document please contact CCW in writing.*

*Conservation (Natural Habitats, &c.) Regulations 1994 (SI 1994 No. 2716),*
*fel y'u diwygiwyd / as amended.*

## COFNOD YN Y GOFRESTR O SAFLEOEDD EWROPEAIDD I GYMRU

## ENTRY IN THE REGISTER OF EUROPEAN SITES FOR WALES

*(Rheoliad / Regulation 11.2)*

***ENW'R SAFLE*:**
***SITE NAME*:** Montgomery Canal

***MATH O SAFLE*:** Ardal Cadwraeth Arbennig (ACA)
***SITE TYPE*:** Special Area of Conservation (SAC)

***CÔD Y SAFLE*:**
***SITE CODE*:** UK0030213

***HANES DYNODIAD*:**

***Dyddiad y trosglwyddwyd i'r Comisiwn Ewropeaidd (Rheoliad 7.4)*:**
Hydref 2002

***Dyddiad y mabwysiadwyd fel safle o bwysigrwydd cymunedol (Council Directive 92/42/EEC, Erthygl 4.2)*:**
7 Rhagfyr 2004

***Dyddiad dynodi*:**
13 Rhagfyr 2004

***Dynodwyd gan (Rheoliad 8.1)*:**
Cynulliad Cenedlaethol Cymru

***LLEOLIAD*:**

***Awdurdod unedol:***
Powys

***Cyfesurynnau*:**
Hydred 03 06 56 Gor, Lledred 52 40 57 Gog
Cyfeirnod Grid Cenedlaethol Arolwg Ordnans: SJ245100

***Gweler hefyd y map(iau) amgaeëdig, nad ydynt yn ffurfio rhan o'r cofnod hwn.***

***DESIGNATION HISTORY*:**

***Date transmitted to the European Commission (Regulation 7.4)*:**
October 2002

***Date adopted as a site of community importance (Council Directive 92/42/EEC, Article 4.2):***
7 December 2004

***Date designated*:**
13 December 2004

***Designated by (Regulation 8.1):***
National Assembly for Wales

***LOCATION*:**

***Unitary authority:***
Powys

***Coordinates*:**
Longitude 03 06 56 W, Latitude 52 40 57 N
Ordnance Survey National Grid Reference: SJ245100

***See also the accompanying map(s), which do not form part of this entry.***

***MATHAU O GYNEFIN A/NEU RYWOGAETHAU Y DYNODIR Y SAFLE O'U PLEGID:***
***HABITAT TYPES AND/OR SPECIES FOR WHICH THE SITE IS DESIGNATED:***

| | | Enw cyffredin | Common name | Term Gwyddonol | Scientific term |
|---|---|---|---|---|---|
| 1 | | Llyriad nofiadwy | Floating water-plantain | *Luronium natans* | |

*Mae'n dynodi mathau o gynefin neu rywogaeth y rhoddir blaenoriaeth iddynt (a ddiffinnir yn Erthyglau 1(d) ac 1(h) o Council Directive 92/43/EEC).

*Denotes a priority habitat type or species (defined in Articles 1(d) and 1(h) of Council Directive 92/43/EEC).

***GWNAED Y COFNOD HWN*:**
14 Mehefin 2005

***THIS ENTRY MADE*:**
14 June 2005

***GAN*:**
Trish Fretten, ar ran Gweinidog dros yr Amgylchedd, Cynllunio a Chefn Gwlad, Cynulliad Cenedlaethol Cymru

***BY*:**
Trish Fretten, on behalf of the Minister for Environment, Planning and Countryside, National Assembly for Wales

***LLOFNOD*:** ***SIGNATURE*:**

***DYDDIAD(AU) COFNODION BLAENOROL AR GYFER Y SAFLE HWN:***
Dim

***DATE(S) OF PREVIOUS ENTRIES FOR THIS SITE:***
None

**CYNGOR CEFN GWLAD CYMRU**
**COUNTRYSIDE COUNCIL FOR WALES**

# CORE MANAGEMENT PLAN
INCLUDING CONSERVATION OBJECTIVES

# FOR

# MONTGOMERY CANAL SAC (& SSSI)

**Version:** 1

**Date:** 22nd January 2008

**Approved by:** David Mitchell

**More detailed maps of management units can be provided on request.**
**A Welsh version of all or part of this document can be made available on request.**

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

NATURA 2000

Ramsar

Llywodraeth Cynulliad Cymru
Welsh Assembly Government
CORFF NODDEDIG | SPONSORED BODY

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## PREFACE

This document provides the main elements of CCW's management plan for the site(s) named. It sets out what needs to be achieved on the site(s), the results of monitoring and advice on the action required. This document is made available through CCW's web site and may be revised in response to changing circumstances or new information. This is a technical document that supplements summary information on the web site.

One of the key functions of this document is to provide CCW's statement of the Conservation Objectives for the relevant Natura 2000 site(s). This is required to implement the Conservation (Natural Habitats, &c.) Regulations 1994, as amended (Section 4). As a matter of Welsh Assembly Government Policy, the provisions of those regulations are also to be applied to Ramsar sites in Wales.

## 1. VISION FOR THE SITE

This is a descriptive overview of what needs to be achieved for conservation on the site. It brings together and summarises the Conservation Objectives (part 4) into a single, integrated statement about the site.

*At least 75% of the canal lengths have open water supporting a rich assemblage of floating-leaved, emergent and submerged plants at a cover of 30% or greater. Plant species include broad-leaved pondweed, autumnal water-starwort, rigid hornwort, alternate water milfoil, white water lily, greater duckweed, long-stalked pondweed, flat-stalked pondweed and perfoliate pondweed. Some sections of canal are tree-lined and here, the diversity of aquatic plants is lower, but may include important species such as floating water-plantain. Water plants, such as the invasive, non-native Canadian pondweed, and filamentous algae, which indicate nutrient enrichment, are scarce.*

*Aquatic invertebrates, especially those indicative of good water quality, such as dragonflies and damselflies and water beetles, are abundant along the canal. More than ten species of dragonflies and damselflies breed here.*

*On average there is a 1m wide strip of diverse marginal vegetation, which includes species such as meadowsweet, common skullcap, flowering rush, angelica, common valerian, greater tussock sedge and water dock. Reed sweet grass is confined to this 1m shelf and is not present in the central channel.*

*The populations of floating-water plantain and other regionally rare water plants are stable or increasing across the site as a whole. The population of grass-wrack pondweed is increasing to best historic levels. Populations of all of these plants are sustainable in the long term, their distribution along the canal is not contracting, sufficient habitat exists to support each one and the factors that may affect these plants or their habitats are all under control.*

*Alien aquatic and land-based species, such as Japanese knotweed, water fern, least duckweed and floating pennywort are absent from the canal.*

# 2. SITE DESCRIPTION

## 2.1 Area and Designations Covered by this Plan

Grid reference(s): SJ220058 SJ223060 SJ254203 SO169967 SO173970

Unitary authority: Powys

Area (hectares): 55.9

Designations covered: Montgomery Canal SAC and Montgomery Canal SSSI share exactly the same boundary.

Map 1 shows the coverage of this document.

## 2.2 Outline Description

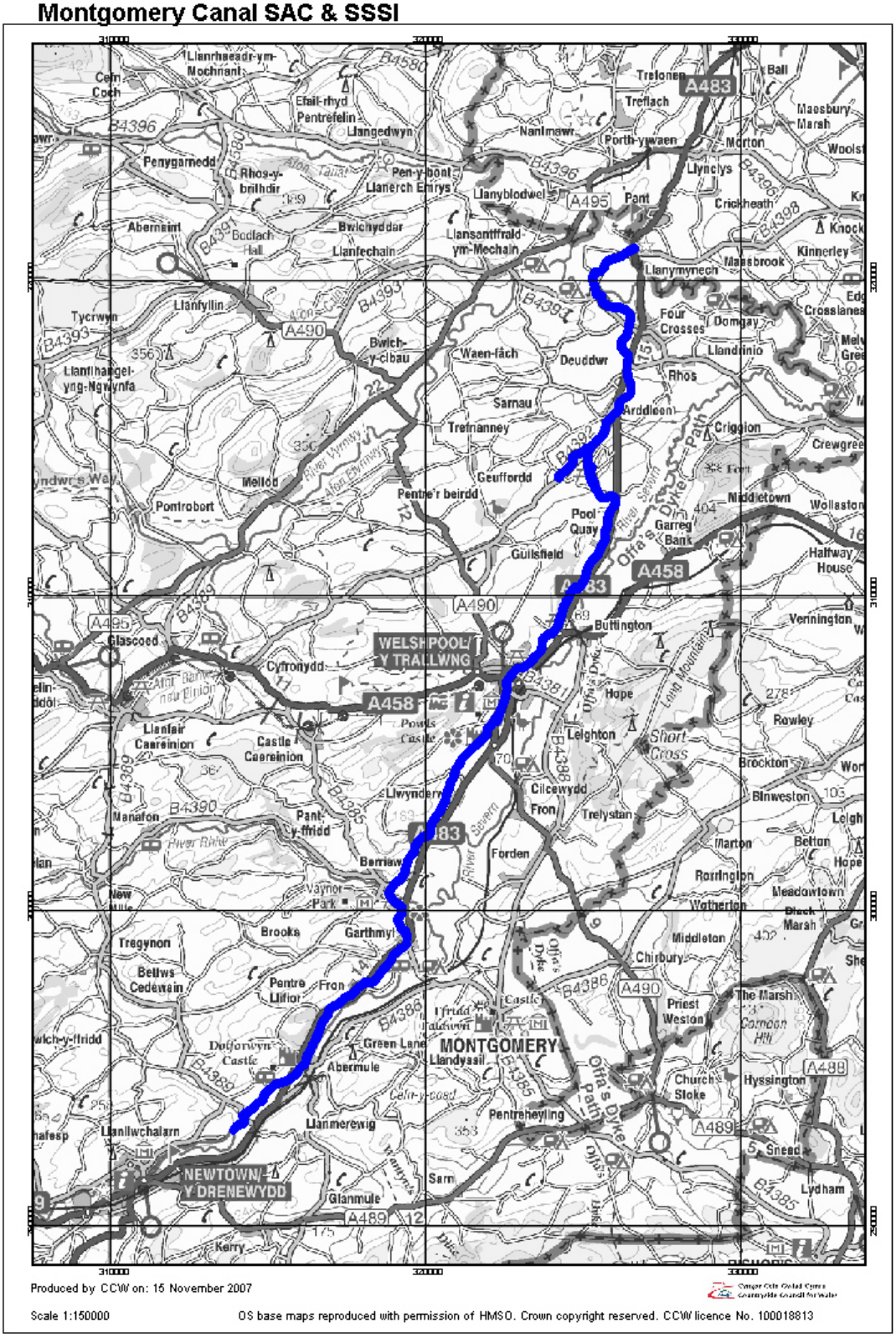
The Montgomery Canal is a partially restored but largely unused waterway. It runs for approximately 36 kilometres from near Aberbechan (three kilometres north-east of Newtown) to the English border at Llanymynech. It also has a small number of linked off-line reserves (kept as small individual management units); these were created to protect examples of the habitats and species found in the canal when restoration of the canal was started in the 1970s.

It supports the largest, most extensive population of floating water-plantain *Luronium natans* in lowland Britain. This is a semi-natural population, having colonised from drift material or seed but needing periodic human disturbance for continued growth; in this respect the canal is a substitute for the species' former slow-moving, mesotrophic river niche, which has been largely destroyed in lowland Britain.

The floating water-plantain is just one of a number of species of submerged, floating and marginal plant species that make up the canal habitat SSSI feature. This habitat is distributed along the entire length of the canal within the SSSI; the interest and quality varies from species-poor to species rich, depending a number of factors, including water depth and management frequency.

**MAP 1:**

## Montgomery Canal SAC & SSSI



## 2.3 Outline of Past and Current Management

Originally the canal was a branch of the Shropshire Union Canal that was connected to the wider English Canal network. The Montgomery Canal in Wales was completed in the early 19th Century and was used to transport various products from this part of Wales. The canal was viable until the First World War, from when there was a gradual deterioration in maintenance and the canal was closed in 1936. Eventually the canal became the responsibility of the British Waterways Board and since the late 1970s there has been some restoration of the canal structure to create the site, as it currently exists.

More recently there has been limited boat traffic along the canal, centred on Welshpool, and British Waterways has maintained the canal through a programme of weed cutting and minor dredging to safeguard water supply and the habitat interests of the site. At present, the lack of funds means that it is difficult to maintain the ideal depth and width of open water over the entire canal that is required to support sustainable aquatic plant communities.

Following collaboration between a number of partners, a strategy for the sustainable restoration of the Montgomery Canal was published in 2005 (**Montgomery Canal Partnership 2005)**. This sets out how the canal will be managed and all its various interests will be safeguarded as the canal is restored and connected to the wider canal network. CCW had considerable input into this document, which sets out the standards that will be applied to ensure that the nature conservation interests of the site are safeguarded. This has been used as the basis for the conservation objectives and performance indicators given in Section 4 of this plan.

## 2.4 Management Units

The plan area has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management units have been based on distribution of the SAC feature and current management of the canal, which is all owned by British Waterways. The units are usually focussed on separating out those lengths where floating water-plantain is abundant, whilst other lengths currently have a low cover or frequency of this species. This has also taken into account the most recent available survey information available for the canal (Newbold 2001).

For a more detailed map of the management units please see accompanying Unit Map.

The following table confirms the relationships between the management units and the designations covered:

| Unit Ref number | Unit Name | SAC | SSSI | CCW owned |
|---|---|---|---|---|
| 1 | Llanymynech to Carreghofa Lock | ✔ | ✔ | |
| 2 | Vynrwy Aqueduct to Pentrehelin | ✔ | ✔ | |
| 3 | Pentrehelin to Bell House | ✔ | ✔ | |
| 4 | Bell House to Red Bridge | ✔ | ✔ | |
| 5 | Guilsfield Arm | ✔ | ✔ | |
| 6 | Wern Reserve | ✔ | ✔ | |
| 7 | Red Bridge to Pool Quay | ✔ | ✔ | |
| 8 | Pool Quay to Buttington | ✔ | ✔ | |
| 9 | Welshpool | ✔ | ✔ | |

| | | | | |
|---|---|---|---|---|
| 10 | Whitehouse Reserve | ✔ | ✔ | |
| 11 | Powis Castle to Berriew | ✔ | ✔ | |
| 12 | Brithdir Reserve | ✔ | ✔ | |
| 13 | Berriew to Garthmyl | ✔ | ✔ | |
| 14 | Garthmyl to Red House | ✔ | ✔ | |
| 15 | Red House to Glanhafren | ✔ | ✔ | |
| 16 | Glanhafren to Freestone Lock | ✔ | ✔ | |

## 3. THE SPECIAL FEATURES

### 3.1 Confirmation of Special Features

| ***Designated feature*** | ***Relationships, nomenclature etc*** | ***Conservation Objective in part 4*** |
|---|---|---|
| *SAC features* | | |
| **Floating water-plantain** *Luronium natans* | EU Species Code: 1831 | 1 |
| *SPA features* | | |
| Not applicable | | |
| *Ramsar features* | | |
| Not applicable | | |

| SSSI features (there may be others) | | |
|---|---|---|
| Open Water (Canal) Habitat | Defined partly by some of the plants listed below | 2 |
| Assemblage of rare and scarce aquatic plants | Includes floating water plantain and grass-wrack pondweed | Not completed |
| Floating water-plantain | This is exactly the same as the SAC feature | 1 |
| Grass-wrack pondweed *Potomogeton compressus* | Regionally rare species | Not completed |
| Autumnal water-starwort *Callitriche hermaphroditica* | Regionally rare species | Not completed |
| Flat-stalked pondweed *Potamogeton friesii* | Regionally rare species | Not completed |
| Perfoliate pondweed *Potamogeton perfoliatus* | Regionally rare species | Not completed |
| Long-stalked pondweed *Potamogeton praelongus* | Regionally rare species | Not completed |
| Greater duckweed *Lemna polyrhiza* | Regionally rare species | Not completed |
| Assemblage of aquatic invertebrates | Regionally rare species | Not completed |

### 3.2 Special Features and Management Units

This section sets out the relationship between the special features and each management unit. This is intended to provide a clear statement about what each unit should be managed for, taking into account the varied needs of the different special features. All special features are allocated to one of seven classes in each management unit. These classes are:

**Key Features**

**KH** - a 'Key Habitat' in the management unit, i.e. the habitat that is the main driver of management and focus of monitoring effort, perhaps because of the dependence of a key species (see KS below). There will usually only be one Key Habitat in a unit but there can be more, especially with large units.
**KS** – a 'Key Species' in the management unit, often driving both the selection and management of a Key Habitat.
**Geo** – an earth science feature that is the main driver of management and focus of monitoring effort in a unit.

**Other Features**
**Sym** - habitats, species and earth science features that are of importance in a unit but are not the main drivers of management or focus of monitoring. These features will benefit from management for the key feature(s) identified in the unit. These may be classed as 'Sym' features because:

a) they are present in the unit but may be of less conservation importance than the key feature; and/or
b) they are present in the unit but in small areas/numbers, with the bulk of the feature in other units of the site; and/or
c) their requirements are broader than and compatible with the management needs of the key feature(s), e.g. a mobile species that uses large parts of the site and surrounding areas.

**Nm** - an infrequently used category where features are at risk of decline within a unit as a result of meeting the management needs of the key feature(s), i.e. under Negative Management. These cases will usually be compensated for by management elsewhere in the plan, and can be used where minor occurrences of a feature would otherwise lead to apparent conflict with another key feature in a unit.
**Mn** - Management units that are essential for the management of features elsewhere on a site e.g. livestock over-wintering area included within designation boundaries, buffer zones around water bodies, etc.
**x** – Features not known to be present in the management unit.

The table below sets out the relationship between the special features and management units identified in this plan:

| **Montgomery Canal** | **Management unit Ref.** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| SAC | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| SSSI | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **SAC features** | | | | | | | | | |
| 1. Floating water-plantain | **Sym** | **KS** | **KS** | **Sym** | **KS** | **KS** | **Sym** | **KS** | **KS** |
| **SSSI features – incomplete** | | | | | | | | | |
| 2. Open Water (Canal) Habitat | KH | KH | KH | KH | KH | KH | KH | KH | KH |

| **Montgomery Canal** | **Management unit Ref.** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **10** | **11** | **12** | **13** | **14** | **15** | **16** |
| SAC | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| SSSI | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **SAC features** | | | | | | | |
| 1. Floating water-plantain | **KS** | **KS** | **KS** | **Sym** | **Sym** | **KS** | **KS** |
| **SSSI features - incomplete** | | | | | | | |
| 2. Open Water (Canal) Habitat | KH | KH | KH | KH | KH | KH | KH |

## 4. CONSERVATION OBJECTIVES

**Background to Conservation Objectives:**

**a. Outline of the legal context and purpose of conservation objectives.**

Conservation objectives are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directives is the maintenance, or where appropriate the restoration of the 'favourable conservation status' of habitats and species features for which SACs and SPAs are designated (see Box 1).

In the broadest terms, 'favourable conservation status' means a feature is in satisfactory condition and all the things needed to keep it that way are in place for the foreseeable future. CCW considers that the concept of favourable conservation status provides a practical and legally robust basis for conservation objectives for Natura 2000 and Ramsar sites.

***Box 1***
***Favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive***

"The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis."

Achieving these objectives requires appropriate management and the control of factors that may cause deterioration of habitats or significant disturbance to species.

As well as the overall function of communication, Conservation objectives have a number of specific roles:

- Conservation planning and management.

  The conservation objectives guide management of sites, to maintain or restore the habitats and species in favourable condition.

- Assessing plans and projects.

Article 6(3) of the 'Habitats' Directive requires appropriate assessment of proposed plans and projects against a site's conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. This role for testing plans and projects also applies to the review of existing decisions and consents.

- Monitoring and reporting.

  The conservation objectives provide the basis for assessing the condition of a feature and the status of factors that affect it. CCW uses 'performance indicators' within the conservation objectives, as the basis for monitoring and reporting. Performance indicators are selected to provide useful information about the condition of a feature and the factors that affect it.

**The conservation objectives in this document reflect CCW's current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by CCW in light of new knowledge.**

**b. Format of the conservation objectives**

There is one conservation objective for each feature listed in part 3. Each conservation objective is a composite statement representing a site-specific description of what is considered to be the favourable conservation status of the feature. These statements apply to a whole feature as it occurs within the whole plan area, although section 3.2 sets out their relevance to individual management units.

Each conservation objective consists of the following two elements:

1. Vision for the feature
2. Performance indicators

As a result of the general practice developed and agreed within the UK Conservation Agencies, conservation objectives include performance indicators, the selection of which should be informed by JNCC guidance on Common Standards Monitoring[1].

There is a critical need for clarity over the role of performance indicators within the conservation objectives. **A conservation objective, because it includes the vision for the feature, has meaning and substance independently of the performance indicators, and is more than the sum of the performance indicators**. The performance indicators are simply what make the conservation objectives measurable, and are thus part of, not a substitute for, the conservation objectives. Any feature attribute identified in the performance indicators should be represented in the vision for the feature, but not all elements of the vision for the feature will necessarily have corresponding performance indicators.

As well as describing the aspirations for the condition of the feature, the Vision section of each conservation objective contains a statement that the factors necessary to maintain those desired conditions are under control. Subject to technical, practical and resource constraints, factors which have an important influence on the condition of the feature are identified in the performance indicators.

[11] Web link: http://www.jncc.gov.uk/page-2199.

## 4.1 Conservation Objective for Feature 1: Floating water-plantain *Luronium natans* (EU Species Code: 1831)

### Vision for feature 1

The vision for this feature is to maintain the extent and distribution of *L. natans* within the Montgomery Canal at favourable conservation status, where all of the following conditions are satisfied:

- The *L. natans* population in favourable condition will reflect the natural carrying capacity of the canal habitat and will be limited principally by species ability to spread or be relocated (vegetative or otherwise), the suitability of the rooting medium and competition between species as part of habitat succession.
- Recreation pressure, principally through boat movements and fisheries management, will not significantly affect the maintenance of the species, or its ability to disperse throughout the canal network and any associated off-line reserves.
- The ecological status of the water environment, including elements of water quality and physical habitat quality, will be sufficient to support the population of *L. natans* in favourable condition.
- All factors affecting the achievement of the above conditions are under control.

### Performance indicators for Feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

| ***Performance indicators for feature condition*** | | |
|---|---|---|
| ***Attribute*** | ***Attribute rationale and other comments*** | ***Specified limits*** |
| **A1.** Extent of *L. natans* | The base-line area (measured from 2001 survey for mapped continuous stands only) is 1.5 hectares. The lower limit is set to allow for up to a 25% decline to allow for natural fluctuations or management activity (like dredging) necessary to restore open water conditions.<br>In reality this is too time-consuming to measure, so will usually be covered by monitoring distribution (A2), unless a new comprehensive mapping survey is completed. | *Upper limit*: None required.<br>*Lower limit*: 1.1 ha |
| A2. Distribution of *L. natans* | This has been set to ensure the size of the population is safeguarded. It also provides a means of ensuring that the species can recolonise areas subject to dredging and weed cutting to maintain open water and water flow.<br>Note that some units are composed of a number of contiguous km lengths.<br>There are no recent records for this species in Units 4, 12 or 13, but at low density this species is very difficult to find. | *Upper Limit*: present along whole length of canal.<br>*Lower limit*:<br>Present in all non-navigable channel kms where it was found in 2001; AND<br>present in 75% of samples and 75% of the mapped area in 2001 in Vyrnwy aqueduct.<br><br>**Also present in** offline reserves at Wern, Guilsfield Arm, Whitehouse |

| *Performance indicators for feature condition* | | |
|---|---|---|
| ***Attribute*** | ***Attribute rationale and other comments*** | ***Specified limits*** |
| | Each offline reserve has also been treated as a separate unit.<br><br>The performance indicator limits are over and above the minimum standards set by JNCC because the plant is so widespread along the canal. | and Brithdir Pools.<br><br>Also requires evidence of spreading by runners, and spreading around site by fragments |

| *Performance indicators for factors affecting the feature* | | |
|---|---|---|
| ***Factor*** | ***Factor rationale and other comments*** | ***Operational Limits*** |
| **F1.** Water Quality | The water determines the quality of the habitat and plant community in which this species grows. These standards are higher than may be required for this species to safeguard the SSSI feature.<br><br>It is recognised that these standards may be replaced by better standards more specific to canals as and when they become available.<br>The standard will only be failed if failure is sustained and is for criteria wider than biochemical oxygen demand and dissolved oxygen.<br>There should be no deterioration from existing levels.<br>These targets should be replaced by experience of the existing data available from the Environment Agency or emerging Water Framework Directive targets over the coming years. | *Upper limit*: As an interim guide the total phosphorus target for the whole canal is <40µg $L^{-1}$ TP. None required for other elements.<br><br>*Lower limit*: The current target is to seek to attain General Quality Assessment Grade A or B for biological water quality, and General Quality Assessment Grade B for water chemical quality. |
| **F2. Water Clarity** | It is considered essential to use a Secchi disk because observation alone cannot be a reliable measure of light penetration.<br>This should not be measured during or after periods of heavy rain. | *Upper limit*: not required<br><br>*Lower limit*; Secchi disk should be visible at depth of 1m in 90% of observations |

## 4.2 Conservation Objective for Feature 2: Open Water (Canal) Habitat

**Vision for feature 2**

The vision for this feature is to maintain the extent, distribution and quality of the floating, submerged, emergent and marginal vegetation that constitutes the canal vegetation habitat feature within the Montgomery Canal at favourable conservation status, where all of the following conditions are satisfied:

- The canal vegetation in favourable condition will reflect the natural carrying capacity of the canal habitat and will be limited principally by species ability to spread or be relocated (vegetative or otherwise), the suitability of the rooting medium and competition between species as part of habitat succession.
- The ecological status of the water environment, including elements of water quality, depth and clarity, will be sufficient to support species-rich canal vegetation with a variety of submerged, floating and marginal species and the populations of locally rare or uncommon species in favourable condition.
- Recreation pressure, principally through boat movements and fisheries management, will not significantly affect the maintenance of the canal vegetation, or its ability to disperse throughout the canal network and any associated off-line reserves.
- All factors affecting the achievement of the above conditions are under control.

**Performance indicators for Feature 2**

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

| ***Performance indicators for feature condition*** | | |
|---|---|---|
| ***Attribute*** | ***Attribute rationale and other comments*** | ***Specified limits*** |
| **A1.** Extent of Canal Vegetation | Lower limit is same as upper limit because the whole canal should support canal vegetation of some description.<br><br>This can be assessed on the basis of all areas being maintained as open water, but allowing for the fact that once over a certain proportion of the channel is dominated by marginal species then a need for dredging will be required. This will effectively be delivered by the performance indicator- A2. | *Upper limit*: 37.5 ha, as limited by available open water habitat.<br>*Lower limit*: 37.5 ha |
| **A2.** Canal Vegetation **– Quantity And Distribution** | Based on the JNCC Standard **Common Standards Monitoring** guidance for this attribute for this feature.<br><br>This should be assessed for individual kilometre lengths. | *Upper limit*: No more that 70% of the channel width should be covered by marginal vegetation<br><br>*Lower limit*:<br>Submerged and floating leaved aquatics should cover at least 30% of the canal channel,<br>AND<br>Marginal (emergent) should cover at least 30% of channel width. |
| **A3.** Canal Vegetation **– Species Richness** | Based on the JNCC Standard **Common Standards Monitoring** guidance for this attribute for this feature. It has been modified according to site-specific requirements to allow for a rotational programme of canal maintenance (dredging & weed cutting), so that not all kilometres lengths have to meet the standard at any one time. This maintenance is to ensure optimal conditions of open water are maintained for the canal habitat and species.<br><br>The performance standards have been set on the basis of monitoring fixed kilometre lengths, but the management units in this plan may be composed of more than one kilometre length.<br><br>The list of species that qualify as aquatic or emergent is site specific. *Elodea* or | *Upper limit*: Not required<br>*Lower limit*: 75% of the Canal Vegetation is 'species-rich' canal vegetation in good condition, characterised by the presence of:<br><br>at least 6 **aquatic** and 6 **emergent** species at DAFOR level Occasional in every 1km of channel;,<br><br>AND<br><br>an average of 7 **aquatic** and 7 **emergent** species per 150 metre sample over full channel length. |

| | | |
|---|---|---|
| | other alien species do not count as aquatic species for this assessment.<br><br>The different figure for the average is to allow some lengths to be far more species rich than others. According the JNCC guidance this is the number of species to be expected in good quality canal vegetation within a 150m sample unit. It is possible that this is over ambitious for this site. | |
| **A4.** Canal Vegetation **– Introduced Species** | Other species may be added to list if the need arises. | *Upper limit*: Each of *Azolla* spp., *Crassula helmsii*, *Hydrocotyle ranunculoides and Myriophyllum aquaticum* occupy less than 50 m of the whole designated site;<br>AND<br>None of these invasive species should be present at DAFOR cover more than Rare in any 150 m survey site.<br>*Lower limit*: none required |
| **A5.** Canal Vegetation **– negative indicator species** | Failure is unlikely on this attribute alone, but it will be monitored. | *Upper limit:* Filamentous algae and combined cover of *Spirodella /Lemna/Azolla*, each less than 10% cover on average<br>*Lower limit*: none required |
| **A6. Indicators of local distinctiveness:** | Populations of rare species and other species characteristic of high quality canal systems should persist.<br><br>The continued presence of populations should be checked during section surveys. | *Upper limit:* none required<br><br>*Lower limit*: the following species populations should be maintained in the following number of kilometre lengths.<br>*Alisma lanceolatum* 4<br>*Butomus umbellatus* 1<br>*Callitriche hamulata* 7<br>***Callitriche hermaphroditica*** 5<br>*Carex acutiformis* 9<br>*Hottonia palustris* 2<br>*Hydrocharis morsus-ranae* 10<br>*Myriophyllum alterniflorum* 10<br>*Potamogeton alpinus* 2<br>*Potamogeton crispus* 6<br>*Potamogeton friesii* 2<br>*Potamogeton obtusifolius* 24<br>***Potamogeton perfoliatus*** 4<br>***Potamogeton praelongus*** 2<br>***Spirodela polyrhiza*** 2 |

| *Performance indicators for factors affecting the feature* | | |
|---|---|---|
| ***Factor*** | ***Factor rationale and other comments*** | ***Operational Limits*** |
| **F1.** Water Quality | | These are exactly the same as for Feature 1. |
| **F2.** Water Clarity | This is assessed by looking at water clarity. It is considered essential to use a Secchi disk because observation alone cannot be a reliable measure of light penetration | This is exactly the same as for Feature 1. |
| **F3.** Channel shading | Tree and hedgerow maintenance can affect the amount of light getting to the water surface. This in turn can affect the quality of the habitat.<br><br>In parts of the site supporting significant populations of *L. natans* this would not apply as the priority is to safeguard the SAC feature. | *Upper Limit*: On average no more than 5% of the channel surface should be shaded by overhanging vegetation in each km length.<br><br>*Lower Limit*: not required |

# 5. ASSESSMENT OF CONSERVATION STATUS AND MANAGEMENT REQUIREMENTS

This part of the document provides:

- A summary of the assessment of the conservation status of each feature.
- A summary of the management issues that need to be addressed to maintain or restore each feature.

## 5.1 Conservation Status and Management Requirements of Feature 1: Floating water-plantain *Luronium natans* (EU Species Code: 1831)

**Conservation Status within the site of Feature 1**

Results of the most comprehensive survey in 2001 (Newbold 2001) showed that this species is widespread along the length of the canal, although there are some lengths where there are no records because of its very low density, recent dredging activity or its local absence. This information had led CCW to conclude that the population was healthy and that this should warrant an assessment of favourable condition.

However, there are concerns about water quality that may account for the current lack of species-richness in some parts of the canal. Whilst this may be of lesser concern for this feature the status of this feature has been currently assessed as **unfavourable (2007)**, pending further discussion and investigation with the Environment Agency (February 2006). This assessment has not been done for each management unit.

Some areas are dominated by *Elodea* spp, which can out compete the more sensitive species (including *L. natans*).

It can be stated with certainly (November 2007) that the population of this feature is currently large and abundant in management units 2 (Vyrnwy Aqueduct to Pentrehelin) and 15 (Red House to Glanhafren).

- **Dredging** – Silting up means that shallow water and competing marginal species restrict the availability of open water and early successional conditions that this species requires to thrive.

  British Waterways are mindful of their responsibilities on this site and work in partnership with CCW to ensure that existing populations are safeguarded during any works that are necessary to maintain water flows and physical structure of the canal.

  New funding sources for proper dredging are continually being sought, and it is hoped that a focussed and sustainable restoration to a controlled but navigated waterway would provide the means to safeguard the future of the site and this feature.

- **Water quality** – There concerns about the quality of the water that feeds into the canal. This is currently being investigated by the Environment Agency as part of their review of consents process.

  It is possible that once proper dredging can occur that this may improve water flow and help to improve quality by removing a nutrient source.

## 5.2 Conservation Status and Management Requirements of Feature 2: Canal Vegetation

**Conservation Status within the site of Feature 2**

Results of the most comprehensive survey in 2001 (Newbold 2001) showed that species richness was very variable, although the data has only been analysed to assess richness per kilometre. Some lengths have a high number of species, but there are many kilometres (18) that have 3 species of aquatics or less. This information had led CCW to conclude that this feature is currently in unfavourable, unclassified condition.

More recent feature monitoring in 2005 (report currently not available) was done on a sample of seven separate kilometre lengths selected as representative of conditions along the length of the canal. Of those sites, only two passed the threshold for number of aquatic species; these equated to management units 2 and 10, which are already known to be the most species-rich areas on the canal.

There are clearly issues over species richness. Much of this is probably due to shallow water depths and siltation because there is insufficient funding for a proper dredging programme. This means that some areas are dominated by vigorous marginal species like *Glyceria maxima*. Some areas are dominated by *Elodea* spp, which can out compete the more sensitive species (including *L. natans*).

There are also concerns about water quality (mentioned for Feature 1) that may account for the current lack of species-richness in some parts of the canal.

The status of this feature has been currently assessed as **unfavourable (2007)**. British Waterways need to be able to access sufficient funds to plan for a proper programme of dredging with arisings being removed off site. The concerns over water quality are pending further discussion and investigation with the Environment Agency (February 2006). This assessment has not been done for each management unit.

- **Dredging** – Silting up means that shallow water and competing marginal species restrict the availability of open water and early successional conditions that this species requires to thrive. British Waterways are mindful of their responsibilities on this site and work in partnership with CCW to ensure that existing populations are safeguarded during any works that are necessary to maintain water flows and physical structure of the canal.

  New funding sources for proper dredging are continually being sought, and it hoped that a focussed and sustainable restoration to a controlled but navigated waterway would provide the means to safeguard the future of the site and this feature.

  There is insufficient information available to say which units currently require management action to create sufficiently deep and open water to permit species-rich vegetation to develop, but data from 2001 suggests that at present there is no need for action in management units 2, and 8 to 12, although south of Llwynderw (km 22) towards Berriew and beyond (km26) all but one individual kilometre lengths have fewer than 6 aquatic species.

- **Water quality** – There are concerns about the quality of the water that feeds into the canal. This is currently being investigated by the Environment Agency as part of their review of consents process.

  It is possible that once proper dredging can occur that this may improve water flow and help to improve quality by removing a nutrient source.

## 6. ACTION PLAN: SUMMARY

This section takes the management requirements outlined in Section 5 a stage further, assessing the specific management actions required on each management unit. This information is a summary of that held in CCW's Actions Database for sites, and the database will be used by CCW and partner organisations to plan future work to meet the Wales Environment Strategy targets for sites.

| Unit Number | CCW Database Number | Unit Name | Summary of Conservation Management Issues | Action needed? |
|---|---|---|---|---|
| 001 | 000063 | Llanymynech to Carreghofa Lock | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 002 | 000068 | Vyrnwy Aqueduct to Pentrehelin | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 003 | 000069 | Pentrehelin to Bell House | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |

| Unit Number | CCW Database Number | Unit Name | Summary of Conservation Management Issues | Action needed? |
|---|---|---|---|---|
| 004 | 000070 | Bell House to Red Bridge | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 005 | 000071 | Guilsfield Arm | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 006 | 000072 | Wern Reserve | Concerns over water quality which needs investigation. | Yes |
| 007 | 000073 | Red Bridge to Pool Quay | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 008 | 000074 | Pool Quay to Buttington | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 009 | 000075 | Welshpool | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 010 | 000076 | Whitehouse Reserve | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 011 | 000077 | Powis Castle to Berriew | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 012 | 000078 | Brithdir Reserve | Concerns over water quality which needs investigation. | Yes |
| 013 | 000079 | Berriew to Garthmyl | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 014 | 000080 | Garthmyl to Red House | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |

| Unit Number | CCW Database Number | Unit Name | Summary of Conservation Management Issues | Action needed? |
|---|---|---|---|---|
| 015 | 000081 | Red House to Glanhafren | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |
| 016 | 000082 | Glanhafren to Freestone Lock | Concerns over water quality which needs investigation. Also, the lack of money available to fund a dredging programme to provide a more sustainable water depth for the habitat and species features. | Yes |

## 7. GLOSSARY

This glossary defines the some of the terms used in this **Core Management Plan**. Some of the definitions are based on definitions contained in other documents, including legislation and other publications of CCW and the UK nature conservation agencies. None of these definitions is legally definitive.

| | |
|---|---|
| **Action** | A recognisable and individually described act, undertaking or **project** of any kind, specified in section 6 of a **Core Management Plan** or **Management Plan**, as being required for the **conservation management** of a site. |
| **Aquatic species** | A species of floating leaved or submerged plant, as defined on a list given by JNCC[2] for canal feature monitoring. |
| **Attribute** | A quantifiable and monitorable characteristic of a **feature** that, in combination with other such attributes, describes its **condition**. |
| **Common Standards Monitoring** | A set of principles developed jointly by the UK conservation agencies to help ensure a consistent approach to **monitoring** and reporting on the **features** of sites designated for nature conservation, supported by guidance on identification of **attributes** and monitoring methodologies. |
| **Condition** | A description of the state of a feature in terms of qualities or **attributes** that are relevant in a nature conservation context. For example the condition of a habitat usually includes its extent and species composition and might also include aspects of its ecological functioning, spatial distribution and so on. The condition of a species population usually includes its total size and might also include its age structure, productivity, relationship to other populations and spatial distribution. Aspects of the habitat(s) on which a species population depends may also be considered as attributes of its condition. |
| **Condition assessment** | The process of characterising the **condition** of a **feature** with particular reference to whether the aspirations for its condition, as expressed in its **conservation objective**, are being met. |
| **Condition categories** | The **condition** of **feature** can be categorised, following **condition assessment** as one of the following[3]:<br>Favourable: maintained; Favourable: recovered; Favourable: un-classified; Unfavourable: recovering; Unfavourable: no change; |

[2] See JNCC guidance on Common Standards Monitoring http://www.jncc.gov.uk/page-2232

| | |
|---|---|
| | Unfavourable: declining; Unfavourable: un-classified; Partially destroyed; Destroyed. |
| **Conservation management** | Acts or undertaking of all kinds, including but not necessarily limited to **actions,** taken with the aim of achieving the **conservation objectives** of a site. Conservation management includes the taking of statutory and non-statutory measures, it can include the acts of any party and it may take place outside site boundaries as well as within sites. Conservation management may also be embedded within other frameworks for land/sea management carried out for purposes other than achieving the conservation objectives. |
| **Conservation objective** | The expression of the desired **conservation status** of a **feature,** expressed as a **vision for the feature** and a series of **performance indicators**. The conservation objective for a feature is thus a composite statement, and each feature has one conservation objective. |
| **Conservation status** | A description of the state of a **feature** that comprises both its **condition** and the state of the **factors** affecting or likely to affect it. Conservation status is thus a characterisation of both the current state of a feature and its future prospects. |
| **Conservation status assessment** | The process of characterising the **conservation status** of a **feature** with particular reference to whether the aspirations for it, as expressed in its **conservation objective**, are being met. The results of conservation status assessment can be summarised either as 'favourable' (i.e. conservation objectives are met) or unfavourable (i.e. conservation objectives are not met). However the value of conservation status assessment in terms of supporting decisions about **conservation management**, lies mainly in the details of the assessment of feature **condition**, **factors** and trend information derived from comparisons between current and previous conservation status assessments and condition assessments. |
| **Core Management Plan** | A CCW document containing the conservation objectives for a site and a summary of other information contained in a full site **Management Plan**. |
| **Emergent species** | A species of floating or submerged plant, as defined on a list given by JNCC[4] for canal feature monitoring. |
| **Factor** | Anything that has influenced, is influencing or may influence the **condition** of a **feature**. Factors can be natural processes, human activities or effects arising from natural process or human activities, They can be positive or negative in terms of their influence on features, and they can arise within a site or from outside the site. Physical, socio-economic or legal constraints on **conservation management** can also be considered as factors. |
| **Favourable condition** | See **condition** and **condition assessment** |
| **Favourable conservation status** | See **conservation status** and **conservation status assessment.**[5] |
| **Feature** | The species population, habitat type or other entity for which a site is designated. The ecological or geological interest which justifies the designation of a site and which is the focus of conservation management. |
| **Integrity** | See **site integrity** |

[3] See JNCC guidance on Common Standards Monitoring http://www.jncc.gov.uk/page-2272

[4] See JNCC guidance on Common Standards Monitoring http://www.jncc.gov.uk/page-2232

[5] A full definition of favourable conservation status is given in Section 4.

| | |
|---|---|
| **Key Feature** | The habitat or species population within a **management unit** that is the primary focus of **conservation management** and **monitoring** in that unit. |
| **Management Plan** | The full expression of a designated site's legal status, **vision**, **features**, **conservation objectives**, **performance indicators** and management requirements. A complete management plan may not reside in a single document, but may be contained in a number of documents (including in particular **the Core Management Plan**) and sets of electronically stored information. |
| **Management Unit** | An area within a site, defined according to one or more of a range of criteria, such as topography, location of **features**, tenure, patterns of land/sea use. The key characteristic of management units is to reflect the spatial scale at which **conservation management** and **monitoring** can be most effectively organised. They are used as the primary basis for differentiating priorities for conservation management and monitoring in different parts of a site, and for facilitating communication with those responsible for management of different parts of a site. |
| **Monitoring** | An intermittent (regular or irregular) series of observations in time, carried out to show the extent of compliance with a formulated standard or degree of deviation from an expected norm. In **Common Standards Monitoring**, the formulated standard is the quantified expression of favourable **condition** based on **attributes**. |
| **Operational limits** | The levels or values within which a **factor** is considered to be acceptable in terms of its influence on a **feature**. A factor may have both upper and lower operational limits, or only an upper limit or lower limit. For some factors an upper limit may be zero. |
| **Performance indicators** | The **attributes** and their associated **specified limits**, together with **factors** and their associated **operational limits,** which provide the standard against which information from **monitoring** and other sources is used to determine the degree to which the **conservation objectives** for a **feature** are being met. Performance indicators are part of, not the same as, conservation objectives. See also **vision for the feature**. |
| **Plan or project** | **Plan**: a document prepared or adopted by a public body or statutory undertaker, intended to influence decisions on the carrying out of **projects.**<br><br>**Project:** Any form of construction work, installation, development or other intervention in the environment, the carrying out or continuance of which is subject to a decision by any public body or statutory undertaker.<br>Decisions on plans and projects which affect Natura 2000 and Ramsar sites are subject to specific legal and policy procedures. |
| **Site integrity** | The coherence of a site's ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it is designated. |
| **Site Management Statement (SMS)** | The document containing CCW's views about the management of a site issued as part of the legal notification of an SSSI under section 28(4) of the Wildlife and Countryside Act 1981, as substituted. |
| **Special Feature** | See **feature**. |
| **Specified limit** | The levels or values for an **attribute** which define the degree to which the attribute can fluctuate without creating cause for concern about the **condition** of the **feature**. The range within the limits corresponds to |

| | |
|---|---|
| | favourable, the range outside the limits corresponds to unfavourable. Attributes may have lower specified limits, upper specified limits, or both. |
| **Unit** | See **management unit.** |
| **Vision for the feature** | The expression, within a **conservation objective**, of the aspirations for the **feature** concerned. See also **performance indicators.** |
| **Vision Statement** | The statement conveying an impression of the whole site in the state that is intended to be the product of its **conservation management.** A 'pen portrait' outlining the **conditions** that should prevail when all the **conservation objectives** are met. A description of the site as it would be when all the **features** are in **favourable condition**. |

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Cyfoeth Naturiol Cymru
Natural Resources Wales

# Our regulatory approach to deliver sustainable management of natural resources

# Our Regulatory Principles

Version 2
April 2016

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# Executive Summary

Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future. Our approach is about how we will secure the long term well-being of Wales, working with those we have direct contact, using new ways of working.

We have set out how we define regulation in the context of the sustainable management of natural resources and our regulatory principles to help the delivery of this.

We define the role of regulation and how this fits in with our purpose and the legislation being put in place by Welsh Government and builds on our already established regulatory principles.

Our regulatory principles are:

- **Deliver outcomes**
- **Be intelligent**
- **Prepared to challenge**
- **Use the full range of tools available**
- **Be flexible**
- **Bring the right skills / expertise together**
- **Be efficient and effective**
- **Be clear on what we do and why**

We explain how our regulatory principles define the themes for our delivery, which are:

- **Outcomes –** We show how effective delivery of regulation and legislation provides a vital foundation for the sustainable management of natural resources, and how long term resilience depends on raising standards by orders of magnitude;
- **Evidence -** We state that we will use regulatory evidence to drive our interventions and innovation, using European Networks and links with other regulators. We set out our position regards data requests from operators;
- **Understanding others –** We set out our commitment to work with and engage with others, through our established stakeholder groups and working with them on future policy changes;
- **Understanding ourselves** – We show the link between our approach and our core organisational values;
- **Tools** – We show how we will use the right regulatory intervention according to the circumstance.
    - We will work from the assumption that those we regulate want to comply with the law and that the responsibility rests on applicants and operators to demonstrate their compliance.
    - We will look to secure a body of clear, accessible and concise guidance materials and work with others to develop this.

    - We will be clear on what compliance means and we want to discuss with operators any problems that they may have in achieving this.
    - We will encourage and support improvement, and recognise those who are compliant.
    - We will be clear on our enforcement and prosecution policy and be tough on those that simply ignore the law or take chances by avoiding compliance.
    - We will work with the compliant operators to help us deal with the criminals and provide a level playing field;
- **Organisation** – We set out our commitment to have the right skills in place and that our staff understand the Regulators Code. We will work with others to access the right skills as we need them. We will fully recover our costs and ensure that the income from fees and charges is used only to fund formal regulatory activities. We will continue to work on our efficiency and effectiveness, and where possible we will minimise formal regulatory burdens and encourage compliance and growth;
- **Communication** - We state that we will be open and transparent, and use our Regulatory Service Standards. We are committed to develop our website as part of our wider development of our communications strategy;
- We will deliver the principles of good regulation.

# Introduction

Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future. Our current responsibilities provide us direct contact with some 1,700 industrial, waste and water sites across Wales. We also grant over 10,000 permits, 65,000 fishing rod licences, 480 tree felling licences and 100 marine licences a year.

Our approach is about how we will secure the long term well-being of Wales, working with those we have direct contact, using new ways of working. These new ways of working reflect the wide range of roles and responsibilities of Natural Resources Wales, and also the new legislative framework put in place by Welsh Government to deliver the long term well-being of Wales. Not only does this mean new ways of working and a flexible approach, but new ways of describing and looking at the challenges to deliver this in Wales.

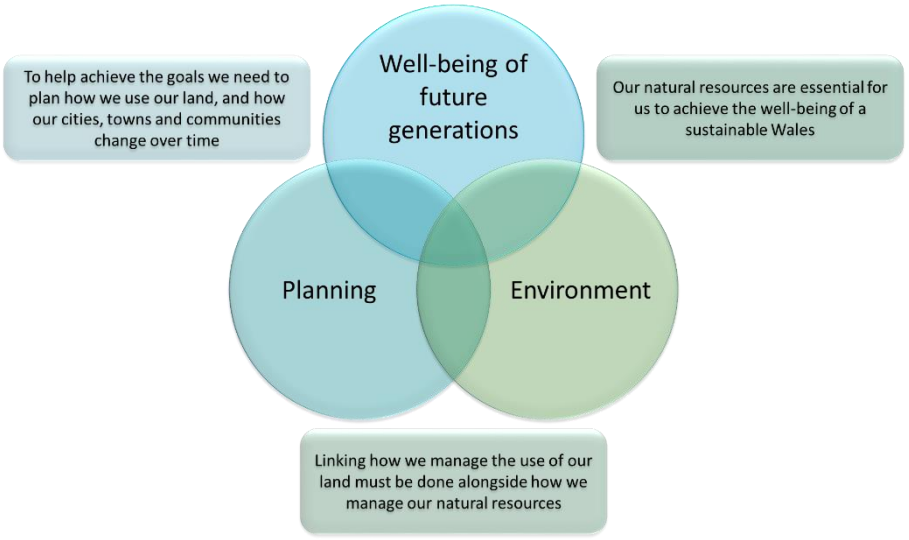
One of the key challenges we seek to address is what is actually meant by regulation. We recognise that this means different things to different groups, but we believe that regulation is about doing something that makes a difference. This is not just about the law, it is broader than this and can include economic and voluntary tools, and the use of information and knowledge sharing. However, we recognise that we must be clear about where things are legally required, and where things are just a good, or the right, thing to do. This is something we aim to do, to help those we are involved with stay the right side of the law.

**We must be clear, however, that where legal requirements exist, we are required to apply them. Complementary approaches are simply that – complementary. They cannot simply act as a replacement, where legal provision exist. We will continue to apply the requirements of the law.**

Here, we set out, both for those we come into contact with, and for ourselves, how we look to define regulation in the context of the sustainable management of natural resources and our regulatory principles to help the delivery of this.

# The sustainable management of natural resources

The new overarching legislative framework being put in place in Wales seeks to deliver the long term well-being of Wales. This framework comprises three main components around the well-being of future generations, the environment and planning.




***Primary legislative landscape in Wales***

The Well-being of Future Generations (Wales) Act places us under a duty to apply the sustainable development[1] principles in our work. This means acting in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs. This is reinforced by the Environment (Wales) Act that states that we must:

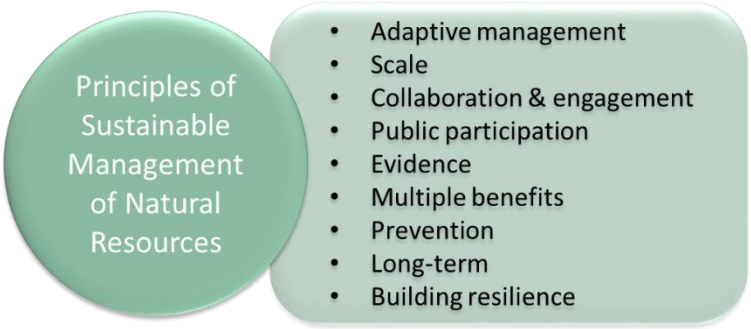
*(a) pursue sustainable management of natural resources in relation to Wales, and*
*(b) apply the principles of sustainable management of natural resources,*
*in the exercise of its functions, so far as consistent with their proper exercise.*

Therefore, we have a key role in the delivery of the long term well-being of Wales and the sustainable management of natural resources. This includes understanding the evidence around the state and resilience of natural resources, how this can then inform national policy and through to what does this mean locally.

***Delivering the long term well-being of Wales***

[1] The Well-being of Future Generations (Wales) Act defines sustainable development as "the process of improving the economic, social, environmental and cultural well-being of Wales, by taking action in accordance with the sustainable development principle aimed at achieving the well-being goals".

The sustainable management of natural resources is not a prescriptive approach, but provides some guiding principles[2] about working with nature for a healthy and resilient environment, for people and nature alike. It is a way of considering the environment – and its health – as a whole, rather than dealing with individual aspects separately. It will enable our projects and programmes to deliver as many benefits as possible for the people, environment and businesses in Wales.




***Sustainable management of natural resources principles***

The aim is to work with other colleagues, communities, industry and Government from the start in order to establish common aims and objectives for a given activity or location. It is a way of helping us all find multiple wins in everything we do, and will enable us to take a more integrated approach across all of our work.

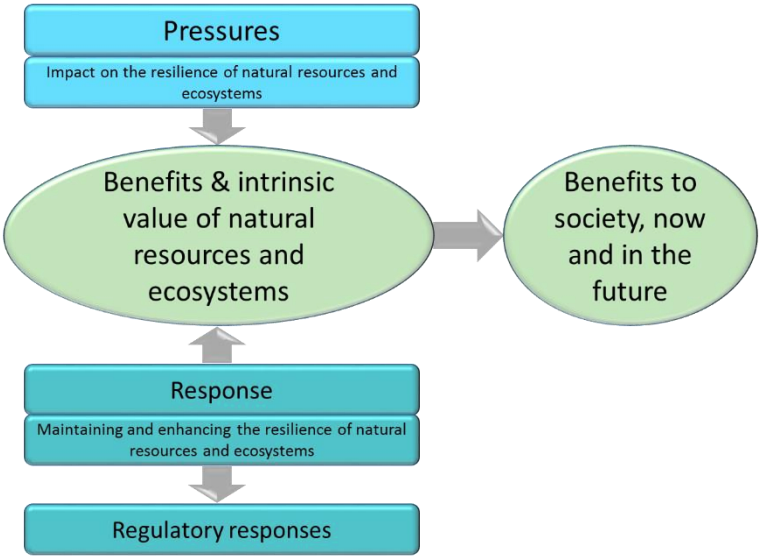
This can make use of our traditional range of tools to protect the environment, but will also require us to build in new ones which will help us achieve even more. This also encourages us to consider the spatial scale and timescale for our actions, managing our approach at the most appropriate level, to help achieve common outcomes. This will also encourage us to think about when to act and look at where early intervention or prevention may deliver better outcomes.

## What is the role of regulation?

When considering the role of regulation in the context of sustainable management of natural resources, we need to consider how our current, and future, society benefits from natural resources and ecosystems. These benefits can include things like water, food and fuel, access to green and blue space, and the natural role that the environment takes in regulating things we benefit from, such as pollination or the water cycle. However, these may be subject to pressures, such as new activities or pollutants, and/or the concentration or localisation of these pressures in the environment. These may compromise or reduce the resilience of these natural resources and ecosystems to provide the range of benefits to society.

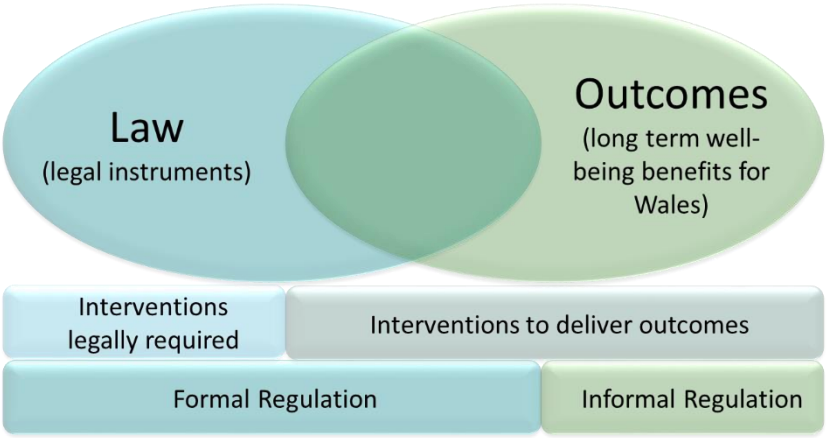
The pressure on the resilience of natural resources and ecosystems, and the threat this may pose, needs a response. The sustainable management of natural resources is this response, and can protect or enhance the resilience and capacity of natural resources and ecosystems, to deal with these man-made or natural pressures.

[2] The nine principles of sustainable management of natural resources are expressed in the Environment (Wales) Act.




***Response to pressures on the natural resources and ecosystems***

We believe that regulation is about doing something that makes a difference. This is not just about the law, it is broader than this. However, we recognise that we must be clear about where things are legally required, and where things are just a good, or the right, thing to do. To provide this clarity, we refer to formal regulation and informal regulation, reflecting where interventions may or may not be underpinned by the law.




***Defining formal and informal regulation[3]***

This will require a change in perspective and examination of the way we have worked previously in our legacy organisations. We will look at what has worked well, what hasn't, and develop new ways of approaching the challenges we, people, businesses, and the natural resources face in Wales.

The nature of the interventions, how these can be delivered, what evidence underpins this, and where this fits with the delivery of national policy are pulled together in the Area Statements. This reflects the need for tailored approaches, respecting the spatial scale of the challenges.

The delivery of this framework will not be achieved overnight. We will need to pull together a range of skills, experience and links to many other organisations. This presents us with a

[3] Some may refer to these as direct and indirect regulation.

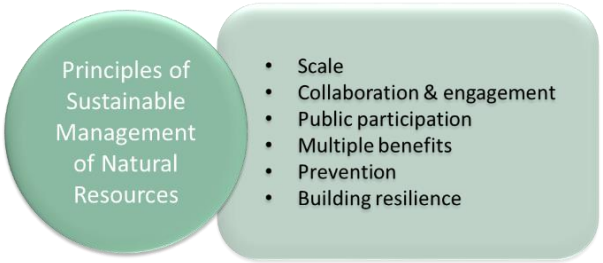
unique opportunity to re-appraise approaches and look at how to effectively deliver our shared outcomes.

# Our Regulatory Principles

Given this broad context for regulation, not all possible approaches can be defined for all circumstances. We have therefore looked to adopt a principles approach, and have defined a set of eight regulatory principles, which also reflect on the principles of sustainable management of natural resources and the ecosystem approach.

## 1. Deliver outcomes

***We will deliver outcomes, not just deliver regulation, seeking to deliver shared outcomes where we can.***

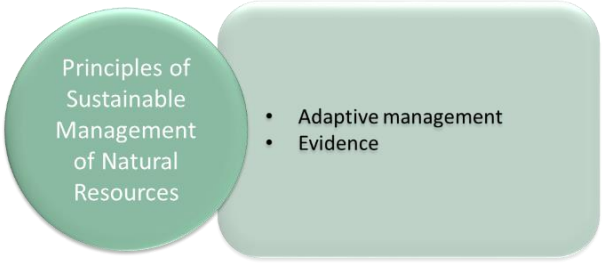



This ensures that the work we do is rooted in the delivery of outcomes. This clarifies the role of regulation as a tool in the delivery. This allows us to consider outcomes reflecting on societal choice and how we all would want our natural resources and ecosystems to function and be resilient.

For example, by looking at area-based approaches (Area Statements) to deliver the outcome of sustainable management of natural resources, we can through trials understand the most effective way to utilise our and others skills and knowledge. The delivery of such an outcome would provide benefits for the people, environment and businesses of Wales.

## 2. Be intelligent

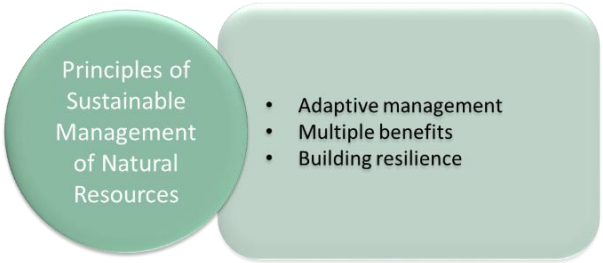
***We will use all available evidence and will ensure the data we collect contributes to the evidence to inform action to deliver outcomes.***




We will ensure that we collect and use data efficiently, seeking this only once wherever possible. We will apply where possible Geographical Information Systems (GIS) principles and use the data collected to deliver action informed by intelligence. This will encourage the use of new types and sources of data, using it with problem solving techniques to create knowledge. Using broad evidence (knowledge, information and data), including that in the State of Natural Resources Report (SoNaRR), will help inform risk based approaches, and highlight the priority areas for action.

## 3. Prepared to challenge

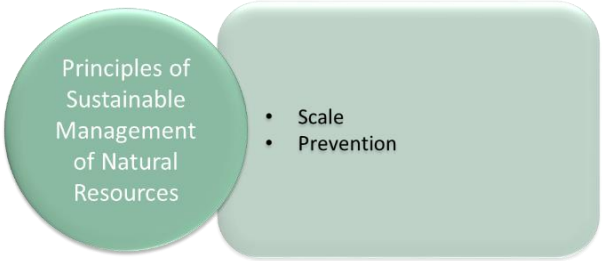
***We will challenge and address barriers where they don't contribute to the outcome.***




By reviewing the effectiveness of the delivery of outcomes, we will be encouraged to challenge the way we work and how we deliver. This also looks to encourage us to identify and highlight potential barriers to delivering outcomes, and look for ways to remove these.

## 4. Use the full range of tools available

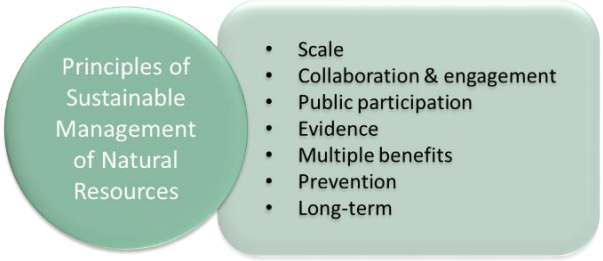
***We will apply a wide range of tools, including the law to deal with those who act illegally, to protect honest business, society and the environment.***




We will access an extensive toolkit. We will understand the effectiveness of the tools and in what context and when they are best applied. Such tools won't necessarily be limited to legal (formal regulatory) approaches. We will use specific legal tools where the circumstances justify, and where this is the right thing to do.

## 5. Be flexible

***We will be flexible and tailor the approach to the needs of the recipient.***



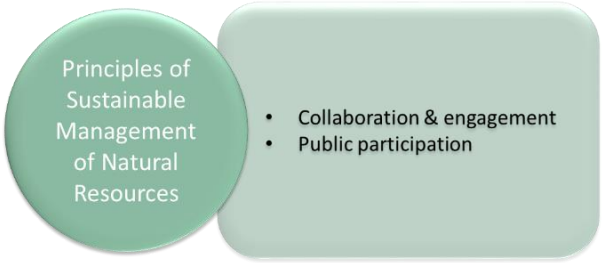

This encourages us to engage and collaborate, and seek to achieve a common understanding of what needs to be done using a wide range of tools, including the use of market mechanisms. Continued and prolonged engagement may instil commitment from those involved to make things happen for wider benefit. We will therefore need to understand the interests and motivations of those we meet. We will engage in conversation, develop mature relations, and avoid simply instructing.

We will however still need to recognise that for some, there will be a need for more help and support than for others. We will tailor appropriately, giving thought to those we engage with, considering factors such as behaviours and knowledge, and for businesses we will need to understand their size, skills and capacity. We will look to foster innovation and novelty and be less bound by historical process or old geographical boundaries.

We will think about the spatial scale and timescale for our actions, and what the most appropriate level and time to do things might be. This will encourage us to think about when to act and look at where early intervention or prevention may deliver better outcomes. Being flexible will also allow us to manage and recognise the inevitability of change.

## 6. Bring the right skills / expertise together

***We will ensure we have the skills to use the right tools or work with those who do.***




We will work with others when their skills and tools will deliver the best outcome. This includes looking at the tools others possess and assessing if they would enable us to be more flexible and effective. When using our own tools, we must ensure that our teams have the rights skills to apply them efficiently and effectively. We will also ensure that we have access to the right skills and knowledge so we can understand others and engage with them effectively.

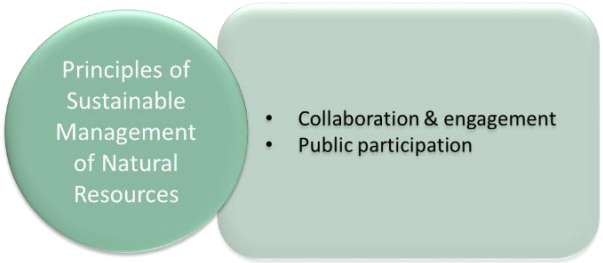
## 7. Be efficient and effective

***We will deliver in an efficient and effective way, working with others where we can, and where this is a good thing to do.***

We will clearly explain what our standards of service are, and how we will measure our effectiveness and efficiency. We will be clear as to how and where we spend our income, and ensure there is the correct balance between costs to business and costs to the tax payer.

## 8. Be clear on what we do and why

***We will ensure everyone understands our role in such a way that it is easy to see the link between what we are doing and why.***

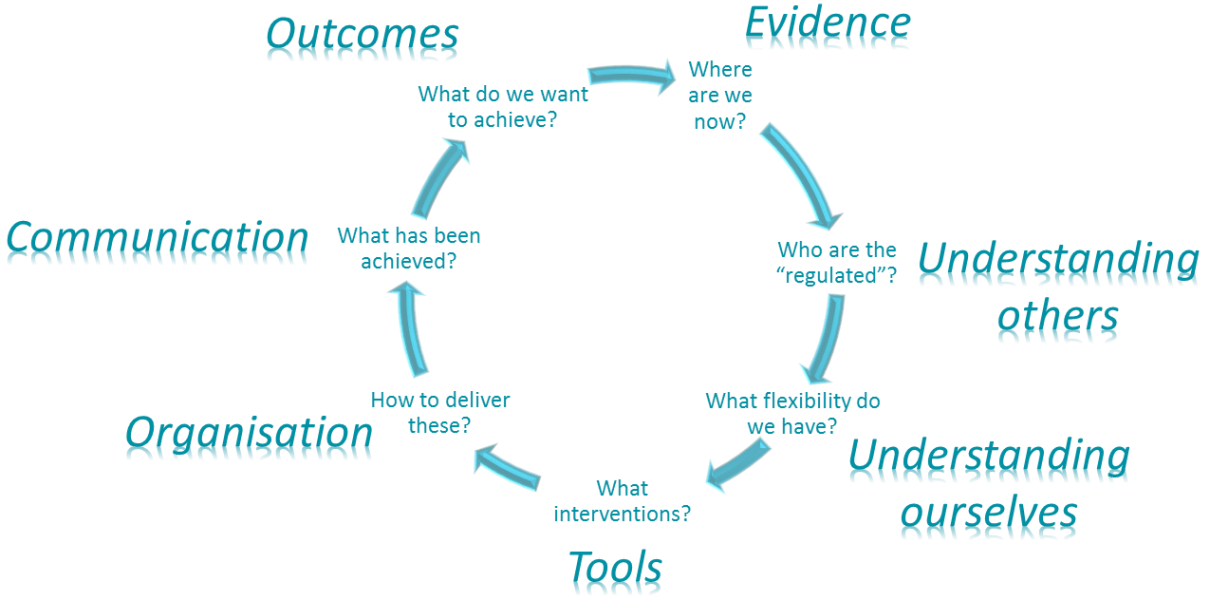


We will clearly explain what we do, and why, in a language and style that means something. This will provide for openness and transparency and, where we consult, clarity on how this can inform our decision making.

## What we will do, and how we will do it

Our Regulatory Principles highlight seven main themes. These are:

- **Outcomes** - ensuring that the outcomes are defined so as to secure optimum benefits and communicated in a way to secure "buy-in" both externally and internally;
- **Evidence** - utilising evidence to inform actions;
- **Understanding others** – understanding how others work, their outcomes, their challenges, and what skills they may have;
- **Understanding ourselves** – understanding our skills, looking at our behaviours and culture, and what changes we need to make;
- **Tools –** understanding the tools that we and other possess, how to properly access and use these, and understand which are the most effective;
- **Organisation** - how best to organise ourselves to deliver in a flexible, effective and efficient way;
- **Communication** - how do we best communicate what we do, why, what has been achieved as a consequence, and how to provide feedback on what we, and others, are doing.




***Delivering outcome, principles and themes***

## Our seven themes

By looking at these seven themes, we can define how we will look to deliver our Regulatory Principles.

### Outcomes (Principle 1)

The high level outcomes are currently expressed in Welsh Governments Natural Resources Policy Statement and will be described in the National Natural Resource Policy.

***Key challenges for the sustainable management of natural resources[4]***

These challenges manifest themselves in different ways in the physical environment, and have many root causes, and therefore there are a wide range of actions capable of addressing these root causes. Understanding these root causes requires problem solving techniques and evidence.

One of the tools identified to deliver these governmental outcomes is legislation, and it is this that defines formal regulation. The legislation may include specific standards, or define how particular activities need to be controlled, in order to protect people or the environment.

Many of these standards arise through European legislation, which is created as instruments to implement and deliver European Union policy objectives.

There are also other outcomes that business and people would expect, that are not necessarily underpinned by legislation. These could be a supportive environment to promote business growth, or reducing the impact of activities that have a negative impact on communities.

## Evidence (Principle 2)

To manage our evidence needs, we will develop a Regulatory Evidence Action Plan. This will not only define our own regulatory evidence work, but will show the links to the work of others through programmes such as the Shared Agency Regulatory Evidence Programme (ShARE), IMPEL, and the Welsh Government's evidence programmes (alongside Defra) (Annex 1). This is essential to ensure that we undertake evidence work in the most efficient and effective way possible, using evidence already available, and working with others where new evidence work is required. This Regulatory Evidence Action Plan will be part of the delivery of our broader Evidence Strategy[5].

[4] These challenges may change, depending on a better understanding of the evidence.
[5] Good Evidence - Our Evidence Management Strategy and Delivery Plan 2014-2017, July 2014

### Data and information – what we request from others

Part of our evidence base is derived from those we formally regulate. Much of this will be related to the process of demonstrating compliance, including information needed to report to Government or the European Commission under a range of legal obligations.

Although there are certain obligatory reporting requirements, we will ensure that formal regulatory reporting to us is:

- Simple;
- Only requested once;
- Requested in a way that it is clear what is needed.

Our development of new systems will ensure this is what we do in relation to information we ask for.

We will also continue to work with those we regulate to understand if there is evidence that can be informative to the State of Natural Resources Report (SoNaRR), beyond obligatory requirements. Any provision of this information will be on a collaborative basis as this would be outside of any formal regulatory framework, but may be useful to inform policy and actions more generally in Wales.

## Understanding others

To deliver effectively, we need wider business (from small and new businesses to large and well established organisations) and societal "buy-in", recognising that shared outcomes greatly increase the likelihood for success. We need to recognise that business itself also needs buy-in from its customers, shareholders, local community and others who may have an influence on the decisions made by the business. It is a combination of all these that provides business with its "licence to operate", which is likely to be broader than meeting its legal obligations, and this balance may be different depending on the nature and size of the business.

By understanding those we work with through formal regulation, we will be able to get a better understanding as to whether other informal regulatory approaches can achieve the same, or better outcomes. We also need to understand behaviours and the nature of those we work with in relation to their size, location, sector and risk potential. We will engage in conversation, develop mature relations, and avoid simply instructing.

We will engage with these organisations and groups. We already do this thorough a number of business fora, and trade associations. This also provides a mechanism to ensure better delivery of formal regulation, examine new approaches, and gain a proper understanding of where formal regulation simply does not work, either for business or for society as a whole.

## Understanding ourselves

We also recognise that our behaviours will be important in delivering outcomes. We will ensure we embed our values and behaviours and be seen as passionate and ambitious, disciplined and focused, trusted and professional, responsible and accountable and applying common sense. In addition, we will be impartial and independent in our decision making around formal regulation.

The way we behave, and the limits and constraints we have, gives us an understanding of the flexibilities available to us. We will need to address those areas where our behaviours

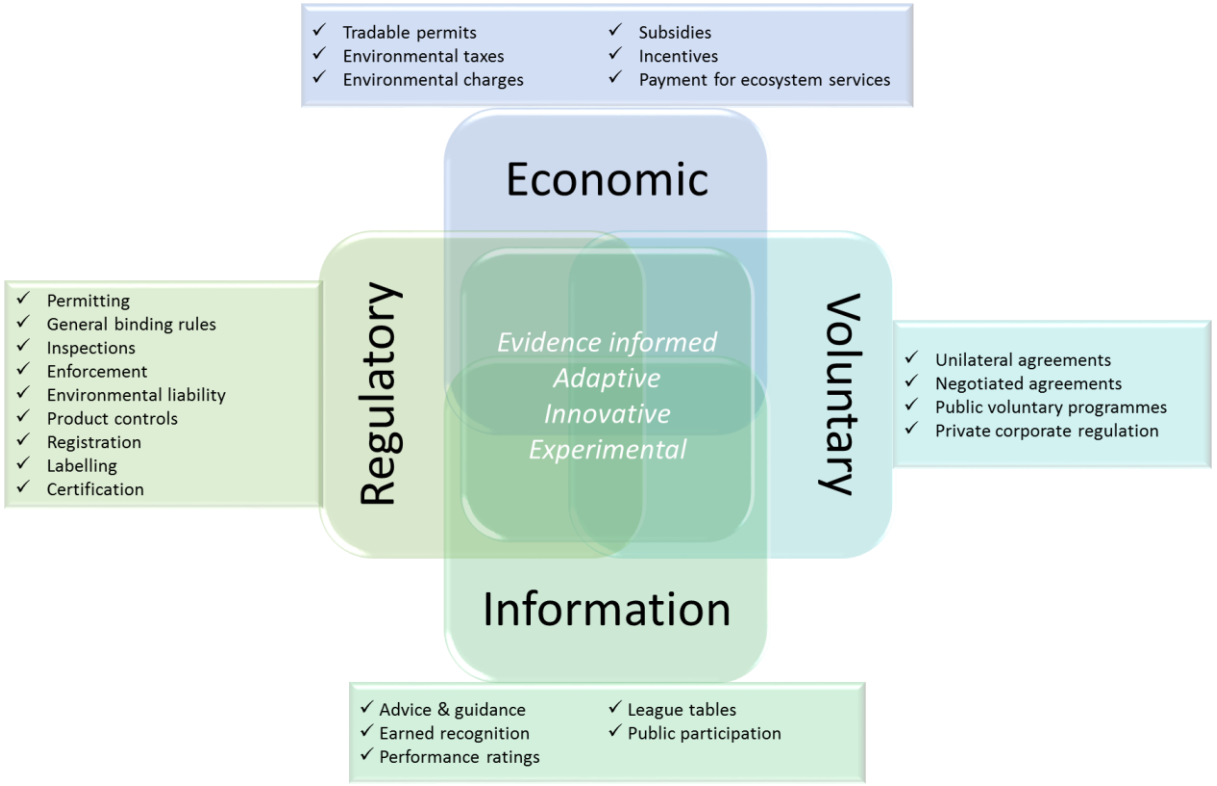
inhibit the flexible and tailored responses we need to make to deliver the sustainable management of natural resources.

## Tools (Principles 3 & 4)

By understanding others and ourselves, and understanding the interests and motivations of those we meet, we will tailor our approach appropriately, giving thought to those we engage with.

We already possess a wide range of tools that provide us some ability to do this, many of which are based around the legal powers and duties we have around formal regulation. There are other tools available including environmental charges, and advice and guidance, amongst others.

This "toolkit" extends beyond what some would consider regulation[6], and can be grouped into various types. There are a number of typologies for these tools, but we are adopting a simple version[7].




***Types of formal and informal regulatory types. Some approaches may involve more than one type***

### Regulatory (formal)

Given the historical focus on the use of formal regulatory interventions, most of the current ways of working are built around the delivery of these. These are around permitting,

6 Regulators' Code principle 1 – Regulators should carry out their activities in a way that supports those they regulate to comply and grow.

7 This typology is defined in the SNIFFER work, "Better Regulation Evidence: Topic Area 2 – Choose and design interventions – ER30 Final Summary Report" from April 2013. There are other groupings, including those arising from work involving Defra & Cranfield University Centre for Environmental Risk and Futures. These are grouped as: Direct Regulation, Economic Instruments, Co-Regulation, Information Based Instruments, Civic and Self Regulation and Support and Capacity Building.

compliance, and enforcement. In recent years, with the broader consideration of what is available in the regulatory toolkit, this has also included advice and guidance as an informal regulatory approach to support the more formal methods.

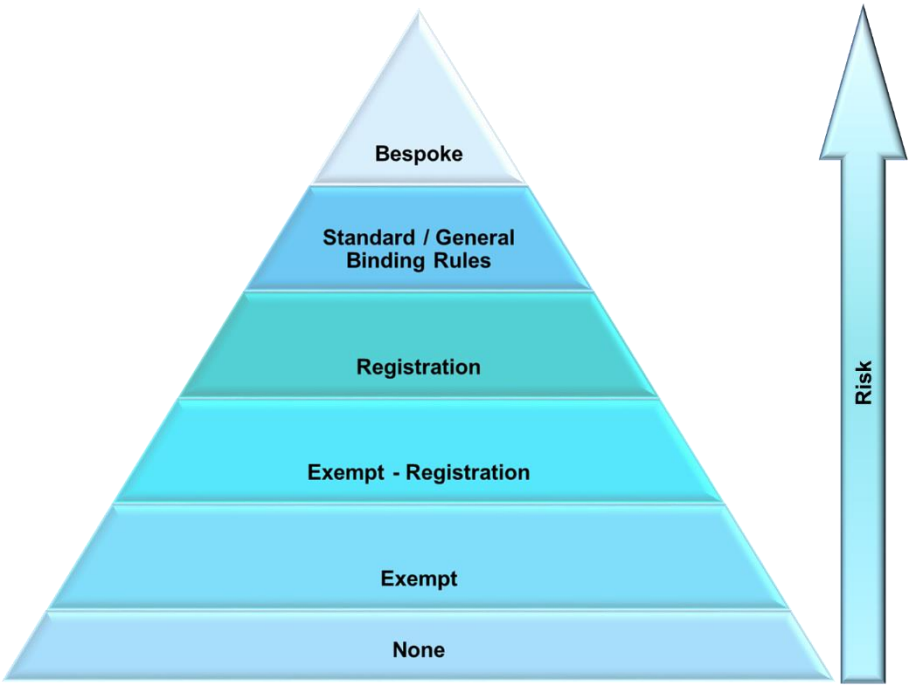
We work from the basic assumption that those we regulate want to comply with the law, and that their applications for permits and subsequent actions responding to permit conditions are intended to achieve this. This places responsibility on applicants and operators to demonstrate their compliance. Some may need help with this, and we have an important role in helping applicants and operators secure compliance. However, there will also be those who will simply not try to comply with their legal obligations.

There are a number of elements to formal regulation, which can be used to deliver outcomes through compliance with legal frameworks.

***Elements of formal regulation***

***Permitting*** – many of the formal regulatory approaches state the requirement for some form of permit within the legislation. The precise form may not necessarily be specified, so the implementation of permitting approaches can become burdensome, not only on those applying for permissions, but for us to deliver them.

We will, as allowed by the legislation, use the permitting approach that appropriately reflects the risk associated with the activity. We will drive permits down the hierarchy as appropriate.




***Permitting hierarchy***

Where this isn't possible, for example where the legal requirements specify the nature of the permit more prescriptively, we will examine how we will drive elements of the permits down

the hierarchy. This will include using standardised or general rule sets within bespoke permits, leaving the bespoke element to reflect site specific needs or requirements.

We will also provide help to operators or applicants to identify where, by doing things differently, their activities may not necessarily require legal controls, as the potential harm the activities may cause are reduced or eliminated.

Where we permit, we will undertake compliance work and potential enforcement. This will be risk-based but the holder of a permit must ensure that they comply with their conditions. Where there is evidence that a permitting approach is not the best way to deliver policy outcomes, then we will seek to improve the legislation underpinning this through discussion with Government.

We will ensure that those who have legal obligations, are helped to ensure they comply with them. This requires clear and effective guidance for those who are applying for permissions. Therefore we will ensure we have clear and accurate guidance on what kind of permit is most appropriate, and how to properly apply for this. This will include an explanation as to why the information requested is needed and important. This will be available alongside clear application forms, which require the minimum use of consultants to complete. We will be flexible around the use of application forms, where the information submitted clearly delivers the information we require (as explained in our advice and guidance).

Many of the legislative regimes contain statutory determination periods, and we will comply with these. We also publish standards of service[8], and applicants can expect us to deliver in accordance with these standards. There may be times, that in order to deliver a better product, we may need to deviate from these. Where we believe this to be the case, we will be clear as to why, what the benefits are, and when a final determination will be expected. Any deviance from our service standards would have to be agreed with the applicant. At the other extreme, we will respond positively where an applicant has an urgent need for a permit (or change to a permit), and look to accommodate this wherever possible and practical.

Permitting incurs costs for both the applicant and for us. Some applicants may find the charges challenging, so we will try to be flexible as to how and when application fees are paid. We still expect full payment prior to the granting of an environmental permit.

In relation to all applications, we actively encourage early engagement, to ensure that operators (and potential operators) have all the necessary information to enable them to submit an appropriate application and comply with their legal requirements.

***Compliance*** – we believe in supporting people to comply with legal obligations, providing ways for that compliance to be demonstrated.

The permitting stage provides the first formal opportunity to help people comply with their legal obligations. It will be this that defines the conditions of compliance, so the requirements must be as clear as possible. We recognise that circumstances change, and that it is possible that not all the necessary information is (or can be) available at the time of permitting. We will be flexible to respond to these changing circumstances through the way we formally regulate compliance with permits. We actively encourage operators to discuss their issues with us, so that we can make an appropriate response, including updating and changing permits, where justified.

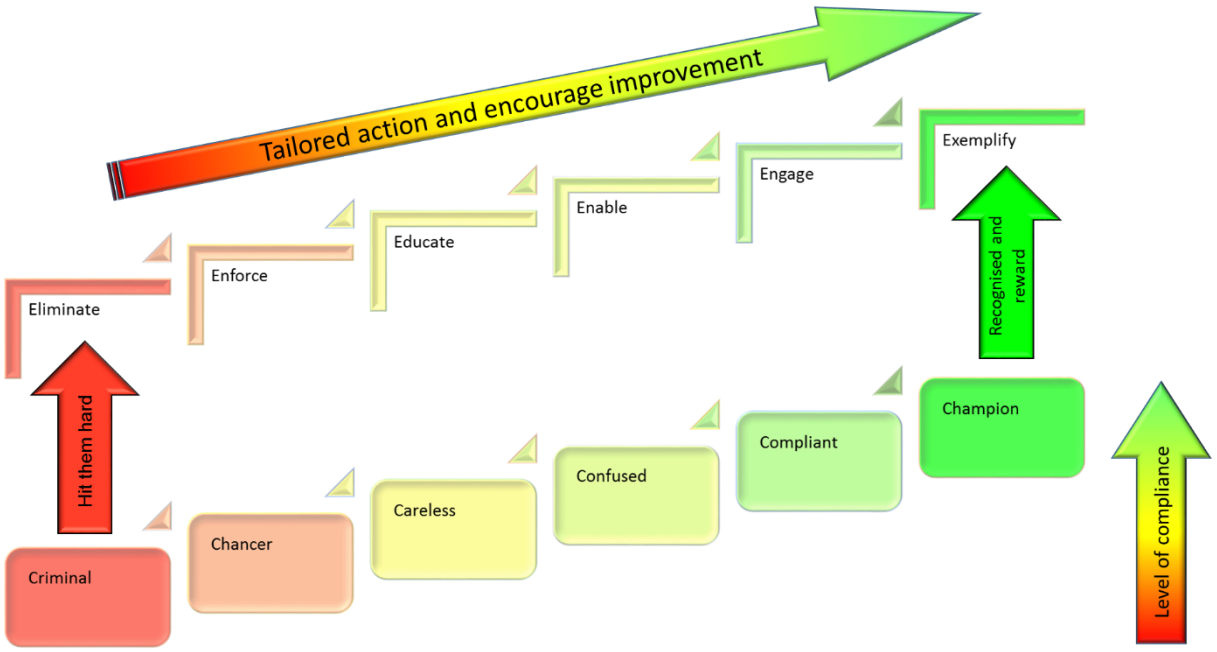
We recognise that it is too easy to label someone as a “non-compliant” operator. This could result in an approach taken by us that may not necessarily be the best for encouraging future

[8] http://naturalresources.wales/how-we-regulate-you/permit-applications-consultations-and-decisions/permitting-service-levels-in-natural-resources-wales

compliance. Some operators will be reticent to discuss any compliance problems they have, for fear of labelling, or possible enforcement action. We want to support compliance, so by knowing what problems some may have, we can provide guidance to help secure future compliance. We may still need to take enforcement, but the nature of such enforcement may be influenced by the positive approach taken by an operator to secure compliance. Our compliance assessment approach recognises that we need a mature relationship with those we regulate, and is about identifying problems and fixing them.

Our approach when considering "non-compliance", will be based on a compliance and engagement spectrum, and will be about encouraging and supporting improvement. We will be clear about where legal compliance ends[9], and where doing the right thing beyond legal responsibilities start. We will not enforce where operators fail to do the right thing, beyond their legal compliance responsibilities.

Encouraging and supporting improvement can benefit from the use of other informal regulatory tools. For example, economic approaches through incentives and our charging scheme, recognising the value of compliance. There is also a significant role for information (through advice and guidance).




***Tailoring approaches to compliance[10]***

***Enforcement*** – we will ensure that our enforcement and prosecution policy is regularly updated to reflect our understanding of the behaviours of those we regulate, and what can be done to bring them into compliance.

At the extreme end of compliance are those that simply ignore the law, or take chances by avoiding compliance. We recognise that those that actively ignore the law have an impact, not just on people and the environment, but also by damaging the competitiveness of legitimate businesses and their ability to grow. Therefore, it is not just in our interests to eliminate these, but also in the interest of other legal business. There is a clear role (and benefit) for the compliant to help us deal with criminals, and we will actively seek this support

9 Regulators' Code principle 5 – Regulators should ensure clear information, guidance and advice is available to help those they regulate meet their responsibilities to comply.

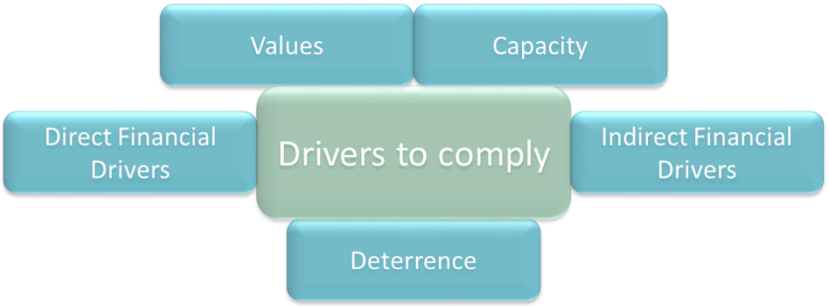
10 Taken from SEPA's Compliance and Engagement Spectrum.

and help. We will also work with other law enforcement agencies, as criminals are likely to be ignoring more than just environmental law.

It is important that there is a clear understanding of the enforcement work we have undertaken and how successful this has been. We will therefore publish an annual enforcement report that describes this.

***Recognition*** – given that we are encouraging compliance, and helping operators to achieve this, then they need to be rewarded. Where operators can demonstrate compliance (or where they have voluntarily done better), this will be recognised. Our charging scheme rewards highly compliant sites with a reduction to the fees and charges. The use of this will be further investigated as we develop our future charging scheme.

What is considered to be reward or recognition may not be the same for all operators, and may depend on their drivers to comply. It is therefore essential we hold dialogue with highly compliant operators to fully understand what recognition and rewards work for them. Alongside the publication of our annual enforcement report, we will also provide examples of what we have done to recognise exceptional performance.




***Drivers on Companies to Comply***[11]

***Advice & guidance for formal regulation*** – we have inherited a large body of guidance from our legacy bodies around our formal regulation. This is likely to cover the spectrum from "invaluable" through to "confusing and unhelpful". As we increasingly use tailored approaches, there remains a challenge for us to secure a body of clear, accessible and concise materials that are useful to everyone. We are committed to this, and will look to work with others to develop this body of materials, using co-production or referral to others where appropriate and sensible. We will also be engaging with those we formally regulate to properly understand what kind of guidance they really need to help them comply with the legal requirements, and in what form, recognising that this also needs to be delivered in an affordable way.

***Informal appeal*** – the formal regulatory regimes underpinned by legislation have formal appeal mechanisms. These can be burdensome, or a disproportionate way of dealing with concerns an operator or applicant may have regarding a decision made by us.

We will therefore provide an informal appeals route for such concerns to be raised, and this will be made clear to those we formally regulate, and to those we take enforcement action against. This does not prevent or replace any of the formal appeal mechanisms.

[11] Annex 9, "Report Exploring Complementary Approaches to Environmental Inspection for Ensuring Compliance", IMPEL, May 2012

## Economic & market-based

As well as formal regulatory approaches, there are a range of economic and market based instruments. Some of these may be underpinned by legislation, and thus may also be considered as formal regulatory approaches. There may be a need for market based approaches and incentives where these do not yet currently exist, or are not effective.

The flexibility around those formalised economic instruments may be limited by legislation. Others provide potential to drive change, such as payment for ecosystem services and environmental charges.

***Payment for Ecosystem Services (PES)*** – this is a developing area that has been identified as an additional economic intervention that may be useful in the context of sustainable management of natural resources. This may be particularly useful as a way of dealing with the possible disconnect between those undertaking work to deliver outcomes (and incurring costs), and those benefitting from the delivery of such outcomes.

***Charging Scheme*** - another form of economic instrument is our own charging scheme. This is currently in a form similar to those inherited from the legacy bodies that created NRW. Currently there are some modifications in place to this scheme to reflect the work being undertaken by us. However, we will be looking at the nature and form of our charging scheme. This will recognise the need to be able to recover the costs of the work we do, but also the different approach we will be taking, and that the types of intervention involved may involve work outside of the formal regulatory approaches that currently attract fees and charges. This also needs to reflect our approach in relation to compliance, and that we would look to incentivise demonstrable compliance.

## Voluntary and information / communications-based

There are a number of intervention types under these two headings which are of interest and will require further work to understand their use, where these are most effective and how to ensure they can be delivered efficiency and effectively. These include advice and guidance beyond that associated with formal regulation.

Such informal regulatory advice and guidance may be associated with preventative measures, or advice in advance of formal legal frameworks. Our approach to advice and guidance will reflect need and affordability. This means we will need to be flexible about delivery, ensuring that this can be developed in a way that is affordable to us, and useful to those who use it.

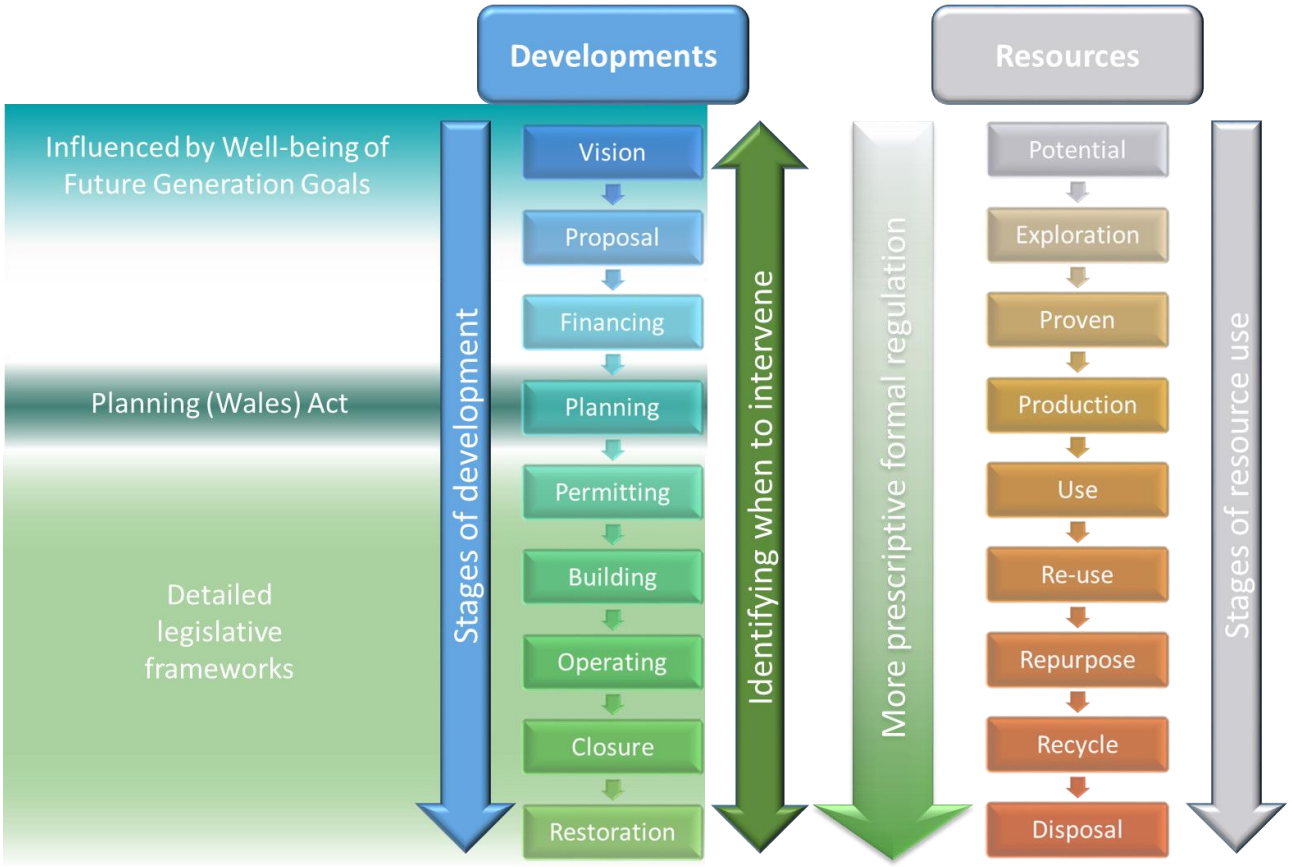
## Using the regulatory toolkit

When considering the use of tool types and their efficient and effective application, it is important to reflect on the outcomes being sought. There remains a risk that looking at driving the efficiency of delivery of a single tool (or tool type) can have consequences elsewhere (by displacing burden from one tool to another), or failure to recognise the value of other interventions. For example, early intervention and prevention via informal regulation may remove or limit the requirements for formal regulation, thus delivering greater benefits than concentrating on formal regulation alone.

This is where the consideration of the sustainable management of natural resources is key, as this provides that broad picture of the outcome being sought.

## Where, when, who?

As well as considering the toolkit, we also need to consider when might be the best time to intervene. This may expand the potential to use informal regulatory approaches, before developments, or the use of natural resources, enter the legal and formal regulatory frameworks.




***When might be the best time to intervene?***

It makes sense to intervene as early as possible, but this requires resources to be available to do so. We will examine the options for early intervention and what this means for how we work (or work with others) and how this should be funded.

## Risk and what this means for what we do

We will not, and will never be able to do all the possible things that may be asked of us. We therefore need a mechanism which provides a way for us to prioritise our work. One such mechanism is to look at the risks associated with not intervening and looking to undertake some form of formal or informal regulation to mitigate these.

We remain committed to taking a risk based approach[12], but also recognise that this approach needs to be undertaken in the context of sustainable management of natural resources. We therefore need to develop our risk approach further, which historically focused on environmental risks in isolation to other social and economic risks. This will form part of our evidence base for the approaches we take.

[12] Regulators' Code principle 3 – Regulators should base their regulatory activities on risk.

This is not about weakening the necessary formal regulation for issues of high risk, but a mechanism to help identify where the priorities are, and where the most effective interventions can be deployed in the most efficient way, using public money and income from those we formally regulate.

Many of our formal regulatory activities take this into account, but we will be extending this to activities that do not yet fully apply this. Our risk based approach needs to be consistent across our formal regulatory activities, so we can target activities presenting the greatest risk. We will review and revise our approach to risk, and ensure that decisions around this are consistent across all the legislative regimes and geography.

## Organisation (Principles 5, 6 & 7)

We are committed to working flexibly and in a way that delivers the best outcomes, and provides the best value of money. We also need to work in a way that is affordable in the medium and long term. This means we need to have the right people with the right skills with the confidence to use the tools available. We are committed to ensuring we have the right skills and support the development and maintenance of these skills. This includes ensuring all those working in the area of formal regulation fully understand the principles of good regulation and the Regulators' Code. We also need to work with others when their skills and tools will deliver the best outcome.

This means we will be flexible in our ways of working, ensuring that we maintain expertise and skills, whilst being able to respond in the integrated way needed to deliver sustainable management of natural resources. The ways of working will reflect the scale of the challenges as reflected in Area Statements, which should encourage more localised decision making and collaboration. Our flexible response will reflect on long-term objectives but be able to respond to change. To do this we will review our current processes and practices to drive efficiency (saving fee payers and tax payers money), and improve effectiveness.

We will be careful that where we look to improve the effectiveness and efficiency of elements of the way we work, we fully understand the wider impacts on our business and those we formally regulate. We will not implement changes that simply displace burdens or costs.

We are also committed to ensuring that we fully recover our regulatory costs. We will ensure that income from fees and charges is only used to undertake formal regulatory activities as allowed under Managing Welsh Public Money. Alongside the 'Annual Report and Accounts', we will publish a more detailed report on regulatory income, activity and expenditure. This will also provide the route for us to report on our progress on improving our approaches, what we are doing to minimise formal regulatory burdens and encouraging compliance and growth.

## Communication (Principle 8)

It is important that we are able to clearly explain what we do, and why, and be open and transparent. We will also provide a clear mechanism to use informal routes to appeal those decisions[13].

[13] Regulators' Code principle 2 – Regulators should provide simple and straightforward ways to engage with those they regulate and hear their views.

We are committed to developing our website so that it is meaningful and simple for users, so that they can find what they want, and be confident that the information is current and accurate. To supplement this, we will use targeted electronic bulletins and other communications.

We will maintain and update a communications strategy, which identifies the most appropriate route to share and communicate information with the wide range of those we formally regulate. This will reflect the particular needs of sectors such as small or medium enterprises, forestry or the farming sector.

We will also be clear on our service standards and what you can expect from us[14], as well as being clear as to what we expect from those that are formally regulated by us.

To help us understand how we are doing, we will seek feedback through a process of engagement with the regulated community. We will also engage with the wider community who may be affected by activities that we formally regulate. Both of these provide a valuable route to understand whether we are doing the right thing. We will therefore also report on what kind of feedback we have received, and what our response to this is.

## Delivering the principles of good regulation

The five principles of good regulation state that any regulation should be: transparent, accountable, proportionate, consistent, and targeted. We will apply the principles of good regulation, and we believe that delivering the Regulators' Code can help us deliver our Regulatory Principles (Annex 2). We have been reviewed by the Better Regulation Delivery Office (BRDO) and are responding to the recommendations made in their report.

The BRDO report recommends that "*NRW should continue with their work to develop their strategic approach to regulation and to build a distinctive and visionary set of regulatory principles which reflect the ethos of the NRW as a new regulator, and are responsive to the needs of those it regulates*". We believe this document provides our vision and reflect our ethos.

We recognise however, that there is work that needs to be done on embedding this in our organisation and building on our competency. This is not simply around the Regulators' Code and our Regulatory Principles. This also includes the wider objectives around sustainable management of natural resources, and what this means for how we work, and what we do. Delivering good regulation has a key role to play in this.

## Feedback

If you would like to provide any feedback, comments, suggestions or ideas after reading this document, these can be submitted to:
regulatory.principles@cyfoethnaturiolcymru.gov.uk

[14] Regulators' Code principle 6 – Regulators should ensure that their approach to their regulatory activities is transparent.

# Annex 1 – Evidence Programmes

## Defra One Programme – Evidence Action Plans

Recognising that the Defra One Programme covers both England and Wales, Welsh Government is seeking to ensure better involvement and engagement in the Evidence Action Plans that describe the evidence areas that will be covered.

Engaging and influencing this through Welsh Government has the potential to provide access to the funding available from the Defra One Programme, or influence those that benefit from this programme.

## IMPEL

IMPEL is an international non-profit association of the environmental authorities of the EU Member States, acceding and candidate countries of the European Union, EEA and EFTA countries. The association is registered in Belgium and has 47 members from 33 countries including all EU Member States, the former Yugoslav Republic of Macedonia, Turkey, Iceland, Norway and Switzerland.

IMPEL was set up in 1992 as an informal network of European regulators and authorities concerned with the implementation and enforcement of environmental law.

The Network's objective is to create the necessary impetus in the European Community to make progress on ensuring a more effective application of environmental legislation. IMPEL facilitates awareness raising, capacity building and exchange of information and experiences on implementation, enforcement and international enforcement collaboration as well as promoting and supporting the practicability and enforceability of European environmental legislation.

IMPEL's topic areas include: industry regulation, waste, water, air quality, trans-frontier shipment of waste, environmental impact assessment, nature and wildlife.

## Shared Agency Regulatory Evidence Programme

The Shared Agency Regulatory Evidence Programme (ShARE) is a new programme involving five environmental regulators. These regulators are Natural Resources Wales, the Environment Agency, the Scottish Environmental Protection Agency (SEPA), the Northern Ireland Environment Agency (NIEA) and the Irish Environmental Protection Agency (Irish EPA), known as the "Five Agencies".

The purpose of the ShARE Programme is to create a flexible framework for Five Agencies' evidence collaboration in the field of regulation. Its objective is to deliver regulated industry evidence of common need, where it is most efficient and effective to work on a UK and Ireland wide basis.

## "Make It Work" Project

The Make it Work Project is an initiative by The Netherlands (Ministry of Infrastructure and the Environment), the UK (Department for Environment, Food & Rural Affairs) and Germany (Federal Ministry of Environment, Nature Conservation, Building and Nuclear Safety) to establish a forum for discussing broader, strategic approaches to smarter EU environmental law. The project seeks to identify opportunities to systematically improve the quality of EU environmental law and thus help to achieve the benefits associated with the law while

delivering a more level playing field across the EU. In particular, it aims at establishing a more coherent and consistent framework for the EU environmental acquis[15] through developing guidance on the use of cross-cutting instruments and procedures in EU environmental directives and regulations.

We will look to work with Welsh Government regarding any input to this project and also though IMPEL who also are involved and have interests in this particular project.

[15] Environmental aquis - this refers to the collection of all environmental laws. The term acquis in French means “that which has been agreed upon”.

# Annex 2 – Regulators' Code and our Regulatory Principles

| Regulatory Principles | Elements of the Regulators' Code |
|---|---|
| **1. Deliver Outcomes**<br>**We seek to deliver environmental outcomes, not just deliver regulation, seeking to deliver shared outcomes where we can.** | 3.5 - Regulators should review the effectiveness of their chosen regulatory activities in delivering the desired outcomes and make any necessary adjustments accordingly |
| **2. Be intelligent**<br>**We should use all available evidence from a range of sources and seek to ensure the data we collect from those we regulate contributes to the evidence to inform action to deliver outcomes.** | 3.1 - Regulators should take an evidence based approach to determining the priority risks in their area of responsibility, and should allocate resources where they would be most effective in addressing those priority risks. |
| | 3.2 - Regulators should consider risk at every stage of their decision-making processes, including choosing the most appropriate type of intervention or way of working with those regulated; targeting checks on compliance; and when taking enforcement action. |
| | 4.1 - Regulators should collectively follow the principle of "collect once, use many times" when requesting information from those they regulate. |
| | 4.2 - When the law allows, regulators should agree secure mechanisms to share information with each other about businesses and other bodies they regulate, to help target resources and activities and minimise duplication. |
| **3. Prepared to challenge**<br>**We will challenge and address barriers where they don't contribute to the environmental outcome.** | *There are no obvious Regulators' Code elements that directly support this. However, UK Governments will look at this via other reviews, including the "Red Tape Challenge" undertaken by UK Government. However, we believe it remains important to continually assess all the tools and approaches to ensure they are fit for purpose and delivery against outcomes, and seek to address any issues, even if that is simply ensuring that Government is aware of the issues and the evidence supporting this.* |
| **4. Use the full range of tools available**<br>**We seek to apply a wide range of tools, chosen for their effectiveness in delivering outcomes. This includes using the law to deal with those who act illegally, to protect honest business, society and the environment.** | 5.1 - Regulators should provide advice and guidance that is focused on assisting those they regulate to understand and meet their responsibilities. When providing advice and guidance, legal requirements should be distinguished from suggested good practice and the impact of the advice or guidance should be considered so that it does not impose unnecessary burdens in itself. |
| | 5.2 - Regulators should publish guidance, and information in a clear, accessible, concise format, using media appropriate to the target audience and written in plain language for the audience. |
| | 5.5 - In responding to requests for advice, a regulator's primary concerns should be to provide the advice necessary to support compliance, and to ensure that the advice can be relied on. |
| **5. Be flexible**<br>**We seek to be flexible and tailor the approach to the needs of the recipient, using innovation and novel approaches where appropriate and learning from past experience.** | 1.1 - Regulators should avoid imposing unnecessary regulatory burdens through their regulatory activities and should assess whether similar social, environmental and economic outcomes could be achieved by less burdensome means. Regulators should choose proportionate approaches to those they regulate, based on relevant factors including, for example, business size and capacity. |
| | 1.2 - When designing and reviewing policies, operational procedures and practices, regulators should consider how they might support or enable economic growth for compliant businesses and other regulated entities, for example, by considering how they can best: understand and minimise negative economic impacts of their regulatory |

| Regulatory Principles | Elements of the Regulators' Code |
|---|---|
| | activities; minimising the costs of compliance for those they regulate; improve confidence in compliance for those they regulate; encourage and promote compliance. |
| | 3.4 - Regulators, in making their assessment of risk, should recognise the compliance record of those they regulate, including using earned recognition approaches and should consider all available and relevant data on compliance, including evidence of relevant external verification. |
| | 5.1 - Regulators should provide advice and guidance that is focused on assisting those they regulate to understand and meet their responsibilities. When providing advice and guidance, legal requirements should be distinguished from suggested good practice and the impact of the advice or guidance should be considered so that it does not impose unnecessary burdens in itself. |
| | 5.2 - Regulators should publish guidance, and information in a clear, accessible, concise format, using media appropriate to the target audience and written in plain language for the audience. |
| | 5.3 - Regulators should have mechanisms in place to consult those they regulate in relation to the guidance they produce to ensure that it meets their needs. |
| | 5.4 - Regulators should seek to create an environment in which those they regulate have confidence in the advice they receive and feel able to seek advice without fear of triggering enforcement action. |
| | 5.5 - In responding to requests for advice, a regulator's primary concerns should be to provide the advice necessary to support compliance, and to ensure that the advice can be relied on. |
| **6. Bring the right skills / expertise together**<br>**We seek to ensure we have the skills to use the right tools effectively, or seek access to and work with those who do.** | 1.3 - Regulators should ensure that their officers have the necessary knowledge and skills to support those they regulate, including having an understanding of those they regulate that enables them to choose proportionate and effective approaches. |
| | 1.4 - Regulators should ensure that their officers understand the statutory principles of good regulation and of this Code, and how the regulator delivers its activities in accordance with them. |
| | 5.6 - Regulators should have mechanisms to work collaboratively to assist those regulated by more than one regulator. Regulators should consider advice provided by other regulators and, where there is disagreement about the advice provided, this should be discussed with the other regulator to reach agreement. |
| **7. Be efficient and effective**<br>***We will seek to deliver in an efficient and effective way, working with others where we can, and where this is a good thing to do.*** | 6.1 - Regulators should publish a set of clear service standards, setting out what those they regulate should expect from them. |
| | 6.2 - Regulators' published service standards should include clear information on:<br>a) how they communicate with those they regulate and how they can be contacted;<br>b) their approach to providing information, guidance and advice;<br>c) their approach to checks on compliance including details of the risk assessment framework used to target those checks and protocols for their conduct, clearly setting out what those they regulate should expect; (Including inspections, audit, monitoring and sampling visits, and test purchases);<br>d) their enforcement policy, explaining how they respond to non-compliance;<br>e) their fees and charges, if any. This information should clearly explain the basis on which these are calculated, and should include an explanation of whether compliance will affect fees and charges; and<br>f) how to comment or complain about the service provided and routes to appeal. |

| Regulatory Principles | Elements of the Regulators' Code |
|---|---|
| | 6.3 - Information published to meet the requirements of this Code should be easily accessible, including being available at a single point on the regulator's website that is clearly signposted, and it should be kept up to date. |
| | 6.5 - Regulators should publish, on a regular basis, details of their performance against their service standards, including feedback received from those they regulate, such as customer satisfaction surveys, and data relating to complaints about them and appeals against their decisions. |
| **8. Be clear on what we do and why**<br>**We will seek to ensure everyone understands the role and purpose of the regulator and what our outcomes are, in such a way that it is easy to see the link between what we are doing and why and to embed a consistent approach.** | 2.1 - Regulators should have mechanisms in place to engage those they regulate, citizens and others to offer views and contribute to the development of their policies and service standards. Before changing policies, practices or service standards, regulators should consider the impact on business and engage with business representatives. |
| | 2.2 - In responding to non-compliance that they identify, regulators should clearly explain what the non-compliant item or activity is, the advice being given, actions required or decisions taken, and the reasons for these. Regulators should provide an opportunity for dialogue in relation to the advice, requirements or decisions, with a view to ensuring that they are acting in a way that is proportionate and consistent.<br>*(This paragraph does not apply where the regulator can demonstrate that immediate enforcement action is required to prevent or respond to a serious breach or where providing such an opportunity would be likely to defeat the purpose of the proposed enforcement action.)* |
| | 2.3 - Regulators should provide an impartial and clearly explained route to appeal against a regulatory decision or a failure to act in accordance with this Code. Individual officers of the regulator who took the decision or action against which the appeal is being made should not be involved in considering the appeal. This route to appeal should be publicised to those who are regulated. |
| | 2.4 - Regulators should provide a timely explanation in writing of any right to representation or right to appeal. This explanation should be in plain language and include practical information on the process involved. |
| | 2.5 - Regulators should make available to those they regulate, clearly explained complaints procedures, allowing them to easily make a complaint about the conduct of the regulator. |
| | 2.6 - Regulators should have a range of mechanisms to enable and regularly invite, receive and take on board customer feedback, including, for example, through customer satisfaction surveys of those they regulate. |
| | 3.3 - Regulators designing a risk assessment framework, for their own use or for use by others, should have mechanisms in place to consult on the design with those affected, and to review it regularly. |
| | 6.4 - Regulators should have mechanisms in place to ensure that their officers act in accordance with their published service standards, including their enforcement policy. |

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Natural Resources Wales

Department for Environment Food & Rural Affairs

Llywodraeth Cymru
Welsh Government

# Government response to consultation on changes to water abstraction licensing exemptions in England and Wales: New Authorisations

**Date: October 2017**

Environment Agency

Cyfoeth Naturiol Cymru
Natural Resources Wales

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This publication is available at https://www.gov.uk/government/consultations/water-abstraction-licensing-changes-to-exemptions-in-england-and-wales

Any enquiries regarding this publication should be sent to Defra at waterresources.consultations@defra.gsi.gov.uk or the Welsh Government at water@gov.wales.

www.gov.uk/defra

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# Executive Summary

Water is essential for people and the environment. It is vital to the economy and for health and is used to generate power, run industries and grow food. Access to clean, safe and secure water supplies is therefore fundamental to society. This is why the Environment Agency in England and Natural Resources Wales in Wales (the Regulator)[1] regulate water abstraction – the process of taking water from the environment, such as rivers or groundwater – through a licensing system.

As a result of increasing competing demands for water, areas of England and Wales are already experiencing water stress. Increasing demand for water from abstractors exempt from the licensing system is exacerbating this position. Other challenges such as a changing climate and population growth are expected to further increase the pressures on water resources.

An abstraction licensing system has been in place since the 1960s, however, certain abstractions have historically remained lawfully exempt from licensing control. This is largely because they were abstractions that were considered low risk or not widely used. As more information has become known about these exempt abstractions, our assessment and understanding of their risk has improved.

Currently around 5,000 significant abstractions are exempt from abstraction licensing. This compares with around 20,000 abstractors that are licensed. These exemptions create an unfair playing field, allowing some abstractors to put pressure on the environment and other water users without any controls, while requiring others to take the burden of addressing these risks. This unfairness can be strongly felt, for example, farmers that use spray irrigation are required to have an abstraction licence while those that use trickle irrigation are not.

The Water Act 2003 included provisions to remove these licensing exemptions in England and Wales. Implementing the legislation will help protect the water environment and make people's rights to take water fairer. This legislation also helps us meet the requirements of the Water Framework Directive (WFD) established in 2000 to make sure that EU Member States manage their water resources.

The WFD requires each Member State to have in place a programme of measures designed to achieve "Good" water body status. One of the basic requirements to help achieve "Good" status is to have in place a system of prior authorisation and control of

[1] We usually refer to the Environment Agency and Natural Resources Wales as the Regulator in this document.

significant water abstraction and impoundments. While we have had a licensing system since the 1960s, the exemptions still within it impact on achieving “Good” status.

We originally consulted on bringing these exempt activities into the licensing system in 2009[2]. Following the responses we received, we worked with stakeholders to investigate the issues raised. Last year, we published a response to that consultation. It also included a further consultation, which we considered necessary to seek further views on a number of issues that had changed since 2009. Last year’s consultation was informed by an impact assessment, which estimated the administrative and economic costs to currently exempt abstractors of removing the exemptions.

In last year’s consultation, we proposed a light touch, risk based approach to bring exempt activities under licensing control. This included:

- Only removing exemptions for water use activities that have or might have significant environmental impacts. Several thousands of abstractions and impounding works with no significant impacts would remain exempt.
- Most abstractors would be granted licences reflecting the volumes they had previously abstracted under the exemption, although there may be cases where conditions are included to protect rivers at very low flows.
- Providing a considerable five-year transitional period from the date we end the exemptions: two years for abstractors to prepare and submit applications and three years for the Regulator to consider and determine applications. Abstractors could continue to take their existing volumes of water during this process.

We published a summary of responses in September 2016[3].

As a result of the consultation response the UK and Welsh Governments will be making some technical changes to the licensing approach consulted on, to make the process of removing the exemptions even more light touch and risk-based regulation. We will be:

- allowing the Regulator flexibility to relax the requirements for volume limits on transfer licences (transfer licences are required to transfer water where there is no intervening use of the water) to avoid undue abstraction control costs on abstractors while still ensuring environmental protection;
- allowing the Regulator to be flexible in the application of flow controls so that it can recognise the wider conservation values; and
- allowing volume limits that better reflect business needs in dry periods by extending the qualifying period to include the dry weather in 2011.

[2] http://webarchive.nationalarchives.gov.uk/20091205011114/http:/www.defra.gov.uk/corporate/consult/water-act/index.htm

[3] https://www.gov.uk/government/consultations/water-abstraction-licensing-changes-to-exemptions-in-england-and-wales

Further to the consultation, we now set out our proposed final plans for changing exemptions to the licensing system in England and Wales by commencing the Water Act 2003 provisions. An updated impact assessment has been prepared to inform these plans. Our plans balance the needs of those currently exempt and the rights and responsibilities of all for creating a sustainable water abstraction licensing system.

We will lay the regulations in Parliament and the National Assembly for Wales. Changes to the exemptions will then come into force on 1 January 2018 at which point the two year licence application period will open.

The Regulator will engage further with all sectors and produce guidance for the application period and beyond.

# 1. Introduction

This document sets out the UK and Welsh Governments' response to the consultation with interested parties on changes to water abstraction licensing exemptions in England and Wales.

## 1.1 Why change the exemptions to abstraction licensing?

An abstraction licensing system has been in place since the 1960s. The licensing system has developed since. However, certain abstractions have historically remained lawfully exempt from licensing control because they had been considered low risk or the activity was not widely used since the 1960s.

Currently around 5,000[4] significant abstractions are exempt from abstraction licensing in England and Wales. This compares with around 20,000 abstractions that are licensed.

Exempt abstractors can potentially take unlimited amounts of water, irrespective of availability and without regard to impacts on the environment or other abstractors. These exemptions are unfair when the impacts can be significant. They allow some abstractors to put pressure on the environment and other water users without any controls, while requiring others to take the responsibility of addressing these risks. This can deplete water resources and damage the environment. It creates an imbalance in the levels of cost and responsibility placed upon licensed abstractors. In addition, exemptions make it difficult for the Regulator to manage water resources effectively.

As a result of competing demands for access to water for abstraction, areas of England and Wales are already experiencing water stress. Increasing demand for water from those outside of the current licensing system is exacerbating this position. Other challenges such as a changing climate and population growth are expected to increase further the pressures on water resources.

We believe that all significant abstractors should be subject to regulation to help protect the water environment and make people's rights to take water fairer. However, we recognise that exempt abstractors have operated lawfully and rely upon their access to water. Our intention is to balance the needs of all abstractors and the environment.

The Water Act 2003 included provisions to remove licensing exemptions in England and Wales. This legislation helps us meet the requirements of the Water Framework Directive (WFD) established in 2000 to make sure that EU Member States manage their water resources. On 23 June 2016, the EU referendum took place and the people of the United Kingdom voted to leave the European Union. Until exit negotiations are concluded, the UK

[4] Approximately 4,700 in England and 300 in Wales

remains a full member of the European Union and all the rights and obligations of EU membership remain in force. During this period the UK Government will continue to negotiate, implement and apply EU legislation. The outcome of these negotiations will determine what arrangements apply in relation to EU legislation in future once the UK has left the EU.

We originally consulted on commencing those provisions and bringing these exempt activities under licensing control in 2009. Following the responses we received, we investigated a number of additional issues and spoke with stakeholders as part of the process.

On 15 January last year, the UK and Welsh Governments, the Environment Agency and Natural Resources Wales published the document '*Changes to water abstraction licensing exemptions*'[5]. It consisted of two parts:

- Part I was the Government response to the original 2009 consultation on the policy to implement the final abstraction elements of the Water Act 2003 to end exemptions to the existing abstraction licensing system; and

- Part II formed the further consultation on the revised policy, reflecting the responses to the 2009 consultation, further engagement with stakeholders, and wider related policy and legislative developments since 2009.

This was an open consultation across England and Wales and lasted for 12 weeks. It closed on 8 April last year. We received 86 responses from interested parties and published a summary of responses on 26 September last year.

In support of the consultation, we also published an impact assessment on the proposed policy and draft legislation.

## 1.2 The aims for changing the exemptions

Changing the exemptions will:

- help create a fairer system for all abstractors – both those already licensed and those that will become licensed when the exemptions are removed;
- enable the Regulator to manage water resources more effectively now and in response to increasing pressures on water resources in the future; and

[5] January 2016 – 'Changes to water abstraction licensing exemptions – Government response to the 2009 consultation and further consultation on implementing the abstraction elements of the Water Act 2003' https://consult.defra.gov.uk/water/water-abstraction-licensing-exemptions/consult_view

- be part of wider work to implement the Water Framework Directive and create a cleaner, healthier environment[6].

Bringing all significant abstractions into regulation is an important part of plans to reform the licensing system. Reform will provide a modern licensing system that is fairer with more resilient local solutions. Our updated plans for reform will be set out in due course.

The UK and Welsh Governments are working together to reform abstraction management.

## 1.3 Impact assessment

The policy position in this document has been informed by an impact assessment[7]. This impact assessment updates the January 2016 consultation version[8].

## 1.4 Working with interested parties

During the consultation period the UK and Welsh Governments, the Environment Agency and Natural Resources Wales held a series of consultation meetings with interested parties. The meetings were held to give participants the opportunity to seek further information or clarification and to tell us their views about the consultation proposals.

Their views were taken account of as part of this response document. Engagement with these abstractors is ongoing.

## 1.5 This document

This document responds to the responses received from the consultation and sets out the final policy for the changes to the water abstraction and impoundment licensing exemptions. The rest of the document is split into the following sections:

- Section 2 – provides our responses to the points raised in the consultation

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[6] For example, as set out in Defra's current departmental plan: https://www.gov.uk/government/publications/defra-single-departmental-plan-2015-to-2020/single-departmental-plan-2015-to-2020 and the forthcoming 25 year environment plan. In Wales, the Well-being of Future Generations (Wales) Act 2015 http://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en

[7] The final Impact Assessment accompanies the Water Act 2003 (Commencement no. 12) Order 2017, and can be found on: http://www.legislation.gov.uk/

[8] Consultation Impact Assessment: https://consult.defra.gov.uk/water/water-abstraction-licensing-exemptions/supporting_documents/Annex%20D%20%20Consultation%20Impact%20Assessment%20for%20New%20Authorisations.pdf

- Section 3 – explains our final proposed policy to change exemptions to water abstraction licensing
- Section 4 – explains what happens next on making changes to exemptions to water abstraction licensing

In this document and for the purposes of this policy, the currently exempt abstractors being brought into the licensing system are often referred to as ‘New Authorisations’.

# 2. The consultation

The consultation '*Changes to water abstraction licensing exemptions'* explained the proposed policy revised since the 2009 consultation, sought views on specific areas and, more broadly, on the proposed approach.

The specific questions asked in the consultation around the proposals were:

- Exemptions: the suitable period for the temporary construction abstraction exemption (Question 1);
- Planned abstractions[9]: the possible evidence required as part of the application process for planned abstractions (Question 2); excluding compensation provisions for planned abstractions from transitional arrangements to bring exempt abstractors into the licensing system (Question 3); and views on the main issues or challenges arising from the proposed approach regarding planned abstractions (Question 4);
- Application process: the evidence that an abstractor would be asked to provide as part of their application for a licence when their respective exemption ends (Question 5);
- Hands off flow conditions: the policy proposal to include a hands off flow condition on licences to protect the environment from the abstraction at times of low river flows (Questions 6-10);
- Transfer licences: the proposal to include authorised volumes on such licences (Question 11); and
- Compensation: proposals for how to fund any compensation arising from the policy (Questions 12-14).

We also asked for general comments on:

- the overall approach to the policy (Question 15); how it might be possible to further reduce any burdens for abstractors (Question 16); and
- the consultation in general (Question 17).

We received 86 consultation responses and published our summary of responses on 29 September last year.

[9] Planned abstractions' are those where there are plans for new abstractions not currently taking place, or planned increases to existing exempt abstractions which will take effect post commencement of the regulations.

## 2.1 Exemptions

In the consultation, we set out the exemptions that would be removed and some additional low-risk exemptions that we proposed would continue. We explained that one exemption that would continue was temporary dewatering abstractions for construction purposes. We sought views on how long the 'temporary' time period should be.

**What we proposed:**

- an exemption for abstractions for temporary dewatering of underground strata; and
- an exemption for abstractions carried out for temporary diversions of waters to prevent interference with building or engineering works.

Where the abstraction:

- does not damage protected aquatic life nor damage the integrity of a site designated for nature conservation[10]; and
- is immediately discharged using a soakaway, if the water is from underground strata, or to surface waters.

In the case of dewatering and where the abstraction is not immediately discharged to soakaway:

(i) the abstraction is less than 100$m^3$/day where the abstraction takes place more than 500 metres from a designated nature conservation site and more than 250 metres from a spring, well or borehole used to supply water for any lawful use of abstracted water; or

(ii) the abstraction is less than 50$m^3$/day and takes place 500 metres or less from a designated nature conservation site, or 250 metres or less from a spring, well or borehole used to supply water for any lawful use of abstracted water).

The possible time periods suggested were: four weeks; three months; six months or longer than six months.

Most responses supported a period of six months or less. Those supporting a longer period were mainly respondents involved with engineering works, explaining that some construction projects lasted more than six months and that they were concerned about increased regulatory burden.

[10] https://www.gov.uk/check-your-business-protected-area

We have considered the responses and the evidence provided and concluded that a temporary period of less than **six consecutive months** is appropriate. We understand this period will capture the majority of engineering and construction works and will therefore minimise unnecessary regulation, while avoiding harm to the environment or other abstractors. Abstraction taking place over a longer period increases the risk of wider environmental deterioration, which should be assessed as part of the licensing process. This decision takes account of the protections that will be in place for the environment and abstractors in the exemptions.

**Final exemption:**

The dewatering of underground strata and abstractions carried out from surface waters solely to prevent interference with building or engineering works where the abstraction is over a period of less than six consecutive months, provided the abstractor can demonstrate that the abstraction:

- does not cause damage or is not likely to cause damage to protected species nor the integrity of a site designated for nature conservation; and
- is immediately discharged to soakaway, if the water is from underground strata, or to surface waters.

In the case of dewatering of underground strata and where the abstraction is not immediately discharged to soakaway:

(iii) the abstraction is less than 100$m^3$/day where the abstraction takes place more than 500 metres from a designated nature conservation site and more than 250 metres from a spring, well or borehole used to supply water for any lawful use of abstracted water; or

(iv) the abstraction is less than 50$m^3$/day and takes place 500 metres or less from a designated nature conservation site, or 250 metres or less from a spring, well or borehole used to supply water for any lawful use of abstracted water (draft regulations 5 and 6).

**Suggestions made for other exemptions**

While there was broad agreement about the exemption changes proposed in the consultation, some respondents made suggestions of other activities that should continue to be exempt from licensing.

Our approach to deciding if an abstraction activity should be licensed has been whether the activity in general could have a significant impact on water resources, and therefore detrimental consequences for the environment or other abstractors.

The exemptions suggested and the responses to those suggestions are:

- Small scale activities.

We believe the *de minimis* threshold[11] for abstraction licensing should continue to be based on the volume of water abstracted. A volume based threshold is the most suitable and fairest way to set a water resources threshold, compared to other suggestions made such as the area of business activity, as it is comparable across licensing activities and directly relates to the impact the abstraction may have on the water environment.

- Dewatering of isolated groundwater or of rainwater collected in mining, quarrying or other engineering works.

Where dewatering of groundwater takes place[12] a licence will be required where the abstracted water is from water contained in any underground strata whether hydraulically isolated or not. Establishing whether and how groundwater interacts with other water sources and the impacts this may have on the environment and other abstractors is part of the considerations of an abstraction licence decision.

A licence is not required for the dewatering of wholly or mainly rainwater from an excavation.

- Public or publicly funded bodies or statutory undertakers or bodies with statutory duties

We believe the abstraction licensing provisions should apply to public bodies. The removal of these exemptions is for the purpose of enabling the Regulator to perform its duties to manage the potential of all significant impacts on water resources caused by abstractions. Many other abstractors (including public bodies and the Regulator) require or will require an abstraction licence and also have to comply with various other duties, licences and permissions, so providing abstraction exemptions for one and not another body would not be fair. We have therefore not provided such exemptions.

- Internal Drainage Boards.

We do not consider that there is sufficient evidence to make a case to exempt all abstraction by Internal Drainage Boards because of the potential consequences for the environment and abstractors downstream of their abstraction intakes. We do however consider that there is good reason to exempt some, which is why the Water Act 2003 included provisions to continue exemptions for transfers within drainage districts and for any land drainage activities. We proposed in our consultation that impounding works within drainage districts should also be exempt; which we will implement.

- Other regulation should be used to protect the environment therefore there is no need for licensing.

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[11] Currently 20m$^3$/day per source of supply.

[12] Unless it is an exempt abstraction, for example, temporary dewatering.

We firmly believe there is a need to directly regulate what water is taken from the environment where it may have significant impacts to make sure there is enough water for people and the environment. However that does not mean we do not recognise the need more broadly for different permissions to better interact and the UK and Welsh Governments are continuing to take action to reduce unnecessary regulatory burdens. When exemptions are removed and if appropriate, we expect the Regulator to use any relevant information used in previous permissions in its decisions. This will help align decisions as far as possible and ensure regulatory effort is proportionate, effective and seeks to minimise negative business impacts.

- Abstraction in an emergency (ports).

We agree that the licensing requirements would be inappropriate in an emergency and we will include this as an exemption.

- Abstraction from navigable rivers into a navigation authority's water system.

Navigable rivers were excluded from the definition of a navigation authority's water system in the Water Act 2003. We have again reviewed the scenarios relating to navigable rivers and we believe that passive river to canal interactions, would not require licences. Circumstances where deliberate action such as artificial structures is taken to allow water to be diverted from a river into a canal would need a licence which is the intention of the Water Act 2003.

In section 3 below, we provide a full list of the additional licensing exemptions that will be made.

## 2.2 Planned abstractions

'Planned abstractions' are those where there are plans for new abstractions or planned increases to existing exempt abstractions.

**What we proposed:**

- To exclude planned abstractions from the new authorisations transitional arrangements (so abstractors could not apply for 'planned abstractions' through the transitional application process for currently exempt abstractions).
- To license any application for a planned abstraction through the standard abstraction application licensing process.
- To exclude planned abstractions also from transitional arrangements for compensation (which may be available where an abstractor can demonstrate loss or damage as a result of the Regulator granting the licence to a lesser extent or refusing to grant the licence).

Across all sectors, the main issue respondents raised was that many had invested in or anticipated future expansion. Excluding these plans from new licences therefore would block growth.

Respondents also noted that some permissions for planned activities had already considered the impact on water resources and so questioned the need for further regulation through licensing.

Respondents also noted however that the proposal made sure that the process was equitable for those existing, licensed abstractors who were planning to increase their abstraction to support business growth. They would need to apply through the standard application process to abstract additional water, and would not receive compensation if their application was refused.

If provision for planned abstractions were made in our transitional arrangements, it would place previously exempt abstractors in a much more favourable position than existing licensed abstractors. It would also prevent us from continuing to take a light touch risk based approach as an application, which included planned abstraction, could not be considered environmentally neutral.

In addition, our plans to end these exemptions have been public and expected since 2003. Abstractors should have been able to prepare for this, and taken account of the position in their business plans.

We understand the reasons for the negative responses received, however, we do not believe that these justify taking an approach which advantages currently exempt abstractors' growth over those currently licensed. We believe this approach to be equitable

and reasonable, as it places all abstractors who have plans to abstract on an equal footing.

We have therefore not changed the approach proposed in the consultation, however, we do not expect the Regulator to limit sustainable economic growth unnecessarily and will apply the principles of better regulation[13] to license planned abstraction.

We expect the Regulator to use any relevant information, such as environmental reports used as evidence to support other permissions already in place for planned works, so that it aligns its abstraction licence decisions, as far as possible.

We also expect the Regulator to provide application forms that allow abstractions for previously exempt activities to be applied for together with planned (variations to increase) abstraction and to have in place internal processes that align the two application processes and are considerate to business needs.

[13] As set out in:

For Environment Agency: https://www.gov.uk/government/publications/regulators-code-and-the-environment-agency/how-the-environment-agency-meets-the-regulators-code

For Natural Resources Wales: https://naturalresources.wales/about-us/what-we-do/how-we-regulate-you/regulatory-principles/?lang=en

## 2.3 Application process

**What we proposed:**

- That evidence of abstraction required to support the licence application could be flexible but could include meter readings, pump ratings, invoices for equipment, photos of infrastructure, or business receipts/contracts.

We sought views on other types of evidence that could be provided.

Given the different types of abstractions and operational circumstances, we proposed the Regulator would be flexible about the evidence of abstraction required as part of the application process. We concluded that a definitive list of relevant evidence may preclude relevant evidence from some abstractors.

We expect the Regulator to apply a flexible, risk-based approach regarding evidence. Applicants should be able to demonstrate to the reasonable satisfaction of the Regulator, by way of the application and supporting evidence, their abstraction requirements and entitlements and that abstraction has taken place within the qualifying period.

The Regulator will produce guidance on evidence requirements that will take account of the variability of abstractor working practices, including situations where abstraction volumes are not measured.

In turn, we expect abstractors to be able to provide sufficient evidence to make a valid application. If abstractors have concerns about what evidence can be used, the quality of the evidence available, or the potential impacts on current business activities, we strongly recommend speaking to the Regulator to discuss the concerns as early as possible in the two year application period.

In response to the consultation views, we have also extended the qualifying period. **Abstraction within the previous seven years will qualify.** This has increased from the four years proposed in the consultation. Doing so, will allow abstractors greater flexibility, and cover a wider range of weather patterns, to demonstrate abstraction requirements.

## 2.4 Hands off flows

**What we proposed:**

- That the Regulator may apply environmental constraints to licences granted, without compensation, to protect the environment at low flows and during drought conditions. This will be a step towards sustainable abstraction.
- The Regulator would do this by including a basic Hands off Flow (HoF) condition on surface water abstraction or groundwater equivalent where the flow in a river is dependent on that groundwater[14] on abstraction licences. By:
    - Placing a universal HoF of Qn95 on licences in catchments that are over-abstracted[15]; and
    - Placing a universal HoF of 75% of Qn99 on licences in catchments that are not over-abstracted.

The majority of respondents agreed with using hands off flow conditions. The main challenges were that the Regulator might impose unnecessarily stringent flow restrictions with uncertain consequences for businesses.

Other respondents meanwhile, while agreeing that these types of restrictions should be applied, thought that they were not at a suitable level to give enough protection to the

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[14] "Hands off flow"(HoF) conditions restrain abstraction when river flows are low. For example, a licence could restrain abstraction where the natural river flow is at or below the flow that is exceeded 95% of the time and this HoF would be shorthanded as Qn95 or 75% of Qn99, which is shorthand for 75% of Qn99 is 75% of the natural flow that is exceeded 99% of the time.

These conditions will be included at the Regulator's discretion depending on environment need. The conditions will usually be set at Qn95 (or a groundwater equivalent in the case of groundwater where the flow in inland waters is dependent on that groundwater) in catchments where there is over abstraction and flows do not support WFD objectives. Where current flows support the WFD objectives i.e. catchments that are not over abstracted 75% of Qn99 will usually be applied.

[15] Over abstracted: recent actual flows are below the environmental flow indicators (EFI). The EFI is the proportion of the natural flow in a river set aside for the ecological health of the water course and is used to prevent ecological deterioration. These indicators are aligned with WFD good status standards for rivers.

The Environment Agency's and Natural Resources Wales' current approach for assessing catchments is through Abstraction licensing Strategies and is the means for achieving the River Basin Management Plan objectives of sustainable management of abstraction and impoundment. For England: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/562749/LIT_4892.pdf (pages 9 to 15) and: https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process has the regional strategies in England. For Wales: https://naturalresources.wales/guidance-and-advice/environmental-topics/water-management-and-quality/water-available-in-our-catchments/?lang=en – see relevant catchment Abstraction Licensing Strategy.

environment. These comments were in particular about a lack of protection for surface waters that are not over abstracted and groundwater not in connectivity with surface water.

The UK and Welsh Governments consider that applying these basic hands off flow conditions provides basic protection for rivers during low flows and in drought conditions and places a proportionate responsibility of reducing unsustainable abstraction on abstractors being brought under licensing control. These conditions are meant to be more favourable to currently exempt abstractors than conditions that are applied to licences for new abstractions as this policy approach acknowledges that these are existing abstractions relied upon by business.

As stated in the consultation, we believe that the proposals strike a fair balance between targeting immediate environmental improvements and recognising that investment has been made based on these existing abstractions.

The UK and Welsh Governments' decisions on priorities under the Water Framework Directive or other environmental legislation, as well as consideration of disproportionate costs, will therefore be taken into consideration for these previously exempt abstractors, as for all licensed abstractors. The policy is therefore a two stage approach to achieve environmental benefits and meeting the Water Framework Directive requirements. Once all significant abstraction is in the licensing system the Regulator will deliver any further improvements needed by taking account of the overall abstraction position in a catchment, to deliver improvements needed to meet Water Framework Directive water body objectives.

From comments received, we recognise, however, that the universal application of these basic conditions could, in some circumstances, perversely cause harm to the environment. We therefore do not expect the Regulator to apply hands off flows universally.

The UK and Welsh Governments expect the Regulator to help abstractors understand what they need to do to comply with hands off flow conditions and to make compliance reasonably straightforward.

**Table 1 – summary of how we propose basic HoF conditions will normally apply**

| Surface water status in abstraction licensing strategy (ALS/CAMS): | Flow / quantitative status supports WFD objectives | NAs HoF applied: |
|---|---|---|
| Water not available / Over abstracted catchments | Fail | Qn95 |
| Restricted water available / Over licensed catchments | Pass | 75% of Qn99 |
| Water available | Pass | 75% of Qn99 |

## 2.5 Transfer licences

**What we proposed:**

- To include volume conditions on transfer licences.

The majority of exempt abstraction activities (estimated at 4,000) that will become licensable in England will be for water transfers. We would expect the Regulator to issue these transfers with transfer licences[16] to meet the policy objectives of maintaining existing rights and entitlements where it can. In Wales, water transfers are expected to make up a lower proportion of exempt activities than in England. The current legislation gives the Regulator discretion as to whether to include volume controls on transfer licences.

The majority of respondents supported the proposal to include volume conditions on transfer licences. Many respondents felt that volumes were necessary to enable the overall monitoring and control of the abstraction.

Those that disagreed did so primarily because their abstraction is difficult to measure or control.

Following our review of the consultation responses, the UK and Welsh Governments have concluded that adding volume limits to water transfers does not always reduce environmental risk and may add unnecessary business costs. We have therefore revised the consultation proposal.

**The Regulator will have flexibility on the inclusion of volume conditions on a transfer licence**. However, the final decision on whether to do so should be proportionate, reflecting environmental risk, impacts on other abstractors and the burdens it places on the abstractor. We expect, in particular, that in situations where an abstraction is currently unmeasured and / or not readily controlled and where there are satisfactory alternative ways to control the abstraction, for example conditions that describe the use of abstraction structures, that the Regulator uses a licensing approach that minimises regulatory burdens on the abstractor. This change from the consultation will reduce regulatory costs while achieving similar outcomes of licences that reflect abstraction requirements and prevent additional environmental impacts.

[16] A 'transfer licence' is required to move water from one source of supply to another, or to the same source of supply, but at another point, in the course of dewatering activities in connection with mining, quarrying, engineering, building or other operations, without intervening use.

## 2.6 Compensation arrangements

**What we proposed:**

Using the compensation charge element of the Regulator's water abstraction charges scheme (Environmental Improvement Unit Charge - EIUC) to fund any compensation, and specifically to:

- Use EIUC funds already collected, that are potentially no longer required for the completion of the Restoring Sustainable Abstraction programme, to fund any compensation that may result from the implementation of New Authorisations.
- Collect additional funds, if required, through the EIUC from non-water company charge payers, to pay any more compensation identified under New Authorisations.

The policy we consulted on will allow claims to be made for compensation in certain circumstances where a qualifying applicant can demonstrate loss or damage as a result of the Regulator either granting a licence to a lesser extent than that of the abstraction the applicant was previously conducting; or refusing to grant a licence. We proposed that the existing compensation charge element of the Regulator's water abstraction charges scheme (Environmental Improvement Unit Charge - EIUC) be used to fund any compensation.

The majority of those who responded to this proposal favoured using compensation funds already collected or to collect additional funds, if required, via the compensation charge to meet any compensation claims. Currently exempt abstractors supported this approach. Those abstractors who are already licensed and have been paying into the compensation fund were not in favour.

The National Farmers' Union believed that the compensation funds collected to date should only be used for the Restoring Sustainable Abstraction programme, their original purpose, and that the rest should be refunded.

It is both the UK and the Welsh Governments' policy however for the Regulator to use charging schemes to recover their costs for relevant regulatory functions. Given the Governments have determined that compensation costs are part of the Regulator's water resources management function, the costs of this policy should also be recovered from abstractors through the Regulator's charges scheme as are other costs. In England and Wales, we will therefore continue with the compensation arrangements as set out in the consultation.

In Wales, the Welsh Government has agreed to consider specific support to Natural Resources Wales if compensation costs should materialise beyond a level that cannot reasonably be met from within the Natural Resources Wales' water resources income.

## 2.7 Other consultation areas

We asked three further questions on:

- any comment on the general, overall approach to New Authorisations;
- how it might be possible to further reduce any burdens for abstractors through the policy approach; and
- the overall consultation.

All comments to these questions have been considered and discussed with respondents as we have finalised the policy. In many cases, we have amended the final policy approach as explained in section 3.

For example, there were concerns about the overall approach included using a four year qualifying period of past abstraction, because it did not take sufficient account of the variability of weather patterns over time. As a result of further consideration and discussion with some respondents we have increased the period to seven years.

The National Farmers' Union and the Chartered Institution of Water and Environmental Management sought further clarification on the application of the Serious Damage provision and guidance on its use. The principles the Regulator would use to assess serious damage are set out in the 2012 consultation and the Government response on the issue[17]. As clarified in the 2016 consultation, if the abstraction is affecting, or has the potential to affect, a European site designated under Habitats Regulations, the Regulator will apply the precautionary principle in its determination decision of serious damage. This means that an abstraction would be restricted to protect from serious damage where the Regulator has insufficient evidence to conclude that no adverse effects to protected sites would be caused.

[17] 2012 Serious Damage consultation: https://www.gov.uk/government/consultations/the-water-act-2003-withdrawal-of-compensation-on-the-grounds-of-serious-damage

# 3. The final policy approach

Our final policy approach takes account of the responses received to the consultation and our assessment of them as set out in section 2.

## 3.1 Exemptions

We can confirm that the exemptions we will end are:

- transferring water from one inland water to another in the course of, or as the result of, operations carried out by a navigation, harbour or conservancy authority;
- abstraction of water into internal drainage districts but not including land drainage activities;
- dewatering mines, quarries and engineering works, where the water is mostly groundwater rather than rain;
- warping (abstraction of water containing silt for deposit onto agricultural land so that the silt acts as a fertiliser);
- all forms of irrigation (other than spray irrigation, which is already licensable), and the use of land drainage systems in reverse (including transfers into managed wetland systems) to maintain field water levels;
- abstractions within currently geographically exempt areas, including some rivers close to the borders of Scotland; and
- the majority of abstractions covered by Crown and visiting forces exemptions.

The normal licensing threshold will apply. This means that only those abstracting more than 20m³/day in aggregate from a source of supply will need to apply for an abstraction licence once these exemptions end.

We will also create new exemptions for some low risk abstractions and impoundments leaving them exempt[18]. We can confirm that these are:

- abstraction (transfers) downstream of the normal tidal limit by navigation, harbour and conservancy authorities, other than in the hour before or after low tide;

[18] An appropriate assessment for the purposes of regulation 99(1)(c) of the Conservation of Habitats and Species Regulations 2010 has been prepared for: abstraction of saline water for ports and harbours; abstraction of water in connection with dredging operations; abstraction of a water with a high saline content from underground strata in the Cheshire basin (part of an existing exemption given to the former Mersey and Weaver River Authority in 1968); and impounding works constructed by or on behalf of Internal Drainage Boards in exercise of their functions within their appointed areas. Exemptions not covered by these assessments may require the Regulator's consent under regulation 99(2) of the Conservation of Habitats and Species Regulations 2010.

- abstraction in connection with dredging operations authorised by an authority in the exercise of its statutory functions in relation to those waters upstream of the normal tidal limit and any abstraction downstream of the normal tidal limit;
- abstraction of water within managed wetland systems (subject to the main abstraction into the system being licensed) and impounding works solely for the management, operation or maintenance of water within managed wetland systems;
- abstraction of water with a high saline content from underground strata in the Cheshire basin (part of an existing exemption given to the former Mersey and Weaver River Authority in 1968);
- impounding works constructed by or on behalf of Internal Drainage Boards (IDBs) to exercise their functions within their appointed area;
- dewatering of underground strata and abstractions of surface waters to prevent interference with building or engineering works where the abstraction lasts less than six consecutive months (subject to restrictions[19]);
- third-party operated dry docks that transfer water to and from a navigation authority's water system;
- impounding works when required in an emergency; and
- emergency abstraction or impounding where undertaken by port, harbour or conservancy authorities.

### 3.2 Light-touch, risk based licensing approach

The UK and Welsh Governments expect the Regulator to take a light-touch, risk based approach to licensing these abstractions. A light touch, risk based approach means:

- The majority of licences will be granted based on existing abstraction requirements. Applicants should be able to demonstrate, to the reasonable satisfaction of the Regulator, their abstraction requirements and entitlements and that abstraction has taken place within the seven year qualifying period.
- Licences will normally have "hands off flow" conditions[20] to protect rivers during low flows and times of drought where these conditions provide benefits to the environment.

[19] See the Water Abstraction and Impounding (Exemptions) Regulations 2017, which can be found at: http://www.legislation.gov.uk/

[20] Or a groundwater equivalent where the flow in an inland water is dependent on that groundwater.

- The Regulator will have flexibility on the inclusion of volume conditions on transfer licences to avoid undue abstraction control costs on abstractors while still ensuring environmental protection[21].

It is expected that lawful abstractions will only be significantly curtailed or refused to protect the environment from serious damage[22]. However in exceptional circumstances applications may be refused or restricted for reasons other than serious damage, such as protecting a Site of Special Scientific Interest from damage but the Regulator does not consider this damage to be serious damage. In these circumstances, abstractors would be able to apply for compensation. We expect the Regulator to take a similar approach to its own abstractions that become licensable.

To support this approach in England, the UK Government will issue a direction to the Environment Agency that will apply to lawful abstractions that qualify for the transitional arrangements[23]. The direction will recognise that to grant a licence for an existing abstraction to the same extent does not in itself change the environmental impact or increase any damage. The direction will neither remove the Environment Agency's existing duties, which will be complied with, nor detract from its independent assessment of individual licence applications.

In England, we expect Natural England to recognise that the Environment Agency has been directed in such a way and to advise accordingly.

The Welsh Government considers recent Welsh legislation sufficient for supporting a light touch, risk-based approach to licensing abstractions that qualify for the transitional arrangements, without making a direction to Natural Resources Wales[24].

---

[21] Conditions could include for example details of the abstraction structure, which would prevent changes to that structure to allow increased abstraction.

[22] The principles the Regulator would use to assess serious damage are set out in the 2012 consultation and Government response: https://www.gov.uk/government/consultations/the-water-act-2003-withdrawal-of-compensation-on-the-grounds-of-serious-damage As clarified in the 2016 consultation, if the abstraction is affecting, or has the potential to affect, a European site, the Regulator will apply the precautionary principle in its serious damage risk assessment.

[23] Exempt abstractors who have abstracted within the seven years preceding the commencement of legislation.

[24] The Environment (Wales) Act 2016 placed sustainable management of natural resources at the core of how Natural Resources Wales should carry out its activities in a manner consistent with its obligations under the Well-being of Future Generations (Wales) Act 2015 and among Natural Resources Wales' seven Well-being Objectives is the objective to promote successful and responsible business that use natural resources without damaging them.

The UK and Welsh Governments' expectations are that the Regulator will normally grant licences with a time limit to the relevant common end date[25] in keeping with its published licensing position[26]. Once within the licensing system, these abstractions will be treated like other licensed abstractors. While licences will be issued with time limits, it is the UK and Welsh Governments' intention to phase out time limits as part of abstraction reform.

Charging provisions for previously exempt abstractors are included in the Regulators' charging schemes, as may be amended[27].

### 3.3 Licensing: application period and Regulator determinations

We will allow two years for abstractors to apply for their licences. The Regulator will determine all applications within three years from the end of the two year application period.

We expect abstractors to provide sufficient evidence of historic abstraction to support the making of a valid application. If applicants are unable to demonstrate that abstraction has taken place during the qualifying period, they will need to apply via the standard licensing process[28]. Evidence could include meter readings, pump ratings, calculations of abstracted quantities, invoices for equipment, photographs of infrastructure, or business receipts/contracts.

We recognise however that abstractors may have other evidence, which demonstrates to the satisfaction of the Regulator the abstraction taking place to meet existing abstraction requirements. We therefore expect the Regulator to be flexible in considering what evidence is suitable to support applications.

---

[25] In exceptional circumstances, the Regulator may issue long duration licences (up to 24 years) if certain tests are met. However, because it is the intention to phase out time limits as part of abstraction reform and because of the additional evidence requirements for applicants to support a valid long duration licence application, we do not generally expect applicants to apply for and the Regulator to be issuing further long duration licences.

[26] England: https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process and Wales: https://naturalresources.wales/guidance-and-advice/environmental-topics/water-management-and-quality/water-available-in-our-catchments/?lang=en

[27] Current charging schemes are available on the Environment Agency and Natural Resources Wales websites.

[28] As set out in the Water Resources (Abstraction and Impounding) Regulations 2006 (http://www.legislation.gov.uk/uksi/2006/641/contents/made, In some cases, this is likely to mean licences with more restrictive water access and that the abstraction cannot take place until a licence is issued.

In England: https://www.gov.uk/guidance/water-management-apply-for-a-water-abstraction-or-impoundment-licence or in Wales: https://naturalresources.wales/apply-for-a-permit/water-abstraction-licences-and-impoundment-licences/?lang=en

New or increased abstractions will be considered by the Regulator using its standard licensing arrangements. There will be no compensation payable where these licence applications are refused or not granted in full.

Once the regulations are in force, abstractors wishing to undertake a new abstraction or increase their existing abstraction should apply using the appropriate form provided by the Regulator. We expect the Regulator to provide application forms that allow abstractions for previously exempt activities to be applied for together with planned (variations to increase) abstraction and to have in place internal processes that align the two application processes and are considerate to business needs.

Except for the timeframes for applying for and determining licences, in most other respects, the process for dealing with licence applications from existing abstractors who become subject to licensing will be similar to those required under the Water Resources (Abstraction and Impounding) Regulations 2006. The Regulator's standard abstraction charges would also apply.

### 3.4 Regulator guidance for the application process

The UK and Welsh Governments expect the Regulator to provide guidance as part of the application process. It will provide clarity on the number and types of licences to be applied for. The Regulator is best placed to advise and may sometimes need to decide which type of abstraction licence[29] or the number of licences an applicant should apply for[30]. When it does so, it will advise an applicant that it proposes to treat an application for a licence as being one of a different type to that sought before it proceeds to determine the application or publish the proposal. We do not consider that full licences will be necessary or desirable in most cases to regulate water transfers. We do not therefore expect applicants to use this process as a means of enhancing existing rights.

We strongly encourage applicants to make early applications to allow sufficient time for discussions about their application with the Regulator. If an application is received towards

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[29] The Water Act 2003 amended the Water Resources Act 1991 to provide that licences will be one of three types: a 'full licence', a 'transfer licence' or a 'temporary licence' (which lasts for less than 28 days). A 'full licence' gives the holder a right to abstract water that is protected in law from any later licences that the Agency may grant and is required for any abstraction lasting 28 days or more. A 'transfer licence' is available for abstraction of water lasting 28 days or more to transfer water from one source of supply to another, or to the same source of supply, but at another point, in the course of dewatering activities in connection with mining, quarrying, engineering, building or other operations, without intervening use.

Transfer licences do not attract protected rights under the Water Resources Act 1991 and therefore this will be the case when currently exempt abstractions become regulated.

[30] As set out in section 36A of the Water Resources Act 1991. Section 36A enables the Regulator to require an applicant for one type of abstraction licence to apply instead for another type, or to group several related applications together. The applicant can appeal against the Regulator's decision.

the end of the application period the Regulator may be unable to carry out the necessary application validity checks before the application period closes. If the application turns out to be deficient and cannot be deemed a valid application, the applicant risks missing the transitional period, meaning the abstraction must stop at the end of the two year application period and an application submitted under standard licensing procedure where it will not be determined using the light touch risk based approach.

### 3.5 Minimising regulatory burden

We expect the Regulator to minimise the burden of the licensing process on the applicants as far as possible. For instance we expect the Regulator to:

- help abstractors minimise administrative costs by for example linking applications for abstractions from the same source of supply[31];
- provide application forms that allow abstractions for previously exempt activities to be applied for together with planned (variations to increase) abstraction and to have in place internal processes that align the two application processes and are considerate to business needs[32];
- take a flexible risk based approach to licensing which accommodates the wide variety of situations abstractors may find themselves in to avoid unnecessary business burdens or controls.

### 3.6 Compensation arrangements

Compensation[33] may be applied for where loss or damage arises from a refused or constrained application for lawful[34] abstraction that is made within the qualifying period, except where refusal or curtailment is necessary to:

---

[31] In the case of abstractions for mining, quarrying, engineering and building operations where the exact point of abstraction changes over time within a sites' area, we expect the Regulator to license this abstraction in a way that will also minimise the need for multiple licences or licence variations by for example referring to the existing worked area as being the point(s) of abstraction.

[32] As explained in Section 4.2, the planned element of these abstractions will be considered by the Regulator under the Water Resources (Abstraction and Impounding) Regulations 2006.

[33] There may be exceptional cases where compensation will be paid. These are most likely to be affecting damaged Sites of Special Scientific Interest (SSSIs), where the Regulator's duties either prevent it from granting licences or mean it must apply more restrictive licence conditions but it does not consider the damage to be serious damage.

[34] Where licence conditions reflect other permissions and entitlements, for example constraints referred to in enabling Acts, conditions contained within planning permissions or to prevent any significant adverse effects

- protect the environment from serious damage[35];
- apply a basic "hands off flow[36]" condition to restrict abstraction during low flows and drought conditions;
- reflect current operating constraints already in place e.g. canal acts, planning conditions, mechanisms to control abstractions during qualifying period in the case of transfer licences with no volumes specified; and
- apply a time limit in accordance with the Regulator's current policy.

Any compensation liabilities will be funded through the Regulator's existing mechanisms for generating water resources income and it should use existing compensation funds collected or, where required, any further collection of compensation funds[37][38].

As a general principle, public authorities or organisations should not expect to seek recompense or claim compensation from other publicly funded authorities in the proper exercise of their statutory functions. This approach was supported by consultees in the 2009 consultation. The Regulator will therefore not be liable to pay compensation where the applicant under the transitional provisions is a public authority.

If there is a dispute about a licence decision or what type or number of abstraction licences an applicant should apply for, the applicant will have a right of appeal. The appeals process will be consistent with the usual appeal process for abstraction licences[39].

identified under the Water Resources (Environmental Impact Assessment) Regulations 2003 as this will not constitute loss or damage.

[35] In relation to sites designated under the Habitats Regulations, serious damage includes instances where the precautionary principle is applied because the Regulator has insufficient evidence to conclude no adverse effects to protected sites would be caused.

[36] Compensation will not be payable where the Regulator applies a Qn95 or less restrictive condition in over-abstracted catchments, similarly 75% of Qn99 where flow supports the environment.

[37] In Wales, the Welsh Government has agreed to consider specific support to Natural Resources Wales if compensation costs should materialise beyond a level that can reasonably be met from within the Natural Resources Wales' water resources income.

[38] When required, the Environment Agency and Natural Resources Wales use the "Environmental Improvement Unit Charge (EIUC)", a component of its abstraction charges, to collect funds for compensation.

[39] Section 36A of the Water Resources Act 1991 for appeals against type or number of licence applications and section 43 of the Water Resources Act 1991 for decision on whether to grant or refuse a licence.

# 4. Timetable and Next Steps

## 4.1 Implementation timetable

We will make the changes to the exemptions in the abstraction licensing system by commencing the primary legislation and through secondary legislation.

We consulted on the draft secondary legislation in January last year as part of the consultation process. We will now lay the regulations in Parliament and the National Assembly for Wales.

The two year licence application process will commence, once the regulations come into force on 1 January 2018.

Abstraction that has taken place during the qualifying period can continue without a licence until the licence is determined or, if no application is made, until the application period closes.

## 4.2 Further work to achieve the policy

The Regulator will produce guidance on the licence application process before the regulations come into force, during the application period and beyond. The Regulator will continue engagement with abstractors throughout the application and determination processes.

Abstractors can contact their local Regulator offices[40] to discuss their individual circumstances.

[40] Abstractors in England can contact the Environment Agency's National Customer Contact Centre to speak to the appropriate contact on: 03708 506 506 or enquiries@environment-agency.gov.uk

Abstractors in Wales can contact Natural Resources Wales' Customer Care Centre to speak to the appropriate contact on: 0300 065 3000 or enquiries@naturalresourceswales.gov.uk

# Glossary

**Abstraction:** Removal of water from a surface or groundwater source.

**Abstraction conditions:** Conditions attached to an abstraction licence, for example, which can stop or reduce abstraction at specified threshold values (a Hands-off Flow), a seasonal restriction or an expiry date.

**Abstraction licence:** The authorisation granted by the Environment Agency or Natural Resources Wales to allow the removal of water from a surface or groundwater source. Licences are currently needed where more than 20 cubic metres (approximately 4,400 gallons) a day per source of supply is removed unless a specific exemption applies.

The Water Act 2003 amended the Water Resources Act 1991 to provide that licences will be one of three types: a 'full licence', a 'transfer licence' or a 'temporary licence' (which lasts for less than 28 days). A 'full licence' gives the holder a right to abstract a specified volume of water that is protected in law from any later licences that the Environment Agency or Natural Resources Wales may grant and is required for any abstraction lasting 28 days or more. A 'transfer licence' is available for abstraction of water lasting 28 days or more to transfer water from one source of supply to another, or to the same source of supply, but at another point, in the course of dewatering activities in connection with mining, quarrying, engineering, building or other operations, without intervening use.

**Abstraction Licence Strategies /Catchment Abstraction Management Strategies definitions:**

- Water Available: there is more than enough water to meet the needs of the environment.
- Over Licensed: the total volume of water licensed could compromise the needs of the environment. If all licensed water is abstracted, there will not be enough water left for the environment.
- Over abstracted: there is not enough water to meet the needs of the environment.

**Environmental Improvement Unit Charge (EIUC):** A component of the annual charge in the Regulators' charges schemes payable by abstractors which is used in some cases to cover the costs of compensating abstractors where their abstraction licences are compulsorily varied or revoked to reduce the risk of environmental damage caused by abstracting too much water.

**Exemptions:** The abstractions that can currently be lawfully made (and will be allowed in the future for low risk activities) without an abstraction or impoundment licence being needed.

**Hands-off Flows (HoFs):** A condition attached to an abstraction licence which states that if flow (in the river) reaches or falls below the threshold specified on the licence, the abstractor will be required to reduce or stop the abstraction.

**Qn95 and Qn99:** Qn95 is generally accepted to be a natural flow that is exceeded 95% of the time. Similarly Qn99 is the natural flow that is exceeded 99% of the time. 75% of Qn99 is 75% of Qn99 flow.

**Regulator:** Environment Agency in England and Natural Resources Wales in Wales

**Restoring Sustainable Action (RSA) Programme:** The programme involves the Environment Agency and Natural Resources Wales reviewing abstraction licences to find out whether water abstraction is causing environmental problems. Where they find licensed abstraction is a problem, they work with abstractors to find solutions.

**Serious damage:** The principles the Regulator would use to assess serious damage are set out in the 2012 consultation and Government response: https://www.gov.uk/government/consultations/the-water-act-2003-withdrawal-of-compensation-on-the-grounds-of-serious-damage and the clarifications made in the 2016 New Authorisations consultation.

# Severn Corridor Abstraction Licensing Strategy

A strategy to manage water resources sustainably

February 2020

We are the Environment Agency. We protect and improve the environment.

We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We can't do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

Published by:

Environment Agency
Horizon House, Deanery Road,
Bristol BS1 5AH

www.gov.uk/environment-agency

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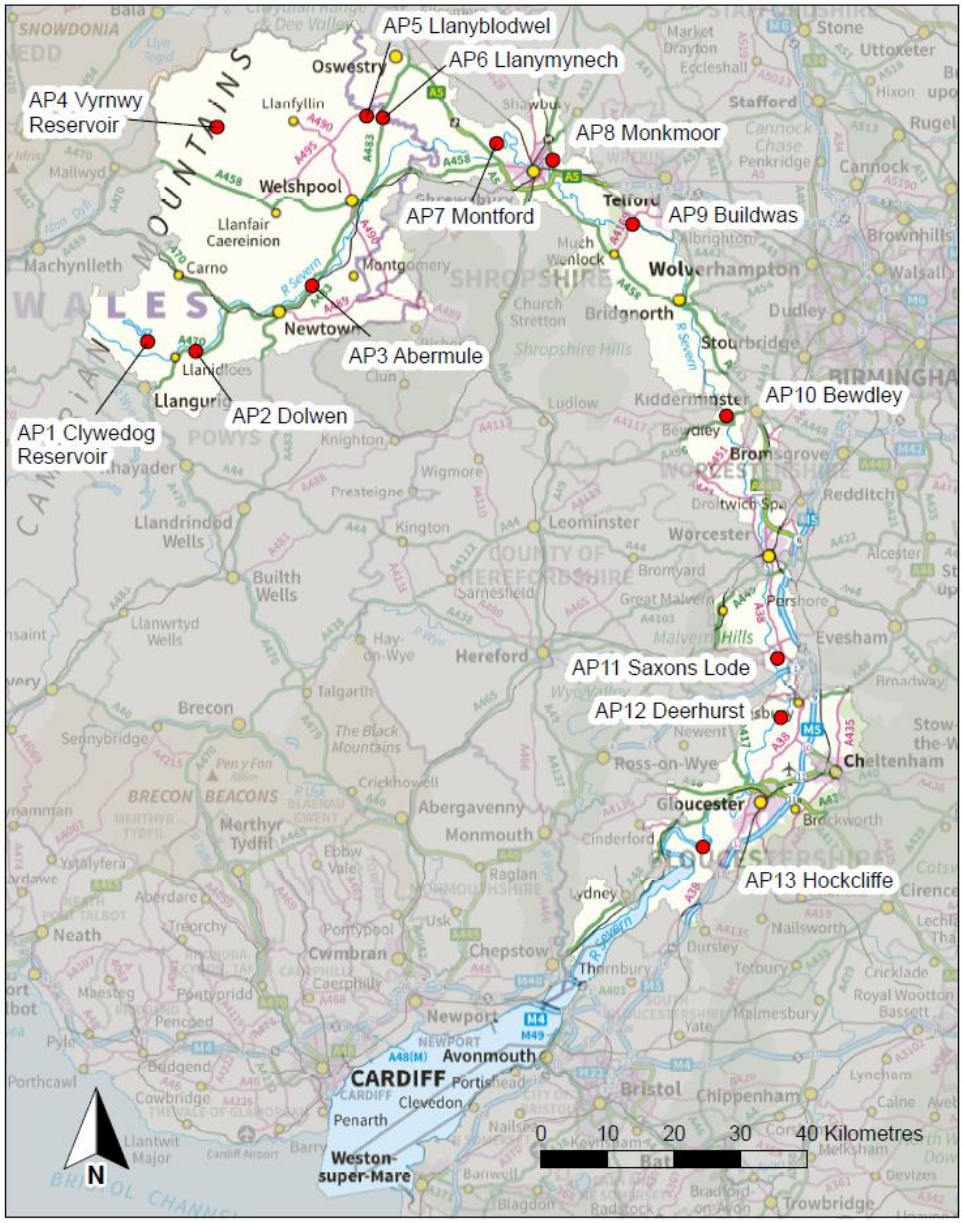
# 1. About the licensing strategy

This strategy sets out our approach to managing new and existing abstraction and impoundment within the Severn Corridor catchment in the Severn river basin district.

The Severn Corridor Abstraction Licensing Strategy (ALS) covers the upper reaches of the River Severn catchment (including all of the upland tributaries) down to the point where it is joined by the River Perry to the north west of Shrewsbury. From here on it focuses on the River Severn itself and a number of smaller tributaries down to the Severn Estuary. The major tributaries such as the Tern, Stour, Teme and Avon are covered within separate ALS documents, although their tributary impacts are incorporated within the Severn Corridor resource assessment.

Map 1 The Severn Corridor area and Assessment Points

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● Assessment Points

Our approach ensures that River Basin Management Plan objectives for water resources activities are met and we avoid deterioration within this catchment.

We apply this approach to the water body in which the abstraction is located. It also applies to all downstream surface water bodies that may be affected by any reduction in abstraction-related flow, or adjacent groundwater bodies affected by any reduction in groundwater level.

Please see Managing Water Abstraction for the technical explanation, legal and policy requirements behind the Abstraction Licensing Strategy (ALS).

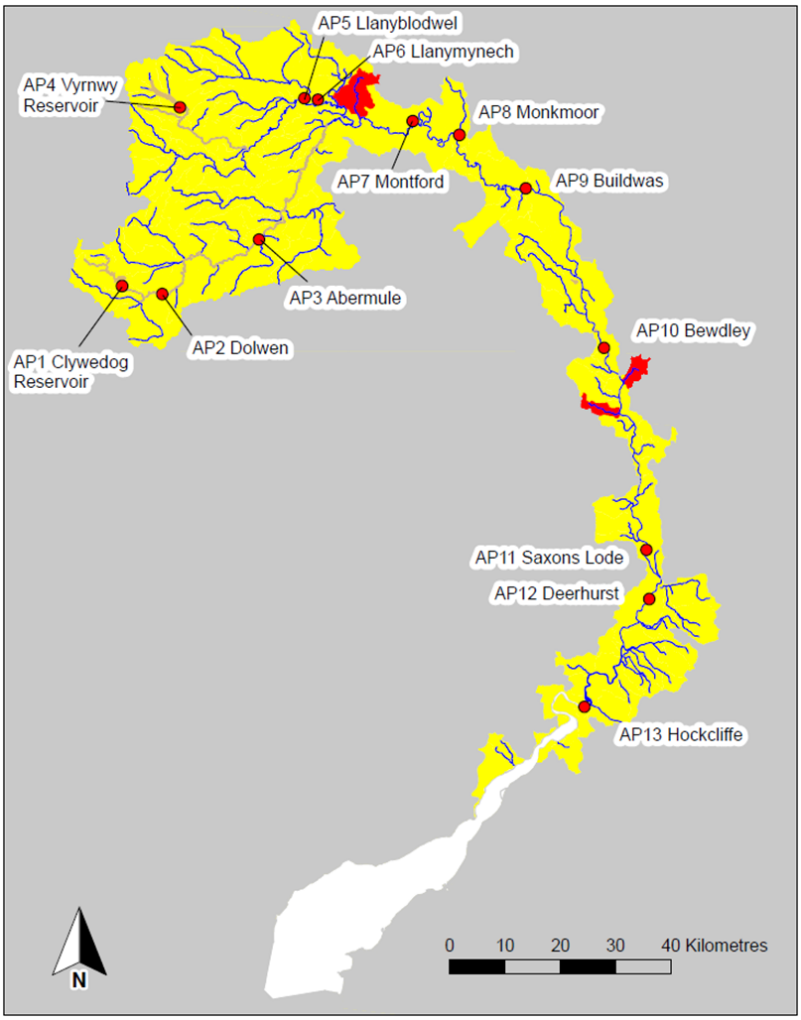
Please see abstraction pages on gov.uk for advice on who needs an abstraction or impoundment licence, and how to apply.

# 2. Water resource availability of the Severn Corridor ALS

## 2.1. Surface water resource availability

The water resource availability, calculated at four different flows, Q95 (the flow of a river which is exceeded on average for 95% of the time i.e. low flow), Q70, Q50, and Q30 (higher flow) for this ALS is presented and explained in Maps 2 to 5 and below.

Map 2 Water resource availability colours at Q95 for the Severn Corridor ALS.

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Assessment Points

Heavily Modified and Artificial Rivers

Heavily Modified Artificial lakes

Rivers

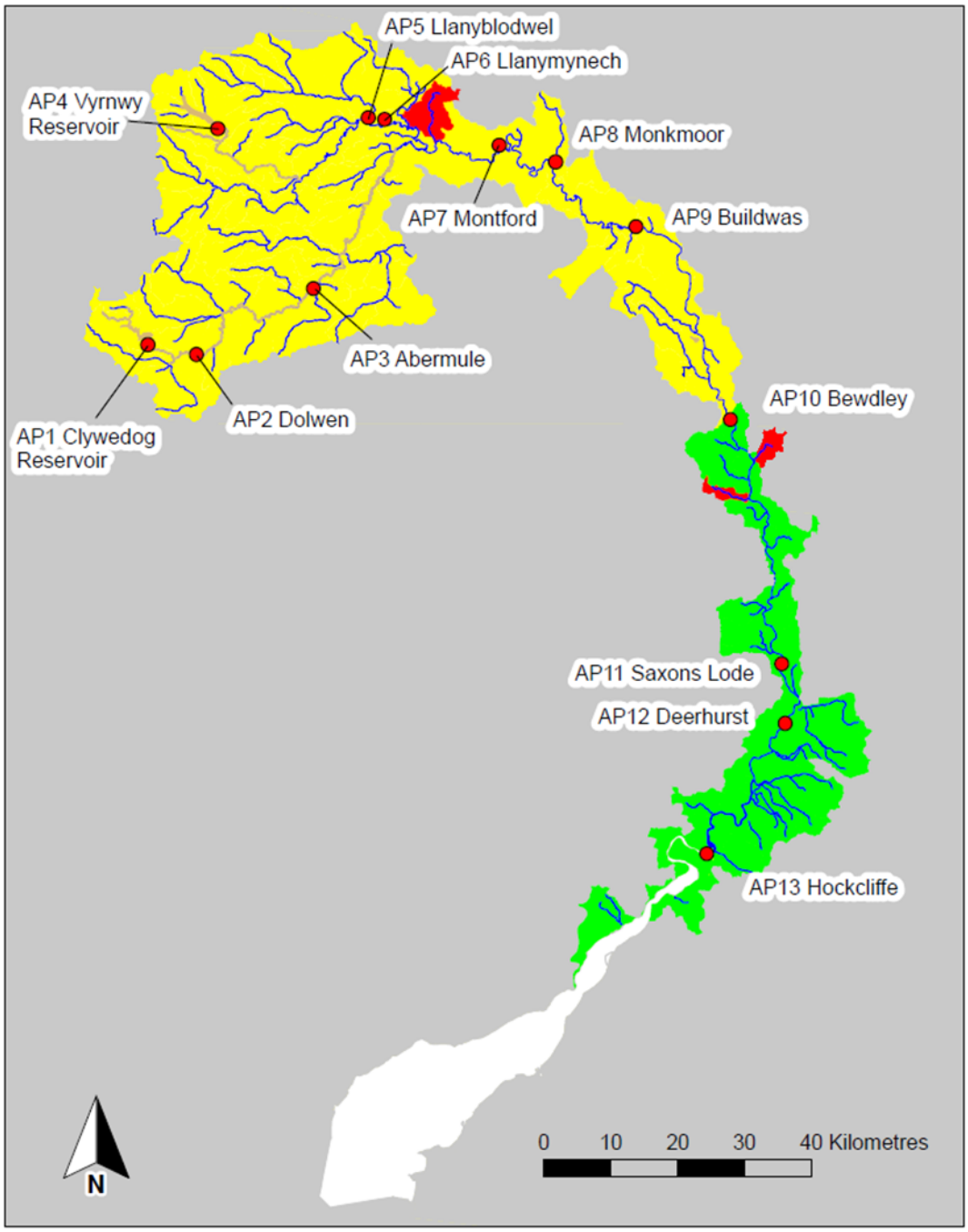
Water Availability at Q95:

Water available

Restricted water available

Water not available

Map 3 Water resource availability colours at Q70 for the Severn Corridor ALS.

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Assessment Points

Heavily Modified and Artificial Rivers

Heavily Modified Artificial lakes

Rivers

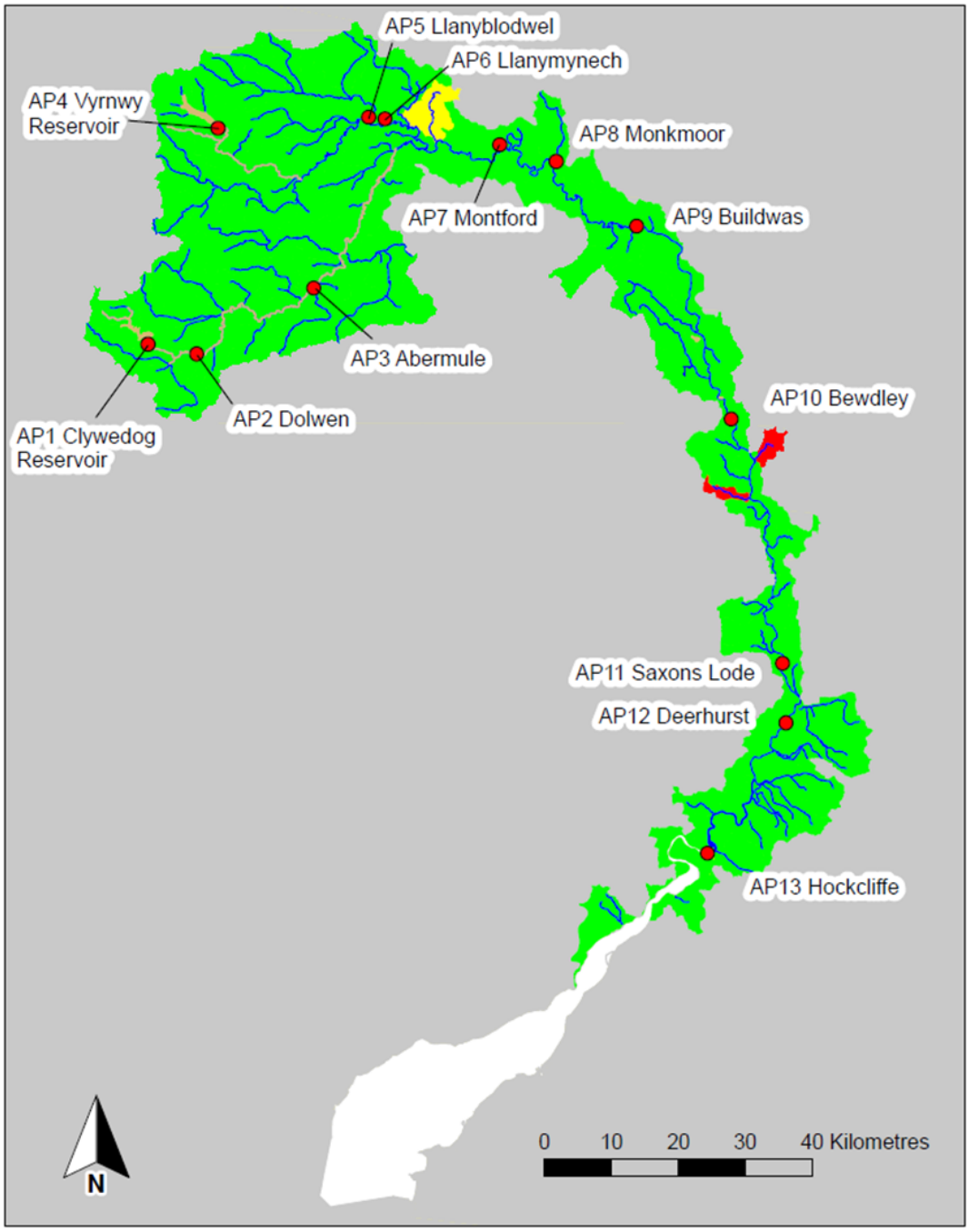
Water Availability at Q70:

Water available

Restricted water available

Water not available

Map 4 Water resource availability colours at Q50 for the Severn Corridor ALS.

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Assessment Points

Heavily Modified and Artificial Rivers

Heavily Modified Artificial lakes

Rivers

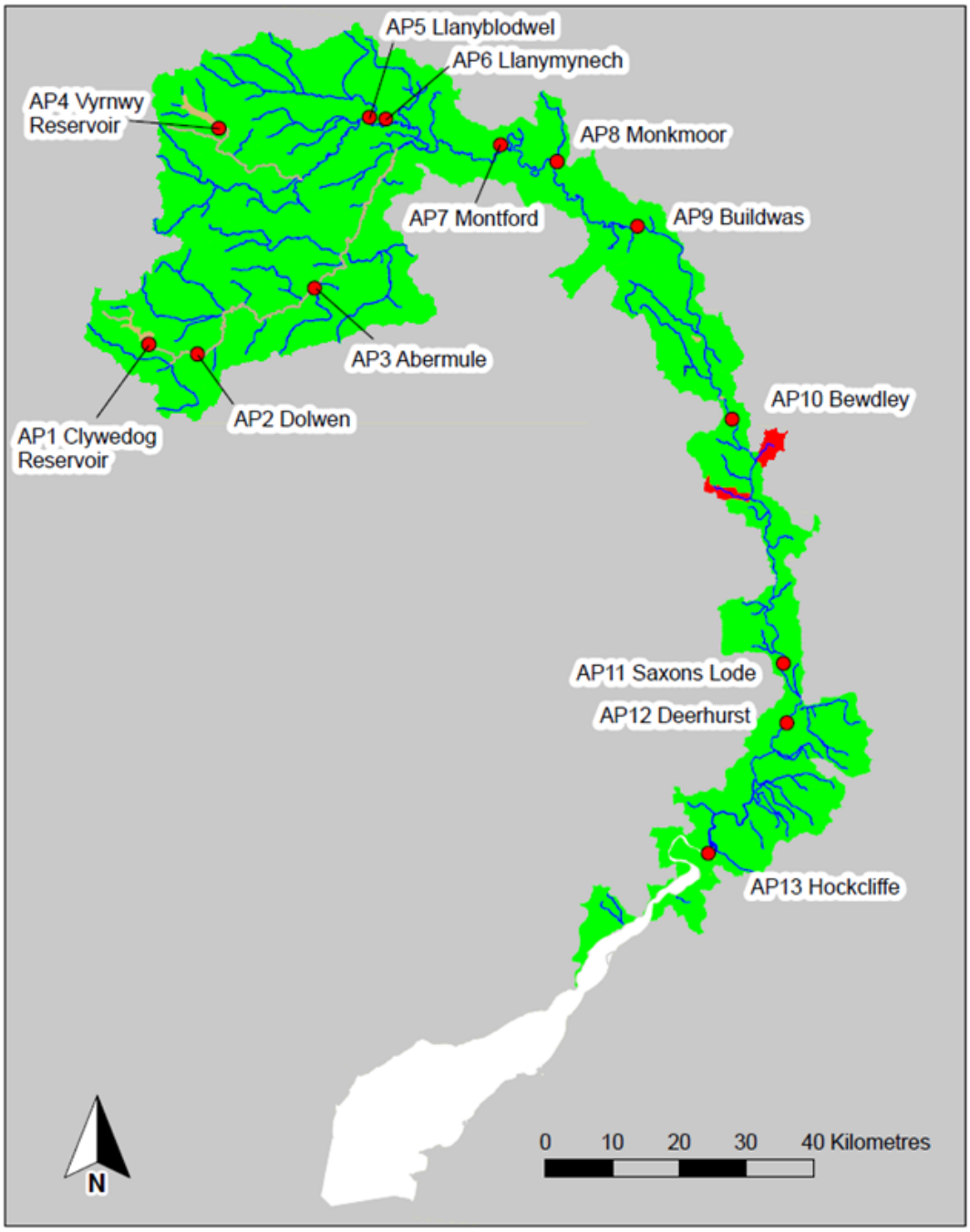
Water Availability at Q50:

Water available

Restricted water available

Water not available

Map 5 Water resource availability colours at Q30 for the Severn Corridor ALS

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- Assessment Points
- Heavily Modified and Artificial Rivers
- Heavily Modified Artificial lakes
- Rivers

Water Availability at Q30:

- Water available
- Restricted water available
- Water not available

### 2.1.1 Water resource availability colours and implications for licensing

**Water available for licensing**

Green

There is more water than required to meet the needs of the environment at the flows shown in maps 2 to 5.

New licences can be considered depending on local and downstream impacts. Consumptive licences will be issued with a hands off flow (HoF) restriction to protect environmental requirements at lower flows.

**Restricted water available for licensing**

Yellow

Full Licensed flows fall below the Environmental Flow Indicators (EFIs) at the flows shown in maps 2 to 5.

If all licensed water is abstracted at these flows there will not be enough water left for the needs of the environment. No new consumptive licences would be granted without a suitable HoF to protect the flows needed by the environment. It is likely we'll be taking action to reduce full licensed risks.

Water may be available if you can ‘buy’ (known as licence trading) the entitlement to abstract water from an existing licence holder. Please refer to Section 3.6.

**Water not available for licensing**

Red

Recent actual flows are below the EFI at the flows shown in maps 2 to 5.

This scenario highlights water bodies where flows are below the indicative flow requirement to help support a healthy ecology in our rivers. We call this 'Good Ecological Status' (GES) or 'Good Ecological Potential' (GEP) where a water body is heavily modified for reasons other than water resources.

We are currently taking action in water bodies that are not supporting GES or GEP. We will not grant further licences.

Water may be available if you can buy (known as licence trading) a volume equivalent to that recently abstracted by an existing local licence holder. Please refer to Section 3.6.

**Heavily Modified Water Bodies (HMWBs) (and/or discharge rich water bodies**

These water bodies have a modified flow that is influenced by reservoir compensation releases or they have flows that are augmented. These are often known as ‘regulated rivers’. They may be managed through an operating agreement, often held by a water company. The availability of water is dependent on these operating agreements.

There may be water available for abstraction in discharge rich catchments, you need to contact us to find out more.

## 2.2. Groundwater resource availability

In certain areas, resource concerns over groundwater mean that the standard water resource availability colours have been overridden. Section 2.2.1 explains the groundwater resource availability colours, and Map 6 shows these colours for groundwater management units (GWMUs) in the Severn Corridor area. Applications for new or varied groundwater abstraction areas outside of GWMUs will continue to be assessed on a case by case basis.

### 2.2.1 Groundwater resource availability colours and implications for licensing

**Water available for licensing**

Green

Groundwater management unit balance shows groundwater is available for licensing. New licences can be considered depending on their impacts on other abstractors and providing there will be no significant impact on surface water flows, dependent wetlands, groundwater levels and they do not cause saline intrusions.

**Restricted water available for licensing**

Yellow

Groundwater management unit balance shows more water is licensed than the amount available, but that recent actual abstractions are lower than the amount available OR that there are known local impacts likely to occur on surface water flows, dependent wetlands, groundwater levels or cause saline intrusions but with management options in place.

In restricted groundwater management units no new consumptive licences will be granted where the groundwater balance and/or surface water flows/groundwater dependent wetlands are at risk of becoming unsustainable as a result of existing licensed abstraction. It will be appropriate to take action to reduce fully licensed risks.

Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder. Please refer to Section 3.6.

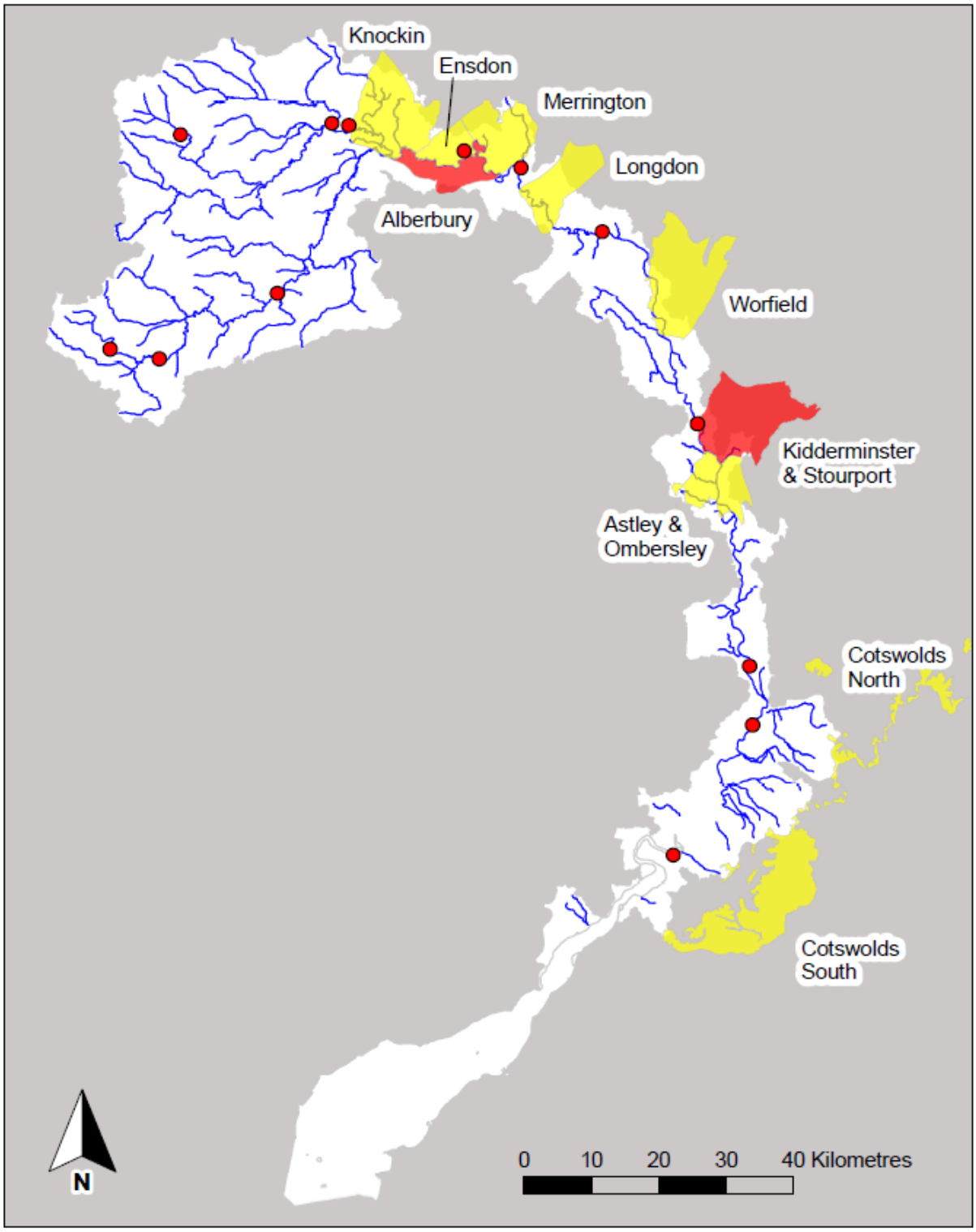
**Water not available for licensing**

Red

Groundwater management unit balance shows more water has been abstracted based on recent amounts than the amount available.

We will not grant further consumptive licences.  It will be appropriate to take action to reduce fully licensed risks. Water may be available if you can 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder. Please refer to Section 3.6.

Map 6 Groundwater resource availability colours in the Severn Corridor

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Assessment Points

Rivers

Restricted water available GWMUs

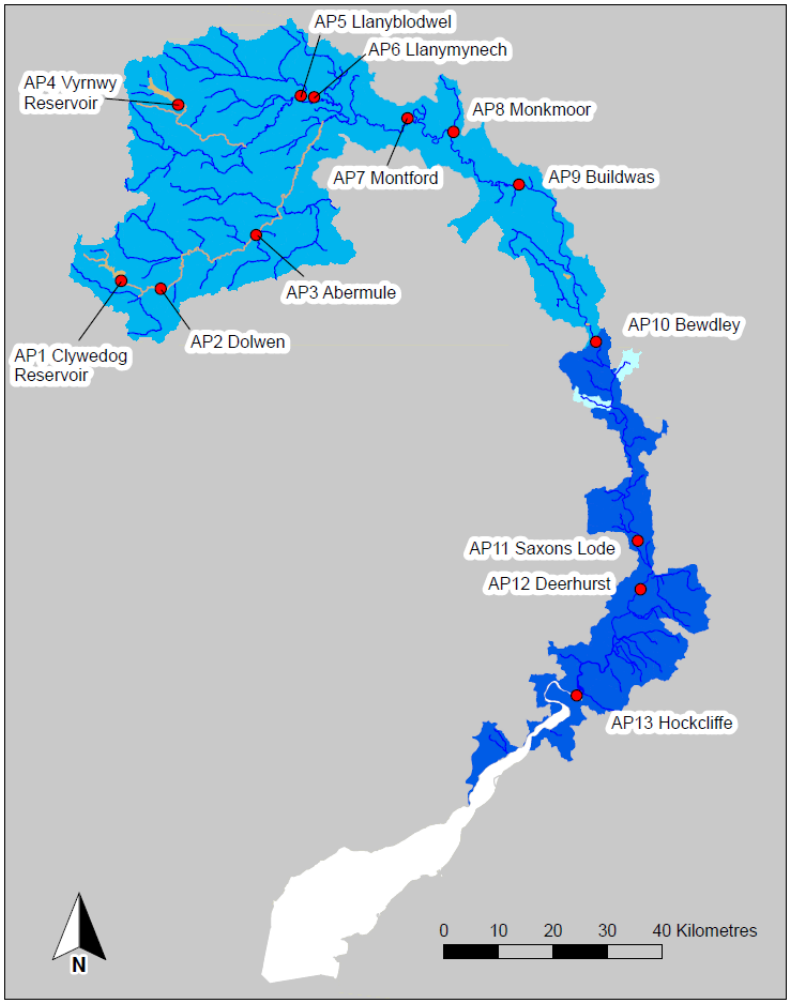
Water not available GWMUs

## 2.3. Resource reliability

If you want to apply for a licence, it's worth considering the reliability of your abstraction.

By assessing the quantity of water available at different flows it's possible to see when there is a surplus or deficit of water and the associated reliability of an abstraction. This is an indication only; actual reliability of a licence will be discussed when you apply.

Map 7 Water resource reliability for consumptive abstraction of the Severn Corridor ALS expressed as percentage of time available

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- Heavily Modified Artificial lakes
- Rivers

Percentage of the time additional consumptive resource may be available:

- Consumptive abstraction available less than 30% of the time
- Consumptive abstraction available at least 30% of the time
- Consumptive abstraction available at least 50% of the time
- Consumptive abstraction available at least 70% of the time
- Consumptive abstraction available at least 95% of the time

## 2.4. Other considerations for availability and reliability

We may have to add constraints to licences such as hands off flow (HoF) conditions to protect the environment and the rights of other abstractors. As a result, when we grant a licence, it doesn't mean that we guarantee a supply of water. These conditions specify that if the flow in the river drops below what's needed to protect the environment, abstraction must reduce or stop. So, in dry years, restrictions are likely to apply more often, which will affect the reliability of supply.

Whilst this document may say that water is available for abstraction, this doesn't guarantee that all applications will be successful. This is because we have to determine each application on its own merits, and local factors may mean we're either unable to grant a licence as applied for, or even at all.

New licences within an ALS are usually given a Common End Date (CED), which allows them to be reviewed at the same time. The next CED for this ALS is 31 March 2034 and the subsequent one is 31 March 2046.

## 2.5. Impoundments

Applications for impoundments will be dealt with on a case by case basis. More information may be found on our water management web pages on gov.uk.

# 3. How we manage abstraction in the Severn Corridor ALS

## 3.1. Surface water assessment points

We assess surface water flows at Assessment points (APs), which are significant points on a river, often where two major rivers join or at a gauging station. APs cover multiple surface water bodies.

To protect the environment we will issue licences with a condition referred to as a hands-off flow (HoF). This specifies that if the flow in the river drops below that which is required to protect the environment abstraction must stop, hence 'hands off flow'.

Table 1 gives an indication of how much water is available for further abstraction at each AP and the HoFs and other associated restrictions applicable to new and varied abstraction licences from the main rivers. Tributaries to the main rivers may be subject to different restrictions and quantities and will be assessed locally on a case by case basis.

Each HoF is linked to an AP and is dependent on the resource availability at that AP. All abstraction licence applications are subject to an assessment to take account of any local and downstream issues. In some cases additional restrictions may apply to licences where there is a more critical resource availability downstream to protect the ecological requirements of the river.

Reading from top to bottom in Table 1 are the APs in the Severn Corridor ALS area. Reading across the columns you can see the water resource availability status, potential HoF that may be applied to a licence in each AP, the number of days water may be available under this restriction and the approximate volume of water that may be available in Ml/d. Further information on any local conditions can be seen in the final column.

The conditions in Table 1 apply to new or varied consumptive abstractions and may not apply if the abstraction is non-consumptive (i.e. it doesn't result in a loss of water to any part of the catchment) or if the licence results in an overall environmental benefit.

To protect fish and eels we may also require the installation of a correctly-sized screen and/or fish pass.

Licences will be issued to the Severn Corridor Common End Date (CED) of 31st March 2034. A shorter time limit or changes to the licence conditions may be required where there are risks to the sustainability of catchments.

Any existing licence which the holder applies to have formally varied to increase the volume abstracted will be subject to the same conditions as new licences on the increased part of the licence only.

Licences due for renewal in this area will have a presumption of renewal, subject to meeting the renewal criteria (requiring the abstraction to be sustainable, justified and efficient) and local considerations. Renewals may be subject to minor changes including the addition of water efficiency conditions. We will endeavour to give six years notice if a licence will not be renewed or is to be renewed but on more restrictive terms. See Section 3.7.2.

Table 1 Summary of licensing approach for the assessment points of the Severn Corridor ALS.

| AP | Name | Water Resource Availability | HOF Restriction | Average number of days per annum abstraction may be available | Approximate volume available at restriction (Ml/d) | Additional information |
|---|---|---|---|---|---|---|
| 1 | Afon Clywedog below Clywedog Reservoir | Restricted Water Available for Licensing | 2271 Ml/d at Bewdley gauging station on the River Severn | 219 | See AP10 | |
| 2 | River Severn at Dolwen | Restricted Water Available for Licensing | 2271 Ml/d at Bewdley gauging station on the River Severn | 219 | See AP10 | |
| 3 | River Severn at Abermule | Restricted Water Available for Licensing | 2271 Ml/d at Bewdley gauging station on the River Severn | 219 | See AP10 | |
| 4 | River Vyrnwy | Restricted Water | 224 Ml/d at Llanyblod-wel gauging | 219 | See AP5 | |

| AP | Name | Water Resource Availability | HOF Restriction | Average number of days per annum abstraction may be available | Approximate volume available at restriction (Ml/d) | Additional information |
|---|---|---|---|---|---|---|
| | (below reservoir) | Available for Licensing | station on the River Tanat | | | |
| 5 | River Tanat at Llany-blodwel | Restricted Water Available for Licensing | 224 Ml/d | 219 | 27.1 from the whole of the catchment upstream of Llanyblodwel | A lower restriction of 207 Ml/d will apply when water company abstractions are reduced |
| 6 | River Vyrnwy at Llany-mynech | Restricted Water Available for Licensing | 224 Ml/d at Llanyblod-wel gauging station on the River Tanat | 219 | See AP5 | |
| 7 | River Severn at Montford | Restricted Water Available for Licensing | 2271 Ml/d at Bewdley gauging station on the River Severn | 219 | See AP10 | Abstractions from the Weir Brook are likely to be restricted to higher flows due to ongoing investiga-tions |
| 8 | River Severn at Monk-moor | Restricted Water Available for Licensing | 2271 Ml/d at Bewdley gauging station on the River Severn | 219 | See AP10 | |
| 9 | River Severn at Buildwas | Restricted Water Available for Licensing | 2271 Ml/d at Bewdley gauging station on the River Severn | 219 | See AP10 | Abstractions from the Sundorne Brook will be assessed on a case-by-case basis due to the modified |

| AP | Name | Water Resource Availability | HOF Restriction | Average number of days per annum abstraction may be available | Approximate volume available at restriction (Ml/d) | Additional information |
|---|---|---|---|---|---|---|
| | | | | | | nature of the watercourse |
| 10 | River Severn at Bewdley | Restricted Water Available for Licensing | 2271 Ml/d | 219 | 131 from the whole of the catchment upstream of Bewdley | A lower restriction of 2131 Ml/d will apply when water company abstractions are reduced |
| 11 | River Severn at Saxons Lode | Restricted Water Available for Licensing | 2568 Ml/d at Deerhurst gauging station on the River Severn | 285 | See AP12 | Hartlebury Brook will be closed to further abstraction and abstractions from the Dick Brook and Shrawley Brook may be limited due to concerns over their sustain-ability |
| 12 | River Severn at Deerhurst | Restricted Water Available for Licensing | 2568 Ml/d | 285 | 172 from the whole of the catchment upstream of Deerhurst | A lower restriction of 2428 Ml/d will apply when water company abstractions are reduced |
| 13 | River Severn at Hockcliffe | Restricted Water Available for Licensing | 2568 Ml/d at Deerhurst gauging station on the River Severn | 285 | See AP12 | |

We are offering lower (less restrictive) HoFs which will be available to licence holders at times when Severn Trent Water's Birmingham Resilience Licence is not being used. It is licensed to be used during the winter months but is unlikely to be used every year. The reduced HoFs would apply to the remainder of the year and in times of non-use. The lower HoFs offered will be:

- Bewdley: 2,131 Ml/d
- Deerhurst: 2,428 Ml/d
- Llanyblodwel: 207Ml/d

As an alternative option to the HoFs set out in Table 1, licence holders may instead choose to obtain a licence up to 2Ml/d with the following conditions:

- No HoF condition.
- A condition stating that the abstraction must cease when total regulation to the River Severn is greater than or equal to 500 Ml/d.
- A time limit to 31 March 2024.
- A presumption of renewal on the basis that a HoF may be imposed on any renewed licence.

A review of this alternative option will be triggered when the total net quantity licensed after the implementation of this strategy reaches 50 Ml/d. An overview of the regulation of the River Severn is given in Section 3.4 Heavily Modified Water Bodies. We can provide further advice and information if licence holders wish to investigate this option further.

## 3.2. Groundwater

Principal aquifers are designated as named groundwater bodies (GWB). We may divide GWB's into smaller groundwater management units (GWMU). In these cases we use the information and assessments on these units to determine water availability and licence restrictions.

Where groundwater abstractions directly impact on surface water flows, including reduction of base flow, the impact is measured at the surface water AP. In these cases, restrictions may be applied to licences, such as Hands off Level (HoL) or Hands off Flow (HoF) conditions. The HoL is a groundwater level below which an abstractor is required to reduce or stop abstraction. The HoF is applied when flows fall below a certain rate in a connected watercourse.

Other restrictions may apply where availability is limited or to protect the environment, for example to prevent saline intrusion.

Table 2 Availability of groundwater and licence restrictions on groundwater abstraction in the Severn Corridor ALS area

| Groundwater body and Status | Groundwater Management Unit | Resource Availability Colour and Licence restrictions on groundwater abstractions |
|---|---|---|
| Severn Uplands Permo-Triassic Sandstone Knockin<br>This groundwater body is considered to be at good | Knockin | Restricted water available for licensing.<br>No new consumptive abstractions will be granted.<br>Opportunities to reduce fully licensed risks will be taken where deterioration of surface water body status is a risk. In these |

| Groundwater body and Status | Groundwater Management Unit | Resource Availability Colour and Licence restrictions on groundwater abstractions |
|---|---|---|
| quantitative status but at risk of deterioration | | locations, time limited licence renewals will require changes to reflect historic usage in order to manage the risk of future deterioration to the environment. |
| Shropshire Middle Severn Permo-Triassic Sandstone East Shropshire<br><br>This groundwater body is considered to be at poor quantitative status and at risk of deterioration | Alberbury | Water Not Available for Licensing.<br>No new consumptive abstractions will be granted.<br>Opportunities to reduce fully licensed risks will be taken. Time limited licence renewals will require changes to reflect historic usage in order to manage the risk of future deterioration to the environment. |
| Shropshire Middle Severn Permo-Triassic Sandstone East Shropshire<br><br>This groundwater body is considered to be at poor quantitative status and at risk of deterioration | Ensdon<br>Merrington<br>Longdon | Restricted water available for licensing.<br>No new consumptive abstractions will be granted.<br>Opportunities to reduce fully licensed risks will be taken. Time limited licence renewals will require changes to reflect historic usage in order to manage the risk of future deterioration to the environment. |
| Worcestershire Middle Severn Permo-Triassic Sandstone<br><br>This groundwater body is considered to be at poor quantitative status and at risk of deterioration | Kidderminster & Stourport | Water Not Available for Licensing.<br>No new consumptive abstractions will be granted.<br>Opportunities to reduce fully licensed risks will be taken. Time limited licence renewals will require changes to reflect historic usage in order to manage the risk of future deterioration to the environment. |

| Groundwater body and Status | Groundwater Management Unit | Resource Availability Colour and Licence restrictions on groundwater abstractions |
|---|---|---|
| Worcestershire Middle Severn Permo-Triassic Sandstone<br><br>This groundwater body is considered to be at poor quantitative status and at risk of deterioration | Worfield<br><br>Astley & Ombersley | Restricted water available for licensing.<br><br>No new consumptive abstractions will be granted.<br><br>Opportunities to reduce fully licensed risks will be taken. Time limited licence renewals will require changes to reflect historic usage in order to manage the risk of future deterioration to the environment. |
| Warwickshire Avon Jurassic Limestone Cotswold Edge North<br><br>This groundwater body is considered to be at good quantitative status and not at risk of deterioration | Cotswold North | Restricted water available for licensing.<br><br>Resources are available from this unit for further groundwater development. The unit covers many catchments and has a strong linkage with surface water. A HoF will be applied to new abstractions according to the surface water catchment influenced by the abstraction.<br><br>Any application will be subject to the assessment of impacts on existing water users, groundwater dependent terrestrial ecosystems, surface water level and flow impacts, as we must ensure that no deterioration of the water environment is allowed to occur.<br><br>Opportunities to reduce fully licensed risks will be taken where surface water body deterioration is a risk. In these locations, time limited licence renewals will require changes to reflect historic usage in order to manage the risk of future deterioration to the environment. |
| Severn Vale Jurassic Limestone Cotswold Edge South<br><br>This groundwater body is considered to be good quantitative status and not at risk of deterioration | Cotswold South | Restricted water available for licensing.<br><br>Resources are available from this unit for further groundwater development.<br><br>New groundwater licences from this unit will be granted with a HoF condition to be measured at Ebley Mill gauging station. The condition will offer the same level of protection as the surface water HoF on the River Frome as set out in the Severn Vale Abstraction Licensing Strategy. This is required as the surface water and |

| Groundwater body and Status | Groundwater Management Unit | Resource Availability Colour and Licence restrictions on groundwater abstractions |
|---|---|---|
| | | groundwater in this area is extremely well connected.<br><br>Any application will be subject to the assessment of impacts on existing water users, groundwater dependent terrestrial ecosystems, surface water level and flow impacts, as we must ensure that no deterioration of the water environment is allowed to occur.<br><br>Opportunities to reduce fully licensed risks will be taken where surface water body deterioration is a risk. In these locations, time limited licence renewals will require changes to reflect historic usage in order to manage the risk of future deterioration to the environment. |

**Secondary Aquifers**

New groundwater licence applications for abstraction from secondary aquifers will continue to be assessed on a case by case basis. Consideration will include potential impacts on existing water users, groundwater dependent terrestrial ecosystems, groundwater resources, surface water level and flow. We must ensure that no deterioration of the water environment is allowed to occur.

## 3.3. Coasts and estuaries

The Severn Estuary supports a wide array of habitats and species and is designated as a Site of Special Scientific Interest (SSSI), a Habitats Directive Special Protection Area (SPA) and Special Area of Conservation (SAC), and is included on the list of wetlands of international importance under the Ramsar Convention (Ramsar Site). The intertidal mudflats, sand banks, rocky platforms and salt marsh are among the largest and most important in Britain; supporting internationally important populations of waterfowl, invertebrate populations of considerable interest and large populations of migratory fish including Atlantic salmon, sea trout, allis and twaite shad, sea and river lamprey and European eels.

The Estuary receives a significant proportion of its flow from the River Severn catchment, and as we have an obligation to protect all Habitats Directive sites, this means that the River Severn and all of its tributaries must be managed using appropriate flow restrictions to protect the environmental needs of the Estuary. All the HoFs to be applied to new or upwardly varied surface water licences granted on the River Severn and its tributaries are equal to or more restrictive than the flow required by the estuarine ecology.

## 3.4. Heavily modified water bodies

Upstream of Bewdley, the Rivers Severn and Vyrnwy are designated as Heavily Modified Water Bodies (HMWBs), due to the impact from the River Severn regulation system, which influences the flow regime of the rivers. This regulation system is designed to meet the water resource demands of abstractors on the river, while maintaining an acceptable flow

for the purposes of fisheries, conservation, recreation, navigation, effluent dilution and other ‘in-river’ uses. The legislation concerning the regulation system was established in 1963, when it was anticipated that the amount of water that people wanted to abstract from the river, principally for public water supply, could be greater than the river could provide, particularly during dry years. The resulting Act of Parliament enabled the construction of Clywedog Reservoir to regulate the flow of the River Severn to maintain a statutory minimum flow of the River Severn and meet the needs of abstraction in the river. The control point for river regulation is located at Bewdley in the middle reaches of the Severn. Following the exceptional drought in 1976, the Act was varied so that the maintained flow is now 850 Ml/d averaged over a 5 day period and a minimum of 650 Ml/d on any single day. During very dry summers the flow at Bewdley may fall below these values when river regulation reaches a prescribed maximum value.

The droughts of the 1970s confirmed that the available resources of Clywedog Reservoir would be insufficient to fully meet the increased future demands for water from the River Severn. Investigations were carried out into the possibility of developing a scheme to pump groundwater from the Sherwood Sandstone Aquifer in Shropshire to support the flow of the River Severn. After several years of research and a five week public enquiry, the Secretary of State for the Environment formally approved the Shropshire Groundwater Scheme (SGS) in October 1981. In addition a small proportion of the storage of Lake Vyrnwy (principally used to provide water supplies to Merseyside) is used for river regulation. Rules set out how much water should be released from each regulation source to support flows in the River Severn. They also give detailed guidelines on the day to day operation of Clywedog Reservoir and Lake Vyrnwy in conjunction with the Shropshire Groundwater Scheme.

## 3.5. Protected areas

UK law provides a very high level of protection to two types of designated sites, these are also referred to as Habitats Directive sites due to their special environment. These are:

• Special Areas of Conservation (SAC), which contribute to biodiversity by maintaining and restoring habitats and species;

• Special Protection Area (SPA), which provides protection to birds and their nests, eggs and habitats.

Ramsar sites and Sites of Special Scientific Interest (SSSI) also carry a high level of environmental importance.

All applications for abstraction licences will be assessed in relation to their direct and indirect impacts on protected areas. If an abstraction is deemed to potentially impact a protected area, the licence (if granted) may be conditioned with local, site specific restrictions to ensure the protected area is not impacted. These conditions may be more restrictive than the strategy outlined throughout this document.

Table 3 lists the water related environmentally designated sites in this ALS.

Table 3: Important local features that may affect water availability

| Feature | Site name |
|---|---|
| Water related Sites of Special Scientific Interest (SSSI) | Including: Ashleworth Ham, Ashmoor Common, Badgeworth, Bryn Coch, Buildwas River Section, Coombe Hill Canal, Granllyn, Grimley Brick Pits, Innsworth Meadow, Malvern Hills, Montford River Section, Montgomery Canal, Northwick Marsh, Old River Severn Upper Lode, Pistyll Rhaeadr, Severn Ham Tewkesbury, Trwstllewellyn, Upper Severn Estuary, Upton Ham, Walmore Common |
| Water related Special Area of Conservation (SAC) | Berwyn a Mynyddoedd de Clwyd/ Berwyn and South Clwyd Mountains<br>Granllyn<br>Montgomery Canal<br>Upper Severn Estuary |
| Water related Special Protection Area (SPA) | Berwyn a Mynyddoedd de Clwyd/ Berwyn and South Clwyd Mountains<br>Granllyn<br>Montgomery Canal<br>Walmore Common<br>Upper Severn Estuary |
| Water related Ramsar site | Parts of Midlands Mosses and Meres<br>Walmore Common<br>Upper Severn Estuary |

**The Severn Estuary**

The Severn Estuary is designated as a Site of Special Scientific Interest (SSSI), a Habitats Directive Special Protection Area (SPA) and Special Area of Conservation (SAC), and is included on the list of wetlands of international importance under the Ramsar Convention (Ramsar Site). For further information see Section 3.3. Coasts and Estuaries.

## 3.6. Water rights trading

We want to make it easier to trade water rights. A water rights trade is where a person sells all or part of their water right, as defined by their abstraction licence(s), to another person on a permanent or temporary basis. In the majority of cases a trade will involve a change in abstraction location and/or use which we will need to approve through the issue or variation of abstraction licences.

In licensing trades, as with new abstraction licences, we need to make sure that we don't cause any deterioration in water body status both within the water body / bodies where the trade will take place and to downstream water bodies. The section below provides a guide to the potential for trading in water bodies of a particular ALS water resource availability colour, as shown on maps 2 to 5.

To find out more about licence trading please go to our water management web pages on gov.uk

### Guide to potential water rights trading in the Severn Corridor ALS

**Water available for licensing**

Green

Allow trades of recent actual abstraction and licensed abstraction, but little demand for trading expected within water body as water available for new abstractions.

**Restricted water available for licensing**

Yellow

There may be opportunities for licence holders to trade up to their full licensed quantities, but the quantities of water available to trade may be restricted once levels of actual abstraction reach sustainable limits. We will not permit licence trades in water bodies/groundwater management units where we are taking action to prevent deterioration unless the trade is consistent with achieving water body objectives.

**Water not available for licensing**

Red

We will only trade up to recent actual abstraction as no increase in recent actual abstraction is permitted in these water bodies/groundwater management units. Licensed abstraction will be recovered for the environment.

**HMWBs**

Grey

Opportunities for trading will depend on local operating agreements and local management.

## 3.7. Taking action on unsustainable abstraction

### 3.7.1 Action being taken on unsustainable abstraction in the Severn Corridor ALS

We will take action to tackle unsustainable abstraction from surface water and groundwater, to ensure that we support good ecological status and manage the risk of deterioration.

### Revocation for non-use / reduction of under used licences

We will continue to target unused and under used licences in the ALS to look to reduce licensed abstraction which is not being used. This helps to reduce the risk of future deterioration and may release unused water for future licensing.

### Changes to time limited licences

During the renewal process we will take into account the current licence conditions, the status of the water body or groundwater management unit, past licence use and water efficiency when deciding if changes are required. Our approach will depend on whether it is a surface water or a groundwater abstraction, and the water availability status.

Licences will be reissued on the same terms to the Severn Corridor Common End Date (CED) of 31st March 2034 where:

- renewal of the licence does not pose a risk of deterioration in ecological or any other status;
- the quantities are justified and;

- the water is used efficiently.

A shorter time limit or changes to the licence conditions may be required where there are risks to the sustainability of catchments. See Section 3.7.2 for more information.

### Water Industry National Environment Programme (WINEP) and Asset Management Plans

Through these programmes we work with the water companies to investigate and deliver environmental improvements which are needed to meet Water Framework Directive and national targets.

### Restoring Sustainable Abstraction (RSA)

This is the Environment Agency's programme of work to review unsustainable abstraction. Where water abstractions cause or potentially cause actual flows to fall short of the EFIs and result in environmental damage, we have been changing or revoking existing abstraction licences in order to achieve a sustainable abstraction regime.

### Serious Damage

There are currently five Water Framework Directive (WFD) surface waterbodies within the Severn Corridor ALS that have been identified as being at risk of Serious Damage. In order to be classified as being at Serious Damage a water body must meet the following 3 criteria:

- Be identified as being Band 3 non-compliant for flow. This means that they are experiencing severe levels of abstraction pressure causing recent actual flows to fall into deficit against the EFI.
- Have an overall WFD status of less than 'Good',
- Have the abstraction of water and subsequent low flows confirmed as the reason, or contributing to the reason, for not achieving 'Good' WFD status.

New applications for abstraction from waterbodies that are classified as being at, or at risk of, Serious Damage will be assessed on a case by case basis, to ensure that no deterioration of the water environment is allowed to occur.

More information on these programmes is available in our Abstraction Plan on gov.uk https://www.gov.uk/government/publications/water-abstraction-plan-2017/water-abstraction-plan-environment.

## 3.7.2 Guide to renewing time limited licences based on water resource availability colour

If you wish to discuss the renewal of your current licences then please contact our National Permitting Service. Our approach will depend on whether it is a surface water or a groundwater abstraction, and the water availability status.

There is a presumption of renewal for time limited licences, subject to the three renewal criteria (environmental sustainability, continued justification of need and efficient use of water) and local considerations.

Water availability colours for surface water can be found on maps 2 to 5, and for each Groundwater Management Unit on map 6.

## Surface water abstraction licences

Surface water licences will be renewed on the following broad principles around environmental sustainability:

### Water available for licensing

Green

We will consider renewing the licence at the same quantities, subject to the renewal criteria, when the waterbody, and downstream waterbodies, have environmentally sustainable rates of water abstraction both now and at times when abstractors take their full licensed quantities of water.

### Restricted water available for licensing

Yellow

On renewal of abstractions in waterbodies where full licensed flows have fallen below the EFI, we may seek to reduce unused portions of licensed quantities to reduce the risk of surface water bodies becoming unsustainable at fully licensed rates of abstraction or the ecology deteriorating compared to the River Basin Management Plan (RBMP) 2015 baseline.

### Water not available for licensing

Red

These surface water bodies are already subject to unsustainable rates of abstraction so we will need to renew the licences with measures to help restore that waterbody to a sustainable level of abstraction.

On renewal, time limited licences may be capped at historic maximum abstraction. This will reduce the risk of abstraction from surface water bodies becoming increasingly unsustainable at fully licensed rates of abstraction or the ecology deteriorating compared to the River Basin Management Plan (RBMP) 2015 baseline. We will also consider more restrictive terms and conditions such as hands off flow/level conditions.

Where measures are still under investigation, then a licence would be renewed with a cap at historic maximum uptake and may be time-limited to an earlier date.

## Groundwater abstraction licences

Unsustainable groundwater abstraction and the resulting environmental impacts are largely associated with the principal sandstone aquifers, in this case the Worcestershire Middle Severn Permo-Triassic Sandstone Groundwater Body, the Shropshire Middle Severn Permo-Triassic Sandstone East Shropshire Groundwater Body and related groundwater management units. As a result of historical licensing, the groundwater resource balance is unsustainable on a Groundwater Body and Groundwater Management Unit scale, resulting in level and flow impacts on groundwater, surface water and wetland systems. These groundwater bodies are therefore considered to be at overall poor quantitative status and at risk of deterioration. We will take opportunities to reduce fully licensed risks.

The Severn Uplands Permo-Triassic Sandstone Knockin groundwater body also partially falls within the Severn Corridor ALS area. This groundwater body is considered to be at good status but at risk of deterioration. We will take opportunities to reduce fully licensed risks where there is potential for deterioration of surface water bodies.

Individual Groundwater Management Unit status and water availability is discussed in Section 3.2.

Groundwater licences will be renewed on the following broad principles around environmental sustainability:

**Water available for licensing**

Green

We will consider renewing the licence at the same quantities when the groundwater body/groundwater management unit, overlying rivers and associated wetland habitats have environmentally sustainable rates of water abstraction both now, and at times when abstractors take their full licensed quantities of water.

**Restricted water available for licensing**

Yellow

If the groundwater/surface water bodies and/or groundwater management unit in which the groundwater abstraction sits are at risk of deterioration, time limited renewals may require licence changes to reflect historic usage in order to manage the risk of deterioration i.e. reduce fully licensed risk.

**Water not available for licensing**

Red

If the groundwater/surface water bodies and/or groundwater management unit in which the groundwater abstraction sits are already subject to unsustainable rates of abstraction, we will need to renew the licence with measures to help restore a more sustainable level of abstraction. These measures could be licence quantity reductions or Hands off Flow/level conditions. Where 'water body' scale measures are still under investigation, then licence changes to reflect historic usage and a short time-limit will be applied. Requirements for any further licence changes (reductions, HoFs etc.) can then be assessed on the subsequent renewal.

## 3.7.3 Current schemes tackling unsustainable abstraction in the Severn Corridor area

**Weir Brook Waterbody**

Groundwater abstraction has been found to be contributing to depleted flows in the Weir Brook, a tributary of the River Severn upstream of Shrewsbury. To supplement the flows in the brook Severn Trent Water Limited discharge a compensation flow from a borehole at Kinnerley into the Weir Brook when flows fall below a trigger level stipulated to protect the watercourse's ecology.

**Dick Brook Waterbody**

Severn Trent Water Limited will be carrying out investigations under the Water Industry National Environment Programme to look at the risk of future deterioration of this waterbody which could be caused by any growth of abstraction at Astley. This will enable the deterioration to be prevented or mitigated against.

**Hartlebury Brook Waterbody**

Work carried out under the Water Industry National Environment Programme has shown that groundwater abstraction is contributing to low water levels in the bog at Hartlebury Common and Hillditch SSSI. A new compensation borehole has been drilled by Severn Trent Water Limited and feasibility work looking at improving water levels in the SSSI by way of a new augmentation scheme will be progressed under the Asset Management Plan 7.

## 3.8. Regulating previously exempt abstraction

As the abstraction licensing system in England and Wales developed over the past 50 years, certain abstractions remained lawfully exempt from licensing control. This meant that those exempt abstractions could potentially take unlimited amounts of water, irrespective of availability and without regard to impacts on the environment or other abstractors.

Following two public consultations Government introduced new Regulations which took effect from 1st January 2018. The Water Resources (Transitional Provisions) Regulations 2017 removed the majority of previous exemptions from licensing control and those previously exempt abstractors will now require a licence to lawfully abstract water.

The main activities affected are:

- transferring water from one inland water system to another in the course of, or as the result of, operations carried out by a navigation, harbour or conservancy authority;
- abstracting water into internal drainage districts;
- dewatering mines, quarries and engineering works, except in an emergency;
- warping (abstraction of water containing silt for deposit onto agricultural land so that the silt acts as a fertiliser);
- all forms of irrigation (other than spray irrigation, which is already licensable), and the use of land drainage systems in reverse (including transfers into managed wetland systems) to maintain field water levels;
- abstracting within currently geographically exempt areas, including some rivers close to the borders of Scotland; and
- abstractions covered by Crown and visiting forces (other than Her Majesty the Queen and the Duchies of Cornwall and Lancaster in their private capacity).

Where we have details of these abstractions, we've included them in our assessments to consider how they impact on the catchment.

# 4. List of abbreviations

**ALS**

Abstraction Licensing Strategy.

**AP**

Assessment Point.

**CED**

Common End Date.

**Defra**

Department of Environment Food and Rural Affairs.

**EFI**

Ecological Flow Indicator.

**GEP**

Good Ecological Potential.

**GES**

Good Ecological Status.

**GW**

Groundwater.

**HMWB**

Heavily Modified Water Body.

**HoF**

Hands off Flow.

**HoL**

Hands off Level.

**Ml/d**

Megalitres per day.

**SAC**

Special Areas of Conservation.

**SPA**

Special Protection Areas.

**SSSI**

Sites of Special Scientific Interest.

**UKTAG**

United Kingdom's Technical Advisory Group.

**WB**

Water body.

# 5. Glossary

### Abstraction

Removal of water from a source of supply (surface or groundwater).

### Abstraction licence

The authorisation granted by the Environment Agency to allow the removal of water.

### Assessment point

A significant point on a river, often where two major rivers join or at a gauging station.

### Catchment

The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.

### Consumptive abstraction

Abstraction where a significant proportion of the water is not returned to the source of supply after use. For example for the use of spray irrigation.

### Discharge

The release of substances (for example, water, treated sewage effluent) into surface waters.

### Environmental flow indicator

Flow indicator to prevent environmental deterioration of rivers, set in line with new UK standards set by UKTAG.

### Groundwater

Water that is contained in underground rocks.

### Hands off flow

A condition attached to an abstraction licence which states that if flow (in the river) falls below the level specified on the licence, the abstractor will be required to reduce or stop the abstraction.

### Impoundment

A structure that obstructs or impedes the flow of inland water, such as a dam, weir or other constructed works.

### Surface water

This is a general term used to describe all water features such as rivers, streams, springs, ponds and lakes.

### Water body

Units of either surface water or groundwater which we use to assess water availability.

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Cyfoeth Naturiol Cymru
Natural Resources Wales

# Guidance note

## Determining Transitional Water Resources Licence Applications

"New Authorisations" (NA): changes to water abstraction licensing exemptions

### Reference number: OGN 176

Document Owner: Regulatory Business Board

### What is this document about?

This guidance sets out the process for determining transitional water resources licence applications for previously exempt activities (also known as 'New Authorisations' or NAs). The purpose of this guidance is to ensure that transitional licence applications are considered in a consistent manner, and our decisions are in line with the Transitional Regulations and NA government policy, as well as our other statutory duties.

### Who is this document for?

This document is for staff who will be involved in the determination of transitional licence applications:

- Permitting Officers (POs) within the Water Resources (WR) Permitting Team
- Geoscience team
- Hydrology and Water Resources Management Teams
- Environment teams
- Industry and Waste Regulation teams
- People and Place teams
- EPP Policy (Water Resources)

### Contact for queries and feedback

Water Resources Permitting / Water Resources Policy teams

| Version History | | |
|---|---|---|
| **Document Version** | **Date Published** | **Summary of Changes** |
| 1.0 | [11 – 2020] | |
| | | |
| Review Date: December 2022 | | |

To report issues or problems with this guidance contact Guidance Development

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# Part A: Introduction

New Authorisations (NAs) is the term given to previously exempt abstractions (see section 2.3) which now need to be brought into the abstraction licensing system.

The licensing process for these abstractions is set out under the Water Abstraction (Transitional Provisions) Regulations 2017 (see section 2.3) and is different to the process followed for standard (or 'day job') water resources licence applications. The purpose of this Operational Guidance Note (OGN) is to ensure that NRW staff understand how to determine Transitional licence applications. It will help staff to:

- Work within the NA policy and legislative requirements;
- Understand how the NA policy and legislative requirements relate to our wider duties; and
- Come to a decision that is legally robust, fair and consistent.

# 1. Policy context

## 1.1 2017 Government response: light-touch, risk-based licensing approach

The 2017 Government response to consultation on changes to water abstraction licensing exemptions in England and Wales: New Authorisations recognises that previously exempt abstractors have operated lawfully and rely upon their access to water. Therefore, it proposes a ***light touch, risk-based*** approach to bringing these abstractions into the licensing system, which is detailed in Part B.

The 2017 Government response states that once all previously exempt abstractions are in the licensing system, any issues identified with the abstractions, that are not addressed under the Transitional licensing process, will be addressed through future sustainability review processes e.g. Water Framework Directive (WFD), Restoring Sustainable Abstraction (RSA) programme.

Bringing previously exempt abstractors into the licensing system will:

- help create a fairer system for all abstractors – both those already licensed and those that will become licensed;
- enable the Regulator to manage water resources more effectively now and in response to increasing pressures on water resources in the future; and
- be part of wider work to implement the Water Environment (Water Framework Directive (England & Wales) Regulations 2017 (the "WFD Regulations 2017") and create a cleaner, healthier environment;
- help aid the transition to a reformed licensing system.

## 1.2 NRW's Regulatory Principles

Our Regulatory Principles are the way that we demonstrate how we comply with the Regulators Code; they are also the means by which we embed the Sustainable Management of Natural Resources (SMNR) approach into our regulatory work.

There are eight Regulatory Principles:

1. Deliver outcomes
2. Be intelligent
3. Be prepared to challenge

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4. Use the full range of tools available
5. Be flexible
6. Bring the right skills/expertise together
7. Be efficient and effective
8. Be clear on what we do and why

The Regulatory Principles set out the key values that NRW applies when we make decisions relating to our regulatory work. They provide us with the context and perspective on what we are legally required to do and how we can work with others to maximise the benefit to our environment.

Consideration of how the regulatory principles listed above have been applied to the determination of transitional licence applications will need to be clearly demonstrated in the determination report (see Part B, section 7.18).

# 2. Legislative framework

## 2.1 Water Environment (Water Framework Directive) (England & Wales) Regulations 2017 (WFD Regulations 2017)

The WFD Regulations 2017 set out the legal requirements to protect and improve the water environment. They require measures to be taken to encourage the sustainable use of water and to protect and improve the water environment, with the aim of achieving good status.

To comply with the requirement to achieve good status[1], it is considered necessary to have in place a system of prior authorisation and control of significant water abstractions and impoundments. While we have had a licensing system since the 1960s, the exemptions within it can impact on achieving good status. Therefore, bringing previously exempt abstraction activities into the licensing system is helping to meet the requirements of the WFD Regulations 2017.

Meeting the objectives of the WFD Regulations 2017 to enhance and protect the aquatic environment also complies with the principles of sustainable management of natural resources (see section 2.5 and our website here).

Further information can be found in Part B, section 7.9 and the OGN 072 'Assessing activities and projects for compliance with the Water Framework Directive' (draft). Alternatively consult the WR Permitting WFD lead.

## 2.2 Water Resources Act (WRA) 1991 and Water Act (WA) 2003

Under the Water Resources Act (WRA) 1991 some water abstractions were previously exempt from licensing control.

To comply with WFD Regulations 2017 objectives, the Water Act (WA) 2003 included provisions to remove significant exemptions (see section 2.3) and bring these lawful exempt abstractions into the water abstraction licensing system. Some 'low risk'

[1] http://www.legislation.gov.uk/uksi/2017/407/regulation/20/made

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abstractions remain exempt (see Appendix A). The WA 2003 also included provisions for making transitional arrangements for ending exemptions and to allow regulations to be developed for making and determining licence applications.

### 2.3 The Water Abstraction (Transitional Provisions) Regulations 2017

The Water Abstraction (Transitional Provisions) Regulations 2017 ("the Transitional Regulations 2017") provide:

- A specialised application, determination and appeals process for licensing previously exempt activities;
- Continued lawful abstraction during the application and determination process;
- The circumstances under which compensation for curtailed or refused licence applications may be paid;
- The process for making compensation payment claims; and
- The process for handling disputed compensation claims.

Applicants were eligible to apply for a licence under the Transitional Regulations 2017 provided they could evidence that they carried out an abstraction which was previously exempt within the 'qualifying period' between 1st January 2011 – 31st December 2017.

The previous exemptions that have now been removed are as follows:

- Water transfers from one inland water to another in the case of, or as a result of, operations carried out by a navigation, harbour or conservancy authority
- Abstractions into internal drainage districts (IDDs) but not including land drainage activities1
- Dewatering of groundwater as part of construction and engineering works2
- Warping (abstraction of water containing silt for deposit onto agricultural land as a fertiliser)
- All forms of irrigation (except for spray irrigation which is already licensable) and the use of land drainage systems in reverse (including transfers into managed wetland systems) to maintain field water levels
- Abstractions by Crown and visiting forces
- Abstractions within previously geographically exempt areas (see Appendix B).

Key checks carried out during the validation process were 1) to ensure the activity applied for was a previously exempt activity and 2) that sufficient evidence had been provided to show that abstraction had been undertaken during the qualifying period. Further information about the validation process in OGN 069: Validation of transitional provisions water abstraction licence applications.

#### 2.3.1 Transitional timescales

The Transitional Regulations 2017 required previously exempt abstractors to submit a valid licence application between **1st January 2018** and **31st December 2019** (**two-year application window**)[3].

[1] As the management of IDDs is carried out by NRW, determination of these applications will be under the Water Resources (Abstracting and Impounding) Regulations 2006 i.e. standard licence requirements**,** as per Part 3 of the Transitional Regulations 2017 (see legacy OI see 286_05 *Environment Agency licence applications*)

[2] Unless for period of less than 6 consecutive months and subject to the criteria detailed in provisions 5 and 6 of The Water Abstraction and Impounding (Exemptions) Regulations 2017.

[3] Please see Appendix C for maps showing all valid Transitional licence applications received in NRW.



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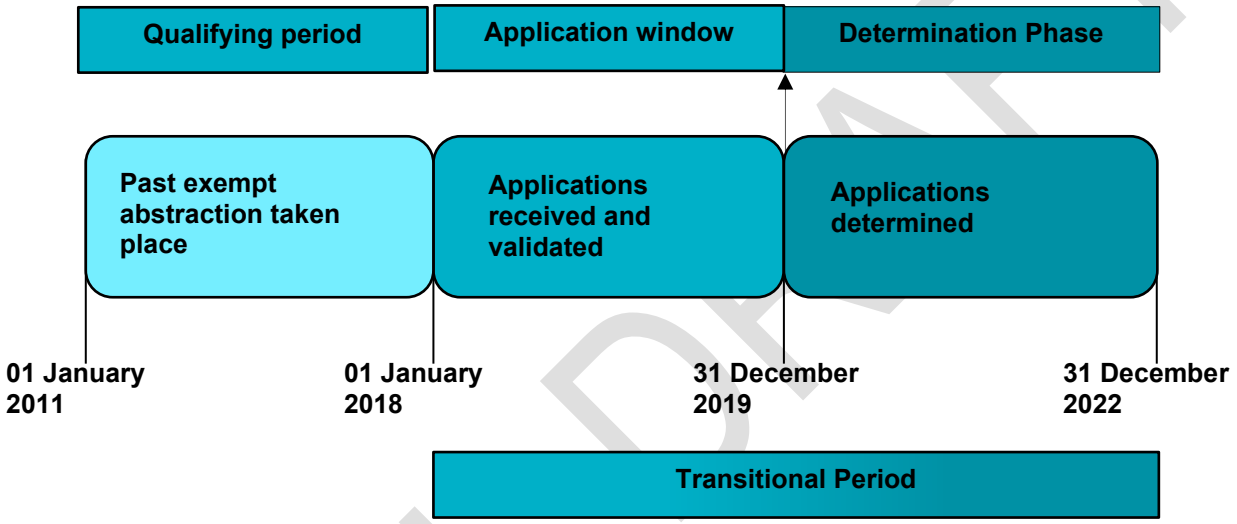
Providing a valid application was submitted by the 31st December 2019, Regulation 6 of the Transitional Regulations 2017[1] allow abstractors to continue abstracting in line with the abstraction carried out during the 'qualifying period' (i.e. at the same rates, location and for the same purpose) until the application is determined.

The Transitional Regulations 2017 require the regulator to ***determine*** all licence applications **between 1st January 2020** and **31st December 2022** (**three-year determination window**).

**Figure 1: transitional timescales**




*Late applications*
Applicants who submitted a transitional licence application prior to the 31st December 2019 deadline, but without sufficient time for the necessary validation checks to be carried out before the deadline, were provided with a 28 day 'grace period' to provide any missing information to make their applications valid. If applicants failed to provide information within the 28 day 'grace period' the application was returned as invalid[2].

In these cases, and where abstractors failed altogether to submit a valid transitional licence application by the 31st December 2019 deadline, the abstraction must stop, and an application must be submitted under the standard licensing process. These applications will be determined under the Water Resources (Abstraction and Impounding) Regulations 2006 and will not be determined using the light touch, risk based approach, as specified in the Policy position for licensing illegal abstractions.

### 2.3.2 Planned abstractions

'Planned abstractions' describe any changes an abstractor wishes to make to their existing operation after the 'qualifying period' e.g. an increase in current abstraction quantities. In these cases, the new abstraction cannot be licensed under the Transitional Regulations 2017, and the applicant is required to submit an additional application for the 'planned'

[1] Regulation 6 of the Transitional Regulations 2017.
[2] Further information on this approach is available in the Regulatory Decision Document entitled "Proposed approach for addressing non-submission of valid Transitional Water Resources licence applications, for previously exempt abstractions, by statutory 31st December 2019 application deadline".

increase under the standard licence application route. Where relevant, the applicant should have been advised of this requirement during the validation checks.

The 2017 Government response states that the Regulator should have in place internal processes that align the Transitional and standard application processes and are considerate to business needs. Where standard and transitional applications are submitted for the same site / operation, we will endeavour to determine them together, as this is desirable from a technical determination point of view and provides a more stream-lined service for the applicant. This will need to be considered on a case by case basis in liaison with the WR Permitting NA lead.

### 2.4 Legislation for conservation, heritage and landscape

Under the transitional licensing process, we have a duty to consider any potential impacts to nationally or locally designated sites or features, including the following:

- Habitats and Species Regulations 2017 National Site Network of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and also Ramsar sites;
- Sites of Special Scientific Interest (SSSI) and Areas of Outstanding Natural Beauty (AONBs) designated under the Wildlife & Countryside Act 1981 as amended by the Countryside and Rights of Way Act (CRoW) 2000
- National Parks

Further information can be found in Part B, section 1 and section 7.10.

### 2.5 Welsh Legislation: Environment (Wales) Act (EWA) 2016 and Well-Being Future Generations Act 2015

The Welsh Government considers this recent Welsh legislation supportive of the ***light touch, risk-based*** licensing approach outlined in section 1.1.

The Environment (Wales) Act 2016 placed sustainable management of natural resources at the core of how Natural Resources Wales (NRW) should carry out its activities, in a manner consistent with its obligations under the Well-being of Future Generations (Wales) Act 2015.

The Environment (Wales) Act (EWA) 2016 introduced new general purposes that NRW[1] must:

1. Pursue sustainable management of natural resources in relation to Wales; and
2. Apply the principles of sustainable management of natural resources (see Appendix D), in the exercise of its functions, so far as consistent with their proper exercise.

The "sustainable management of natural resources" (SMNR) means[1]—

a) using natural resources in a way and at a rate that promotes achievement of the objective;
b) taking other action that promotes achievement of that objective; and
c) not taking action that hinders achievement of that objective.

The objective is to maintain and enhance the resilience of ecosystems and the benefits they provide and, in so doing—

[1] Section 3 Environment (Wales) Act 2016

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i) Meet the needs of present generations of people without compromising the ability of future generations to meet their needs, and
ii) Contribute to the achievement of the well-being goals (available on the Welsh Government website here) in section 4 of the Well-being of Future Generations (Wales) Act 2015.

NRW is only required to ***pursue*** SMNR where it is compatible with the proper exercise of its functions i.e. in the context of determining transitional licence applications, if there is any conflict between our general purpose as set out in the EWA 2016 and our specific duties and powers under the WRA 1991, WA 2003 and Transitional Regulations 2017, then our specific duties and powers would prevail.

### 2.6 The Water Resources (Environmental Impact Assessment) Regulations 2003 (WR EIA Regs 2003)

The WR EIA regulations apply to abstractions for agriculture, including irrigation, which are judged likely to have significant environmental effects due to their nature, size or location. As the competent authority, NRW is responsible for deciding whether an EIA is required or not (known as a 'screening decision'). Many NA abstractions have been operating lawfully for many years, under an exemption, without concerns about their impact on the environment being raised. Hence, the need to undertake an EIA will be the exception rather than the norm. The approach to assessing EIA need is no different to standard applications. For further advice on whether the EIA regs apply, please consult the WR Permitting NA lead.

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# Part B: Determination

The **light touch, risk-based** licensing approach means there are limited licensing outcomes when determining Transitional licence applications. These are summarised as follows:

- The majority of licences will be granted based on **evidenced abstraction requirements.** Applicants should be able to demonstrate, to the **reasonable satisfaction** of the Regulator, their abstraction requirements and entitlements and that abstraction has taken place within the 1st January 2011 – 31st December 2017 'qualifying period'.
- The Regulator will have **flexibility** on the inclusion of **volume conditions** on transfer licences to avoid undue abstraction control costs on abstractors while still ensuring environmental protection.
- Where appropriate, licences may include **basic** "hands off flow" (HoF) conditions (see section 7.15) to protect rivers during low flows and times of drought.
- Abstractions will usually **only be significantly curtailed or refused** to protect the environment from '**serious damage**' (see Part B, section 7.11). However, in exceptional circumstances abstractions may still be refused or restricted where the damage does not meet the serious damage criteria, but our legal duties require the abstraction to be curtailed or application refused e.g. environmental damage to a SSSI.
- Any sustainability issues not addressed through the Transitional licensing process will be addressed through future sustainability review processes.

The flow chart below outlines the process that will need to be followed to determine Transitional licence applications. Further detail and guidance on the process are set out in the following sections of this document.

A more detailed project plan is available here.

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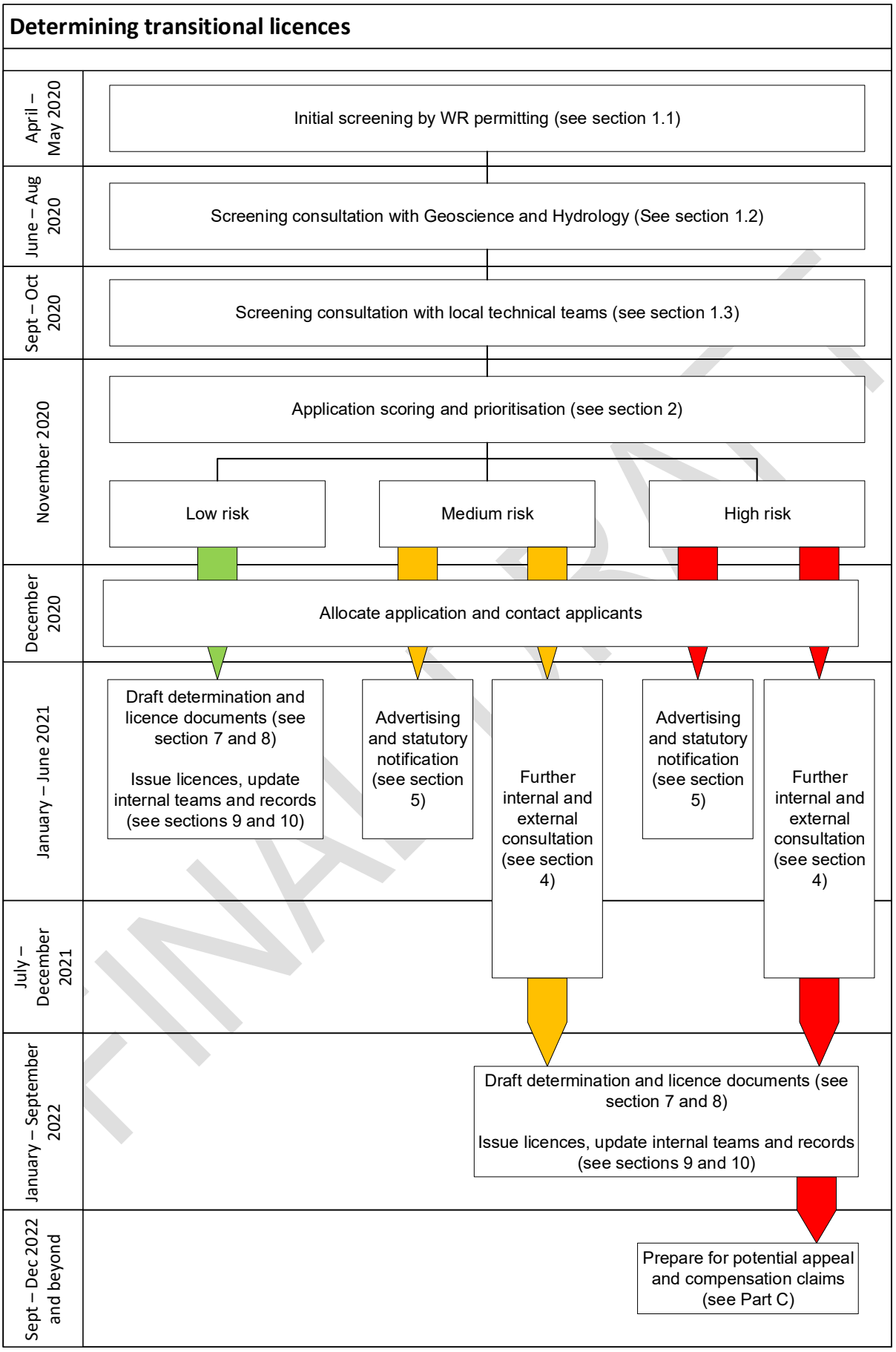
Determining transitional licences
April – May 2020
Initial screening by WR permitting (see section 1.1)
June – Aug 2020
Screening consultation with Geoscience and Hydrology (See section 1.2)
Sept – Oct 2020
Screening consultation with local technical teams (see section 1.3)
November 2020
Application scoring and prioritisation (see section 2)
Low risk
Medium risk
High risk
December 2020
Allocate application and contact applicants
January – June 2021
Draft determination and licence documents (see section 7 and 8)
Issue licences, update internal teams and records (see sections 9 and 10)
Advertising and statutory notification (see section 5)
Further internal and external consultation (see section 4)
Advertising and statutory notification (see section 5)
Further internal and external consultation (see section 4)
July – December 2021
January – September 2022
Draft determination and licence documents (see section 7 and 8)
Issue licences, update internal teams and records (see sections 9 and 10)
Sept – Dec 2022 and beyond
Prepare for potential appeal and compensation claims (see Part C)

# 1. Application screening

The aim of the screening stage is to understand the following:

- the risk / complexity of applications to inform the determination work going forward i.e. how applications will be prioritised and potential resource requirements.
- which applications require further consultation. In line with the 'light touch' policy approach, the aim is to 'screen out' as many applications as possible from further consultation.
- if any of the features picked up in the *My Map* screening are potentially being impacted by the NA abstraction
- any supporting information that may need to be requested from the applicant.

It is recognised that the list of questions asked via the initial screening consultation is extensive, and **not all questions** are expected to be answered **for all applications**. However, the more information provided at this stage will help ensure the risk and complexity of each application is understood as best as possible. It will also reduce the need for further consultation later in the determination window, and hopefully lessen time and resource pressures as the determination deadline gets closer. It is recognised that consultees may not be able to provide full details during this process but recommend that they are flagged so that they can be explored fully as the determination progresses.

It is also important to note there may be issues that we may be unable to address under the Transitional arrangements, however they can still be flagged at this stage so they can be fully considered as part of the determination process. Any issues recorded here that cannot be addressed as part of the determination may be used to inform any changes required under future sustainability review processes.

The screening stage will be carried out in three steps, as outlined below:

## 1.1 Initial screening by Water Resources Permitting team

All applications will initially be screened by the WR Permitting team in line with our current process for screening standard licence applications.

Once the screening has been completed WR POs are required to save the outputs to the application case file on the DMS.

WR POs will also need to summarise the results in the NA screening spreadsheet, under the following headings:

| Column | Feature | Groundwater (GW) or Surface Water (SW) screening | Notes |
|---|---|---|---|
| AW | Screening radius Km | GW only | The screening radius for groundwater applications is determined according to abstraction quantity – see Appendix D.<br>For applications with multiple points, professional judgement should be |

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| Column | Feature | Groundwater (GW) or Surface Water (SW) screening | Notes |
|---|---|---|---|
| | | | exercised to decide if screening on a single point is appropriate. Consideration will need to be given to the site setting and the screening radius should be increased if considered necessary. |
| AX | Superficial geology | GW only | |
| AY | Bedrock geology | GW only | |
| AZ | Designated sites, including the following designations:<br>• (proposed) SACs, SPAs and Ramsar sites;<br>• (proposed) SSSIs;<br>• protected species / habitat<br>• National or Local Nature Reserves;<br>• Ancient Woodland<br>• SINC<br>• Marine Conservation Zones | SW only<br><br>SW only | This will inform whether further assessment is required regarding impact to designated sites – see section 7.10 |
| BA | National Park AONB | | This information is required to inform whether external consultation / notification is required – see sections 4.2 and 5.2. |
| BB | Response from National Park Authority | | To record any response from National Park Authority - see sections 5.2. |
| BC | Scheduled Ancient Monument, Listed Buildings, Historic Monuments, World Heritage Sites & Heritage Coast | SW only | These features are not considered relevant for groundwater abstractions in Wales, therefore further consultation is only required if identified for SW abstractions. |
| BD | Licensed or deregulated abstractions | | SW screening includes EA Water Resource Permits whereas GW does not. However, the screening consultation process (see section 1) will highlight any potential cross border impacts. |

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| Column | Feature | Groundwater (GW) or Surface Water (SW) screening | Notes |
|---|---|---|---|
| BE | Other permit applications, including permitted discharges | | These will only be relevant for SW apps or for any GW abstractions in connectivity with SW.<br><br>Screening consultation to identify whether there have been any reported impacts to local water quality relating to the discharge. If not, no need to consider further. |
| BF | Drinking Water Protected Areas (DWPA) | SW only | This includes any Lakes or River Catchments designated as Drinking Water Protected Areas.<br>All of Wales is a DWPA for GW so only need to consider for SW applications. |
| BG | Source Protection Zone | | This indicates if there is a potable groundwater supply nearby. |

The WR Permitting team will also need to populate the following WFD Regulations 2017 - related fields in the NA screening spreadsheet:

| Column | Baseline information | Information Source[1] | Notes |
|---|---|---|---|
| AL | River catchment name | My Map for Permitting: Permitting EU Directives / WFD River catchments (Cycle 2 2015) | PO to crosscheck with screening report in DMS case file. |
| AM | River catchment ID | My Map for Permitting: Permitting EU Directives / WFD River catchments (Cycle 2 2015) | PO to crosscheck with screening report in DMS case file. |
| AN | Overall Status | WFD Classification Data 2015C2 S'sheet: 'Rivers and Canals 2015C2' tab; Column K 'Overall Status' (Original Source: Water Watch Wales - Classification data 2015) | The Transitional Regulations 2017 refer specifically to the Recent Actual Flow and quantitative assessment rather than the Overall WFD classification. However, Overall WFD Status should be recorded to inform the determination process. |

[1]The 2015 Cycle 2 WFD classification data has been used to ensure all applications are screened, assessed and licensing decisions are made from the same static baseline dataset. The 2015 Cycle 2 WFD classification data (published in the second cycle RBMP's Dec 2015) was the most up to date data at the time when exemptions were removed, and the application window opened.

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| Column | Baseline information | Information Source[1] | Notes |
|---|---|---|---|
| | | | If a waterbody is designated as high overall status for it cannot be screened out of WFD Compliance assessment requirements (See section 7.9). |
| AO | HMWB? (Heavily Modified Water Body) | WFD Classification Data 2015C2 S'sheet: 'Rivers and Canals 2015C2' tab; Column J 'HMWB' (Original Source: Water Watch Wales - Classification data 2015) | If a waterbody is designated as Heavily Modified it could indicate that the river is a supported source, which will have implications for the HoF requirements (see section 7.15). |
| AP | High status morphology / hydromorphology? | WFD Classification Data 2015C2 S'sheet: 'Rivers and Canals 2015C2' tab; Column AE 'Morphology' (Original Source: Water Watch Wales - Classification data 2015) | If a waterbody is designated as high status for morphology / hydromorphology it cannot be screened out of WFD Compliance assessment requirements (See section 7.9). |
| AQ | Hydrological Regime / Flow | WFD Classification Data 2015C2 S'sheet: 'Rivers and Canals 2015C2' tab; Column AF 'Hydrological Regime' and Column AG 'Flow' (Original Source: Water Watch Wales - Classification data 2015) | • The Transitional Regulations 2017 refer specifically to Recent Actual Flow in relation to HoF requirements. As part of further consultation (section 4.1), Hydrology will need to confirm: |
| AR | Recent Actual (RA) Q95 Flow Compliance status[2] | WRGIS - RA Compliance Q95 layer | • - the flow failure[1]<br>• - HoF requirements (see section 7.15) |

[1] There may be differences between the 'Hydrological Regime' / 'Flow' results and the RA Q95 Flow Compliance results i.e. 'Hydrological Regime' / 'Flow' could be "supporting good / or "pass" but RA Q95 Flow Compliance result Band 1/2/3 failure. This is because the RA Q95 Flow Compliance layer available in the WRGIS is raw processed data, whereas the 'Hydrological Regime' and 'Flow' results have been through an Operational QA before input to final WFD classification as published in the RBMP 2015 classification result. Screening consultation with Geoscience / Hydrology (see section 1.2 below) will resolve any differences and confirm whether the water body is failing or passing for flow.

[2] Compliance status is defined in section 7.15.

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| Column | Baseline information | Information Source[1] | Notes |
|---|---|---|---|
| AS | Included in 'NA apps in failing WBs' tab? | WRGIS - RA Compliance Q95 layer | A separate screening exercise has been undertaken by the WR Policy Advisor and WR Permitting NA lead to identify NA abstractions located in WBs failing for flow, to inform the HoF requirements. The results of this exercise have been recorded in the 'NA apps in failing WBs' tab of the NA Screening spreadsheet<br><br>Any abstractions that are included in the failing WBs tab should be flagged in the main 'NA apps - screening record' tab via this column. |
| AT | Ground Water Body name | My Map for Permitting: Permitting EU Directives / WFD Groundwater Cycle 2 2015 | PO to crosscheck with Screening Report in DMS case file. |
| AU | Ground Water Body ID | My Map for Permitting: Permitting EU Directives / WFD Groundwater Cycle 2 2015 | PO to crosscheck with Screening Report in DMS case file. |
| AV | GW Body Quantitative status | WFD Classification Data 2015C2 S'sheet: 'Groundwater 2015C2' tab; Column G 'Quantitative' (Original Source: Water Watch Wales - Classification data 2015) | The Transitional Regulations 2017 refer specifically to WFD GW Body Quantitative status.<br><br>According to Water Watch Wales all GW bodies in Wales are Good, however results should be included to inform the determination and for audit. |

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### 1.1.1 QA / PALS update

Whilst updating the NA screening spreadsheet, WR POs should ensure the pre-populated application information contained in the other fields is correct. They should also update PALS with any relevant information, as per the PALS field reference guide.

## 1.2 Screening consultation with Geoscience and Hydrology

Once the above steps have been completed, the Geoscience team will be asked to review all groundwater applications.

In addition to the main aims of the screening process listed above, consultation with Geoscience is also required to understand which groundwater abstractions have the potential to affect river flows. This will inform whether Hydrology need to also review the application.

Once Geoscience have completed their review, the relevant Hydrology team will be asked to review all SW abstractions as well as any GW abstractions that Geoscience have indicated could potentially affect river flows.

## 1.3 Screening consultation with local technical teams

Once Geoscience / Hydrology have completed their review and updated the NA screening spreadsheet, the following local technical teams will be required to review the applications in their patch:

- People and Places.
- Environment Teams, including local Environment, Conservation, Designated Sites and Biodiversity officers. For surface water applications the local Fisheries officer and Geomorphologist may also need to be included[1].
- Water Resources Planning - for water company applications only.

## 1.4 Managing the screening consultation process

### 1.3.1 recording consultation responses

All screening consultation responses should be saved in the NA screening spreadsheet, under the following headings:

| Column | Team | Question | Notes |
|---|---|---|---|
| BH<br>BY<br>CM<br>CZ | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Are there any concerns regarding abstraction volumes applied for / evidence provided? | Justification of need is not a consideration under the Transitional process, rather quantities are based on evidenced historical use, which will have been checked as part of the validation process.<br><br>However, this question is included to allow consultees to flag any technical concerns about the quantities of water applied for e.g. are abstraction rates feasible under normal flow |

[1] It may not be necessary for Conservation, Designated Sites, Biodiversity, Fisheries or Geomorphology officers to respond to the screening consultation. Rather, Environment Teams can flag that further consultation will be required with these specialists.

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| Column | Team | Question | Notes |
|---|---|---|---|
| | | | conditions? Or to verify quantities where weir / pipe dimensions or calculations, structure drawings, pump capacity / ratings etc. have been submitted.<br><br>It is recommended that this is only considered for larger (i.e. higher risk) abstractions.<br><br>For ease of reference quantities are included within the NA screening spreadsheet (columns O – R). Also see Appendix C (map 2) showing NA abstractions by quantity.<br><br>Further information also available in section 7.1.3 and section 7.6 for further information. |
| BI<br>BZ<br>CN<br>DA | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Is the current method of measurement acceptable? | See section 7.1.3 and section 7.7<br><br>It is recommended that this is only considered for larger (i.e. higher risk) abstractions, or where there are known concerns about the measurement of water e.g. through the planning process. |
| BJ | Geoscience | Is the MyMap screening radius (column AW) considered sufficient? | Geoscience to review the search radius applied and advise if additional screening should be undertaken. |
| BK<br>CA<br>CO<br>DB | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Are there any local issues to be aware of that have not been picked up in the screening outputs? | Include any features not picked up in initial screening e.g. complaints, lawful uses, protected rights, protected species, abstraction pressures, RSA sites etc. |
| BL<br>CB<br>CP<br>DC | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Please provide details of any related permitting or planning consents. | Any nearby permits will be highlighted in column BE.<br><br>Please note a thorough check of existing planning / permitting records is not required at this stage. Rather, this question is included to allow consultees to flag any permitting or planning issues that they are aware of |

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| Column | Team | Question | Notes |
|---|---|---|---|
| | | | that relevant to the abstraction applied for example quarry dewatering:<br>• Does the associated planning consent contain any conditions related to the abstraction?<br>• Is there an existing discharge consent? (This will inform the consumptiveness of the abstraction and how the licence will be represented in the RAM Ledger). |
| BM<br>CC<br>CQ<br>DD | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Are there any local legislative requirements to be aware of? E.g. Canal Act conditions | See section 7.16.<br>Consideration will need to be given to how these existing permissions will be reflected in any transitional licence issued. |
| BN | Geoscience | Is there any probable connectivity between groundwater and surface water? | A professional judgement based on available information will be sufficient at this stage.<br><br>The purpose of this question is to highlight those groundwater abstractions that are likely to affect river flows. This will be important information for deciding whether further screening is required by Hydrology (see section 1.2 above), potential HoF requirements, and also how the licence will be represented in the RAM Ledger). |
| BO<br>CD | Geoscience<br>Hydrology | Is there any probable pathway / connectivity with any features identified through screening? | A professional judgement based on available information will be sufficient at this stage. |
| DE | Environment Teams | Is the activity having any known impacts on any of the features identified in the screening outputs? | See section 7.10.<br>For example, if any designated sites have been highlighted in screening, are any of the designated features likely / known to be affected by the abstraction? |
| DF | Environment Teams | Is a HRA / Appendix 4 required? | See section 7.10. |

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| Column | Team | Question | Notes |
|---|---|---|---|
| BP | Geoscience | Is there a (potential) risk of saline intrusion? | This information is relevant for GW abstractions situated near the coast which can cause saline intrusion which may result in a WFD failure. |
| CE<br>CR<br>DG | Hydrology<br>People and Places<br>Environment Teams | Please review WFD / (catchment) information. Please use this column to indicate any changes required. | This information has been pre-populated using the relevant layers in MyMap for Permitting and the WFD 2015 Classification data available via the Water Watch Wales website (see section 1.1). QA by relevant teams required.<br><br>Hydrology / People and Places are required to review columns AN – AR. Environment Teams are required to review column AN (Overall WFD Status) only. |
| BQ<br>CF<br>CS | Geoscience<br>Hydrology<br>People and Places | For abstractions included in the 'NA apps in failing WBs' tab (as indicated in column AS), please review the relevant row and update this tab where required. | If possible, consultees to rule out any abstractions that are not contributing to / causing the flow failure. Where this is not possible at screening stage further consultation will be required. A professional judgement based on available information will be sufficient at this stage. |
| BR<br>CG<br>CT | Geoscience<br>Hydrology<br>People and Places | Are there any (potential) in-combination / cumulative impacts? | See section 7.12<br><br>Please consider if the abstraction applied for could be acting in combination with other known ongoing or proposed activities, including other transitional applications (see columns BD - BE). |
| DH | Environment Teams | Potential Fish or Eel screening / passage requirements | SW abstractions only. |
| BS<br>CH<br>CU<br>DI | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Do you consider the abstraction to be causing or have the potential to cause serious damage? | See section 7.11<br><br>Only an indication of the potential for serious damage will be required at this stage. Further investigation / consultation will be required to confirm this. |
| DP | Water | Is this abstraction part of any | Water Company applications only |

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| Column | Team | Question | Notes |
|---|---|---|---|
| | Resources Planning | Drought or Water Resources Management Plans? | |
| DQ | Water Resources Planning | Are there are any Supply Demand Balance issues to be aware of? | Water Company applications only |
| BT<br>CI<br>CV<br>DJ | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Is further internal consultation required?<br><br>If so, please advise what teams should be consulted e.g. Fisheries, Planning, Regulated Industry, Land Management. | See section 4.1.<br><br>Industry & Waste Regulation teams should be consulted for any applications from regulated industrial sites i.e. EPR installations. |
| BU<br>CJ<br>CW<br>DK | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Is any external consultation required e.g. EA, Natural England? | See section 4.2.<br>Please note consultation requirements are decided by permitting officers, but this question is included to allow consultees to flag any external consultation they feel might be necessary e.g. for abstractions close to the England / Wales border, could Geoscience advise if consultation with the EA/Natural England is necessary? i.e. provide a professional judgement as to whether the abstraction is likely to be having an impact on any features located in England. |
| BV<br>CK<br>CX<br>DL | Geoscience<br>Hydrology<br>People and Places<br>Environment Teams | Is any further information required from the applicant? | Applicants are required to submit any further information considered necessary to determine an application. To prevent unnecessary delays, this information should be requested as early in the determination window as possible. |
| BW<br>CL<br>CY<br>DM | Geoscience<br>Hydrology<br>People and Places | Any further comments? | Any other comments relevant to the abstraction. |

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| Column | Team | Question | Notes |
|---|---|---|---|
| | Environment Teams | | |

For the purposes of consultation with local teams, the NA screening spreadsheet has been divided into individual spreadsheets according to Operational area. It is possible to filter further within the individual spreadsheets by sector (exemption / purpose) or place (Environment team boundary / catchment) so individuals can choose how to manage work allocation / prioritisation. All screening responses will be collated in the master NA screening spreadsheet.

#### 1.3.2 agreeing response times

The WR Permitting NA lead will work with consultees to agree appropriate timescales for responding to screening consultation requests, with the aim of completing the screening consultation by Autumn 2020.

## 2. Application scoring and prioritisation

The aim of the application scoring and prioritisation stage is to ensure the following:

- the level of risk and complexity associated with each application is understood;
- appropriate timescales and resources are assigned according to risk / complexity;
- the correct level of consultation (internal and external);
- to inform advertising requirements; and
- applications are determined consistently and in line with the NA policy approach.

### 2.1 Application risk / complexity score

Once the screening process is complete, each application can be scored in terms of risk and complexity.

The table below should be used to help decide which score is most appropriate. Please note not all criteria will need to be met to place an application in a certain category. Decisions will be made on a case by case basis, via the NA Panel[1] where appropriate.

| Score | Criteria | Preferred determination approach |
|---|---|---|
| Low | • For groundwater abstractions with no connectivity to surface water - Groundwater Quantitative assessment is Good;<br>• For surface water abstractions or groundwater abstractions with potential connectivity to surface | • Allocated to PO1.<br>• Screening consultation only; no further internal consultation required.<br>• No advertising requirement.<br>• Standard text and templates to be used.<br>• Licences to be granted in line with quantities applied for; no HoF required |

[1] The New Authorisations (NA) Panel was originally established within NRW to ensure consistency with validation checks and decision-making. It is made up of members from WR Permitting, Policy, Legal, Geoscience and other local technical teams where relevant. It will continue throughout the determination period to ensure consistency with NA determination process and policy.

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| Score | Criteria | Preferred determination approach |
|---|---|---|
| | water - flow compliance[1] assessment – Compliant / Supports Good Ecological Status (GES).<br>• No known sustainability issues[2] related to flow / level.<br>• No local issues.<br>• Not in close proximity to or within a designated site i.e. no designated sites identified through *MyMap* screening. | (see section 7.15); subject to published time limits and standard licence conditions.<br>• Aim to complete determination by June 2021. |
| Moderate | • For groundwater abstractions with no connectivity to surface water - Groundwater Quantitative assessment is Poor[3];<br>• For surface water abstractions or groundwater abstractions with potential connectivity to surface water - flow compliance[2] assessment – Non-compliant / Does not support Good Ecological Status (GES) / Band 1 or 2 Flow failure.<br>• Actual or potential impact to water dependent features of a designated site.<br>• Potential sustainability issues related to flow / level.<br>• Record of local issues / interest.<br>• Abstraction is linked to existing entitlement e.g. canal acts. | • Allocated to PO2 / PO1 with support from PO2.<br>• Further (bulk) consultation - internal and external.<br>• Advertising likely to be required.<br>• May need to request further information from applicants e.g. abstraction structure details.<br>• Standard text and templates to be used, supplemented with bespoke wording where required.<br>• HRA / Appendix 4 / WFD Regulations 2017 assessments carried out where required.<br>• In most cases, licences to be granted in line with quantities applied for, basic HoF conditions to be included if required (see section 7.15); subject to published time limits and other standard conditions where required.<br>• In exceptional circumstances, bespoke conditions / refusal may be required i.e. where our legal duties require the abstraction to be curtailed or application refused, but where the serious damage criteria does not apply.<br>• Aim to complete determination by December 2021. |
| High | • For groundwater abstractions with no connectivity to surface water - Groundwater Quantitative assessment is Poor; | • Allocated to Senior Officer / PO2 with support from Senior Officer.<br>• Further extended consultation - internal and external. |

[1] Flow Compliance is defined as follows:
-Non-Compliant Band 1 = Recent Actual Flows are up to 25% below the EFI at Qn95
-Non-Compliant Band 2 = Recent Actual Flows are between 25% and 50% below the EFI at Qn95
-Non-Compliant Band 3 = Recent Actual Flows are greater than 50% below the EFI at Qn95

[2] A flow/level sustainability issue means that there are impacts due to reductions in flow and/or lowered water levels/table as opposed to other issues e.g. pollution.

[3] No groundwater bodies in Wales are at Poor Quantitative status

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| Score | Criteria | Preferred determination approach |
|---|---|---|
| | • For surface water abstractions or groundwater abstractions with potential connectivity to surface water - WFD flow compliance assessment – Non-compliant / Does not support Good Ecological Status (GES) / Band 3 Flow failure.<br>• Potential or actual serious damage to water dependent features within a designated site.<br>• Substantial local / public interest, including media / ministerial involvement. | • Advertising required, potential High Public Interest (HPI).<br>• Further detailed information from applicants likely to be required e.g. environmental reports.<br>• Standard text and templates to be used, supplemented with bespoke wording where required.<br>• HRA / Appendix 4 / WFD Regulations 2017 assessments carried out where required.<br>• Bespoke licence conditions or refusal likely.<br>• Applications to be determined by June 2022 (allowing a 6-month contingency to December 2022 deadline).<br>• Appeal and compensation arrangements may apply (see Part C). |

### 2.2 Application prioritisation

The NA panel will decide how applications should be prioritised, based on the following factors:

- Risk / complexity score assigned to each application;
- catchment common end dates (see section 7.3).
- any requests for early determination (captured in Column Y of the NA Screening Spreadsheet).
- Resource and workload commitments of local and technical teams.

The NA panel will also use the risk scores to inform the following:

- Advertising requirements, including potential HPI sites (see section 5).
- Potential compensation requirements (see Part C, section 2).

The WR Permitting NA lead will work with the WR Permitting Team Leader to allocate applications to Permitting Officers (POs). Once allocated, POs should update PALS to show which applications have been allocated to them. POs should follow the steps set out below and summarised within the NA Determination application checklist.

## 3. Contact applicant

Once the screening and prioritisation process is complete and applications have been allocated, POs should use the NA Applicant Update letter template to contact and update applicants[1]. This letter will:

[1] Under the Schedule to the Transitional Regulations 2017 (Part 2, parag 7 (Provision of information to the applicant), NRW must, by 30th June 2021, provide the applicant with the following information in relation to a valid application—
(a) whether a notice of the application has been or is to be published in accordance with section 37(1);
(b) the date by which the applicant must be notified of the appropriate agency's decision on the application;

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1. Provide contact details of the officer dealing with their application.
2. Update applicants on the progress of their application, including a reminder of the statutory determination deadline of 31st December 2022 (see section 2.3).
3. Confirm if advertising required.
4. Confirm right of access:
    - if there are any concerns regarding whether the applicant has a legal right of access, it may be necessary to request further evidence from the applicant e.g. lease agreements.
    - The application should be refused if this is not confirmed with a reasonable period before the issue date.
5. Identify any changes in application details:
    - Any changes to the site or operation (e.g. change in abstraction period or location, increase to abstraction quantities) from what took place during the qualifying period cannot be considered under the Transitional Regulations 2017, and will require an additional application under our standard licensing process.
    - However, if there is no significant change to the nature or impact of the operation (e.g. minor change in abstraction location but relates to same source of supply / site), consideration can be given to dealing with the changes as part of the transitional application.
6. Request any other additional information[1] that may have been identified at screening stage. Where additional information is required from the applicant then POs should clearly specify a deadline by which the information should be submitted. POs should make reasonable efforts to obtain this information e.g. by following up the letter with phone calls, further emails or letters etc. All correspondence and attempts to contact applicants should be recorded and saved to the relevant case folder on the DMS. Where POs have been unable to contact an applicant or obtain the necessary information, they should update the WR Permitting NA lead to identify the next steps.
7. Notify applicant if screening has identified issues which may affect their operation going forward e.g. if the application is considered to be causing serious damage (see section 7.11) or will require certain conditions such as a Hands off Flow (see section 7.15). Correspondence should be worded carefully, in order to avoid pre-determination of the licence application. For further advice, discuss with the WR Permitting NA lead.
8. Remind applicants of potential abstraction charges requirements[2].

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(c) the applicant's entitlement to appeal, in accordance with section 43(1)(b), against any failure by the appropriate agency to give notice, within the time period prescribed by paragraph 10(1), of its decision on the application.

[1] The Schedule to the Transitional Regulations 2017 (Part 2, parag 6 'Provision of additional information in support of the application') states that "The appropriate agency may, following receipt of a valid application, require the applicant to submit any further information or reports that it considers necessary to determine that application". The applicant may also be required to submit information under the Habitats Regulations and WFD Regulations 2017.

[2] The applicant will have been made aware of these issues in the Validation letter, but as some time may have passed since the validation letter being sent and the update, it is considered necessary to remind the applicant again at this stage.

9. Remind applicants of potential abstraction recording and reporting requirements[1].
10. Reminder that applicants are entitled to continue abstract the same quantities of water applied for until a decision is reached on their application, and that any proposed increase to abstraction quantities will require a separate application under our standard licensing process (see section 2.3).
11. Remind applicants of their right to appeal (see Part C, section 1).

# 4. Further consultation

The aim of the further consultation stage is to:

- Investigate further any issues flagged during the screening stage (see section 1);
- Confirm whether any WFD flow failures are caused by / linked to NA abstractions;
- Complete any necessary HRAs / Appendix 4 assessments;
- Identify any supporting information that may need to be requested from the applicant.

It is **important to note** there may be issues that we may be unable to address under the Transitional arrangements, however consultees should flag any issues or concerns they may have so they can be fully considered as part of the determination process. Any issues that cannot be addressed as part of the determination may be used to inform any changes required under future sustainability review processes.

The relevant local and technical teams will already have reviewed all transitional applications at the screening stage (see section 1) and for **low** scoring applications, no further consultation (internal or external) is required. These applications will be determined in line with NA policy and legislation and using standard templates, paragraphs and conditions.

For **moderate** and **high**-scoring applications, further internal and / or external consultation will be required, as outlined below.

## 4.1 Internal consultation

Generally, the internal teams that will need to be further consulted for **moderate** and **high**-scoring applications are as follows:

- Geoscience (if groundwater)
- Hydrology (if surface water or ground water with surface water connectivity)
- People and Places
- Environment Teams, including local Environment, Conservation and Biodiversity officers. For surface water applications, or some groundwater applications where the abstraction may affect surface water flows, the local Fisheries officer and Geomorphologist may also need to be consulted.
- Industry & Waste Regulation teams (for any applications from regulated industrial sites i.e. EPR installations).
- Water Resources Planning (for water company applications only)

[1] The applicant will have been made aware of these issues in the Validation letter, but as some time may have passed since the validation letter being sent and the update, it is considered necessary to remind the applicant again at this stage.

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It may be necessary to consult additional teams about certain, more complex applications. For example, the local Planning, Waste and / or Regulatory Industry teams will need to be consulted for any regulated EPR installations. Wider consultation may also be necessary to complete HRA / Appendix 4 assessments. Refer to the NA screening spreadsheet for further information regarding what specific issues may require this additional consultation / details of who should be consulted.

An initial deadline of **15 working days** should be given for any consultation responses. However, the request should make it clear that more time can be given if necessary, i.e. in the case of more complex applications or bulk consultations.

Consultations for **moderate** and **high** scoring applications should initially be carried out using the NA Internal Consultation Evidence (ICE) pack template. If there are a large number of applications situated within an operational / environment team boundary, it may be appropriate to arrange for a 'bulk' consultation. Any concerns raised must be identified and flagged with the WR Permitting NA lead as soon as possible. Where necessary, further consultation can be carried out via email, meetings etc. to conclude any complex issues. All correspondence must be saved to the DMS and summarised clearly within the determination report.

For any applications that are likely to be curtailed or refused, local / technical teams should be made aware that they are likely to be required to provide evidence / defend licensing decisions in any appeal scenario. POs should seek written confirmation that consultees support the determination decision and ensure the correspondence is saved to the relevant case file on the DMS.

If there is any disagreement between local / technical teams and WR permitting this should be escalated via the WR Permitting NA lead in the first instance, and then subsequently via the NA Panel and / or relevant management routes.

## 4.2 External consultation

### 4.2.1 Cross-border consultation

If an application includes multiple points of abstraction and some of these points are located in both Wales and England, the application is considered a 'cross-border application'. Applicants should have submitted applications to NRW for any points of abstraction located in Wales; whilst applications for points located in England should have been submitted to the Environment Agency (EA). Applicants submitting cross-border applications should have provided details of the EA application to us and vice versa. In these cases, the respective organisations are required to consult each other, to ensure the determination is joined-up. Discussions on application prioritisation should have already taken place to match determination timescales to ensure joined up determinations.

There may also be applications located in the 'cross-border' catchments - the Wye, Severn and Dee. NRW lead on the Water Resources management of the Wye and Dee catchments so the EA are required to consult NRW on any applications located in the English part of these catchments. The EA lead on the Water Resources management of the Severn catchment so NRW are required to consult the EA on any applications located in the Welsh part of the catchment.

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The WR Permitting team are responsible for coordinating and responding to cross-border consultations from the EA, as outlined in the cross-border water resources process document (draft). If there are a large number of applications requiring cross-border consultation, it may be appropriate to arrange for a 'bulk' consultation. The WR Permitting NA lead will coordinate this as required.

#### 4.2.2 Consultation for conservation, landscape and heritage

To comply with our statutory duties for conservation, landscape and heritage we have a legal duty to consult with / notify the following relevant external organisations[1]:

- Natural England – for any abstractions with the potential to impact on designated sites in England (see section 7.10)
- Area of Outstanding Natural Beauty (AONB) Conservation Board – for any abstractions located within AONBs (surface water abstractions only). Use Appendix 5.
- English Heritage or Cadw – for any potential impacts on Scheduled Ancient Monuments or listed buildings (surface water abstractions only).
- Local Authority – for any abstractions with potential to impact local wildlife sites, nature reserves, ancient woodlands, World Heritage Sites (surface water abstractions only).

External consultation is different from statutory notification (see section 5.2). External consultation is required as per the list above and is carried out regardless of whether advertising is required.

External consultations should be sent using the NA Statutory Consultation letter template with a copy of the application and any supporting documents. If there are a large number of applications requiring external consultation with a particular organisation, it may be appropriate to arrange for a 'bulk' consultation. The WR Permitting NA lead will coordinate this as required.

External consultees should be allowed **28 days** to respond, as per our process for standard licence applications. However, the request should advise that more time can be given if necessary, i.e. in the case of more complex applications or bulk consultations.

# 5.Advertising and statutory notification

## 5.1 Advertising

Under paragraph 8 of the schedule to the Transitional Regulations 2017, NRW is required to publish notice of an application "in at least one newspaper circulating in the locality of the proposed point of abstraction and on the appropriate agency's website". It requires all advertisements to be placed by **30th June 2021**. The WR Permitting NA lead is responsible for managing the timetable for determination and ensuring all applications are advertised by this deadline.

Under the Transitional Regulations 2017, we are only required to advertise applications that are considered to have a potential adverse effect on the environment[2]. This is different to the requirement under the standard licensing process which requires applications to be

[1] From legacy OI 226_10 Screening and assessing new water resources permissions for impacts on conservation, heritage and landscape

[2] Under section 8 (parag 6) of the schedule to the Transitional Regulations 2017 the requirements of section 37(1) and (2) may be dispensed with if it appears to the appropriate agency that the proposed abstraction would have no appreciable adverse effect on the environment.



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advertised if the proposed abstraction is considered to have an adverse effect on the environment ***and*** lawful users / protected rights.

Generally low scoring applications will not need to be advertised, while medium and high scoring applications will require advertising. However, all advertising decisions should be made on a case by case basis and agreed by the NA Panel as part of prioritisation exercise (see section 2.2). The advertising requirement decision will be recorded in the NA Screening spreadsheet (Column DU).

Where applications are not advertised there is no need to complete the advertising dispensation form, however the advertising decision and reasons must be included in the determination report.

Where the decision is for an application to be advertised, this should be in line with our current processes for advertising standard licence applications. However, the NA WR advert template for should be used. Where a large number of applications are due to be advertised within the same newspaper, arrangements should be made for a 'bulk' advertisement, as per the NA Advertisement process guide. The WR Permitting NA lead will coordinate this and provide amended templates where required. All web adverts should be published to the 'Applications for licences under transitional arrangements' webpage.

### 5.1.1 National security and commercial confidentiality

There are special arrangements in place for dealing with applications where a customer has claimed that disclosing details of an application would be contrary to the interests of national security. Where a claim has been upheld applications should not be advertised. For further information please speak to the WR Permitting NA lead.

Where a claim for commercial confidentiality has been made, the notice must not include any information that the applicant has requested to be withheld under the claim.

Where a claim for national security or commercial confidentiality has been made, any information that the applicant has requested to be withheld under the claim, must not be included on the public register.

In these situations, the PO must ensure a Public Register Statement is added to the DMS / public register to advise the public that certain information is being withheld as a result of a national security / commercial confidentiality claim.

Where information is withheld as a result of a claim for commercial confidentiality, the statement will advise that additional information relating to this application can be requested by contacting the Access To Information (ATI) team. The ATI team would be responsible for liaising with Water Resources Permitting team regarding what information can be provided.

### 5.1.3 Advertising NRW-own applications

All licence applications where NRW is the applicant must be advertised. WR Permitting will arrange to publish the notice in a local paper and on our website.

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For internal applications the £100 administration fee is waived. However, the full cost of the advert (both English and Welsh) is charged. Payment of the advertising cost is dealt with through a transfer between cost centres. Permitting will contact a member of the finance team to arrange this.

When advertising NRW-own applications the draft licence and determination report will need to be made available to be viewed on request. Therefore, both documents will need to have been QAd (see section 9.1) beforehand. This will need to be taken in to account when prioritising applications for determination, in order to meet the advertising deadline of **30th June 2021.**

### 5.2 Statutory notification

Under paragraphs 8 and 9 of the schedules to the Transitional Regulations 2017, NRW is required to notify the organisations listed below. All relevant organisations must be notified of the application by **30th June 2021**. The WR Permitting NA lead is responsible for managing the timetable for determination and ensuring all notices are served by the 30th June 2021 deadline.

| Organisation / function | Notes on organisation | When to notify |
|---|---|---|
| Internal Drainage Board (IDB) | Internal Drainage District (IDD) functions in Wales are now carried out by NRW | If the application is advertised, and where the abstraction point (surface water only) lies within the IDD. |
| Navigation Authority e.g. Canal and Rivers Trust (CRT) | Section 221(1) of the Water Resources Act 1991 defines "navigation authority" as any person who has a duty or power under any enactment to work, maintain, conserve, improve or control any canal or other inland navigation, navigable river, estuary, harbour or dock". | If the application is advertised, and where the authority's functions relate to any inland waters[1] where the abstraction is located. |
| Harbour Authority (HA) e.g. Cardiff Harbour Authority | Section 221(1) of the Water Resources Act 1991 defines "harbour authority as a person who is a harbour authority [as defined in section 151 for the purpose of Chapter II of Part VI of the Merchant Shipping Act 1995] and is not a navigation authority". | |
| Conservancy Authority (CA) | Section 221(1) of the Water Resources Act 1991 defines a conservancy authority as "any person who has a duty | |

[1] The definition of 'Inland Waters' only refers to surface water sources. However, to be consistent with our standard licensing process, we have extended this requirement to ground water abstractions where there is potential connectivity to surface water.

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| Organisation / function | Notes on organisation | When to notify |
|---|---|---|
| | or power under any enactment to conserve, maintain or improve the navigation of a tidal water and is not a navigation authority or harbour authority" | |
| Statutory Water Undertaker (SWU) e.g. Dŵr Cymru | | If the application is advertised, and within whose appointed area the abstraction is occurring. |
| National Park Authorities (NPA) | The following National Parks are located in Wales:<br>Brecon Beacons<br>Snowdonia<br>Pembrokeshire | Regardless of whether application is advertised and if the abstraction is located in the area of a National Park. |
| The Broads Authority | Norfolk or Suffolk Broads - Not applicable in Wales | |

Note, if the applicant is one of the organisations listed above, then it is not necessary to serve (a copy of the) notice.

Once the relevant notifiable organisations have been identified, the notification cover letter should be drafted using the Statutory Notification letter template. A copy of the press notice (advert) should be enclosed with the letter.

**! Important** Notification to the relevant organisation must arrive before or on the same day the notice / advert appears in the local newspaper and on our website. The press notice, web advert and notice must be all be dated with the same date.

Where there is a need to notify an organisation regarding a large number of applications, a 'bulk' notification may be sent. The WR Permitting NA lead will advise on this as necessary and provide amended templates where required.

After sending the notice to the relevant organisations we may receive requests from them for further information. All requests should be responded to promptly so as not to delay the determination process.

Most relevant notifiable organisations will be required to respond within the period specified in the notice (within 28 days). However, under paragraph 9 of the of the schedule to the Transitional Regulations 2017, National Park Authorities have up to 3 months to respond[1]. As above, the WR Permitting NA lead will coordinate consultation with the National Park Authorities to ensure no unnecessary delays to the determination process.

### 5.3 Applications of High Public Interest (HPI)

As outlined within NRW's Regulatory Public Participation Statement (RPPS), for some applications, if we consider there is, or is likely to be, a high degree of public interest it may

[1] Under section 9 (parag 3) of the schedule to the Transitional Regulations 2017 the National Park authority may make representations in writing to within three months, beginning on the date on which the notice is served.



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be appropriate to take additional communication and engagement activities to raise awareness of the application and the opportunity to participate in our decision making by responding to the consultation. Options can include an extended period of consultation and offering a public drop-in session, the purpose of which is to help facilitate informed consultation responses. As with the advertising decision itself, the decision to treat an application as HPI should be considered against the need to manage expectations under our statutory obligations and the light-touch, risk-based NA policy approach. The HPI process could be used to explain the two-step policy approach of first bringing in abstractions to the licensing system and secondly addressing any sustainability issues under existing work processes such as the Renewals or RSA programme.

As outlined in section 2.2, the NA panel will agree which, if any, applications are likely to be HPI as part of the risk and prioritisation scores and the decision will be recorded in Column DV of the NA Screening spreadsheet.

# 6. Dealing with consultation responses and representations

All consultation response / representations are 'valid' if they are made in writing and received before the end of the consultation / public notice period. However, for a response or a representation to have a material effect on the licensing outcome, it will need to be supported by ***specific technical / scientific*** evidence.

Any issues raised through the consultation and advertising process will need to be considered and if possible, resolved as part of the determination in line with the intentions of the Transitional Regulations 2017 and NA policy. Where we are able to address via the NA determination process, in most cases, it is expected that issues raised will be resolved through further discussion / the inclusion of standard licence conditions where relevant. However, in some cases, it may be necessary to curtail the abstraction, through the inclusion of bespoke licence conditions, or in rare cases, refuse the application.

Any response that suggests the inclusion of bespoke licence conditions or refusal of an application will need to be flagged to the NA Panel, via the WR Permitting NA lead to ensure the decision is in line with NA legislation and policy, as these decisions are likely to trigger the appeals and / or compensation processes (see Part C). If the concerns have been raised by an internal consultee, they will need to be advised that they may be expected to give evidence at any subsequent appeal hearing.

## 6.1 Update records

Consultation responses, representations and any subsequent correspondence / information submitted will need to be saved to the application case file on the DMS. Any issues raised and the outcomes of further discussion / work carried out will also need to be recorded and summarised in the determination report.

## 6.2 Responding to representations

If any representations are received the permitting officer should use the NA Acknowledgement letter to representee template to acknowledge receipt of the representation and the likely determination date of the application. The letter should include a copy of the 'Making Your Views Count' fact sheet that explains in more detail what will happen to any representation and how we will handle it.

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Once a licence has been issued / refused, a response should be sent to any representations received notifying them of our decision. Depending on the issues raised, a standard response letter (granted / refusal) may be sufficient or more bespoke text may be required. For further advice, contact the WR Permitting NA lead.

If the application is refused (see section 9.4) or attracts significant opposition, a decision statement will need to be drafted and published on our website. A link to the decision statement will need to be included in the response letters.

Further information on writing and publishing decisions statements is available in legacy Operational Instruction 378_03 How to publish abstraction licence decision statements to the internet.

### 6.3 Update the applicant

Once the consultation and advertising process is complete, the WR Permitting officer should contact the applicant to update them on the progress of their application and any updates regarding likely timescales for determination.

At this stage, POs should make applicants aware of any potential licensing decisions likely to affect their operation (i.e. refusal or curtailment). Where there is a likelihood of challenge or appeal, the PO should discuss the concerns with the applicant to allow them an opportunity to understand the requirement and if possible, resolve any issues or queries.

Where there is any indication that the applicant was likely to disagree with the determination decision, this should be escalated via the WR Permitting NA lead early on in the process.

#### 6.3.1 Requests for further information

The internal and external consultation process may in some cases, highlight further information is required before the issue can be resolved. If a hydrological / hydrogeological impact assessment is required, then internal consultees must specify the scope of any impact assessment. Generally, the onus will be on the applicant to carry out any necessary investigations and provide any additional information required e.g. hydrometric monitoring, hydrology / hydrogeological investigation, ecological survey, as determined by internal consultees. It is important that the applicant is notified of the need to provide further information as soon as possible to allow them to submit it with enough time for it to be considered within the determination period[1].

**In line with the light-touch**, risk-based policy approach existing information should be used where available (e.g. hydrometric or hydrogeological assessments) and additional information should only be requested in exceptional circumstances. Generally, we only expect to request additional information for moderate or high-scoring sites (see section 2.1). Examples of further information that may be requested include details of abstraction structures; any information required to assess risk of serious damage and / or to complete HRA / Appendix 4 / WFD Regulations Compliance Assessments. Please discuss any requests for additional information with the WR Permitting NA lead before contacting the applicant.

[1] The Schedule to the Transitional Regulations 2017 (Part 2, parag 6 (Provision of additional information in support of the application) states that "The appropriate agency may, following receipt of a valid application, require the applicant to submit any further information or reports that it considers necessary to determine that application".

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Once the additional information has been submitted, it will need to be reviewed by the relevant consultees in order to assess if the issues have been adequately resolved.

Where information is not submitted in time to be considered within the statutory determination period (1st January 2020 – 31st December 2022), applications will need to be determined on the best available information, which could result in a less favourable outcome for the applicant. Such cases should be discussed with the WR Permitting NA lead at the earliest opportunity.

## 7. Prepare determination report and supporting assessments

The purpose of the determination report and any supporting assessments is to:

- justify the decision on an application and to show how it has been reached in a reasoned, logical way;
- demonstrate that in determining this application, NRW have acted in a way that is logical, robust and consistent with the Transitional Regulations 2017 and NA policy, as well as our wider legislative duties;
- provide an audit trail for any decisions made, especially where applications are curtailed or refused.

Permitting officers should draft the determination report using the NA determination report template. Information regarding templates for other supporting assessments is provided in the relevant sections below.

**Remember** that determination reports and supporting assessments are in the public domain. They can legitimately contain statements of opinion about the application, but it must not comment on the applicant (unless this is relevant to the assessment of the proposals and their determination e.g. their status as a navigation authority).

Guidance on the specific issues that need to be considered within the determination report, and when further assessment may be required, is provided below. For more general guidance on writing determination reports see legacy Operational Instruction 314_10 "Determining water resources licence applications".

### 7.1 Eligibility to apply

To be eligible to apply for a transitional licence, the applicant has to demonstrate they meet the three eligibility criteria outlined in sections 7.1.1 - 7.1.3 below.

The eligibility criteria will have been checked as part of the validation process and recorded in the validation checklist saved to the application case file on the DMS, as detailed in OGN 069: Validation of transitional provisions water abstraction licence applications.

The eligibility to apply will also need to be documented in the determination report, as detailed below.

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### 7.1.1 Right of access

The applicant is required to demonstrate that they have a legal right of access to the point of abstraction[1] e.g. they are the 'owner' or 'occupier' of the land the abstraction is located on.

If during determination concerns are raised regarding whether the applicant has a legal right of access, it may be necessary to request further information from the applicant e.g. lease agreements. It is also worth considering the need to advertise the application to check for any opposition to the claimed right of access. In these situations, the WR Permitting NA lead should be consulted on the best way to proceed.

### 7.1.2 Abstraction for a previously exempt purpose

The abstraction must be for a previously exempt purpose or be located within a previously exempt groundwater or surface water area (see Part A, section 2.3).

If during determination concerns regarding the previous exemption are raised, it may be necessary to request further information from the applicant e.g. copies of any relevant pieces of legislation, details on site operation. In these situations, the WR Permitting NA lead should be consulted on the best way to proceed.

### 7.1.3 Evidence of abstraction during 'qualifying period'

As part of the transitional licence application, applicants were required to submit evidence to demonstrate the quantities of water abstracted and when the abstraction took place during the seven year 'qualifying period'.

The 2017 Government response states that the Regulator is expected to be flexible in considering what evidence is suitable to support applications. Examples of evidence include meter readings, pump specification details, agricultural records, sales information or business contracts. Guidance was published to our website, providing further advice on the types of evidence that could be submitted to support this requirement.

The determination report will need to explain how the evidence submitted demonstrates the following:

- the **quantities** of water abstracted;
- the **method** of abstraction;
- how the abstraction quantities have been **measured** or **assessed**;
- the quantities were abstracted during the seven-year '**qualifying period**'; and
- **when** the abstraction took place in any given year i.e. the period of abstraction

Where weir / pipe dimensions or calculations, structure drawings, pump capacity / ratings etc. have been submitted to support this requirement, Hydrology / Geoscience will need to verify the abstraction quantities applied for. If there are any discrepancies or concerns regarding the quantities applied for, it may be necessary to request further information from the applicant e.g. clarification on meter readings, pump capacity etc. In these situations, the WR Permitting NA lead should be consulted on the best way to proceed.

If the applicant requires more water than can be demonstrated through their evidence, even if this is for only part of the year, they are required to submit an additional standard licence

[1] Water Resources Act 1991 (as amended by the Water Act 2003), section 35

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application for the extra quantities. As noted in Part A, section 2.3, it may be possible / desirable to determine both the transitional and standard licence application together.

### 7.2 Effective dates

Under Section 46 (5) Water Resources Act 1991, all licences must state the date from which they take effect. In all cases, effective dates should be no later than 31/12/2022, to coincide with the determination window deadline.

The effective date of a licence should be the same as the issue date. However, there may be some circumstances (e.g. to allow Licence Holders time to implement any necessary changes needed to comply with licence condition(s), such as installing metering equipment or a gauge board) where consideration can be given to applying a later effective date to specific licence conditions (e.g. metering or HoF conditions). Any necessary changes will need to be secured as soon as reasonably practicable, although in some cases, it may be appropriate to consider an effective date that fits with other planned changes

POs should liaise with applicants as early as possible to allow them an opportunity to consider any conditions where a later effective date may be applicable, and to discuss the potential timescales required to implement any changes required. Applicants will be required to provide robust justification as to why a later effective date is required, which should be shared with the NA panel for consideration, and local compliance team, and detailed within the determination report.

In the case of abstraction impacting on a designated site (see section 7.10), we are required to address any actual or potential adverse effects at the point of grant[1], which must be by 31st December 2022 at the latest. Therefore, we cannot issue a licence on the basis of mitigation at a later date i.e. with a future effective date. This may mean a licence refusal or initially issuing a licence with the same issue and effective dates and appropriate conditions that curtail the historic abstraction to prevent any actual or potential adverse effect on the site. Options to licence the mitigation / solution may include the issuing of a transitional licence with two schedules (first schedule with the same issue and effective dates curtailing abstraction to prevent adverse impact and second schedule authorising the mitigation/solution by a future effective date) or a future variation of any transitional licence issued via the standard application route.

Each application should be considered on a case by case basis with the NA Panel to allow all information (e.g. condition details, timescales to implement mitigation measures) to be taken into account to ensure the best regulatory approach is adopted.

### 7.3 Licence duration

Section 46 of the Water Resources Act 1991 (as amended by Section 19 of the Water Act 2003) requires all licences, including transitional licences, to state the date on which they expire. For further information please refer to the draft OGNs Applying time limits to abstraction licences (internal) and Long Duration Licences (external).

#### 7.3.1 Normal duration

As set out in the 2017 Government response, the intention is for the Regulator to grant transitional licences with a time limit to the relevant catchment common end date (CED) in

[1] Regulation 63 (5) of the Habitats Regulations is clear that we must be satisfied as to the effects of continued abstraction on site ***before*** granting a licence.



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line with its published licensing position for the catchment - see Appendix E. Once within the licensing system, these abstractions will be treated like other existing licensed abstractors.

Determination timescales will need to take account of common end dates to ensure licences can be reviewed at the earliest opportunity i.e. to prevent 'skipping end dates[1]'.

### 7.3.2 Short duration

Shorter time limits should not generally be applied to Transitional licences. Applying shorter time limits is not part of NA Policy as set out in the Government response document and NRW may be liable to pay compensation in this situation (see Part C, section 2). Therefore if consideration is being given to a short duration time limit it should be raised via the WR Permitting NA lead and escalated to NA Panel for agreement and compensation risk assessment (see Part C, section 2.3).

### 7.3.3 Long duration

The 2017 Government response states that in exceptional circumstances, the Regulator may issue long duration licences (LDLs), which can be granted for up to 24 years, if certain tests are met. However, no LDL applications were received by NRW under the Transitional Regulations 2017 so will not be considered as part of the NA application process.

### 7.3.4 Variations

There are specific rules on how time limits are applied to variations of existing licences. Generally, the relevant time limit (as outlined above) should be applied to the variation only, unless the variation cuts across the whole licence, in which case, the time limit should be applied the whole licence. In these situations, the WR Permitting NA lead should be consulted on the best way to proceed.

## 7.4 Abstraction location(s)

The abstraction location(s) will have been confirmed as part of the validation checks and recorded in the application case file on the DMS. As detailed in section 3, in order for the application to be considered under the transitional licence application process, there can be no significant change to the abstraction location(s) during the 'qualifying period' and the abstraction location(s) specified on the licence document.

Any licence issued can only relate to a single source of supply. However, the 2017 Government response states that the Regulator is expected to license abstractions in a way that minimises the need for multiple licences or licence variations. For example, in the case of quarries, the existing worked area could be referred to as the point(s) of abstraction. In these situations, the abstraction location specified on a licence should be agreed with the WR Permitting NA lead and NA panel.

## 7.5 Abstraction period

The abstraction period included on any licence issued should reflect the evidence submitted as part of the application. For example, if the evidence shows that abstraction in the 'qualifying period' only occurred during the summer months, the abstraction period should specify those months.

[1] When a licence application is made within six years of the CED we will generally apply the next CED to any licence granted. If there are sustainability issues identified with an abstraction that can't be addressed at the determination stage, then we would look to address ahead of the catchment CED. Therefore, where possible, we would want to avoid skipping to the next common end date to ensure the sustainability issues are addressed sooner rather than later.

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There may be situations where abstraction may have only started or changed late in the 'qualifying period' e.g. from August to December 2017. In these instances, the licence document will need to apply different abstraction periods to different volumes, points and / or purposes. If the applicant wishes to have a licence which reflects the recently changed abstraction all year, they will need to apply for the additional volumes, points and / or purposes via the standard licensing application route.

### 7.6 Abstraction quantities

Under section 46(2) of the WRA 1991 all full abstraction licences must specify the quantity of water authorised for abstraction. On transfer licences these provisions are optional.

The NA policy intention is to "maintain the status quo" by issuing licences in line with the abstraction rates evidenced during the seven year 'qualifying period'.

As part of the validation checks the abstraction quantities applied for and the evidence provided to support these quantities would have been checked (see section 7.1.3). The determination report will need to demonstrate the quantities applied for have been evidenced.

Any concerns or queries regarding abstraction quantities applied for should have been flagged during the screening consultation (section 1). In these situations, further work may be needed to determine the appropriate volume conditions to be included on any licences issued.

Some examples are provided in the table below.

| Scenario | Volume conditions (required on all full licences, optional on transfer licences) |
|---|---|
| An applicant has provided evidence showing that a pump has been run for 24 hours per day at maximum capacity all year. | Specify instantaneous, daily and annual quantities (based on 365 days usage). |
| An applicant has provided daily estimates based on number of cattle | Specify daily and annual quantities only. Annual quantity to be calculated in line with maximum numbers of days usage evidenced. |
| An applicant has applied for a daily rate of 50 cubic metres but was only able to demonstrate that abstraction took place for 200 days within a year. | The maximum annual quantity should be limited to 10,000 cubic metres (50 cubic metres x 200 days) restricted to the season/months that abstraction took place during the qualifying period. |
| An applicant has abstracted from multiple points / for multiple purposes. | Licence should specify individual maximum quantities for each abstraction point, and / or a maximum aggregated quantity across all / a combination of some points. To be agreed with SPO and if necessary, NA Panel. |
| An applicant has specified 3 abstraction boreholes (A, B and C), however, the evidence suggests that only points A and B or points A and C | Maximum quantities to be specified for each individual borehole (if available), however a maximum aggregated quantity should also be included to reflect the total maximum quantity |

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| Scenario | Volume conditions (required on all full licences, optional on transfer licences) |
|---|---|
| were used simultaneously within the 'qualifying period'. | of water taken from points A and B and A and C in any given year, rather than the total maximum quantity of water taken from points A, B and C at different points throughout the qualifying period. |
| An applicant has specified 2 abstraction points (A and B), but only abstraction from point B has potential to impact designated site. | If the licence only includes a maximum aggregated quantity across all points, the abstractor would be able to take more water than evidenced from the point most likely to impact the designated site (point B), which may change the impact on the site. In this scenario, if the impact from point B is considered to be Serious Damage, the licence will need to specify the maximum annual quantity for point B and point A or specify a maximum for point B and a maximum aggregate quantity for both points. |
| Applicant has requested lower quantities to be licensed than their evidenced abstraction rates | Quantities should be confirmed with the applicant before any licence is issued. Applicants should be made aware that if they wish to increase their quantities in the future, they will need to apply to vary their licence through our standard licensing process. |

The scenarios and licensing options above are not exhaustive but are provided to demonstrate what sort of issues may need to be considered when determining volume conditions.

Conditions regarding quantities will need to be determined on a case by case basis, taking into account the evidence provided, the operation of the site and potential impacts. Where necessary, condition wording should be agreed with the WR Permitting NA lead and NA panel.

### 7.6.1 Regulator discretion – transfer licences

It is recognised that in some cases, abstraction is difficult to control, for example in the case of water transfers. In addition, adding volume limits does not always reduce environmental risk and may add unnecessary burden to the applicant or NRW's compliance and enforcement requirements. Therefore the 2017 Government response states that the Regulator will have flexibility on the inclusion of volume conditions on transfer licences. It goes on to say that the final decision on whether to do so should be proportionate, reflecting environmental risk, impacts on other abstractors and the burdens it places on the abstractor. In situations where there are satisfactory alternative ways to control the abstraction it is expected that the Regulator uses a licensing approach that minimises regulatory burdens on the abstractor. For example, conditions could include details of the abstraction structure, which would prevent changes to that structure to allow increased abstraction. Such situations should be discussed with the WR Permitting NA

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lead at the earliest opportunity so that abstractors can be made aware of any necessary additional requirements to control abstractions at the earliest opportunity.

### 7.7 Measurement, recording and reporting requirements

Under section 46(2) of the WRA 1991 all full abstraction licences must include provisions for the measurement or assessment of the actual volume of water abstracted. On transfer licences these provisions are only required where abstraction volumes are included within the licence conditions. Abstractors with these licence conditions are required to submit details of the volumes of water abstracted, which are known as 'abstraction returns. As well as helping to check compliance, abstraction returns are also required to assess water availability, the impact of abstractions on the environment and the current and future demands for water.

Measurement and assessment conditions should be appropriate to the environmental risk and operation of the abstraction. Metering should be the approach adopted where available but where not available consideration can be given to alternative means of assessment/measurement. For example, in the case of a dairy farm a condition could be included requiring the licence holder to provide a record for the number of cattle and multiply
this by an agreed abstraction figure (based on the Optimum Use Guide in Appendix F). Alternatively, a condition could be included requiring the licence holder to record and report on pumping hours multiplied by pump capacity. This is in line with what has been accepted as evidence of abstraction quantities as part of the application and validation process, as per the evidence guidance published on our website[1].

Where volumes have been specified per purpose / point, the abstraction should be measured separately.

Recording and reporting frequency requirements for transitional licences should be in line with those applied to standard licences, as per the table in Appendix G.

Abstraction quantities and measurement and recording conditions **should be determined on a case by case basis** and approved by the WR Permitting NA lead where necessary.

Further information on reporting and recording requirements can be found in Legacy Operational Instruction 056_08 Operator returns for Water Resources and the legacy Abstraction Metering Good Practice Manual.

### 7.8 Discharge condition

A point of return or discharge condition should be included on the licence where:

- some or all of the water abstracted is discharged back to the environment e.g. for applications involving large transfers of water such as dewatering;
- there is a need to protect the environment or to manage water resources;
- there is a need to ensure abstraction is licensed in line with the operation during the qualifying period.

Where possible the proportion / quantity of water to be discharged back to the environment should be specified, provided it is in line with the operation during the qualifying period.

[1] Web page has now been removed. Link is to copy of guidance note saved on DMS

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Even where an Environmental permit for a water discharge activity or groundwater activity is already used to control the return of water from an abstraction, then the point of return and minimum volume to be discharged back to the environment should still be included on any abstraction licence issued[1]. This is because an Environmental permit will usually only specify a maximum that can be returned, whereas in the case of an abstraction licence, we need to ensure a minimum amount is returned to the environment.

### 7.9 The WFD Regulations 2017

In line with the draft OGN 072 'assessing activities and projects for compliance with the Water Framework Directive we have a duty to ensure compliance with the requirements of the WFD Regulations 2017 when determining transitional licence applications.

When considering compliance with the WFD Regulations 2017, consideration should be given to the following:

- abstraction quantities will be licensed based on historic use, so licensing them will not change river flows or groundwater levels or cause deterioration in WFD water body status.
- In most cases NA abstractions have been ongoing for many years, any impacts of the abstraction may already be reflected in WFD ecological data.
- where appropriate, NA abstractions will be subject to basic Hands-off Flow conditions (see section 7.15), meaning that low flows will be protected and the abstraction will no longer be contributing to / causing the flow compliance failure at low flows.
- moving previously exempt abstractions into the licensing system is considered a first step to move towards sustainable abstraction and will allow them to be reviewed / addressed through future sustainability review processes.

On this basis, the following approach to undertaking WFD Regulations 2017 compliance assessments for NA applications has been agreed:

| Application score (see section 2) | Approach |
|---|---|
| Low | • In line with the approach set out in Annex D of OGN 72 for **green** activities, the application can be screened out from further WFD Regulations 2017 compliance assessment.<br>• Licensed abstraction quantities will be based on historic use, so licensing them will not change river flows or groundwater levels or cause deterioration in WFD water body status.<br>• The 75% of Qn99 HoF recommended in the 2017 Government Response to protect lowest (drought) flows is not considered appropriate for the reasons outlined in section 7.15.<br>• Licence to be reviewed through future sustainability review processes. |
| Medium / High | • In line with the approach set out in Annex D of OGN 72 for **amber** activities, the application should be reviewed as part of the further consultation stage (see section 4) to determine if further scoping / detailed assessment will be required under WFD Regulations 2017.<br>• In the first instance, the consultation should ask Hydrology / Geoscience to confirm the requirement for further scoping / detailed assessment, depending on whether the abstraction is from surface water or |

[1] It is not necessary to reference the Environmental permit within the licence document. It is considered sufficient to ensure the licence conditions correspond with the conditions of the permit. The Environmental permit should be referred to in the licence determination report where relevant.

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| Application score (see section 2) | Approach |
|---|---|
| | groundwater respectively. Other functions such as geomorphology, fisheries and biodiversity should be consulted if the need for further scoping / detailed assessment is confirmed.<br>• Licensed abstraction quantities will be based on historic use, so licensing them will not change river flows or groundwater levels or cause deterioration in WFD water body status.<br>• A Qn95 or bespoke[1] HoF will be applied where beneficial to the environment, meaning that low flows are protected, and the licensing of the abstraction will not be contributing or causing the flow compliance failure at low flows.<br>• Licence to be reviewed through future sustainability review processes. |

Where no WFD compliance assessment is required, **all decisions must be recorded within the determination repor**t. Where WFD compliance assessment has been completed, this should be saved to the application case file on the DMS and referenced within the determination report.

### 7.10 Impacts on designated sites

Any applications with the potential for impacts upon designated sites (e.g. SACs, SSSIs) will have been identified at the screening stage (see section 1). Where there is risk of the site being affected by the abstraction (e.g. features of the site are water dependent), further assessment will be required.

The type of assessment to be completed will depend on the nature of the designation, as follows:

- Habitats Regulation Assessment - for any applications with the potential to impact on Habitats and Species Regulations 2017 National Site Network of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and also Ramsar sites.
- Appendix 4 – for any applications with the potential to impact Sites of Special Scientific Interest (SSSI).
- Appendix 5 – for any application with the potential to impact AONBs.
- For any other designations identified through screening (e.g. SINCs), it may be necessary to undertake further consultation (see section 4) and document within the relevant section of the determination report.

The conclusions of any assessments will also need to be summarised within the relevant section of the determination report.

Where possible, bulk assessments should be carried out. For example, where there are multiple applications potentially impacting upon the same designated site. This will help ensure efficiencies as well as satisfying requirement for in-combination assessment. The WR Permitting NA lead will be responsible for organising this process and identifying any sites which can be included in bulk assessments. Individual assessment will be required where bulk assessments are not possible / considered any more efficient.

[1] If considered serious damage or has the potential to impact on a designated site.

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As NA abstractions have been ongoing, there may be some cases where an Appendix 4 / HRA has already been completed, albeit in relation to a differing permission e.g. in the case of planning applications for quarry operations or for EPR permit applications. In these cases, WR Permitting will still be responsible for completing its own assessment, however it may be possible to draw on the existing work and conclusions to avoid duplication of effort and ensure consistent decision-making where possible. NRW would need to be satisfied that the prevailing conditions had not changed since original assessment had been completed.

Generally, the WR Permitting team have responsibility for carrying out the assessment. The Environment team responsible for the designated site concerned should be consulted in order to provide the protected site advice (see section 4.1). If the designated site is located in England, Natural England should be consulted (see section 4.2.2). Input from other relevant teams should be sought where necessary. Whilst the WR Permitting team should have regard to the advice of the consultees the decision on the HRA / Appendix 4 lies with the WR Permitting team.

For transitional licence applications requiring an HRA / Appendix 4 assessments, the possible licensing outcomes are summarised as follows:

| Scenario | Licensing outcome |
|---|---|
| Confirmed no adverse effect | Licences to be granted with basic HoFs (see section 7.15) / standard conditions, where required. |
| Unable to conclude no adverse effect / Proven adverse effect - sites designated under Habitats Regulations 2017 | Serious damage is considered to apply where there is a proven adverse effect or where we are unable to conclude no adverse effect (i.e. the precautionary principle applies – see section 7.10.1).<br><br>In these cases an additional Serious Damage assessment is ***not*** required (see section 7.11) and the abstraction can be curtailed / application refused ***without compensation*** (see Part C, section 2).<br><br>The determination report will need to refer to the HRA and make clear that refusal / curtailment is required to protect against serious damage. |
| Unable to conclude no adverse effect / Proven adverse effect – other designated sites | Serious damage is only considered to apply when there is a proven adverse effect, specifically as a result of the NA abstraction.<br><br>In these cases a serious damage assessment will be required to demonstrate that serious damage is occurring (see section 7.11). This will allow us to curtail an abstraction / refuse an application ***without compensation*** (see Part C, section 2). |

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| Scenario | Licensing outcome |
|---|---|
| | The determination report will need to refer to the serious damage assessment and make clear that refusal / curtailment is required to protect against serious damage.<br><br>If we are unable to prove an adverse impact / we cannot demonstrate serious damage it may still be necessary to curtail an abstraction / refuse an application but in these cases ***compensation may be payable*** (see Part C, section 2.1). Such situations should be discussed with the lead SPO at the earliest opportunity.<br><br>Where abstractions are not curtailed / applications are not refused, licences should be issued with basic HoFs / standard conditions, where required, and will be subject to future sustainability review processes. |

Further advice on completing HRAs can be found in the Operational Guidance Note 200: Habitats Regulations Assessments of Projects. For Appendix 4s please refer to legacy Operational Instruction 226_10 "Screening and assessing new water resources permissions for impacts on conservation, heritage and landscape".

### 7.10.1 Habitats Regulations – precautionary principle

If an abstraction is within or has the potential to impact on a designated SAC[1] we must apply the 'precautionary principle'. This means that if we are unable to demonstrate no adverse effect (actual or potential) on the SAC integrity then any relevant conditions to protect the SAC should be applied, or in certain circumstances the application should be refused. The 'precautionary principle' applies unless robust evidence can be provided which demonstrates no adverse effect.

### 7.10.2 Habitats Regulations – mitigation measures

In 2018 a ruling in the Court of Justice of the European Union raised fundamental questions about the screening of plans and projects under the Habitats Regulations. For standard licence applications this means that mitigation measures cannot usually be considered when screening for a likely significant effect (LSE).

For transitional licence applications, the basic HoFs described in section 7.15 are not considered specific measures to protect a site designated under Habitats Regulations, and can therefore be considered within the screening stage. However, any other conditions (including bespoke HoFs) considered necessary to protect a designated site cannot be included within the screening stage and therefore, the appropriate assessment to determine whether such measures are adequate must be carried out in full.

[1] For example, where an abstraction is from or in connectivity with a watercourse where flow is a supporting element to a SAC (including tributaries of a riverine SAC not designated) or a designated wetland.



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### 7.10.3 Habitats Regulations - imperative reasons of overriding public interest (IROPI)

In some cases, there may be no options to enable a conclusion of no adverse effect to be reached. In these situations, the applicant can request that consideration be given to whether IROPI applies. For IROPI to apply, NRW would need to be satisfied that the imperative reasons in the public interest would override the harm to the site that had been identified.

Permitting officers should notify the WR Permitting NA lead as soon as they think IROPI may be applicable to an application.

In practice, the IROPI process is led by the applicant, who would need to demonstrate the following:

i) there are no feasible alternatives that would deliver the same overall objective;
ii) there are "imperative reasons of overriding public interest" (IROPI) for the plan or project to proceed;
iii) any necessary compensatory measures being taken.

It is for the applicant to provide sufficient information for NRW to make a decision. Primarily, we would need to consider reasons relating to human health, public safety, or beneficial consequences of primary importance to the environment. If the site does not host priority habitat or species, NRW can also consider other reasons including those relating to social or economic benefit.

There is a requirement for NRW to notify Welsh Government at least 21 days before making the decision. NRW need to provide Welsh Government with sufficient information to make the IROPI case. NRW cannot agree to a decision until 21 days have elapsed since the notification, unless directed to do so by Welsh Government. Therefore, it is recommended that the applicant would need to notify NRW of their intention to pursue IROPI by June 2022 at the latest to allow sufficient time to complete the above process and licence determinations based on the direction from Welsh Government. However, to enable discussions around what form the compensatory measures might take, applicants should engage in discussions with NRW and Welsh Government as early as possible. It should be noted that this process may be considered too onerous for many applicants and the chances of success are not certain.

### 7.10.4 Work prioritisation

The requirement for Appendix 4 or HRA assessments will be taken in to account when applications are prioritised for determination (see section 2.2). Where these requirements only become apparent later in the determination process, prioritisation timescales will be reviewed and revised if necessary.

### 7.10.5 Update the applicant

Where screening or consultation suggests that Appendix 4 or HRA assessments are required the applicant should be notified as early as possible. It is important to keep the applicant informed of the process and possible implications, including any additional information that they may need to provide or alternative options they may need to consider. However, correspondence should be worded carefully, in order to avoid pre-determination of the licence application. For further advice, discuss with the WR Permitting NA lead.

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## 7.11 Serious damage

Under the 2017 Government response and Transitional Regulations 2017[1] applications will *only be significantly curtailed or refused* to protect the environment from '*serious damage*'.

The principles of serious damage are set out in the 2012 consultation and the Government response on the issue. This sets out the following three key principles against which to assess whether the damage is serious:

- Establishing the qualitative nature of the damage - this describes why what is being damaged is considered important – it can be the status of a river or the designation of a habitat or population.
- Establishing the extent and magnitude of the damage - this describes the physical scale of the damage (i.e., area of water or habitat).
- Establishing if the damage is reversible and how long recovery may take - this describes whether the damage is temporary or whether more lasting effects are expected

Further detail on these principles and how they can be assessed is available in the legacy Operational Instruction 1473_12 "Serious damage from abstraction (Section 27 of the Water Act 2003)".

It is not possible to provide a definitive list of impacts that constitute serious damage. Each case will be different, and many factors will need to be considered to determine the impact on the environment. However, under the Transitional application process, the following scenarios are considered likely to meet the serious damage criteria:

| Scenario | Approach |
|---|---|
| Effects on sites designated under Habitats Regs | In the case of a site designated under Habitats Regs, where an abstraction is affecting, or has the potential to affect it, the 2017 Government Response states that the Regulator will apply the 'precautionary principle' in its determination decision of serious damage. This means that an abstraction would be restricted to protect from serious damage where the Regulator has insufficient evidence to conclude that 'no adverse effects' to protected sites would be caused. As a result, no additional serious damage assessment required. |
| Effects on other designated sites. | We only have the ability to curtail an abstraction without compensation (see Part C, section 2) if there is a known, tangible impact to the site/area identified.<br>Serious damage assessment required to demonstrate that serious damage is occurring, specifically as a result of the NA abstraction. |
| WFD waterbody flow failure (Band 3) | In order for an abstraction to be causing serious damage under WFD Regulations 2017, a water body would need to meet the following 3 criteria:<br>i) Classified as Band 3 non-compliant for flow i.e. they are experiencing severe levels of abstraction |

[1] The Transitional Regulations 2017 (Part 3 Provision 9) clarifies compensation eligibility in relation to NA applications.



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| Scenario | Approach |
|---|---|
| | pressure causing recent actual flows to fall 50% below the EFI.<br>ii) Have an overall WFD status of less than 'Good'<br>iii) Have the abstraction of water and subsequent low flows confirmed as the reason, or contributing to the reason, for not achieving 'Good Ecological Status'.<br>Serious damage assessment required to demonstrate that serious damage is occurring, specifically as a result of the NA abstraction. |

The final decision will be determined on a case by case basis taking into account the weight of evidence across all three principles, as well as the likelihood of serious damage occurring. Any decision must be supported by appropriate evidence. In some cases, it may be necessary to request this from the applicant (see section 7.11.2 below) or to carry out our own investigations.

**Before requesting any information or carrying out our own investigations** the risk / likelihood of serious damage occurring should have been confirmed with consultees and approved by the WR Permitting NA lead.

As above, serious damage assessments are not required in the case of actual or potential impacts to a site designated under the Habitats Regs. However, the determination report should clearly reference the HRA and summarise the evidence for either curtailing or refusing the application, in order to protect from serious damage.

In other cases (i.e. effects on other designated sites or WFD flow failure) a serious damage assessment form should be completed[1], and should also be summarised within the determination report. The determination report and / or serious damage assessment form must provide the evidence for either curtailing or refusing the application, in order to protect from serious damage. As these cases are likely to be subject to appeal, the assessments must be sufficiently robust to defend the decision to curtail or refuse.

Once the form has been completed, it must be reviewed by the WR Permitting NA lead and NA Panel for consideration. They will review the form with input from relevant colleagues (e.g. legal, Biodiversity / Fisheries Policy) where required and agree on a final recommendation.

Where serious damage is confirmed, abstractions will not benefit from the 'light touch' regulatory approach or be eligible for compensation (see Part C, section 2). The abstraction must be curtailed, or the application refused, in order to protect the water environment from serious damage.

Where serious damage cannot be confirmed then consideration will need to be given to whether the application is refused or curtailed with risk of compensation (see Part C, section 2) or if the licence should be determined in accordance with the 'light touch' regulatory approach, and reviewed as part of future sustainability review processes.

[1] OI 1473_12 refers to an assessment form SD01 and example assessments SD02. Speak to the WR Permitting NA lead for these documents.

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### 7.11.1 Work prioritisation

Applications considered to meet the criteria of serious damage must be prioritised to deliver environmental benefits to the most damaged, or at risk, sites as early as possible. This will be taken into account when applications are prioritised for determination (see section 2.2). Where serious damage only becomes apparent later in the determination process, prioritisation timescales will be reviewed and revised if necessary. Formal assessments of serious damage must be carried out at the earliest opportunity.

### 7.11.2 Update the applicant

Where abstractions have been identified as causing potential serious damage, it is important to be engage with applicants as early as possible. In the first instance permitting officers should work with applicants to see if alternative options are possible. POs should also ensure applicants understand any potential licensing decisions (i.e. refusal or curtailment). They should allow applicants an opportunity to discuss any concerns and if possible, resolve any issues or queries. It may be appropriate to share a draft copy of the licence with the applicant prior to licence issue. However, correspondence should be worded carefully, in order to avoid pre-determination of the licence application.

Where there is a likelihood of challenge or appeal, this should have been escalated via the WR Permitting NA lead early on in the process.

Permitting officers should also contact applicants at the earliest stage to request any additional information that may be required to determine the application.

For further advice on updating applicants, discuss with the WR Permitting NA lead.

## 7.12 Cumulative impacts

Screening / consultation may have identified potential cumulative impacts e.g. how an NA activity could potentially be acting in combination with other ongoing or proposed activities. These will have been captured in the NA screening spreadsheet and will need to be investigated and documented fully in the determination report and any associated WFD Regulations 2017 / HRA / Appendix 4 / serious damage assessment, using expert and local knowledge where available.

Where a number of abstractions, including already licensed and previously exempt activities, are acting in combination, it will be necessary to establish the impact of the NA abstraction. If there is no clear evidence of the impact of this, it is unlikely that the abstraction can be curtailed / application can be refused, unless in the case of serious damage (see section 7.11).

## 7.13 Protected rights and lawful uses

A protected right is a right to abstract, for example, under a full abstraction licence or a deregulated abstraction[1]. The right protects the quantity of water that can be abstracted.

[1] small abstractions of less than 20 cubic metres per day were removed from water resource regulation as of 1 April 2005 and do not require an abstraction licence. Those persons who held a licence to abstract less than 20 m3/day at the time of the deregulation, retained their protected right status until such time as the licence was revoked or a new abstractor succeeded to the licence.

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A lawful use is a use of water that does not have a protected right but is a legal use e.g. abstraction under a transfer or temporary licence or an abstraction exempt from licensing controls.

Protected rights and lawful uses are complex legal issues and how they are considered under the transitional determination process differs to how they are considered under the standard licensing process.

Under our standard licensing processes, we may look to mitigate the effects on protected rights or lawful uses. However, for transitional licence applications we need to consider Section 102(5) of the Water Act 2003, which essentially allows us (NRW) to issue licences for previously exempt activities *even if the abstraction is causing derogation or affecting lawful users*. If we were to curtail or refuse a transitional licence application that is potentially derogating a protected right or affecting a lawful use, then compensation may be payable (see Part C, section 2).

Any claims of impacts on protected rights or lawful uses will need to be supported by specific technical and scientific evidence in order for them to be considered fully during the determination process. All claims will need to be assessed on a case by case basis and documented in the determination report. The determination report will need to address the requirements under the relevant water resources legislation, as well as consideration of the SMNR principles (see Part A, section 2.5 and our website here). In cases where licences are issued, affected (third) parties may seek to secure compensation through a private claim[1].

If any impacts regarding protected rights or lawful uses are flagged during screening or consultation **it is important to discuss** with the WR Permitting NA lead as early as possible.

### 7.14 Subsidence and desiccation

When determining transitional licence applications, we may encounter claims for subsidence and desiccation. Geological conditions in Wales means that subsidence and desiccation will be very rare and unlikely to be caused by groundwater abstraction.

If we were to curtail or refuse a transitional licence for potential desiccation or subsidence issues, then compensation may be payable (see Part C, section 2).

Any claims of subsidence will need to be supported by specific technical and scientific evidence in order for them to be considered fully during the determination process. All claims will need to be assessed on a case by case basis and documented in the determination report. The determination report will need to address the requirements under the relevant water resources legislation, as well as consideration of the SMNR principles (see Part A, section 2.5 and our website here). In cases where licences are issued, affected (third) parties may seek to secure compensation through a private claim as they were able to prior to the NA exemption removals[2].

If any claims for subsidence and desiccation are flagged during the determination process **it is important to discuss** with the WR Permitting NA lead as early as possible.

[1] Under Section 48A Water Resources Act 1991.
[2] Under Section 48A Water Resources Act 1991.

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### 7.15 Hands off flow conditions

"Hands off Flow" (HoFs) are conditions attached to abstraction licences which require that if a river flow falls below the threshold specified, the abstraction is to be reduced or stopped.

HoF conditions are used to protect rivers during low flows and at times of drought, and therefore support the objectives of the WFD Regulations 2017 (see Part Am section 2.1 and Part B section 7.9 above).

The 2017 Government response allows NRW as the regulator to have some discretion about the application HoFs to transitional licences[1], using them only where it is sensible to do so, or doing so would not harm the environment e.g. where compensation flow from a reservoir or an existing structure provides a higher flow than would be afforded by the HoF. Therefore, we do not expect HoFs to be applied universally.

NRW's approach to applying HoFs to transitional licence applications is summarised in the table below.

| Scenario | HoF |
|---|---|
| • Abstraction located in a waterbody where flow is **adequate to support GES** i.e. Recent Actual flows are above the EFI; and<br>• Confirmed no adverse effects on designated sites. | No HoF[2] |
| • Surface water abstraction, or groundwater abstraction in continuity with surface water flows; and<br>• located in a waterbody where flow is **not adequate to support GES** i.e. Recent Actual flows are below the EFI. | Basic Qn95 HoF (i.e. natural flow that is exceeded 95% of the time).<br><br>OR<br><br>No HoF, if there is no sense in applying one or applying one would cause environmental harm. |
| • **Serious damage**<br>• **Environmental damage** to a designated site, but where serious damage criteria has not been met (compensation may be payable – see Part C, section 2.1) | Bespoke - to be assessed on a case by case basis |

[1] For further detail on the HoFs outlined in the 2017 Government response see Appendix H.

[2] In line with our regulatory discretion, NRW have made a policy decision **not to apply the 75% of Qn99 HOF** condition (see Appendix H) to abstractions that are located within WFD waterbodies that are 'supporting good ecological status'. This is because there is insufficient evidence in Wales that a prescribed flow of 75% of Qn99 would provide any environmental benefit / be likely to result in any improvement to WFD status. Finally, flow gauges are not generally considered to operate reliably at such low flows, and therefore any condition applying this HoF would not meet the legally enforceable aspect of the 'UNCLE' test (see section 8.3).

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In some cases, the HoFs applied may be lower than the recommended HoFs detailed in the Abstraction Licensing Strategy (ALS) for that catchment. This is in recognition that these abstractions may have been happening lawfully for many years. The transitional licence is considered to be a "first step to move towards sustainable abstraction".

In the case of serious damage, or other exceptional circumstances, we are able to grant a more restrictive bespoke HoF (based on local requirements or in-line with the ALS for that catchment), although where serious damage criteria does not apply, applicants may be eligible for compensation (see section C, part 2).

In line with the light-touch, risk-based policy approach, basic HoF conditions should be linked to an appropriate existing gauging station where possible. This will minimise burden on the applicant and NRW compliance resource. Decisions on the most appropriate gauging station will be made on a case by case basis by the local Hydrologist as part of further consultation. In the absence of an appropriate existing gauging station, local HoFs can be used but this should only be when there is existing data available and the HoF can already be secured or measured via existing infrastructure.

Where bespoke HoFs are required, the light touch approach outlined above may not apply and additional work (e.g. spot flow gauging or infrastructure changes) to determine / secure the HoFs may be required.

All HoF conditions should meet the 'UNCLE' test (see section 8.3). If this is not possible then a HoF condition should not be applied[1]. This decision must be approved by the NA permitting lead, in liaison with NA Panel if required, and fully documented in the determination report.

### 7.15.2 Groundwater abstractions

In Wales there are no groundwater bodies that have poor quantitative status under the WFD Regulations 2017, so the application of HoFs for NA groundwater abstractions will be dependent on whether the groundwater is in connectivity with surface water. If this is the case, HoFs will be applied in line with the table above. "Hands off Level" (HoLs) conditions, based on groundwater levels, can be used instead of a HoF but they must be set so that they afford the same protection on river flows as the identified basic HoF. Decisions on whether it is appropriate to apply a HoF or HoL to a groundwater abstraction will be taken on a case by case basis, in consultation with Geoscience and Hydrology teams.

Where Geoscience have advised potential connectivity between groundwater and surface water flows, Hydrology will also need to review the application to advise whether the groundwater abstraction could be contributing to any surface water flow failures under the WFD Regulations 2017.

During further consultation, WR permitting will need to work with the relevant teams (e.g. Hydrology, Geoscience and People + Places) to agree the appropriate HoF or HoL, if required.

[1] It may be appropriate to notify applicants that under future sustainability review process a HoF may be required and that this may require additional work e.g. spot flow gaugings, infrastructure changes etc.

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### 7.15.3 Update the applicant

Where abstractions have been identified as requiring a HoF condition, it is important to engage with applicants as early as possible. In the first instance permitting officers should liaise with applicants to ensure they understand the potential requirements. They should allow applicants an opportunity to discuss any concerns and if possible, resolve any issues or queries. It may be appropriate to share a draft copy of the licence or HoF condition(s) with the applicant prior to licence issue. POs should also consider discussing timescales an applicant may require for making any necessary changes to their operation so future effective dates can be considered if appropriate (see section 7.2).

Where there is a likelihood of challenge or appeal, this should have been escalated via the WR Permitting NA lead early on in the process.

Permitting officers should also contact applicants at the earliest stage to request any additional information that may be required to determine the appropriate HoF.

Correspondence should be worded carefully, in order to avoid pre-determination of the licence application. For further advice on updating applicants, discuss with the WR Permitting NA lead.

## 7.16 Existing legislation and permissions

Some sites may be subject to existing local or historic legislation or permissions such as Canal Acts or planning consents.

Where these are relevant to the NA abstraction, details may have been provided by the applicant to demonstrate how the abstraction is operated in line with the existing legislation e.g. intake structure dimensions. Further information can be requested from the applicant during determination if required. Information may also have been provided internally though the screening and consultation process.

Where appropriate, it is possible to replicate relevant conditions from existing legislation or permissions within transitional licences. For example, in the case quarry dewatering, any water protection requirements previously agreed via planning (e.g. via water management plans) should be replicated within transitional licences.
In some cases, historic abstraction practices may differ from what is stated in existing legislation or permissions. For example, for some canal or port operations the abstraction which has taken place between 2011 – 2017 ‘qualifying period’ may be different to what was authorised by local Acts. In these cases, it is not necessary to mirror the statutory abstraction conditions from existing permissions, and it is considered more appropriate to licence the abstraction as it has been operated within the ‘qualifying period’. This is considered in line with existing water resources legislation[1] and NA policy.

Any conditions should be agreed with the relevant local technical team (e.g. Hydrology, Geoscience or People and Places) and reviewed by the WR Permitting NA lead. Any non-standard conditions must meet the ‘UNCLE’ test – see section 8.3).

[1] section 24(6) of the WRA 1991 enables statutory abstraction conditions to be varied in abstraction licences.

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The 2017 government response suggests compensation will not be payable where conditions are added to reflect current operating constraints in place e.g. canal acts or planning conditions as this will not constitute loss or damage (see Part C, section 2).

### 7.17 Fish / eel regulations

When determining Transitional licence applications, we are required to consider impacts on fish behavior such as movement, migration, spawning; or species composition and abundance. We also have duties to safeguard European Eels. Where relevant, abstractors were required to provide details of any measures in place to safeguard eels as part of the application process.

If impacts to fish / eels are identified through screening / consultation they will need to be considered further within the determination report and any other relevant assessment if required.

f conditions to protect fish / eels are included on a licence **compensation may be payable** (see Part C, section 2), unless in the case of serious damage. Therefore, any conditions will need be reviewed by the WR Permitting lead for NA and approved by the NA panel.

#### 7.17.1 Update the applicant

Where abstractions have been identified as requiring conditions relating to fish / eel passage and / or screening, it is important to engage with applicants as early as possible. In the first instance permitting officers should liaise with applicants to ensure they understand any potential requirements. They should allow applicants an opportunity to discuss any concerns and if possible, resolve any issues or queries. It may be appropriate to share a draft copy of the licence or relevant condition(s) with the applicant prior to licence issue. POs should also consider discussing timescales an applicant may require for making any necessary changes to their operation so future effective dates can be considered if appropriate (see section 7.2).

Where there is a likelihood of challenge or appeal, this should have been escalated via the WR Permitting NA lead early on in the process.

Correspondence should be worded carefully, in order to avoid pre-determination of the licence application. For further advice on updating applicants, discuss with the WR Permitting NA lead.

### 7.18 SMNR

The legislative background to the sustainable management of natural resources (SMNR) is provided in Part A, section 2.5. Consideration of how the principles of SMNR apply to the determination of transitional licence applications will need to be included in any decision documents. It will be sufficient to focus on those principles which could be considered to be in conflict with any decision made. The determination report will need to either explain why the decision is still considered to be consistent with that principle, or explain why the decision is maintained, notwithstanding the principle.

The clearest and most comprehensive way to demonstrate compliance with NRW's general purpose would be to ensure that the following general issues are considered as part of the decision-making process:

- Whether a given application maintains and enhances the resilience of ecosystems and the benefits they provide?

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- How does a given application meet the needs of present generations?
- Whether, in what manner, and to what degree does it impact on the ability of future generations to meet their needs?
- How, if at all, would the application contribute to each of the 7 well-being goals (available on the Welsh Government website here) being met?
- In considering the application, has NRW applied the principles of SNMR (see our website here), as set out in section 4 of Environment (Wales) Act 2016?
- Insofar as the application is conceivably in conflict with any of those principles, how should NRW resolve that tension and why?

# 8. Prepare the licence document

The licence document is a legal document authorising the holder to abstract water, subject to the conditions specified in the document.

The purpose of this section of the guidance is to ensure transitional licences are:
- consistent with other transitional licences;
- in line with the Transitional Regulations 2017, NA policy and other relevant legislation;
- easily understood by the licence holder and enforcement and compliance staff;
- enforceable; and
- legally correct.

Using the PALS guidance 'Generating and Formatting Water Resources Licence' POs should generate and complete the licence document.

Where a Transitional application has been submitted to vary an existing licence (see PALS or column K of the NA Screening Spreadsheet) any new licence issued must incorporate the relevant terms of the existing (base) licence and the varied terms. Whether the transitional licence templates or existing licence document is used will depend on the variation and how much of the licence is being varied.

## 8.1 Licence holder's name and address

It is important that the correct name and address is specified on the licence document for enforcement and compliance purposes.

The licence holder name must be a legal entity, such as an individual person, a company or a public body. For examples please refer to Appendix I.

If there is any uncertainty about the legal status of a licence holder, it may be necessary to clarify with the applicant. In addition, any queries should be raised to the WR Permitting NA lead, who may need to consult with legal where necessary.

For companies and Limited Liability Partnerships the registered number should be included on the licence[1]. Whilst a company name can change at any time, the number remains the same and might be useful should any enforcement be necessary (i.e. we can track the company through the number and see if its changed names during its lifetime).

[1] Details will be on the Companies House website https://find-and-update.company-information.service.gov.uk/?_ga=2.240332033.360995387.1611246090-499002964.1582898978

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The address on the licence will need to be the registered office[1].

When a licence is issued to a Trust, the trustees should be named on the licence so that if any enforcement action is required at a later stage, the licence has been properly issued to a legal person.

The licence document will need to include the names and address of all persons comprising the licence holder.

### 8.2 Issue, effective and expiry dates

For new licences, the effective date should be the same as the issue date. See section 7.2 for more information.

For variations to existing licences, you will need to include the original issue date as well as the issue and effective dates of the variation.

As outlined in section 7.3, licences will need to include an expiry date (time limit) in line with the relevant common end date as per the published licensing position for the catchment - see Appendix E. For variations to existing licences, the expiry date should be discussed and agreed with the WR Permitting NA lead.

### 8.3 Licence schedule of conditions

Licence conditions must be consistent with the Transitional Regulations 2017 and NA policy, as well as any other relevant legislation.

All licence conditions should meet the 'UNCLE' test, that is they be Unambiguous, Necessary, Clear and Legally Enforceable.

To complete the schedule of conditions, the following actions should be completed:

- Use the condition library to populate conditions within the licence document template.
- For the purpose condition, please refer to the Purpose Code Guidance (links available through the Water Resources Permitting Guidance Catalogue).
- For HoF conditions refer to section 7.15.
- If you have multiple points, purposes and/or season with separate quantities applicable, consider presenting this information in a table.
- Add any relevant conditions from existing legal agreements (e.g. Canal Acts, Planning Permission), as agreed through internal consultation (see section 7.16).

Any **non-standard / bespoke conditions should be drafted and reviewed** by the WR Permitting NA lead, who will consult the NA panel if necessary. Generally non-standard or bespoke conditions should only be used where these is a need to protect against serious damage / environmental damage to a SSSI.

### 8.4 Reasons for conditions

For standard conditions, the 'reasons for condition' text should be in line with that used under our standard licensing process.

For basic HoF conditions, reference should be made to the Transitional Regulations 2017. For bespoke conditions, the 'reasons for condition' wording should be agreed by the WR Permitting NA lead / NA panel as above.

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### 8.5 Important notes
This section does not form part of the licence but can be used to provide information that may be useful to the reader, such as the fact that the licence was granted under the Transitional Regulations 2017. In the case of variations to existing licences, this section could include reference to the original licence.

### 8.6 Licence maps
To ensure licence maps are produced to a consistent standard, they should be generated using the existing guidance for creating a Water Resources Licence Map

### 8.7 Plans and drawings
Relevant technical teams should advise whether any plans or drawing should be included on the licence document. Where required, drawings or plans should include dimensions and levels where relevant and will need to be referenced in the further conditions.

For dewatering operations, the licence document should include the following:
- A cross section to include the extent of the workings
- A plan to show the workings
- A cross-section to show water table levels

Further guidance on writing licence documents is available in legacy Operational Instruction 505_09 Preparing water resources licence documents

## 9. Licence issue / refusal

### 9.1 Quality Assurance (QA)
The PO should complete the NA QA checklist and send a link to the application case file on the DMS to the Reviewing Officer (RO) for QA. The PO should also update the status (column W) of the application in the NA Apps Tracker (within the NA Determination work plan) to indicate the application is awaiting QA. Ideally the RO will be the same or higher grade than the PO, but alternative arrangements can be agreed with the WR Team Leader. The RO should use the QA checklist to complete the QA of the determination and licence documents, including the issue letter. The QA checklist should be saved to the application case file on the DMS. The PO / RO should raise any queries with the WR Permitting NA lead where appropriate.
Note that for NRW-own applications the QA will need to take place at an earlier stage in process as the draft licence and determination report will be available to be viewed on request during advertising and the draft licence will also need to be sent to during external consultation.

### 9.2 Sign-off
The PO should send a DMS link to the completed QA checklist, licence document and determination report to the WR Permitting team leader for sign off. As above, the PO should also update the status (column W) of the application in the NA Apps Tracker (within the NA Determination work plan) to indicate the application is awaiting sign-off.

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### 9.2.1 NRW-own applications – referral to Welsh Government

All applications submitted by NRW must be referred to Welsh Government, as the appropriate authority, who will decide whether an application should be 'called in' or 'not called in'.

Once the application has been QA'd internally, the PO should complete the referral letter and send along with all relevant documents to WG's Water Branch via email (water@gov.wales and susan.jenkins@gov.wales). The PO should also notify the PA of the Executive Director of Evidence, Policy and Permitting (EPP) that the application has been referred to Welsh Government.

Welsh Government have 28 days to respond to confirm whether they are calling in the application. However, the PO should wait for a response from Welsh Government, regardless of whether the 28 days has elapsed.

Applications that are 'not called in' are signed-off within NRW. The PO should send the application to the PA of the EPP director for sign-off.

If Welsh Government ***do*** 'call in' the application, WG must consider the application and notify NRW of their decision. The PO should notify the WR Permitting NA lead and team leader to discuss and agree the next steps.

More information is available in legacy OI 286_05 Environment Agency water resource licence applications and application checklist for NRW own applications.

## 9.3 Notify the applicant

Under section 10 (paragraph 1) of the schedule to the Transitional Regulations 2017, NRW is required, by **31st December 2022**, to notify the applicant in writing of its decision on an application for a licence. POs should use the issue letter template.

If a licence is granted on terms that are different in any material respect from the application, or the application is refused, the notification must:

- include a statement of the appropriate agency's reasons for doing so;
- state the applicant's entitlement to appeal.

POs should have made applicants aware of any potential licensing decisions likely to affect their operation (i.e. refusal or curtailment) as early as possible. Where there is a likelihood of challenge or appeal, the PO should discuss the concerns with the applicant to allow them an opportunity to understand the requirement and if possible, resolve any issues or queries.

It may be appropriate to share a draft copy of the licence with the applicant prior to licence issue.

Where there is any indication that the applicant is likely to disagree with the determination decision, this should have been escalated via the WR Permitting NA lead early on in the process. However, if potential challenges only became apparent at this late stage in the process, it should be escalated via the WR Permitting NA lead as soon as possible.

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Applicants should be made aware of the time limit applied to any licence issued and that the licence will be reviewed at this time. Applicants should also be made aware of any sustainability issues that have been identified through determination, but cannot be addressed through transitional licence conditions, and the likelihood of future constraint being required. The issue letter template will include standard wording, but further information should be added, giving specific details of any likely constraint or refusal. The issue later should be reviewed as part of the QA process outlined in section 9.1.

### 9.4 Refusal

Refusal of a transitional licence application is only expected to arise in the following situations:

- The applicant is unable to demonstrate to our satisfaction that they have a right of access to the abstraction point;
- Where the abstraction is causing serious damage and the licence cannot be conditioned to protect against serious damage.
- In exceptional circumstances, where the abstraction is causing environmental damage (but does not meet serious damage criteria) and the licence cannot be conditioned to protect against the damage.

Evidence for any decision to refuse or curtail must be provided via the consultation process and must be fully defensible in case of an appeal. All decisions and evidence must be fully documented in the determination and relevant case file on the DMS and have been raised with the NA lead for further discussion with the NA panel if required

WR permitting need to update WR policy on any decision to curtail / refuse so the compensation risk assessment can be updated (see Part C, section 2.3).

For any applications that are refused, a decision statement must be published on our website. Any decision to refuse must be supported by the WR Permitting NA lead and NA Panel. All correspondence must be saved to the relevant case folder on the DMS.

As above, notification of the decision to the applicant must:

- include a statement of the appropriate agency's reasons for doing so;
- state the applicant's entitlement to appeal.

### 9.5 Responding to representations

Once a licence has been issued / refused, a response should be sent to any representations received during advertisement notifying them of our decision. Depending on the issues raised, a standard response letter (granted / refusal) may be sufficient or more bespoke text may be required. A link to the decision statement (see section 9.4) will need to be included in the response letters. For further details see section 6.2.

## 10. Records management

### 10.1 DMS and public register records

Our work may, occasionally, be subject to scrutiny. There may be internal auditing or other reasons for investigation; occasionally the scrutiny may result from judicial review or an Ombudsman inquiry. There must be an audit trail to provide details of who decided what and when. This will ensure protection to individual staff and our professional reputation as an organisation.

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To ensure an appropriate audit trail, the actions below should be completed:

| Step | Action |
|---|---|
| 1 | Ensure all important telephone conversations are confirmed in writing. Ensure substantive points of other telephone conversations are recorded and saved to the application case file on the DMS. |
| 2 | Ensure all documents (originals as appropriate) are saved to the application case file on the DMS in date order, including both Word & PDF copies of licences & determination reports, decision documents, issue/refusal letter, application forms & supporting documents, any relevant correspondence, withdrawals of applications, agreements to time extensions, representations, letters to the applicant or others. |
| 3 | All consultation responses (internal or external) must be saved to the application case file on the DMS. |
| 4 | Ensure the correct public register disclosure status is assigned to each document[1]. this is especially important where the applicant has claimed confidentiality on commercial or national security grounds – see section 10.3.<br><br>The relevant documents will need to be available on the online public register within 28 days of the licence decision being made[2]. |
| 5 | **Do not express personal opinions** about an application or the applicant or any other party in the determination report or on file. |

## 10.2 PALS

All relevant fields on PALS should be completed, as per the PALS field reference guide.

### 10.2.1 Licence number

Once signed off, the licence can be issued on PALS. PALS will generate a licence number, and the licence document and determination report will need to be updated with this number.

### 10.2.2 Criticality classification

Assign a criticality classification to the licence using the guidance Water Resources compliance, enforcement and incident investigation. For further advice discuss with the WR Permitting NA lead who will liaise with the NA panel as necessary.

This will need to be recorded in the determination report template.

### 10.2.3 Charging

Transitional licence applications are subject to the same charging provisions as set out in the Scheme of Abstraction Charges, available on our website here.

Note that there are no annual charges associated with transfer licences.

[1] For advice please speak WR Permitting NA lead.
[2] Reg 7(1)(c) and 7(2)(b) requires that particulars of any decision should be on the public register within 28 days of a decision on the application.

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For full licences, the annual charges should be calculated using the guidance in 135_06 Setting annual charges and the abstraction charges calculator[1]. This will need to be recorded in the determination report template and checked as part of the QA process outlined in section 9.1.

In line with recent legal advice, Section 127 of the Water Resources Act 1991 is only relevant to spray irrigation and consequently applications for trickle irrigation are not eligible for a Two-Part Tariff billing agreement[2]. Charges for trickle irrigation should be calculated in full.

Under Section 126 of the Water Resources Act 1991 it is possible to abate part or all the annual charge for full abstraction licences meeting specific criteria. Licence holders will need to show that the abstraction is for environmental benefit, contributes to our duties and responsibilities and that they do not gain commercially from the abstraction. Eligibility for S126 is considered as part of the determination process via this WR Form 274 and subsequent agreement if appropriate.

For NRW-own licences, charges are recovered from the project or function. Finance raise an invoice followed by a credit note (to cancel it out). This is to ensure there is a formal record of a payment. Finance then contact Michael Peter Jones (Business Finance Team Manager) for authorisation of a cost centre transfer.

#### 10.2.4 Issuing transitional and standard licences (i.e. 'planned abstractions') at the same time

First, issue the transitional application in PALS to obtain your licence number. Next, change the application type for the standard licence application to a variation and link it to the new licence number for the transitional application. Then issue the standard licence as a variation, effective on the same day as the transitional application.

### 10.3 National security and commercial confidentiality

There are special arrangements in place for dealing with applications where a customer has claimed that disclosing details of an application would be contrary to the interests of national security. For further information please speak to the WR Permitting NA lead.

Where a claim for commercial confidentiality has been made, any information that the applicant has requested to be withheld under the claim, must not be included on the public register.

In these situations, the PO must ensure a Public Register Statement is added to the DMS / public register to advise the public that certain information is being withheld as a result of a national security / commercial confidentiality claim.

Where information is withheld as a result of a claim for commercial confidentiality, the statement will advise that additional information relating to this application can be requested by contacting the Access To Information (ATI) team. The ATI team would be responsible for liaising with Water Resources Permitting team regarding what information can be provided.

[1] Ensure you are referring to the calculator for the correct financial year.
[2] Applicants who indicated that they wanted to apply for a two-part tariff agreement under question 11, form WRH have now been advised that they are not eligible.

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### 10.4 Notify relevant teams

The relevant People and Places / Hydrology teams will need to be notified on issue of all licences. This to ensure RAM ledgers are updated to take account of Transitional abstraction licences[1].

The relevant Environment and Industry & Waste Regulation Teams will need to be notified on issue of all licences to ensure any compliance activities are carried out.

Geoscience should be notified of any licences issued for any potable or food supply use, so the necessary SPZ assessments can be undertaken.

Where a large number of applications have been issued within the same ‘patch’, it may be preferable to arrange a ‘bulk’ notification. This will be coordinated by the NA WR Permitting lead as necessary.

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[1] For further information about the programme of work to update RAM Ledgers please contact EPP – Water Resources.

# Part C: Appeals and compensation

## 1. Appeals process

The Transitional Regulations 2017 allow for appeals under section 43(1) of the Water Resources Act 1991. This relates to appeals against the regulator's decision on an application (section 43(1)(a)), as well as for non-determination (section 43 (1)(b)(i)).

The appeals process for transitional licence applications can be summarised as follows:

1. Applicants can obtain a standard notice for making an appeal by contacting the Planning Inspectorate at:
   Address: Crown Buildings, Cathays Park, Cardiff, CF10 3NQ
   Telephone: 0303 444 5940
   Email: wales@planninginspectorate.gov.uk
2. Appeals should be submitted to the Planning Inspectorate at the above address.
3. If the appeal is for non-determination, the notice of appeal must be sent to the Planning Inspectorate within 28 days of the 31 December 2022.
4. If the appeal is against the decision on an application (e.g. curtailment or refusal), then the notice of appeal must be sent to the Planning Inspectorate within 28 days of the date of our decision letter.
5. Notice of appeal must state the grounds of appeal and be accompanied by a copy of:
   i) the application to which the appeal relates;
   ii) any information or report submitted with the application;
   iii) the notice of the decision on the application, if any;
   iv) all other relevant correspondence
6. Applicants are also required to send us (NRW) a copy of their notice of appeal, including all details listed above.

Appeals can be withdrawn at any time before a decision has been made.

In exceptional circumstances, the Planning Inspectorate has the power to allow a longer period for serving a notice of appeal.

Please note, the appeals provisions suggest it may be possible to agree to an extension to the determination period, however, this is not considered to be in line with the NA policy intention. Such situations should be escalated via the WR Permitting NA lead, who will be responsible for notifying the NA Panel, (including legal and WR policy lead / Team Leader) and the relevant Operations manager.

Any licensing decisions that are likely to result in an appeal must be escalated at the earliest opportunity to the WR Permitting NA lead, who again, will be responsible for notifying the NA Panel, (including legal and WR policy lead / Team Leader) and the relevant Operations manager.

Upon formal notification on an appeal, either by the applicant or PINS, the Water Resources permitting team should contact legal services immediately to ensure the above timescales and process are complied with. Legal services can assist with advising on the Appeals process.

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Local / technical consultees will be required to support WR Permitting with the provision of evidence and / or defending licensing decisions.

## 2. Compensation arrangements

Part 3 of the Transitional Regulations 2017 provides for the payment of compensation to certain persons whose application for a licence is refused or granted but in respect of an abstraction of more limited extent than previously abstracted.

**Regulation 9** sets out the circumstances in which compensation is payable, as follows:

- where an application is refused, or granted "in a more limited extent" than the abstraction carried out in the seven year 'qualifying period'
- where an appeal (see section 1 above) is dismissed
- where loss or damage arises as a result of a licensing decision
- where an application for compensation has been made within six years of the determination of an appeal (as per regulation 10 below)

In addition, **Regulation 9** describes where compensation is not payable, as follows:

- to protect defined waters or any flora or fauna dependent on those waters from serious damage (see section 7.11)
- to comply with any relevant legal requirement (see Part C section 2.1 below).

**Regulation 9** also states that the application of a 75% of Qn99 or Qn95 hands-off flow constraint (see section 7.15) is not considered to be an abstraction of "more limited extent".

Other circumstances where NRW do not consider compensation to be payable are as follows:

- where conditions are included to reflect current operating constraints already in place e.g. canal acts, planning conditions (see section 7.16);
- where a time limit is applied in accordance with the Regulator's current policy (see section 7.3);
- where the applicant is a public authority
- applications for 'planned abstractions' (i.e. new or increased abstractions) where these licence applications are refused or not granted in full.

**Regulation 10** provides that applications for compensation must be made to us within six years of the determination of an appeal.

**Regulation 11** provides that any question of disputed compensation is to be determined by the Upper Tribunal.

**Regulation 12** covers the compensation calculation method.

Any licensing decisions that are likely to result in compensation claim must be escalated at the earliest opportunity to the WR Permitting NA lead and NA Panel.

Compensation claims will be assessed in accordance with regulation 12. Claims will initially be assessed by the NA panel, but it may be necessary to request support from

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NRW's surveyors to advise on the level of compensation. Any subsequent disputes will need to be escalated by the applicant via the Upper Land Tribunal.

Further information regarding compensation issues is available in legacy OI 841_11 Restoring Sustainable Abstraction: Pre Licence Change Compensation Assessment.

### 2.1 Compliance with "any relevant legal requirement"

As drafted, Regulation 9(1) and (2) of the Transitional Regulations 2017 suggests that no compensation is payable in the situation where we refuse an application or curtail an abstraction so as to comply with any relevant legal requirement e.g. to comply with the CROW Act even where there is no serious damage.

However, there does appear to be some tension between the Transitional Regulations 2017 and the policy intent as set out in the 2017 Government Response (pages 23 & 26), which suggests that there may be exceptional circumstances where compensation **will** be paid (not may) and states this situation is most likely to arise in the case of impact to a SSSI, where that impact is not deemed to be Serious Damage. In using this wording, there might be a legitimate expectation by abstractors that compensation will be payable.

Although it is a matter for the regulator as to whether compensation is paid, the position of the UK and Welsh Governments in relation to the exceptional circumstances when compensation should be paid (as set out in the 2017 Government Response) is a relevant consideration when making the decision.

Assessments of any impact or effect should be made on a case by case basis to determine whether the provisions might apply and to then come to a view firstly on whether there is serious damage and if not, secondly, whether the refusal/curtailment is on the basis that its necessary to comply with any relevant legal requirement.

Any decision will need to be evidence based and fully documented so that in the event that a decision is made not to pay compensation, we have a clear position should the decision be challenged. Such applications should therefore be discussed with the WR Permitting NA lead the earliest opportunity to allow further discussion with all relevant colleagues via the NA panel.

### 2.2 Compensation funding

Any compensation liabilities will be funded through the Regulator's existing mechanisms[1] for generating water resources income and it should use existing compensation funds collected or, where required, any further collection of compensation funds.

Compensation funds are raised on a catchment basis. NRW are responsible for raising these for the Wye and Dee catchments and the EA for the Severn catchment. Therefore, NRW and EA will need to notify the respective organisations of any likely compensation risks at the earliest opportunity. Any licensing decisions that are likely to result in compensation claim in these catchments should be flagged to the WR Permitting NA lead the earliest opportunity who will provide support and advice as required.

[1] When required, NRW use the "Environmental Improvement Unit Charge (EIUC)", a component of its abstraction charges, to collect funds for compensation.

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### 2.3 Compensation risk assessment

The compensation risk assessment previously completed by NA Policy leads concluded a negligible compensation risk. However, the process outlined in Part B will allow the compensation risks to be reviewed and amended if necessary. NA Policy leads will revise the compensation risk assessment with support from WR Permitting NA leads. This is necessary to ensure sufficient funds can be raised[1]. There are only set windows to consult on, and put in place arrangements to raise funds so it is vital to immediately flag with NA permitting and policy leads any new information that comes to light during licence determinations which may result in a decision to curtail or refuse an application.

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# Appendix A: Remaining exemptions for 'low risk' abstractions

Further exemptions have been created to allow low risk abstractions to remain exempt from licensing. These are detailed in The Water Abstraction and Impounding (Exemptions) Regulations 2017 and can be summarised as follows:

- Abstractions carried out by navigation, harbour or conservancy authorities downstream of the normal tidal limit, and abstractions into and out of a dry dock.
- Emergency abstractions by navigation, harbour and conservancy authorities to prevent risk of death or harm to humans, or damage to property or the environment.
- Third-party operated dry docks that transfer water to and from a navigation authority's water system.
- Small scale, temporary dewatering in the course of building or engineering works, but subject to specific conditions.
- Abstractions in the course of dredging downstream of the tidal limit, or if upstream, carried out by, or on behalf of any authority.
- Abstraction of water **within** a managed wetland system, if for the sole purpose of the management, operation or maintenance of the water levels or flows in that system.
- Construction or alteration of impounding works **within** a managed wetland system if the sole purpose of the works is the management, operation or maintenance of water levels or flows in that system.
- Construction or alteration of impounding works in emergencies, in order to meet provisions of the Reservoirs Act 1975, or impouhnding works carried out by or on behalf of navigation, harbour or conservancy authorities in connection with their functions or by any person with the prior written consent of NRW.
- Construction or alteration of impounding works by an internal drainage board **within** its district and is in connection with the board's functions.

Further detail regarding the new exemptions is available in OGN 069: Validation of transitional provisions water abstraction licence applications (see section 3.4).

It should be noted that the normal licensing threshold continue to apply. This means that anyone abstracting less than 20m³/day in aggregate from a source of supply will not require an abstraction licence, even though the other exemptions have been removed. In addition, the exemptions for the use of water during firefighting, and land drainage, as set out in the Water Resources Act 1991 (section 29(2) and (2C) have not been removed and abstractions for these purposes remain exempt. For dewatering activities, please refer to our external briefing note[1].

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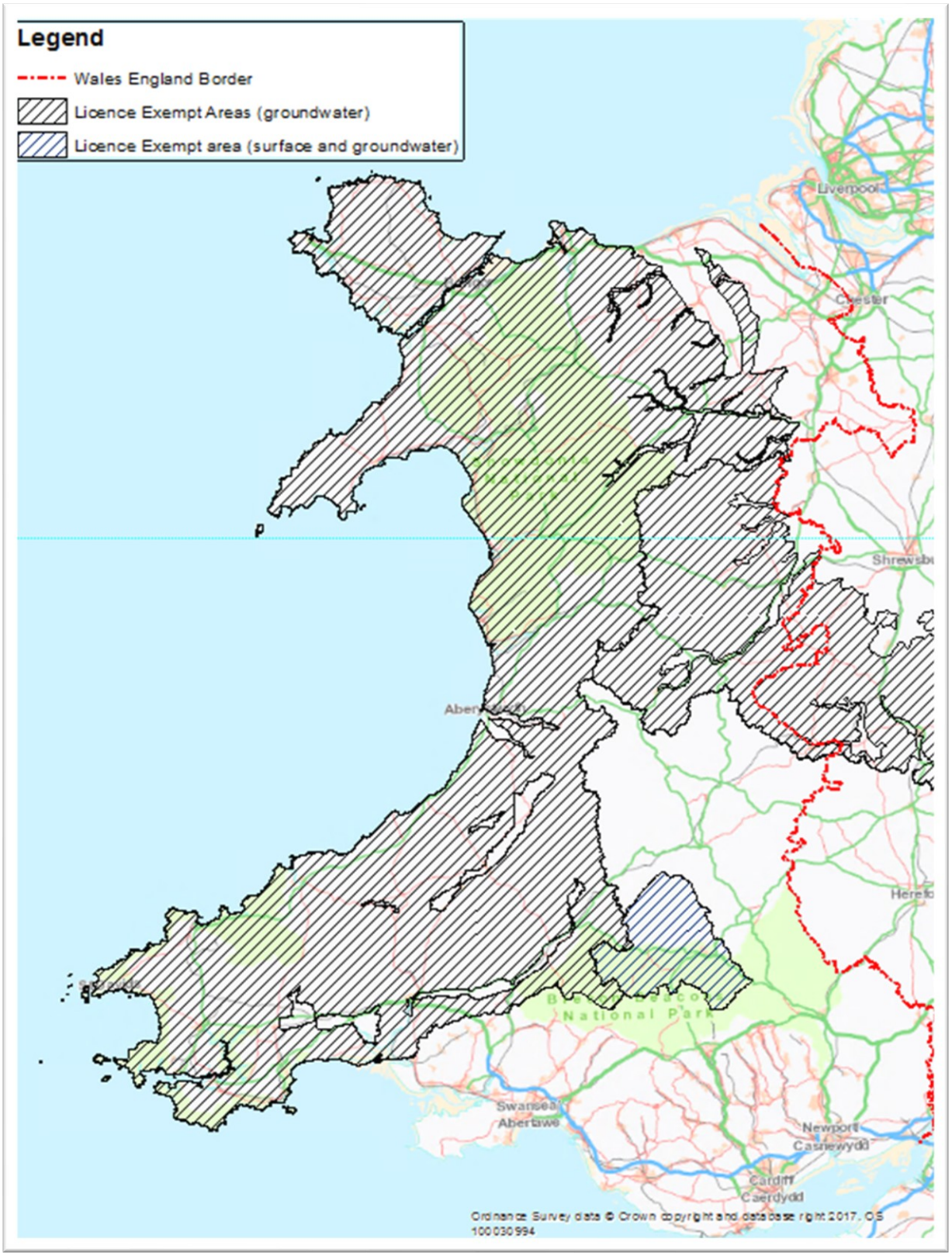
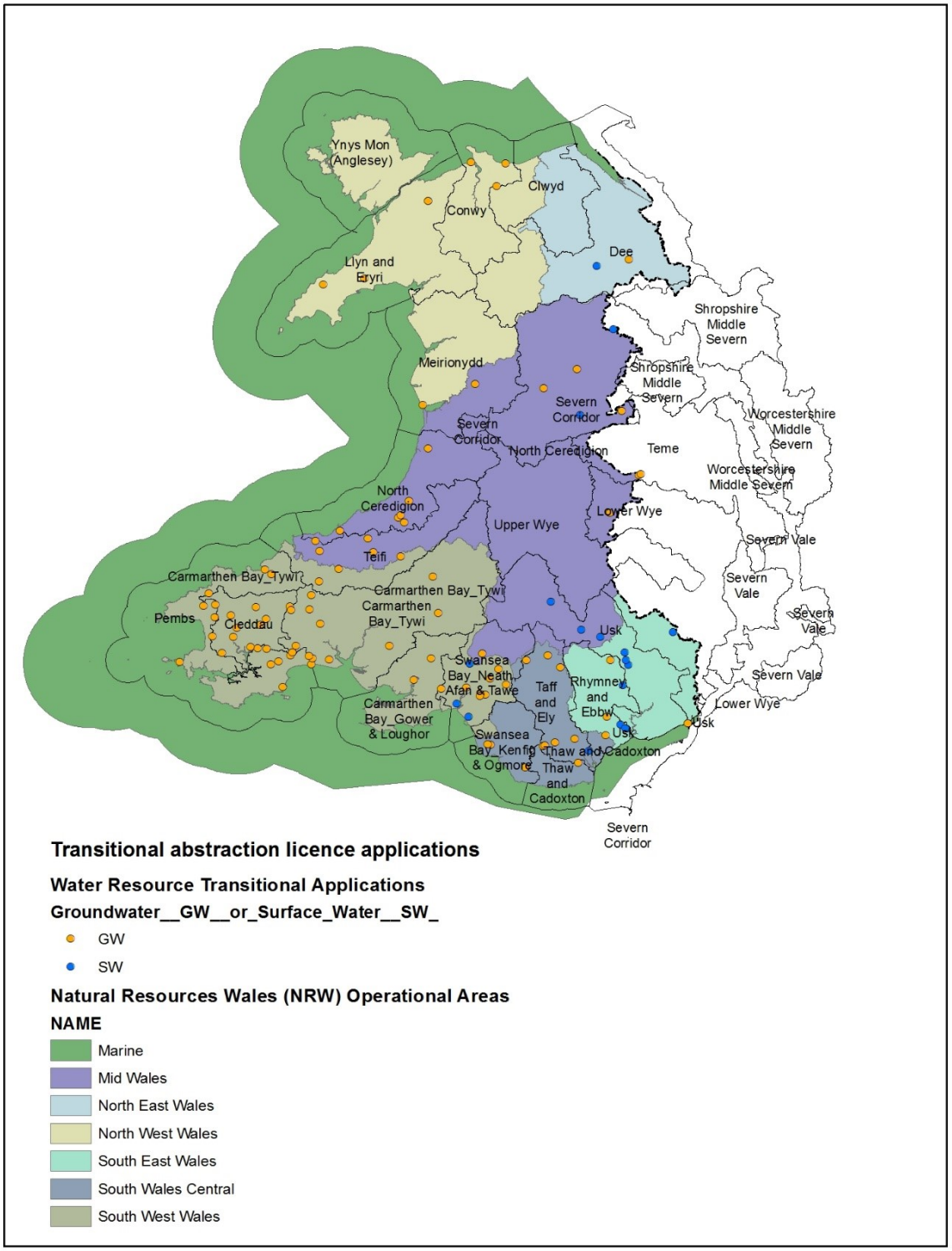
[1] External briefing note: licensing of dewatering activities

## Appendix B: Abstraction Licence previously exempt areas in Wales

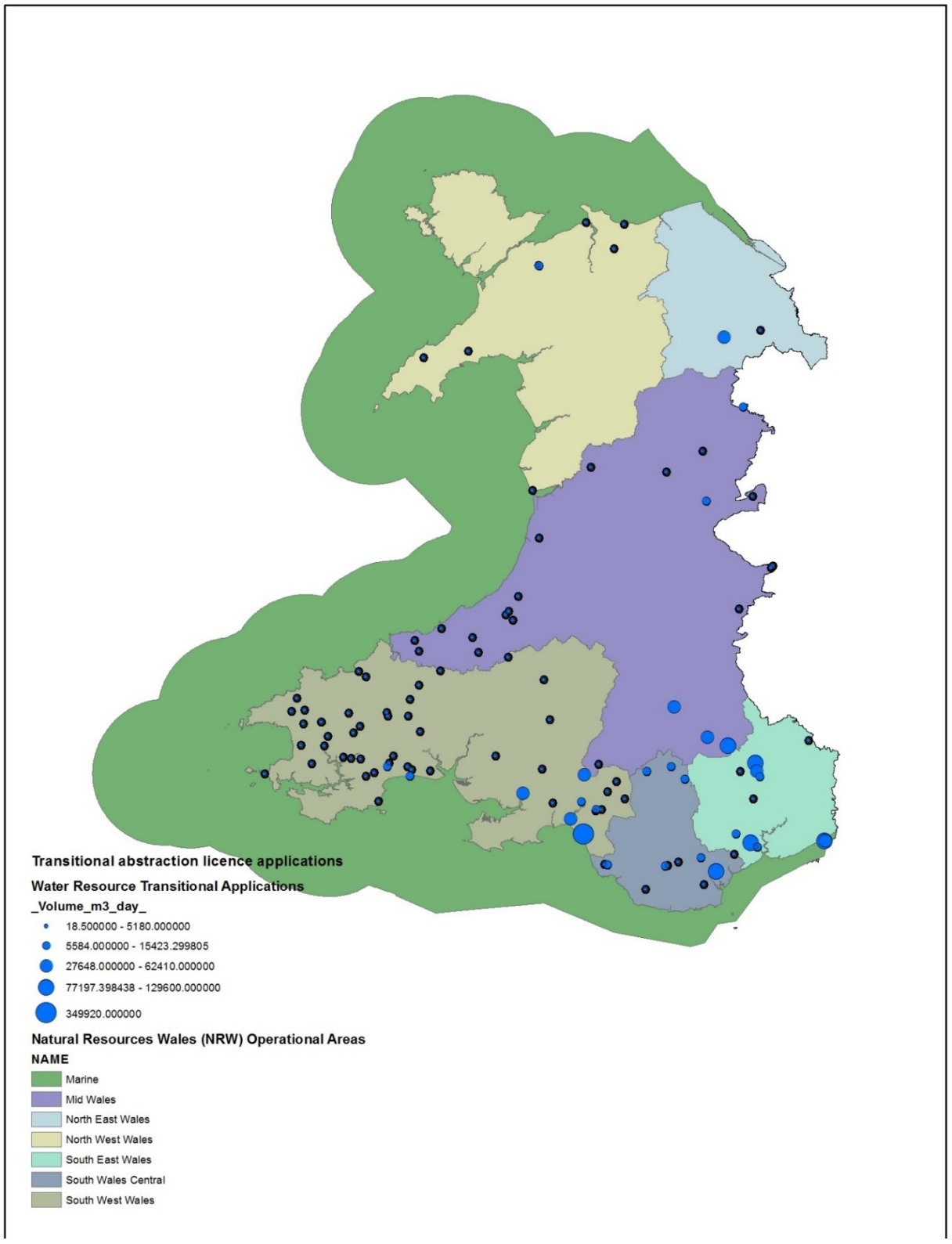


# Appendix C: Maps to show valid Transitional Licence Applications in Wales

## Map 1: GW and SW Transitional Licence Applications



## Map 2: Transitional Licence Applications by abstraction quantity



## Appendix D: MyMap screening radius for groundwater abstractions

| Abstraction quantity ($m^3$ / day) | Normal screening radius |
|---|---|
| 20 to 100 m3/day | 250 m |
| 100 to 500 m3/day | 500 m |
| 500 to 1,000 m3/day | 1.0 km |
| 1,000 to 3,000 m3/day | 1.5 km |
| 3,000 to 5,000 m3/day | 2.0 km |
| Over 5,000 m3/day | 2.0 to 4.0 km |

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## Appendix E: CAMS Common End Dates

| Catchment | Current Common End Date | Date to skip to next CED | Next Common End Date | No of NA applications within catchment |
|---|---|---|---|---|
| Conwy | 31-Mar-28 | 31-Mar-22 | 31-Mar-40 | 3 |
| Clwyd | 31-Mar-29 | 31-Mar-23 | 31-Mar-41 | 1 |
| Meirionydd | 31-Mar-30 | 31-Mar-24 | 31-Mar-42 | 2 |
| Llyn and Eryri | 31-Mar-25 | 31-Mar-19 | 31-Mar-37 | 4 |
| Ynys Mon (Anglesey) | 31-Mar-26 | 31-Mar-20 | 31-Mar-38 | 0 |
| Dee | 31-Mar-27 | 31-Mar-21 | 31-Mar-39 | 2 |
| South East Valleys | 31-Mar-29 | 31-Mar-23 | 31-Mar-41 | 15 |
| Usk | 31-Mar-26 | 31-Mar-20 | 31-Mar-38 | 8 |
| Wye | 31-Mar-27 | 31-Mar-21 | 31-Mar-39 | 4 |
| Thaw & Cadoxton | 31-Mar-30 | 31-Mar-24 | 31-Mar-42 | 1 |
| Teifi & North Ceredigion | 31-Mar-28 | 31-Mar-22 | 31-Mar-40 | 13 |
| Swansea Bay Rivers | 31-Mar-29 | 31-Mar-23 | 31-Mar-41 | 15 |
| Carmarthen Bay Rivers | 31-Mar-30 | 31-Mar-24 | 31-Mar-42 | 15 |
| Cleddau and Pembrokeshire Coastal Rivers | 31-Mar-25 | 31-Mar-19 | 31-Mar-37 | 27 |
| Severn Corridor (including Severn uplands) | 31-Mar-22 | 31-Mar-16 | 31-Mar-34 | 5 |
| Teme | 31-Mar-25 | 31-Mar-19 | 31-Mar-37 | 2 |
| **TOTAL** | | | | **117** |

*Note the NA abstraction within the Clwyd catchment has already been issued.

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# Appendix F: Extract from Optimum Water Use for Industry and Agriculture

Extract from Optimum Water Use for Industry and Agriculture Phase 3.
Table B3 – stock water requirements p134

| Animal/person | Category | Cubic meters per day |
|---|---|---|
| People | Private domestic use | 0.15 |
| Dairy Cows | Cleaning non-power hose | 0.014-0.022 |
| | Cleaning power hose | 0.027-0.045 |
| | Drinking[1] | 0.045-0.07 |
| Calves | Drinking | 0.015-0.025 |
| Beef cows | Drinking | 0.025-0.045 |
| Pigs[2] | Cleaning after each batch (10 pigs/pen) | 0.016-0.024 |
| | Lactating sows | 0.015-0.03 |
| | Pregnant sows and boars | 0.009-0.014 |
| | Weaners | 0.005 |
| Sheep | Drinking | 0.0025-0.005 |
| | Dipping (per dip) | 0.0025 |
| Poultry | Layers/100 birds | 0.02-0.03 |
| | Fattening/100 birds | 0.013 |
| Turkeys | Fattening/100 birds | 0.055-0.075 |

[1] Higher value for lowland production in Southern England
[2] for outdoor pigs the maximum litres/day/animal should be increased by 50% to allow for wastage and wallows.

Irrigation quantities are best assessed via the system to be used (manufacturer's or advisers estimate of output), type of crop to irrigated, site – i.e. open ground or tunnels/greenhouses, acreage etc.

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## Appendix G: Recording and reporting requirements

| Category of licence | Data to be provided[5] | Meter readings/means of assessment to be undertaken |
|---|---|---|
| All licences held by the statutory water companies | Daily totals or meter readings | Daily |
| Electricity generation with a consumptive element | Daily totals or meter readings | Daily |
| Spray irrigators with two- part tariff agreements with daily quantities exceeding 2,500 cubic metres per day | Weekly[1] totals or meter readings | Weekly[2] |
| Spray irrigators with two- part tariff agreements with daily quantities equal to or less than 2,500 cubic metres per day. | Monthly[3] totals or meter readings | Monthly |
| Other licences with daily quantities exceeding 2,500 cubic metres | Weekly[2] totals or meter readings | Weekly[4] |
| Other licences with daily quantities greater than or equal to 100 cubic metres and less than or equal to 2,500 cubic metres. | Monthly[3] totals or meter readings | Monthly[3] |
| Other licences with daily quantities below 100 cubic metres. Although this category doesn't provide any data, meter readings/assessment details are needed for compliance purposes and also for identifying licences that are not used. Although most licences have a return condition, if necessary, you can ask for returns on an ad hoc basis, using our powers under section 201 Water Resources Act 1991. | None | Monthly[3] |

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[1] Meter readings should be taken on the same day each week.
[2] Meter readings should be taken on the same day each week.
[5] Return information is requested annually
[3] Meter readings should be taken on the last (working) day of the month.
[4] Meter readings should be taken on the same day each week.
[5] Return information is requested annually

## Appendix H: Summary of basic HoF Conditions from the 2017 Government Response

**Table 1 – summary of how we propose basic HoF conditions will normally apply**

| Surface water status in abstraction licensing strategy (ALS/CAMS): | Flow / quantitative status supports WFD objectives | NAs HoF applied: |
|---|---|---|
| Water not available / Over abstracted catchments | Fail | Qn95 |
| Restricted water available / Over licensed catchments | Pass | 75% of Qn99 |
| Water available | Pass | 75% of Qn99 |

- Fail = flow / groundwater quantitative status '***does not support*** Good Ecological Status' (GES)
- Pass = flow / groundwater quantitative status '***does support*** Good Ecological Status' (GES).

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## Appendix I: Table to show how the various types of legal entity are to be shown on a licence document

| Legal entity | Show on the licence as… |
|---|---|
| Firms and sole traders | Firms and sole traders should be the name of the person together with 'trading as xyz' if appropriate. |
| Companies | Limited companies are named 'X Limited' or 'PLC'. |
| Partnerships | Partnerships must have the names of the individual partners together with any trading name. List the partners' names vertically |
| Limited liability partnership (LLP) | A limited liability partnership (LLP) can be in the name of the partnership rather than the names of the partners, as an LLP is a body corporate (a legal entity in its own right). The name of the applicant will need to be 'X Limited Liability Partnership'. LLPs are registered at Companies House. |
| Statutory corporations | Bodies like the 'National Trust for Places of Historic Interest or Natural Beauty' are statutory corporations and can be named without reference to trustees. |
| Educational establishments | In most cases, they will be legal entities so the name of the establishment can appear on the licence. Some schools or colleges may be run by charities, religious organisations or local authorities. Check with the applicant if you are unsure |
| Local councils | Councils are statutory bodies and must always be named correctly. Such as 'X District Council' or 'Y County Council'. There are also parish, town, borough, metropolitan boroughs and city councils, check with the applicant if you are unsure. |
| Bodies corporate | Bodies like the Environment Agency for example are bodies corporate and need just their name. |
| Incorporated association | For incorporated associations just the name will do. |
| Unincorporated associations | An individual (or individuals) should be nominated to hold the licence. Where an individual holds a licence on behalf of, for example, a club, put the address as the club rather than their home address. |
| Trusts | Only include key post holders, for example, secretary, chairman or treasurer. Keep the |

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| Legal entity | Show on the licence as… |
| --- | --- |
| | names of the post holder or trustees on file. If there are no such posts, then discuss with the NA WR Permitting lead, who may need to liaise with legal. |

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Cyfoeth Naturiol Cymru
Natural Resources Wales

# Operational Guidance Note

**For Internal Use Only**

## Habitats Regulations Assessment of Projects

### OGN 200

Document Owner: Protected Sites Team (EPP)

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | References to the 2010 Habitats Regulations updated to reflect new consolidated version of the regulations which entered into force on 30th November 2017; References to KSP and National Services Directorates updated to EPP |
| 1.2 | 28 June 2018 | With unsafe areas in light of ruling in CJEU case c-323/17 'People over Wind' highlighted in yellow. |
| 1.3 | 27 June 2019 | With unsafe areas in light of CJEU case c-323/17 highlighted in yellow. See Guidance here |

Next review date: April 2019

## What is this document about?

This document is about the procedures that NRW should follow when assessing the potential impacts of 'projects' on Natura 2000 sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) in accordance with Article 6(3) and 6(4) of the EC Habitats and Species Directive and transposing Regulations. As a matter of Welsh and UK Government policy, Ramsar sites, though not legally subject to the Habitats Directive and Regulations, should be treated in the same way as SACs and SPAs. Therefore this document applies to projects affecting Ramsar sites as well as SACs and SPAs.

This document is not intended to provide detailed technical or legal guidance on the requirements and practice of HRA.

The assessment procedures covered by this document are generally referred to collectively as 'Habitats Regulations Assessment' (HRA). In many cases an 'appropriate assessment' is a key part of the HRA process, but the term 'HRA' also covers the process of deciding whether to carry out an appropriate assessment (sometimes called 'screening' for likely significant effects) and the consideration, following completion of an appropriate assessment, of whether a project should be carried out for imperative reasons of over-riding public interest.

This document includes guidance on what constitutes a 'project'. In simple terms, any material intervention in the environment which is capable in principle of affecting a Natura 2000 site could be considered a project. However there is no enhaustive definition so whether or not there is a project depends on the particular circumstances concerned. Many different types of activity for which NRW and other authoriries issue consent and which NRW and other authorities undertake, are projects under the Habitats Directive and Regulations and are therefore subject to HRA.

In addition to projects, HRA applies to many types of 'plan'. However this document does not deal with the HRA of plans, which is covered by other OGNs also available on the Environmental Assessment pages of the NRW intranet.

## Who is this document for?

This document is for NRW staff involved in:

- provision of advice, within NRW or to external bodies, on the potential implications of any type of projects for any SACs, SPAs or Ramsar sites;
- determination of applications made by external parties to NRW for any form of authorisation to undertake projects with the potential to affect one or more SACs, SPAs or Ramsar sites;
- decisions by NRW on whether to undertake, as part of any operational activities, projects with the potential to affect one or more SACs, SPAs or Ramsar sites, and decisions on whether to issue orders for the undertaking of such projects.

**Not all sections of this document are relevant to all of these areas of work.**

## Contact

Protected Sites Team, EPP. Feedback/comments on this OGN or accompanying forms should be emailed to:
habitatsdirective@cyfoethnaturiolcymru.gov.uk

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List of Forms:

***Editable copies of the following forms for carrying out HRAs can be downloaded separately from the relevant section of the NRW Intranet (****Our work > Corporate > Environmental Assessment > Habitats Regulations Assessment).*

| | |
|---|---|
| Form 1: | Record of a Habitats Regulations Assessment for **Category 2** or **Category 3** projects |
| Form 2: | Provision of nature conservation advice for **Category 2** and **Category 3** projects |
| Form 3: | Article 6(4) ‘Statement of Case’ |
| Form 4: | Internal application for an NRW permission - Habitats Regulations Assessment by Permitting Service in EPP |

# 1. Purpose of this Operational Guidance Note

This is an Operational Guidance Note (OGN) to help ensure that NRW carries out its functions in relation to Habitats Regulations Assessment of 'projects' in an efficient, effective, proportionate and legally robust manner.

The term Habitats Regulations Assessment (HRA) is used throughout this document to describe the process of assessing a plan or project in accordance with Article 6(3) and 6(4) of the Habitats Directive. HRA is one of the key mechanisms by which NRW and other statutory bodies deliver the appropriate management and safeguard of Natura 2000 sites[1]. The Habitats Directive is largely transposed into law in Wales by the Conservation of Habitats and Species Regulations 2017[2], referred to throughout this OGN as the Habitats Regulations. The key elements of the legal framework for HRA are set out in **Annex 1.**

HRAs and the regulatory and operational decisions they support are frequently under close scrutiny by developers, NGOs, local communities and other authorities, including Welsh Government and UK Government and the European Commission, so it is essential that NRW has a robust, consistent, transparent and proportionate approach to HRA. Properly conducted HRAs support legally robust decision making.

This OGN is procedural guidance, describing principles, roles and governance arrangements for how NRW should conduct itself when advising others on, and carrying out, HRAs. There is a large amount of guidance and Government policy already available on the statutory requirements of HRA, legal interpretation and practical advice, which is referenced in section 4, but not repeated or summarised in this OGN, except to the extent necessary to explain the procedures that NRW should follow.

This OGN will be subject to periodic review, particularly in light of feedback from staff, and if external developments in policy, legislation or case law indicate that NRW's procedures relating to HRA need to be adjusted.

## 1.1 Relationship to other NRW guidance

Note that this OGN only covers HRA of 'projects' and does not address the HRA of 'plans'. There are separate NRW OGNs for HRA of plans available on the Environmental Assessment pages of the NRW intranet.

The meaning of the term 'project' in the context of HRA is explained in more detail in section 3 below. In the absence of a statutory definition of 'project' for the purposes of the Habitats Regulations, **any material intervention in the environment which is capable in principle of affecting a Natura 2000 site** should be considered to be a project. However there is no comprehensive definition of the term 'project', or exhaustive list of what activities constitute projects, so whether a matter involves a project depends on the particular circumstances.

[1] 'Natura 2000 sites' is used here to include designated SACs and SPAs, candidate SACs (those submitted formally to the EC but not yet adopted or designated), proposed SPAs and SACs (sites subject to consultation on whether they should be designated) and proposed and designated Ramsar sites, which are not Natura 2000 sites but under Welsh Government policy should have the same level of protection as SACs and SPAs. A map of the sites is given in **Annex 2** and further information is available on the NRW website.
[2] These regulations consolidated and repealed the 2010 Habitats Regulations.

In most cases the HRA of a project will form only part of NRW's advice to another authority deciding whether to authorise a project, or only part of the decision on whether NRW should issue an authorisation or undertake a project. Therefore this OGN applies alongside other OGNs or work instructions covering relevant NRW functions. It is not intended to replace or replicate other non-HRA related guidance covering NRW's numerous permitting, operational and planning/advisory functions.

However this OGN is intended to replace a large number of guidance documents, procedure notes, work instructions and templates specifically concerned with HRA which NRW inherited from the legacy bodies. These are, or will be, listed in Annex 3. The documents listed, or to be listed, in Annex 3 have been withdrawn and should no longer be used by NRW staff or presented to external bodies as current NRW policy or procedure.

**If there are any conflicts between this OGN and any legacy body guidance relevant to HRA that has not yet been reviewed or withdrawn, this OGN should take precedence.**

## 2. Structure of this Operational Guidance Note

The remainder of this OGN is set out as follows:

- Section 3 explains which NRW processes this OGN applies to.
- Section 4 outlines the key stages and general principles of HRA, and gives sources of detailed technical/legal guidance.
- Section 5 sets out the HRA procedure to be followed in NRW for **Category 1 projects: those which are authorised by decisions made by other competent authorities,** including in particular planning permissions determined by planning authorities. Section 5 does not cover projects undertaken by NRW for which we require the authorisation of another authority – these are dealt with in Section 7.
- Section 6 sets out the HRA procedure for **Category 2 projects: those for which NRW issues any form or authorisation to external parties.** Section 6 also covers the procedure for external projects which require authorisations from both NRW and other authorities.
- Section 7 sets out the HRA procedure for **Category 3 projects: those undertaken by NRW, including those where NRW requires authorisation issued by another authority**.

Between them, sections 5, 6 and 7 set out the requirements that apply to **all** NRW functions where project level HRA forms part of NRW's advice to another authority, or part of an NRW operational or regulatory decision (including where we 'self-consent'). However, there may also be additional operational instructions or guidance relating to HRA which are specific to particular NRW functions and which are not in the list of deleted/withdrawn documents in Annex 3, because they contain guidance or instruction that needs to be retained. The longer term intention is for any function-specific HRA guidance that needs to be retained, and which is not sufficiently covered by the guidance in the main body of this document, to be included in further Annexes to this OGN, which will be added as necessary following further ongoing review of extant legacy body guidance documents.

Many of the projects which are covered by this OGN are also subject to other types of legal obligations (for example Environmental Impact Assessment, SSSI consenting/ assenting), which are or may be dealt with in other OGNs. Links between HRA and these other processes are noted where relevant.

## 3. What NRW functions does this Operational Guidance Note apply to?

In relation to the HRA of projects generally, there are several distinct roles envisaged under the Habitats Regulations:

- The **proponent of a project**, including the applicant for any form of statutory authorisation, or the team or department within a statutory body seeking internal approval to undertake a project;
- The **competent authority**, which can be a project proponent and/or the body determining whether a consent, permission or other authorisation should be given (which may be to another team or department within the same authority);
- The **appropriate nature conservation body** advising the competent authority;
- The **appropriate authority** in relation to damaging projects proceeding for imperative reasons of over-riding public interest (IROPI). In all cases, the 'appropriate authority' in relation to approval for IROPI projects is either the Welsh Ministers (for devolved matters) or the UK Secretary of State (for non devolved matters).

NRW variously exercises the first three of these roles (i.e. we are never the 'appropriate authority'). We are the appropriate nature conservation body for all Natura 2000 sites in Wales[3] and hence for all HRAs affecting sites in Wales, regardless of who is the project proponent or competent authority. We are also a competent authority responsible for carrying out HRAs and determining applications for a wide range of types of statutory authorisation, and we are also a project proponent.

This OGN deals in turn with the three categories of project set out below, which are defined by reference to the various roles that NRW exercises.

### 3.1 Category 1 projects: those authorised or undertaken by other competent authorities where NRW's only role is appropriate nature conservation body

NRW is the appropriate nature conservation body for HRAs carried out by other competent authorities. This includes both where another competent authority is determining an application from a third party for a statutory permission of some kind, and where that authority is deciding whether to undertake a project itself. The main ones are (this not a comprehensive list):

- Planning permissions of any kind, including those issued by Local Planning Authorities, or Welsh Ministers (called-in applications, Developments of National Significance (DNS)), planning appeals and permitted development for which planning permission is granted by General Permitted Development Order 1995 (as amended);
- Transport and Works orders;
- Port and Harbour works (which may also be subject to marine licensing – see below);
- Consents for electricity, pipelines, oil and gas installations;

[3] 'Wales' includes the sea out to the 12 mile limit of Territorial waters. For 'cross border' Natura 2000 sites, namely those straddling the Wales/England border or the limit of Territorial waters, the relevant NRW roles are exercised by NRW and Natural England and/or JNCC, as applicable.

- Development Consent Orders (DCOs) for Nationally Significant Infrastructure Projects (NSIPs);
- Any authorisations issued by English or UK authorities for projects taking place outside Wales which affect Natura 2000 sites in Wales;
- Projects in relation to grant applications (especially for EU funding).

### 3.2 Category 2 projects: those for which NRW issues any form of authorisation to a third party

NRW is the competent authority responsible for carrying out HRAs and determining applications made to NRW for many different forms of consent, permission or authorisation. A full list of these is available on the NRW intranet (Our work>Corporate>Permitting), but they include:

- Permits under the Environmental Permitting Regulations;
- SSSI consents;
- Section15 / section 16 management agreements;
- Water abstraction/impoundment licences;
- Protected species licences[4];
- Felling licences;
- Marine licences;
- Coast Protection Act consents;
- Fish stocking licences;
- Flood defence consents;
- Herbicide consents;
- Plant Health Notices.

### 3.3 Category 3 projects: those undertaken by NRW itself, where we 'self-consent' and where we apply to other authorities for consent

Where NRW is 'self-consenting', we exercise all three roles: that of project proponent (undertaking the project); competent authority providing a consent or authorisation to itself and carrying out the HRA as part of the determination of that consent or authorisation; and appropriate nature conservation body. In many cases, NRW needs to apply internally for one of the types of permission listed under Project category 2 above. Examples include:

- Operations on the WG Woodland Estate

[4] Note that HRA of applications for licences seeking derogation from the protection of European protected species is a separate requirement to the assessment of the applications under the species derogation provisions. The implications of a proposed operation on a protected species may be different, or even completely unrelated to, its potential impact on a Natura 2000 site.

- NNR management works
- Flood defence/coast protection works
- Habitat restoration or enhancement works (including for example fish passes)
- Metal mine remediation works
- Hydrometry or telemetry improvement projects
- Monitoring projects (e.g. including groundwater boreholes, marine sampling)

For some types of Category 3 projects, NRW needs to obtain consent from another body (typically from a planning authority for works that constitute development under town and country planning legislation). In such cases, NRW will be both the applicant and a statutory consultee. In many cases a ‘self-consent’ will also be required. This is covered further in section 7.

# 4. Key principles of HRA and other sources of guidance

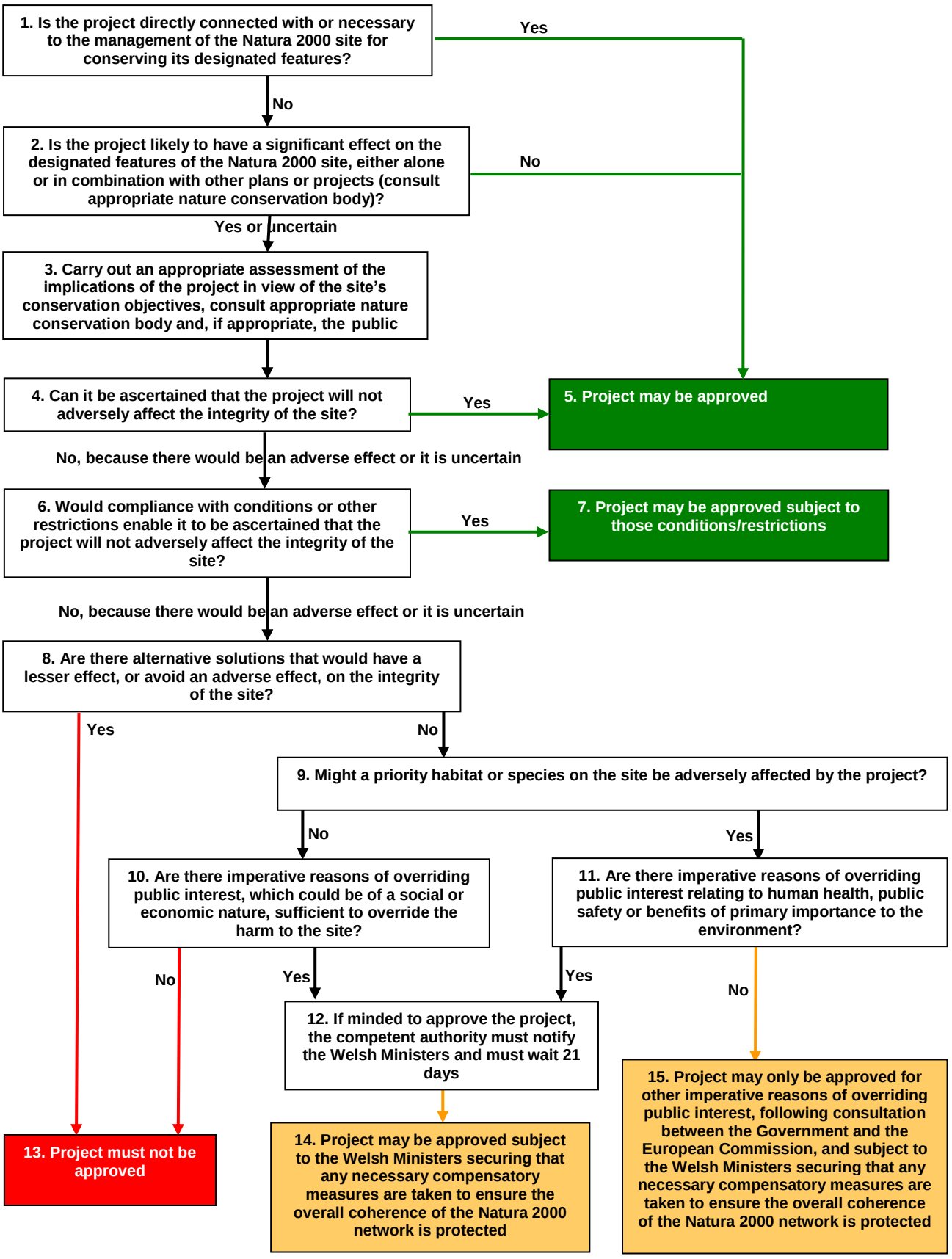
The purpose of this OGN is to set out the procedure that should be followed by NRW when carrying out or advising on the HRA of any type of project. This OGN is not intended to provide detailed technical or legal guidance on the requirements and practice of HRA, since a wide range of guidance produced by other bodies already exists. The most useful documents are referenced below.

## 4.1 Key principles

The term ‘Habitats Regulations Assessment’ (HRA) has become a widely used shorthand term to describe the whole process of assessing a plan or project under Article 6(3) and 6(4) of the Habitats Directive. It is important not to confuse HRA with the ‘appropriate assessment’ of a plan or project. The appropriate assessment is only one of the stages of HRA, albeit an important stage. Likewise the term HRA includes both the ecological assessment of the implications of a plan or project for the habitats or species for which a site is designated, and the separate stage of, in some cases, considering whether a plan or project should proceed for imperative reasons of over-riding public interest.

The legal framework for HRA is given in **Annex 1**. The key stages of HRA are set out in the flowchart in **Figure 1**. The process in Figure 1 applies to all types of project and is not specific to NRW. Sections 6 and 7 include text and flowcharts setting out the specific processes to be followed by NRW when carrying out HRA.

## Figure 1
## Consideration of projects affecting Natura 2000 Sites



Key points to note:

- ***HRA is a potential 'show stopper'***. Unless the provisions of relevant legislation are satisfied (Articles 6(3) or 6(4) of the Habitats Directive and Part 6 of the Habitats Regulations, as applicable), proceeding with a project, or granting consent for it, is unlawful and open to legal challenge. A related point is that the information requirements for HRA can in some cases 'stop the clock' on the period within which a permission normally has to be determined, for example if more information is required from the applicant for a consent in order to be able to carry out an HRA. If compliance with the source legislation for a particular consenting process requires a determination to be made within a given deadline, **approval can only be given if the necessary tests in the Habitats Regulations have been satisfied. Otherwise approval cannot be given.**

- ***HRA is not an assessment of the general environmental effects of a project***. The only effects of a project that are relevant to an HRA are the effects on the features (habitats or species) for which Natura 2000 sites are designated, and only to the extent that the project might adversely affect the achievement of a site's conservation objectives. The designated features are listed on the official designation documents, and the conservation objectives are set out in the NRW Core management plans for the sites and, for marine sites, the Regulation 33/35/37 advice documents. These are all available from the Protected sites section of the NRW website.

- ***HRA embodies 'the precautionary principle'***. The burden of proof is to show that the project will not adversely affect the integrity of any Natura 2000 sites. This precautionary burden of proof has been upheld in case law of the Court of Justice of the European Union.[5]

## 4.2 Other sources of guidance

There is a wide range of existing published guidance on the technical aspects of HRA and matters of legal interpretation, which are applicable to HRA generally rather than being specific to how NRW carries out its HRA functions. As a general principle, NRW does not formally endorse or 'adopt' any of this material as our own operational practice. However, we are clearly required to take careful account of those documents that constitute statements of Government policy (Wales and UK) and guidance issued by the European Commision. We need to keep in mind that other competent authorities, developers and their agents will often be using these guidance documents. All the documents listed below are readily available online to NRW staff.

- **Welsh Government guidance**

  *Welsh Assembly Government Planning Policy Technical Advice Note (TAN) 5: Nature conservation and planning* is the most comprehensive and detailed

[5] In particular the judgment of the Court of Justice of the EU in case c-127/02 (often referred to as the 'Waddensee' case).

statement of WG's position on project-level HRA (and also covers other matters). Although strictly speaking this applies only to decisions made under the town and country planning system, it can be taken as an authoritative statement of WG policy on HRA more generally.

Available on the Planning section of the WG website.

- **Nationally Significant Infrastructure Projects (NSIPs) advice notes published by the Planning Inspectorate (PINS)**

  See in particular Advice Note 10: Habitats Regulations Assessment.

  Available on the PINS website.

- **Other PINS Guidance**

  PINs are also producing guidance on their pre-application advice service. This guidance will contain a chapter on HRA and will set out the procedural requirements that apply to Developments of National Significance (DNS) and HRA.

- **UK Government guidance**

  Although guidance published by the UK government on devolved matters (which includes the implementation of the Habitats and Birds Directives) has no formal policy status in Wales, it can usefully be referred to if it provides guidance on matters which are not covered by policy or guidance issued by WG, and if dealing with cross-border Natura 2000 sites or projects with cross-border implications, since Natural England and other English competent authorities will be referring to UK policy and guidelines. However if there are any differences in the policy position between Wales and UK, or any doubt about the policy position in Wales, advice should be sought initially from the Strategic Assessment Team in Office of the Chief Executive (OCE), or Protected Sites Team in EPP Directorate. It may be necessary to also seek advice from the Habitats and Birds Directives policy leads in Welsh Government.

  The UK government equivalent of TAN5 (referred to above) is *Circular 06/05: Biodiversity and geological conservation – statutory obligations and their impact within the planning system*.

  Other useful guidance published by the UK Government includes:

  *Guidance on competent authority coordination under the Habitats Regulations* (July 2012), which applies where a project requires approval of more than one competent authority.

  *Habitats and Wild Birds Directives: Guidance on the application of Article 6(4): alternative solutions, imperative reasons of overriding public interest (IROPI) and compensatory measures (*December 2012).

All the above UK government guidance documents are available via the 'gov.uk' website.

- **European Commission guidance**

The European Commission (EC) has published a number of pieces of guidance on HRA. The main and most authoritative is *Managing Natura 2000 sites: the provisions of Article 6 of the Habitats Directive*. This is not detailed procedural guidance, but sets out how the EC interprets the requirements of Article 6, and includes chapters specifically dealing with Article 6(3) (appropriate assessment etc.) and Article 6(4) (plans or projects proceeding on IROPI grounds). Note however that this document is now 14 years old and a revised version is expected to be issued some time in 2016. The chapter dealing with Article 6(4) (IROPI) has already been replaced by an updated version issued in 2012.

The EC has also published a number of supplementary guidance documents dealing with the application of Article 6 of the Habitats Directive in particular sectors, including: wind energy, mining/quarrying, aquaculture, ports and forestry. Some of this sector specific guidance suggests slightly different interpretations or emphasis in some areas, compared to the guidance contained in *Managing Natura 2000*. The relevant chapters of *Managing Natura 2000* should always be referred to as the most definitive expression of the EC's interpretation of how Articles 6(3) and 6(4) of the Habitats Directive should be applied.

All the above are available on the Nature and Biodiversity section of the European Commission's website 'europa'.

- **The Habitats Regulations Handbook**

This is a detailed web-based 'manual' for HRA, published commercially by an independent environmental consultancy. This online document supersedes and updates guidance previously published by CCW on project level HRA (from which the flowchart in Figure 1 above has been adapted).

It is available to NRW staff via the 'Electronic journals' page under Library and Information Services on the NRW intranet.

- **Case law**

Another useful and authoritative source is case law, including judgments of both the UK courts and the Court of Justice of the EU, which have addressed questions over interpretation of the legal framework for HRA. Some important principles of HRA have been established through such cases, and many of the guidance documents referred to above have been written or updated to take into account relevant case law. Where case law has clarified the way in which legislation should be interpreted it is important to adopt that interpretation. However it can take some time for a judgment to be reflected in guidance documents, so you should seek advice from NRW Legal Services before taking into account any recent case law when carrying out or advising on HRAs. In some cases, court decisions are subject to appeals which can modify or even reverse their findings. Also it is necessary to consider

carefully to what extent a judgment given on the specific circumstances of a particular case has wider applicability.  A good place to look for information on recent caselaw and its implications, is the Habitats Regulations Assessment Journal, which can be found on the same website as that described above for the Habitats Regulations Handbook.

## 5. HRA procedure for Category 1 projects: those authorised or undertaken by other competent authorities where NRW's only role is appropriate nature conservation body

**Legal requirements:**

**Under Regulation 63(3)[6] of the Habitats Regulations a competent authority:**

**'must for the purposes of the [appropriate] assessment consult the appropriate nature conservation body an appropriate assessment and have regard to any representations made by that bodywithin such reasonable time as the authority may specify.'**

As can be seen from Box 3 in Figure 1, the legal requirement on other competent authorities is to consult NRW for the purposes of the appropriate assessment stage of an HRA. However, in practice competent authorities also typically seek NRW advice on whether a project is likely to have a significant effect, and hence on whether an appropriate assessment is required.

Operational guidance for NRW's responses to development planning consultations, including applications for planning permission, and applications for a Development Consent Order (Nationally Significant Infrastructure Projects) are being developed, and when ready will be available on the Development Planning pages of the NRW intranet.

In addition to the information provided in this OGN, Case Managers should check any guidance provided in those documents relevant to HRA matters when compiling a development planning consultation response.

### 5.1 Roles and responsibilities

Our representations to other authorities as the appropriate nature conservation body in relation to the Natura 2000 implications of a project should be clearly distinguishable from our comments on other issues within our advisory remit. Meanwhile care must be taken to ensure that our advice in relation to whether a project is likely to have a significant effect or in relation to an appropriate assessment is not, and does not give the impression of being, unduly influenced by any advice we provide in relation to other areas of NRW's advisory remit. It is the responsibility of those preparing a consultation response to ensure that the basis of our advice as the appropriate nature conservation body under the Habitats Regulations is clear and transparent, whilst recognising, as outlined in section 4.1 above, that HRA can be a potential 'show stopper' for the project.

Where NRW is approached informally by a competent authority or an applicant (for example where a prospective applicant is seeking pre-application advice on what matters will be of interest to NRW), care should be taken not to pre-empt any formal advice that will need to be given in due course in relation to HRA issues. Advice from the relevant protected sites advisors should be sought at an early stage, and any advice or information provided to prospective applicants in relation to HRA issues should be transparent and reflect the independence of our role as the appropriate nature conservation body.

[6] Formerly Regulation 61(3)

In some cases we may enter into an extended dialogue with another competent authority and an applicant/developer over HRA matters, involving meetings and exchange of correspondence, and particularly as part of 'pre-application' discussions. After an application has been received by the competent authority, it is particularly important to ensure that our statutory role as the appropriate nature conservation body advising the competent authority is carried out transparently. Therefore if, after an application has been submitted, direct contact between NRW and an applicant is considered necessary in order for us to properly discharge our functions, such contact can take place provided any meetings or correspondence are properly recorded, so that our representations to the competent authority under Regulation 63(3) of the Habitats Regulations are clear and transparent and distinct from any exchanges we have with the applicant.

The record of the HRA as prepared by the competent authority may undergo several iterations to take account of our comments. All correspondence with the competent authority containing our comments on HRA matters should be retained, since it constitutes our representations under the Habitats Regulations. In particular, our comments should be clearly distinguishable from the competent authority's own record of the HRA. We should not, for example, 'sign off' a competent authority's HRA by simply placing an NRW signature on the document, and we should discourage competent authorities from asking us to do this. If we agree with the findings of the HRA we should record that fact, along with any necessary qualifications, either in separate correspondence or, where the competent authority has provided us with a partially completed HRA record, in a section of that document specifically set aside for recording NRW's representations.

The officer (normally referred to as the case manager) preparing the consultation response to the competent authority (whether in Operations or EPP) should seek the input of the relevant protected sites advisors and specialists in Operations or EPP. In practice this may be through internal exchange of emails, or may include arranging meetings involving protected sites advisors and/or specialists and the competent authority (and in some cases the project proponent/applicant, although as noted above, after a formal application has been submitted this should only be where considered necessary for us to effectively carry out our functions).

There are statutory deadlines for NRW consultation responses under planning legislation, but under the Habitats Regulations (Regulation 63.3) it is for the competent authority to give NRW a 'reasonable' time to respond. In some cases the implications of a project for a Natura 2000 site may be more complex than other issues, in which case it may be necessary to seek the competent authority's agreement to extend the deadline for our response. Similarly, in some cases, the information provided by the competent authority may provide an insufficient basis for us to advise properly on the HRA, in which case we should request more information, which can also prolong the consultation process. The key point is that until we are satisfied either that the project is not likely to have a significant effect on any Natura 2000 sites or that, following an appropriate assessment, it will not adversely affect the integrity of any Natura 2000 sites, we should advise the competent authority that the project should not proceed. That includes situations where we consider there is insufficient information to rule out a significant effect or an adverse effect on site integrity.

## 5.2 Projects taken forward for 'imperative reasons of over-riding public interest'

As outlined in section 4.1 above, some projects may proceed under Regulation 64[7] of the Habitats Regulations, notwithstanding a negative assessment of their implications for Natura 2000 sites, if there are no alternative solutions, if they are necessary for imperative reasons of over-riding public interest (IROPI) and subject to any necessary compensatory measures being taken to secure the overall coherence of the Natura 2000 sites network.

For these projects, the decision on the existence of alternative solutions and IROPI is for the competent authority to make, subject to the requirement to notify the 'appropriate authority' (which for devolved matters is the Welsh Ministers) and wait 21 days before approving the project. There is no statutory requirement on the competent authority to consult NRW for the purposes of assessing a project under Regulation 64. However, in practice NRW is very likely to be asked to advise on the ecological implications of potential alternative solutions (if there are any), and on what form of compensatory measures may be required. It is not normally within NRW's remit to advise on whether there are IROPI associated with a project for which another competent authority is responsible, except where the project is also subject to one or more statutory permissions issued by NRW. This is dealt with further in section 6.4.

Before agreeing to a plan or project on IROPI grounds, the competent authority responsible (i.e. not NRW in the case of category 1 projects) must give notice to WG (as the appropriate authority) of their intention to agree to the project. The competent authority must not agree to the project until 21 days have elapsed since the first day of notification, unless WG notifies them that they may do so. On receiving such notice from a competent authority, WG may ask NRW to confirm that we agree with the conclusions of the appropriate assessment, and the adequacy of the compensatory measures proposed. Therefore there is a requirement for NRW and WG to act quickly to meet the 21 day target, although WG may give directions to the competent authority prohibiting them from agreeing to the plan or project, either indefinitely or during such period as may be specified in the direction.

NRW's advice to other competent authorities and to WG in relation to IROPI projects should ideally be provided by the same team or individual advising on the appropriate assessment under Regulation 63, and follow the same principles of consistency with advice on other matters raised by the consultation, and the provision of 'single voice' responses. It will be particularly important for the NRW team preparing the advice to seek appropriate specialist and protected sites input to any discussion of potential compensatory measures. Although it is not NRW's responsibility to define or deliver compensatory measures, in practice we should, and will be expected to, engage constructively with the competent authority and the project proponent in the development of any package of compensatory measures that may be required.

[7] Formerly Regulation 62.

## 6. HRA procedure for Category 2 projects: those for which NRW issues any form of authorisation to a third party

In terms of HRA, NRW's roles here are (i) competent authority and (ii) appropriate nature conservation body.

**Legal requirements**
*This is a summary of the relevant provisions of the 2017 Habitats Regulations. For the actual text of the regulations, staff should consult the legislation itself (e.g. on the legislation.gov.uk website)*

- **Under Regulation 63 (formerly 61) NRW, before deciding whether to give any consent, permission or other authorisation for a project which is likely to have a significant effect on a Natura 2000 site, and which is not directly connected with or necessary to the management of that Natura 2000 site (for the purposes of conserving its qualifying features), must carry out an appropriate assessment of the implications of the project for the site, in view of the site's conservation objectives.**
- **The applicant for that authorisation must provide NRW with sufficient information for the assessment, or to determine whether an appropriate assessment is required.**
- **Regulation 63 stipulates that the competent authority must consult NRW for the purposes of an appropriate assessment and have regard to any representation that NRW makes.**
- **NRW may normally only give permission for the project after having ascertained that it will not adversely affect the integrity of any Natura 2000 site.**
- **If NRW is satisfied that there are no alternative solutions and the project must be carried out for imperative reasons of overriding public interest (IROPI), permission can be granted, provided we have notified WG and either 21 days have elapsed with no response, or WG has notified us that we may grant permission. WG must secure that the necessary compensatory measures are taken.**
- **Regulation 63 does not apply to SSSI consents determined by NRW under section 28 of the Wildlife and Countryside Act 1981 (as substituted). These are covered by Regulation 24 which, like Regulation 63, requires NRW to carry out an appropriate assessment if the operation concerned is likely to have a significant effect on a Natura 2000 site, and is not directly connected with or necessary to the management of that Natura 2000 site (for the purposes of conserving its qualifying features). However, NRW may only give consent if we have ascertained that the project will not adversely affect the integrity of any Natura 2000 site. That is, consent cannot be issued under Regulation 24 on IROPI grounds. The procedure for HRA of SSSI consents is explained further in Annex 4.**

The purpose of this part of the OGN is to complement other NRW operational guidance on how all different types of applications to NRW are handled. Each consenting or permitting regime operated by NRW is different and involves different teams and procedures, but **this OGN sets out common elements of the procedure required for HRA in all cases.**

## 6.1 Roles and responsibilities

NRW itself, as a corporate entity, is the competent authority, but in practice the role of competent authority must be assumed by a specific function within the organisation. Responsibility for carrying out the HRA lies with the team/person responsible for determining the application, which is the team assuming the competent authority role on behalf of NRW. This role may be delegated to another part of the organisation (e.g. to technical specialists outside the team responsible for determining the application), but it should not be delegated to a team or individual that will be fulfilling the appropriate nature conservation body role, as this would remove the independence of function required between these two roles. With a very small number of exceptions, the competent authority role for this category of project is assumed by one of the teams within NRW's Permitting Service in EPP. Exceptions to this include SSSI consents, some flood defence consenting and a number of other types of permission, which are currently determined by teams in the Operations Directorates rather than in the Permitting Service. **The HRA procedure for SSSI consents is described in Annex 4.** Guidance on the HRA procedure for a range of other types of permissions which are determined within the Operations Directorates is under development and will be included in due course in Annex 5.

As noted above, it is the responsibility of the applicant for an NRW authorisation to provide such information as we may reasonably require to enable the HRA to be properly carried out. As noted in section 4 of this OGN, HRA is a potential 'show stopper' in that unless the provisions of the legislation are satisfied, authorisation cannot lawfully be granted. Therefore insufficient information to enable it to be established, for example, that a project will not adversely affect the integrity of a Natura 2000 site, requires refusal (if there is a statutory determination period), or may require the applicant to provide more information before a satisfactory HRA can be carried out.

In all cases, the responsibility for providing the protected sites advice lies with the relevant Natural Resouce Management (NRM) team responsible for the Natura 2000 site concerned (the appropriate nature conservation body role). Whilst it is these teams that lead on the formal responses, they should also seek input from relevant technical specialists in EPP or elsewhere in Operations as required. The EPP technical specialists have a Wales and UK wide remit to ensure that a consistent approach is adopted, and to make sure that the most up to date evidence is used in the assessment.

A single lead protected sites advisor should be agreed between all to coordinate the advice being given to the permitting team, and to ensure that advice in relation to all Natura 2000 sites affected by the project is provided to the permitting team in a timely manner.

Under the Habitats Regulations the carrying out of the HRA of a project, and the resulting decision on whether to give any consent permission or authorisation, lies with the competent authority. It does not lie with the nature conservation body. The competent authority must have regard to the advice of the nature conservation body. That principle must also be applied where NRW exercises both roles. There must be a functional separation between NRW's roles as appropriate nature conservation body and competent authority, and each role must be exercised independently of the other. The fact that a

project is subject to HRA does not change where the responsibility lies within NRW for determining the application for consent for that project.

Where NRW is approached informally by a prospective applicant, for example seeking pre-application advice on what matters will be of interest to NRW, advice from the relevant protected sites advisors should be sought at an early stage, and any advice or information provided to prospective applicants in relation to HRA issues should be transparent and reflect the independence of our role as the appropriate nature conservation body. Likewise care should be taken when giving pre-application advice not to pre-empt formal consideration of HRA issues that may take place once the application is received. Therefore unless there are clearly no implications for any Natura 2000 sites, advice from the relevant protected sites advisors should be sought at an early stage so that from the outset NRW is advising prospective applicants 'with one voice', and noting that HRA could represent a significant element in the determination of an application, and may even be a potential 'show stopper' for the project.

### 6.2 The standard process to be followed

**Figure 2** summarises the steps to be followed when carrying out an HRA of an external application to NRW for some form of authorisation.

A. On receipt of an application the permitting team should consider whether the project requires an HRA. It is the applicant's responsibility to provide the necessary information to enable NRW to determine if an HRA is required and properly carry out an HRA if it is required. If there is insufficient information to make this assessment, the applicant should be asked to provide additional information. The assessment should be based on the project as received, and taking into account any mitigation measures already included within the project specification or methodology. A decision not to carry out an HRA should be recorded, and this can be done either using existing procedures/forms for handling of applications, or by completing sections 1 and 2 of a Form 1 HRA report (see below).

   There is no automatic requirement to obtain protected sites advice at this point, as there will be many projects (and possibly entire categories of projects) where the possibility of any effect on Natura 2000 sites can be ruled out. For example some types of permit (e.g. water abstraction licences) are issued for a fixed period and are subject to periodic renewal. Renewal applications are subject to the relevant legislation in the same way as new applications. However as a general principle, a renewal can be automatically screened out as not likely to have a significant effect provided that a number of conditions are met including:-

   - there being no outstanding or unresolved differences of view between permitting teams and protected sites advisors, including advice formerly provided by CCW, on the Natura 2000 implications of a consent which is up for renewal;
   - the prevailing environmental conditions relating to the potential impact on a Natura 2000 site of the consent in question have not changed (for example, other completed consents in the vicinity could act cumulatively or there may be new monitoring/surveillance data showing negative effects on a relevant Natura 2000 site, from the consent in question, meaning a renewal should be considered more carefully);

- there is no new generic evidence (as opposed to site/consent specific information) indicating previously unknown or underestimated effects;
- protected sites advisors or national technical experts have not flagged up any Natura 2000 issues during the lifetime of the expiring licence or permit;
- the renewal is on the same or more restrictive terms.

When **all** of these criteria are met, renewals can be automatically screened out as not likely to have a significant effect. If in doubt, seek advice from protected site staff and/or technical specislists. For water resource permit renewals a set of 'pre-screening' criteria has been adopted and will be used to determine whether each renewal application can be screened out of further consideration under the Habitats Regulations.

Otherwise, an HRA report should be drafted, using the standard template in **Form 1. This template should be used for all HRA records for all Category 2 projects in NRW, and replaces <u>all</u> previous forms and templates used for that purpose, including legacy Environment Agency 'Appendix 11' and 'Appendix 12' forms, the forms currently being used for the HRA of felling licences and by the Marine Licencing Team for marine licences, all of which are now withdrawn.**

B. Unless the risk of significant effects can be excluded without seeking protected sites advice, the permitting team should discuss the potential Natura 2000 implications of the project with the protected sites advisor prior to finalising section 3 of the **Form 1 HRA report**. There are various ways in which this can be facilitated, depending on the nature of the project and the potential Natura 2000 issues it raises, for example:

- permitting team completes section 3 of the HRA report in draft and asks for protected sites advisor's comments;
- permitting team sends protected sites advisor details of the project (e.g. copy of relevant parts of the application) and asks for comments;
- meeting or telecon is arranged to discuss the application.

C. If the permitting team decides that the project is NOT likely to have a significant effect (and hence that the HRA will be completed without there being an appropriate assessment), they should send a dated copy of the Form 1 HRA report with section 3 completed to the protected sites advisor for comment, regardless of whether there has already been any verbal or informal input from the protected sites advisor (note that this does not apply to renewals as set out in A above).

D. The protected sites advisor should provide written advice to the permitting team, using the standard form in **Form 2**. This form should also be used where discussions/meetings have been held or where draft versions of the HRA report have been exchanged. The permitting team must take careful account of this advice in completing the HRA report, and attach a copy of the Form 2 advice to the Form 1 HRA report to become part of the record of the HRA.

E. If the permitting team concludes that significant effects cannot be ruled out and therefore that an appropriate assessment is required, there should be further consultation with the protected sites advisor in order to complete the remaining sections of the Form 1 HRA report, including in particular section 4 which will

constitute the formal record of the appropriate assessment. In all cases, and irrespective of any other verbal or written exchanges, a dated version of the HRA report with relevant sections completed should be sent to the protected sites advisor for final comment.

F. The protected sites advisor should reply using Form 2, in particular highlighting whether they agree with the findings of the Form 1 HRA report, or noting any outstanding concerns. Again, the permitting team must take careful account of the advice in finalising the HRA report, and attach a copy of this advice to the HRA report to become part of the record of the HRA.

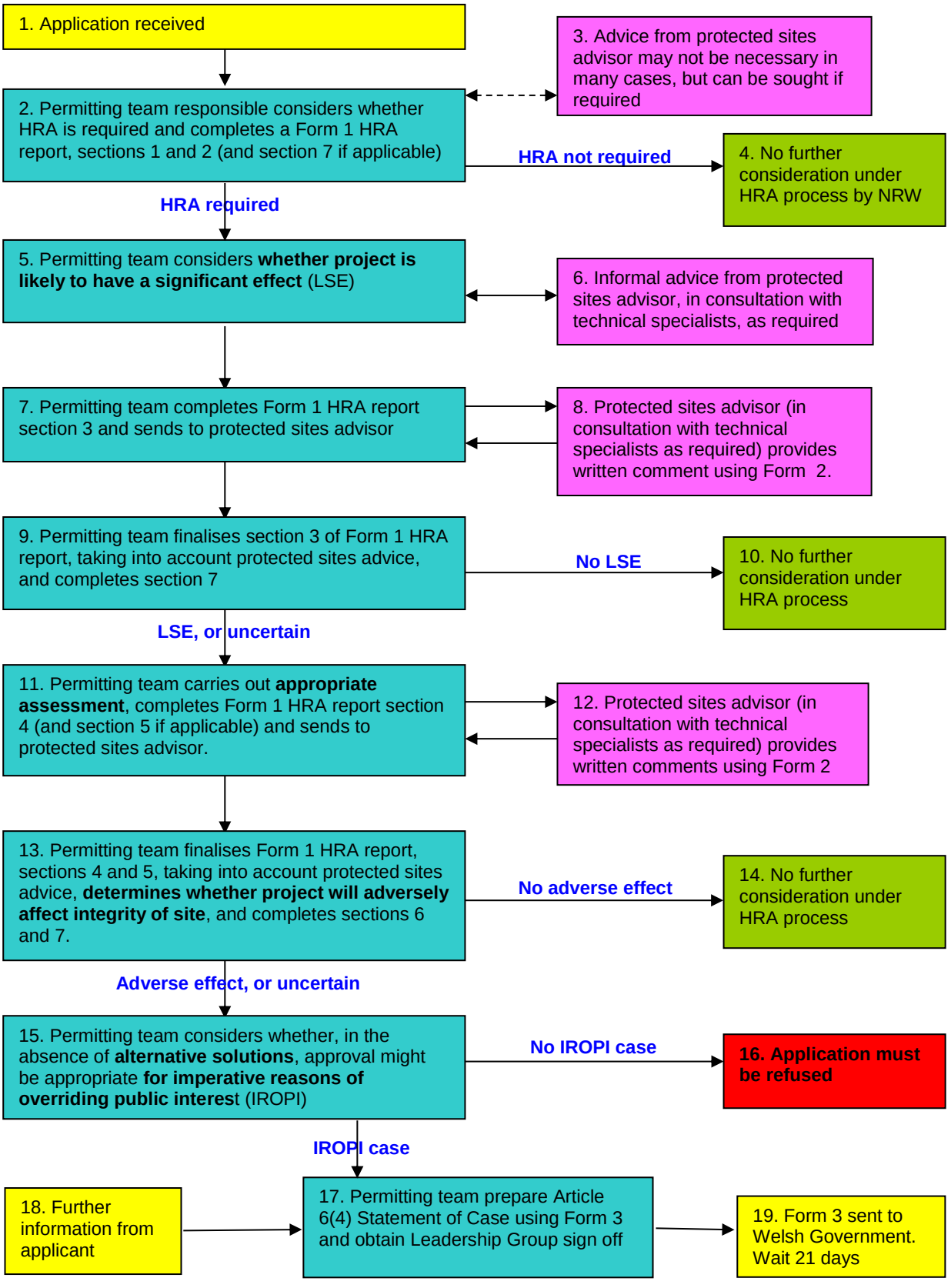
G. The HRA may require dialogue between NRW (exercising the competent authority role) and the applicant, in particular because the Habitats Regulations specifically require the applicant to provide such information as the competent authority may reasonably require. In line with the 'one stop shop' principle and delivering customer focussed service, all requests to the applicant for information in support of the HRA should be handled by the permitting team carrying out the HRA. If, after an application has been submitted, direct contact between NRW protected sites advisors and an applicant over HRA matters is considered necessary in order for us to properly discharge our functions (for example in a complex case where significant discussions over the evidence base, or identification of potential mitigation measures are required), correspondence and records of any meetings with the applicant should be carefully documented so that the advice provided by the NRW team exercising the appropriate nature conservation body role to the NRW team exercising the competent authority role, is clear and transparent and distinct from any exchanges between NRW and the applicant.

H. Where there is a need for applications to be determined within a certain timescale (for example to comply with statutory determination periods), protected sites advisors should endeavour to respond as soon as is reasonable, meet reasonable deadlines, and ideally the teams involved should establish a mutually agreed timetable, recognising that HRA is part of wider decision making process and HRA needs to reflect the timelines of the consenting process. A default of 15 working days for provision of the protected sites advice is suggested, unless circumstances dictate a shorter or longer deadline. Early engagement between applicant, permitting team and protected sites advisors should help identify information requirements so that these can be built into the timetable early on, rather than arising later in the process when information requests will be harder to accommodate. However, given the requirement to establish that projects will NOT adversely affect Natura 2000 sites before authorisations can be given, the requirements of the HRA may in some cases necessitate agreeing longer timescales for internal consultation. For example, if at the point at which an application determination deadline has been reached, the HRA has not been completed, or is still inconclusive, permission cannot be given. All parties should be aware of this from the outset and plan accordingly.

I. The Regulations do not require consultation with the public for the purposes of carrying out an HRA. In line with NRW's Public Participation Scheme, NRW may consult the public on draft permitting decisions which we consider have a significant degree of public interest, due to the nature of the application and/or the location.

Where it is decided to consult the public, the consultation should cover the HRA. There is no need for us to carry out separate public consultation on the HRA. Meanwhile the degree of public interest in an application may or may not be related to its implications for Natura 2000 sites.

## Figure 2: HRA procedure for Category 2 projects: those for which NRW issues any form of authorisation to a third party



### 6.3 Where the permitting team and protected sites advisors do not agree

In most cases it is expected that the conclusions of the HRA will reflect the advice of the protected sites advisors. However, given the separation of roles of competent authority and nature conservation body, in principle it is possible that the permitting team determining an application could do so against the protected sites advice. Nevertheless, in all cases there is a clear responsibility on the permitting team to demonstrate how they have had regard to the protected sites advice, and this applies particularly if they are minded not to follow that advice.

In these cases it is important that the protected sites advice documented in Form 2 clearly sets out the protected sites advisor's views on the implications of the project for the designated Natura 2000 features concerned and that section 7 of Form 1 clearly documents how that advice has been considered by the permitting team and why the conclusion of the HRA does not reflect that advice. The finalised HRA report should be sent to the protected sites advisor for information.

Where the protected sites advisor does not agree with a conclusion of no likely significant effect or no adverse effect on site integrity, the permitting team should refer the case to their Leadership Group manager. The Leadership manager will then consider how to proceed, in discussion with the relevant Leadership manager for the protected sites advisor concerned. They may decide to proceed in a number of ways, including:

- accepting the position of one or other team and instructing the permitting team to proceed accordingly;
- convening further discussions between the two teams (and involving technical specialists as appropriate), in an effort to resolve the difference of view;
- asking for the case to be independently reviewed.

The final decision and responsibility for signing off the HRA in these circumstabnces rests with the Leadership manager of the team exercising the competent authority role. Particularly difficult or sensitive cases can be referred to Executive Team if necessary.

It is not necessary to refer to Leadership unresolved differences of detail or emphasis that would not affect the overall conclusions of the HRA. In these circumstances after reasonable efforts have been made to accommodate the advice of the protected sites advisor, the permitting team should complete the Form 1 HRA report according to their best judgement.

Where, following the escalation process, the conclusion of the HRA is contrary to the protected sites advice, a brief record of the case should added to a centrally held register of such cases held on the DMS. This should be done once the Leadership Manager has signed off the final HRA, even if the final decision on whether to issue the permit has not yet been made, and irrespective of whether the consent is subsequently refused for any reason.

**Click here to open the register**

## 6.4 Procedure for 'IROPI projects'

NRW may on occasion receive applications for consent for projects which, despite a negative outcome of the appropriate assessment, are necessary for imperative reasons of over-riding public interest (IROPI). Provided there are no alternative solutions, and provided that any necessary compensatory measures are taken to ensure that the overall coherence of the Natura 2000 network is protected, such projects may proceed under the derogation allowed by Article 6(4) of the Habitats Directive (as transposed by Regulation 64 of the 2017 Habitats Regulations).

The determination of whether a project in this category should proceed for IROPI is a decision for NRW to make, subject to notifying Welsh Government that we intend to authorise the project. Once WG have been thus notified we must wait 21 days before giving authorisation unless WG notify us that we may do so. WG may prohibit us from giving authorisation, or from doing so within a specified time period.

There is a substantial amount of guidance on what constitutes IROPI in the various documents referenced in section 4.2 of this OGN. Deciding whether a project satisfies the Article 6(4) tests can be a complex matter, as it involves weighing the harm, or likely harm that the project will have on the Natura 2000 site, against its anticipated benefits, which may be entirely socio-economic, or relate to environmental objectives other than the Natura 2000 site conservation objectives, or a mixture. Where a SAC feature likely to be affected by a project is identified in Annexes to the Habitats Directive as a 'priority' habitat type or species[8], the only reasons which may constitute IROPI are those relating to public health, public safety, environmental benefits of primary importance, or other reasons which a competent authority considers to be IROPI having sought and had regard to the opinion of the European Commission. If NRW wishes to seek the opinion of the European Commission on whether there are imperative reasons of over-riding public interest, we can submit a request to WG who may then seek the EC's opinion and relay it back to NRW.

A project can only be considered for IROPI if it has undergone an appropriate assessment which has concluded that there will be adverse effects on the integrity of one or more Natura 2000 sites, or that such effects cannot be excluded. Therefore, in all cases, the relevant permitting team must have completed and signed off an appropriate assessment.

If giving consent to a project on IROPI grounds is being contemplated, a detailed 'Article 6(4) Statement of Case' (SoC) covering the tests in Article 6(4) of the Habitats Directive should be prepared by the team determining the application (i.e. the team that has assumed the role of competent authority). A generic template for this is given in **Form 3**. In practice, completing this form is likely to require extensive dialogue between NRW (in its competent authority role) and the project applicant, and provision of additional information that has not formed part of the HRA up to this point, including on the availability of alternative solutions, the social or economic importance of the project, and the package of compensatory measures. The relevant protected sites advisors will need to advise the NRW team exercising the competent authority role, on the potential impact of any

[8] 'Priority' habitat types and species are relevant only in relation to SACs. They do not apply to SPAs or Ramsar sites.

alternative solutions (which might include different locations for the project), and on the requirements for compensatory measures.

The completed Form 3 SoC should be signed off at Leadership group level, copied to Executive Directors for information, and sent to WG. Copies should be emailed to both the Welsh Government Biodiversity & Nature Conservation Team and Marine Conservation and Biodiversity Team. Those teams will liaise, as required, with other WG departments.

As noted above, authorisation for the project may then only be given if either 21 days have elapsed since WG received the Form 3 SoC, or WG has notified us that we may give authorisation. Within that 21 day period WG may prohibit us from authorising the project either indefinitely or within a specified time period.

WG is required to inform the European Commission of the compensatory measures taken for projects which are approved on IROPI grounds, and will use the information provided in the SoC for this purpose. Under the Habitats Regulations, it is WG's responsibility to ensure that any necessary compensatory measures are taken. Therefore, it is important that the notice given to WG using Form 3 contains sufficient information about the compensatory measures. The development of the compensatory measures will in most cases be a substantial task to be carried out before any SoC submission to WG can be made. It is beyond the scope of this OGN to provide further guidance on developing compensatory measues, but further guidance may be developed in future.

In some cases, the likelihood that a project will need to be considered under Article 6(4)/Regulation 64 will be apparent at an early stage in the HRA process, possibly even during 'pre-application' discussions. If so, the applicant should be encouraged to consider gathering, during the earlier stages of the HRA, the information that will be needed to support an Article 6(4) assessment, but it should be made clear that this is without prejudice to the conduct or conclusions of the HRA. In particular, applicants should be clearly informed that early consideration of the information needed to support an assessment under Article 6(4), including in relation to possible compensatory measures, is without prejudice to the determination of whether the project would meet the tests in Article 6(4).

## 6.5 Projects requiring multiple permissions

### 6.5.1 Where multiple NRW permissions are required

A single HRA (covering all Natura 2000 sites affected) should be produced to support the determination of all applications, and covering all potential impacts of the whole project on Natura 2000 features where possible. If different permissions are the responsibility of different NRW teams, a lead team should be agreed to prepare the HRA on behalf of the others and carry out the internal consultation with the protected sites advisor. This should normally be the team responsible for the application covering the elements of the project that are likely to have the most significant impact. However, in many cases, applicants may seek permissions sequentially, with an expectation of obtaining one permission and then applying for the next. This makes conducting an HRA of an entire project more difficult, and applicants should be encouraged to provide all the information necessary to enable a

single HRA of the whole scheme to be carried out, even if they intend to submit formal applications for the subsequent consents at a later stage.

If the relevant permitting legislation requires an application to be determined within a timescale that precludes carrying out an HRA of the whole project, and/or where the applicant is unwilling or unable to provide all the necessary information from the outset, NRW should ensure that it at least has enough information to do an in-combination test with the other permissions that will be required, and the application will need to be determined on the basis of this more limited-scope HRA. If permissions are given in these circumstances, the applicant should be clearly informed that the granting of an authorisation for one element of a project does not in any way create a presumption that later permissions will be granted, or prejudice the conclusions of subsequent HRAs.

### 6.5.2 Where a project requires permissions from NRW and another competent authority

Many projects require both a permission from NRW and a permission from another competent authority. A common example is a development requiring planning consent from the local planning authority, and an Environmental Permit from NRW. In these cases, as well as needing to carry out an HRA of the application, NRW will also be the appropriate nature conservation body and will need to advise the other competent authority for the purposes of their HRA.

Each competent authority determining an application for permission of any kind is responsible for carrying out its own HRA and reaching its own conclusions. However, in practice it is possible for NRW and the other authority to work together and to share information so as to avoid duplication of work, and ideally reach the same conclusion in relation to the HRA, while respecting each other's autonomy and independence of decision-making. Although a competent authority cannot delegate or transfer its statutory responsibility for HRA to another authority, one authority may rely on the findings of another's HRA in making its own determination. In many cases, because of NRW's technical competence in relation to the environmental, and particularly the ecological implications of many types of project, other competent authorities will generally give considerable weight to the findings of HRAs carried out by NRW. It is also possible for two or more competent authorities to agree that one will assume the role of 'lead competent authority' and carry out a central coordinating role, for example leading the preparation of jointly agreed documents to support the HRA, liaising with applicants over information requirements and coordinating any publicity or wider stakeholder engagement in relation to the HRA of the project. It is beyond the scope of this OGN to provide detailed guidance on the appointment and roles of a 'lead' authority, but guidance on this may be developed in future. Note also that under Regulation 67[9] of the Habitats Regulations a competent authority is not required to assess any implications of a plan or project that would be more appropriately assessed by another authority.

Under various enactments, applicants may apply for various permissions at different times, which makes it very difficult to carry out a single HRA dealing with all the implications of the project at the same time (as noted above). Wherever possible, NRW's planning consultation response and NRW's HRA of the permit application, although distinct roles,

[9] Formerly Regulation 65.

should be progressed in parallel, with the teams responsible working closely together, and supported by consistent advice from the protected sites advisors. In practice, this will depend on whether the timing of the two application processes enables parallel tracking or whether it is necessary for one process to precede the other, as is often the case. However, as a general principle it is preferable for HRAs to be carried out on projects in their entirety rather than sequentially on individual components of a project subject to different permissions. Therefore we should strongly encourage applicants to provide all the information necessary to carry out an HRA of the entire project, even if they intend to seek further consents at a later stage, and encourage planning authorities to do likewise. At the very least, any subsequent planning application anticipated should be considered in-combination with a permit application.

Where for any reason HRAs for multiple-consent projects need to be carried out on individual component parts of the project rather than considering the implications of the entire scheme, applicants should be clearly informed that the granting of an authorisation for one element of a project does not in any way create a presumption that later permissions will be granted, or prejudice the conclusions of subsequent HRAs.

In all cases the nature conservation advice will be provided by the same protected sites team to both the NRW team determining the NRW permission(s), and to the other competent authority, via the team responsible for providing NRW's consultation response. It is the responsibility of the protected sites advisor and the planning team to ensure that the advice given on both HRAs is consistent, regardless of the timing of the respective consultations. For example any protected sites advice provided to the permitting team on Form 2 should be copied to the team preparing NRW's consultation response.

Where NRW or another competent authority is considering approving a project which requires authorisations from both bodies, on IROPI grounds, NRW and the other authority must each consult the other and have regard to the other's views on whether the project should proceed on IROPI grounds, before making that determination (Regulation 67(5)).

### 6.6 HRA and 'emergency works'

The following guidance is given in recognition of the fact that NRW may receive applications for consent where urgent action is needed (for example to protect human life or to prevent damage to property or environmental assets) within a timescale which does not enable any meaningful HRA to be conducted prior to a decision to proceed. However, there are no explicit provisions in the Habitats Directive or Regulations for projects to escape scrutiny under HRA provisions on the grounds that they constitute 'emergencies'. Therefore, notwithstanding the following guidance, wherever possible legal advice should be sought before issuing any form of approval for an 'urgently needed' project without prior application of the HRA requirements.

Provided the idea of 'emergency' is understood as incorporating **all** three of the following:

- a significant degree of public interest (e.g. protecting human life or health or preventing serious and irreparable damage to property or to natural assets), AND
- urgency of action required to protect those interests, AND
- absence of alternative courses of action capable of protecting those interests

then ‘emergency works’ can reasonably be considered as a type of IROPI capable in principle of satisfying the tests in Article 6(4) of the Habitats Directive. However, by definition it is not possible to carry out the HRA before the approval for the project can be given. Therefore the best that can reasonably be done in these circumstances is for the operation to be undertaken in a way that causes as little damage as possible, and then to document an HRA retrospectively. This should include establishing as clearly as possible the scale and nature of any adverse effects on site integrity that occurred and to what extent they can be mitigated through further intervention (e.g. habitat restoration works) or through natural regeneration (or a combination of both). In some cases, damage to Natura 2000 features may be only temporary and amenable to rapid restoration, in which case the conclusion of a retrospective HRA could in principle be ‘no adverse effect’, provided any necessary restoration or reinstatement measures are taken and shown to be effective within a short period of time following the damage. Where rapid restoration or repair is not possible, the retrospective HRA will need to accept that damage has occurred, and to document the lack of alternative solutions to the course of action that was taken, the existence of IROPI that justified the works being undertaken, and what compensatory measures are needed.

## 7. HRA procedure for Category 3 projects: those undertaken by NRW itself, where we 'self-consent' and/or where we apply to other authorities for consent

In terms of HRA, NRW's roles here are (i) project proponent/'applicant', (ii) competent authority and (iii) appropriate nature conservation body.

**Legal requirements**
*This is a summary of the relevant provisions of the 2017 Habitats Regulations. For the actual text of the regulations, staff should consult the legislation itself (e.g. on the legislation.gov.uk website)*

- **Under Regulation 63 (formerly 61), NRW, before deciding whether to undertake a project which is likely to have a significant effect on a Natura 2000 site, and which is not directly connected with or necessary to the management of that site (for the purposes of conserving its features) must carry out an appropriate assessment of the implications of the project for the Natura 2000 site(s), in view of the Natura 2000 site's conservation objectives.**

- **Regulation 63 stipulates that the competent authority must consult NRW as the appropriate nature conservation body, for the purposes of an appropriate assessment and have regard to any representation that NRW makes. The situation of NRW 'consulting itself' is not explicitly provided for in Regulation 63, but in order to ensure, and be able to demonstrate, that we are properly carrying out our distinct duties as (i) a competent authority deciding whether to undertake works, and (ii) the appropriate nature conservation body in Wales, we must in effect 'consult ourselves'.**

- **Subject to the IROPI provisions, NRW may only undertake the project after having ascertained that it will not adversely affect the integrity of any Natura 2000 site.**

- **Where the project constitutes 'development' and would normally be undertaken under NRW's permitted development rights, the Regulations do not allow us to apply the IROPI provisions. Therefore, unless adverse effects on the integrity of any Natura 2000 sites can be ruled out, we must submit a planning application to the relevant local planning authority, who will conduct a HRA.**

- **Where a project does not constitute 'development' NRW can in principle apply the IROPI provisions. If we are satisfied that there are no alternative solutions and the project must be carried out for IROPI, we can undertake the project provided we have notified WG and either 21 days have elapsed with no response, or WG has notified us that we may proceed. WG must secure that the necessary compensatory measures are taken.**

Projects in this category may be 'stand alone', or may be works which are planned and undertaken under the terms of different types of land use plans or resource plans (for example Forest Design/Resource Plans, National Nature Reserve management plans, Flood Risk Management plans/strategies). These plans are themselves subject to HRA,

but plan-level HRA rarely if ever addresses the Natura 2000 implications of any consequential projects to the level of detail that would enable those projects to escape further HRA altogether. Rather it will normally be the case that a plan can satisfy the requirements of HRA and be adopted on the basis that lower tier projects arising from that plan will themselves be subject to HRA (deferring down). In such cases, each project deferred down will need to undergo HRA before it can be approved, although the project level HRA will be more straightforward if many of the issues have already been addressed at the plan level, for example if the plan prescribes the location of projects so as to avoid significant effects on Natura 2000 sites, or establishes that only projects satisfying certain criteria will be taken forward under the plan.

Meanwhile of course, any NRW-instigated project that does not arise specifically from an approved plan that has been subject to HRA, needs to undergo HRA before approval is given.

### 7.1 Roles and responsibilities

The relevant project manager (i.e. the project proponent) assumes the competent authority role and is responsible for carrying out HRA for this category of project. They may be assisted in this, if required, by the Environmental Assessment Team (EAT) in EPP, who provide an internal advisory service. In terms of project level HRA, EAT undertakes or advises on HRA of NRW projects where they are also undertaking Environmental Impact Assessment (EIA) of the project (high risk projects). Assistance may also be provided by Biodiversity officers in Operations teams, **although if these officers are in the same team as the protected sites advisors who will be exercising the appropriate nature conservation body role in relation to the project concerned, care should be taken to ensure that the HRA itself, and the nature conservation advice on the HRA, are clearly and transparently documented, so that we can in all cases demonstrate separation of roles between competent authority and appropriate nature conservation body.**

Where NRW's proposed projects require NRW permissions (i.e. 'self-consenting'), the relevant permitting team in EPP will also exercise the role of competent authority and will **also** need to carry out its own HRA. Whilst this may appear to create unnecessary duplication, it is necessary in order to reflect the principle in the Habitats Regulations that a competent authority is subject to the HRA provisions both when deciding whether to undertake projects itself, and when deciding whether to issue authorisations to undertake projects. Even though for this category of projects NRW is exercising both roles, it is necessary to maintain a clear distinction between them. Duplicated or unnecessary work can in practice be avoided in most cases since the HRA carried out by the project team (or EAT or Biodiversity officers where relevant) prior to internal applications for permission being submitted, should provide much of the information needed for the HRA to be done by the permitting team. The permitting team must either satisfy itself that the HRA carried out by or on behalf of the project team is sufficiently robust to inform the permitting decision, or it must conduct a new HRA before determining the internal permit application.

In all cases, the responsibility for providing the protected sites advice lies with the relevant Natural Resouce Management (NRM) team responsible for the Natura 2000 site concerned (the appropriate nature conservation body role). Whilst it is these teams that lead on the formal responses, they should also seek input from relevant technical

specialists in EPP or elsewhere in Operations as required. The EPP technical specialists have a Wales and UK wide remit to ensure that a consistent approach is adopted, and to make sure that the most up to date evidence is used in the assessment.

Where a project affects more than one Natura 2000 site within a single Operations region or in both Operations regions, different protected sites advisors may need to be involved. A single lead protected sites advisor should be agreed between all to coordinate the advice being given to the project team, and to ensure that advice in relation to all Natura 2000 sites affected is provided.

For marine HRAs with marine issues, the project proponent should contact EPP Evidence and Analysis Group marine staff where appropriate for informal and formal nature conservation advice.

An important principle in the Habitats Regulations is that the conclusion of the HRA of a project, and the resulting decision on whether to approve it, lies with the competent authority. It does not lie with the appropriate nature conservation body. The competent authority must have regard to the advice of the nature conservation body. That same principle is to be applied where NRW exercises both of roles**.** The fact that a project is subject to HRA does not change where the responsibility lies within NRW for determining the application for consent for that project. Similarly, the fact that a project team has reached a particular conclusion on the HRA of a project does not pre-judge the outcome of the HRA conducted by the permitting team.

### 7.2 Standard process to be followed

**Figures 3(a)-(c)** set out the process to be followed when carrying out an HRA of a project where NRW is the project proponent or 'applicant':

- Figure 3(a) applies where the project falls within NRW's permitted development rights.
- Figure 3(b) applies where the project requires NRW to apply for consent from another competent authority (e.g. planning applications).
- Figure 3(c) applies where the project requires the granting of some form of permission by one of the teams in the EPP Permitting Service.

Note that the role of the project team in carrying out the HRA may be fulfilled by the Environmental Assessment Team (EAT) in EPP or others acting on the project team's behalf. However to avoid repetition only the term 'project team' is used below and in Figures 3(a)-(c).

A. The potential implications of a project for any Natura 2000 sites should be considered as early as possible in the project planning process, and ideally project specifications and option selection should be designed to avoid the risk of significant effects on Natura 2000 sites. Project teams should therefore discuss proposed projects with the relevant protected sites advisors at an early stage, and take their advice into account in project design and options appraisal.

B. This paragraph (step B) apples only if the project constitutes 'development' which comes under NRW's permitted development rights.

The project team should at this point write to the relevant local planning authority (LPA):

- briefly describing the project;
- stating that we consider it to fall within our permitted development rights;
- stating that, as a competent authority proposing to undertake a project, we intend to carry out a Habitats Regulations Assessment of the project ourselves, in accordance with Regulation 63 of the 2017 Habitats Regulations;
- making clear that unless the conclusion of our HRA is either that the project is not likely to have a significant effect either alone or or in combination with other plans or projects, or, following an appropriate assessment, that it will not adversely affect the integrity of any European site, we cannot take it forward as permitted development and therefore we would not seek approval of the LPA under Habitats Regulations 75-77[10], but would need to consider submitting a planning application;
- stating that we will be happy to provide the LPA with a record of our HRA when completed;
- inviting any observations the LPA may wish to make at this stage.

C. If the possibility of any impact on Natura 2000 sites can be readily ruled out (either due to the inherent nature or location of the project, or because it has been specifically designed to avoid significant affects on any Natura 2000 sites), it is not necessary to carry out an HRA. A decision not to carry out an HRA at this point should be clearly recorded. This can either be done within the relevant project documentation, or can be done by completing sections 1 and 2 of an HRA report (see next paragraph).

D. In all other cases, namely for any project where there is a reasonably foreseeable possibility that it could affect any Natura 2000 site features, or where the protected sites advisor does not agree that no HRA is required, an HRA report should be drafted by the project team, using the template in **Form 1. This template should be used for all HRA records for all Category 3 projects in NRW, and replaces all previous forms and templates used for that purpose, including legacy Environment Agency 'Appendix 11' and 'Appendix 12' forms, the forms used for the HRA of felling licences and by the Marine Licencing Team for marine licences, all of which are withdrawn.**

E. The project team should discuss the potential Natura 2000 implications of the project with the protected sites advisor(s) prior to completing section 3 of the Form 1 HRA report. There are various ways in which this can be facilitated, depending on the nature of the project and the potential Natura 2000 issues it raises, for example:

- project team completes section 3 of the HRA report in draft and asks for the protected sites advisor's comments;
- project team sends the protected sites advisor details of the project and asks for comments;
- meeting or telecon is arranged to discuss the proposal.

[10] Formerly Regulations 73-75

F. The protected sites advisor should provide written advice to the project team, using the template in **Form 2**. This form should also be used where discussions/meetings have been held or where draft versions of the HRA report have been exchanged.

G. If, taking account of the advice provided by the protected sites advisors, the project team decides that the project is NOT likely to have a significant effect (and hence that the HRA will be completed without there being an appropriate assessment), they should send a dated copy of the Form 1 HRA report, with sections 1 to 3 completed, to the protected sites advisors for final comment (regardless of whether there has already been any input from the protected sites advisor).

H. If the project team concludes that significant effects cannot be ruled out and therefore that an appropriate assessment is required, there should be further consultation with the protected sites advisors (as in paragraph D above) in order to complete the HRA. In all cases, and irrespective of any other verbal or written exchanges, a dated version of the Form 1 HRA report with all relevant sections completed should be sent to the protected sites advisors for final comment.

I. The protected sites advisors should provide their final comment, again using Form 2, in particular highlighting whether they agree with the conclusions of the HRA, or noting any outstanding concerns. The project team should attach a copy of this advice, and any previous advice received, to the Form 1 HRA report to become part of the record of the HRA.

J. Where there is a need for projects to be approved within a certain timescale (for example to comply with timeframes for approval of funding, or because there is a degree of urgency to the work being undertaken), protected sites advisors should endeavour to respond as soon as is reasonable, meet reasonable deadlines, and ideally the teams involved should establish a mutually agreed timetable, recognising that HRA is part of wider decision making process and HRA needs to reflect the timelines of the project approval process. A default of 15 working days for provision of the protected sites advice is suggested, unless circumstances dictate a shorter or longer deadline. Early engagement by the project team with the protected sites advisors should help identify information requirements so that these can be built into the timetable early on, rather than arising later in the process when information requests will be harder to accommodate. However, given the requirement to establish that projects will NOT adversely affect Natura 2000 sites before projects can be undertaken, the requirements of the HRA may in some cases necessitate agreeing longer timescales for internal consultation. For example, if at the point at which a project deadline has been reached, the HRA has not been completed, or is still inconclusive, approval for the project cannot be given. Project teams and nature conservation advisors should be aware of this from the outset and plan accordingly.

K. The Habitats Regulations do not require consultation with the public for the purposes of carrying out an HRA, rather they allow it. Where it is decided to consult the public (for example if there is a high degree of public interest, or where we routinely publicise certain categories of project, such as under EIA regulations), the consultation should ideally include the HRA: there is no need in these cases for us to carry out separate public consultation on the HRA. Meanwhile the degree of

public interest in an application may or may not be related to the implications for Natura 2000 sites.

L. For any project valued at over £50,000, the Form 1 HRA record should accompany the business case required to be submitted to NRW's Project Assurance Board (PAB). Where sufficient detail is not available to complete an HRA in time for PAB submission (for example for capital schemes where PAB approval is sought at outline design stage), sufficient information must nevertheless be included to show that the preferred option is likely to be acceptable in terms of effects on protected sites, particularly Natura 2000 sites. In the event of significant changes to a project being made post-PAB approval, the HRA will need to be reviewed through further consultation with protected sites advisors.

From this point onwards, the process to be followed depends on whether an NRW project:

- comes under NRWs permitted development rights, in which case **steps M.1 to M.3 and Figure 3(a)** apply;

or

- requires NRW to submit an application to another competent authority (e.g. for planning permission), in which case **steps N.1 to N.3 and Figure 3(b)** apply;

or

- requires NRW to 'self-consent', in which case **steps O.1 to O.2 and Figure 3(c)** apply.

M. Process to be followed from this point onwards where a project falls within NRW's permitted development rights (see Figure 3(a)):

M.1 Any observations or comments made by the local planning authority in response to the initial letter from NRW informing them of our intentions (see step B above), should be taken into account by the project team, especially if the local planning authority has expressed any concerns or doubts about the project being within our permitted development rights.

M.2 If the conclusion of the HRA is either that the project is not likely to have a significant effect, or that it will not adversely affect the integrity of any Natura 2000 site, a copy of the HRA should be sent to the LPA under covering letter:

- stating that on the basis of the HRA we have carried out, we do not consider that the project is likely to have a significant effect and therefore we do not consider that we are required to obtain the written approval of the LPA under Regulation 75[11] of the Habitats Regulations;
- inviting them to submit any observations on this position or on the enclosed record of the HRA.

M.3 In all other cases, the project cannot proceed as permitted development. If we consider that the project should nevertheless proceed on IROPI grounds,

[11] Formerly Regulation 73

we will need to prepare an Article 6(4) 'statement of case' (see section 7.4 below) and submit it to the LPA as part of a planning application, following steps N.1 to N.3 below.

N. Process to be followed where a project requires NRW to obtain consent from another authority - see Figure 3(b):

N.1 For NRW projects requiring planning permission (including most capital projects), the overall aim is that before a planning application is submitted, all significant issues should have already been addressed. It is especially important that environmental issues, in particular Natura 2000 implications, have been adequately addressed before planning applications are made, since NRW will be a statutory consultee in relation to its own applications.

N.2 The completed HRA should be submitted to the planning authority as part of NRW's planning application. The planning authority will then consult NRW as part of its consideration of the application, including in particular in carrying out its own HRA as required by the Habitats Regulations. In most cases we would expect the authority to follow the reasoning and conclusions of NRW's HRA, but this cannot be assumed to be the case, so our representations as the appropriate nature conservation body under Regulation 63(3) are still an important function, being distinct from our roles as a competent authority and a 'developer' applying for permission. These representations will be provided to the planning authority by the relevant planning consultation team, incorporating the protected sites advice.

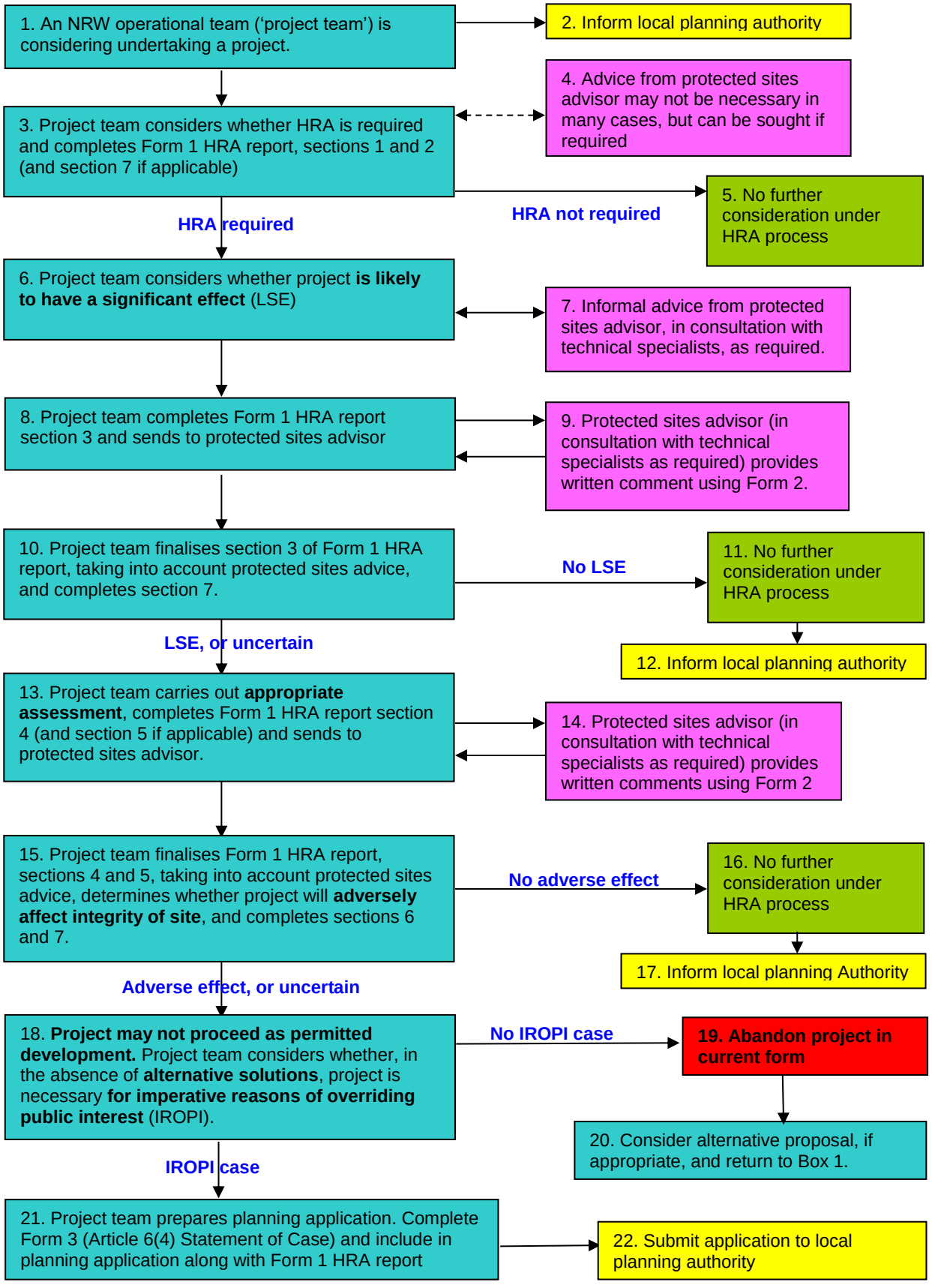
N.3 Therefore NRW should only submit planning applications for projects where an HRA has been completed following steps A to L above (as applicable), or determined as not necessary. The HRA conclusions (or a decision not to carry out an HRA) must either be in accordance with the representations from the relevant protected sites advisors, or have been determined through the escalation process described in section 7.3 below. The planning authority will consult NRW for the purposes of the HRA which it will carry out as the competent authority responsible for determining the application. NRW's representations to the planning authority as the appropriate nature conservation body will in all cases reflect the protected sites advice**, including for a project which has been through the escalation process the outcome of which was a decision by NRW (its competent authority role) which did not accord with the protected sites advice**. Therefore, to avoid putting ourselves in the highly undesirable position of needing to object to our own planning application (in the interests of ensuring that we properly and transparently fulfil our role as appropriate nature conservation body under the Habitats Regulations), every effort should be made to ensure that a project is only taken forward to planning application stage in accordance with the protected sites advice.

O. Process to be followed where a project requires NRW to 'self consent' - see Figure 3(c):

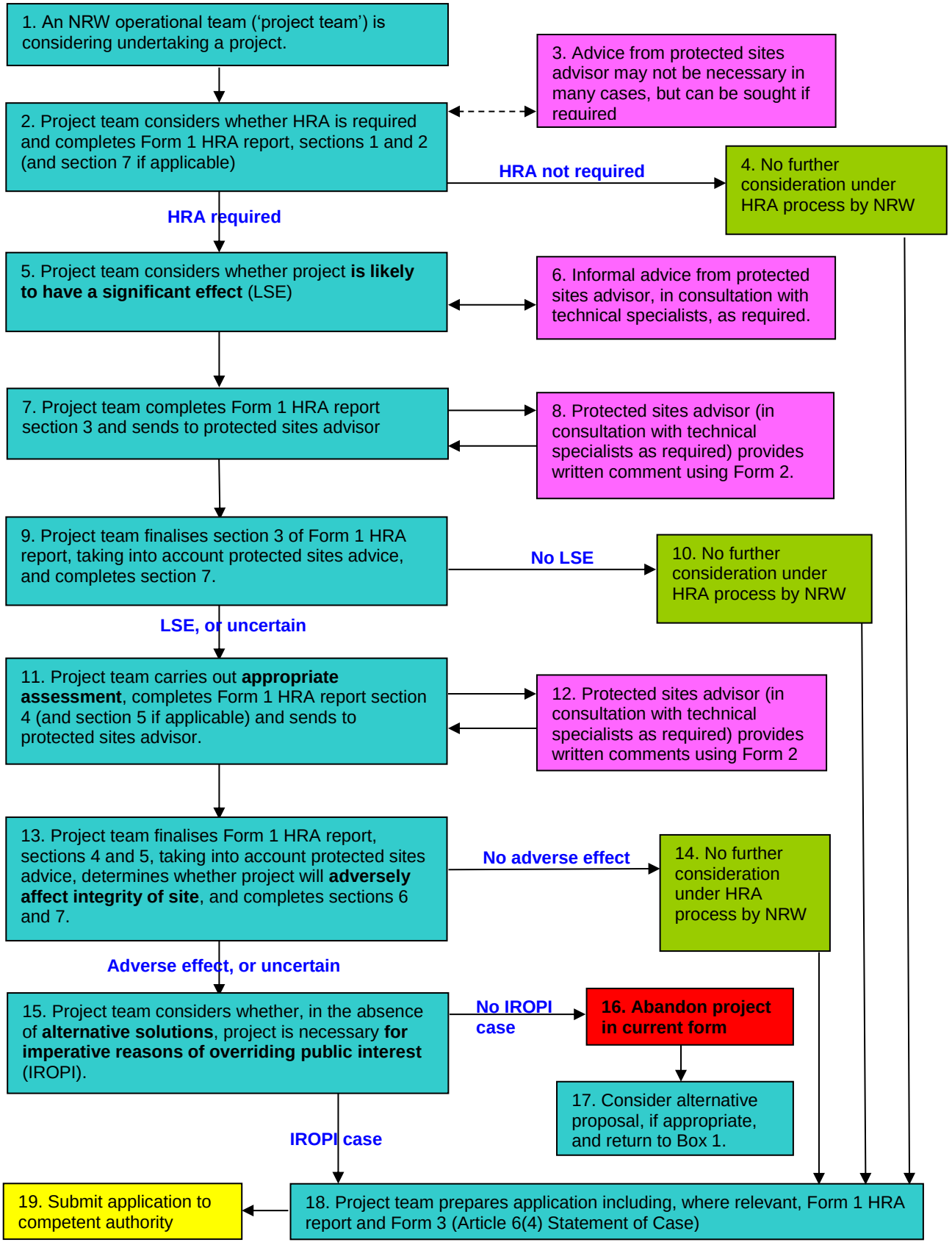
O.1 The Form 1 HRA report should be included as part of any internal applications for NRW-issued permits or consents (following PAB approval if applicable). The permitting team will use this information to prepare their HRA as part of the permitting decision.

O.2 On receipt of an internal application accompanied by a Form 1 HRA report signed off by the project team, the permitting team should consider that report as information to inform their own HRA. If they are satisfied that the Form 1 HRA report properly addresses the potential impact of the project on any Natura 2000 sites, properly reflects any representations made by the protected sites advisors, and comes to the correct conclusion, the permitting team should record that fact and the reasons for it, using **Form 4**, and determine the application accordingly. Otherwise they should complete Form 4 accordingly, seek further information from the project team and protected sites advisor, and complete their own HRA report using Form 1 and following **steps A to I in section 6.2 of this OGN** (i.e. as if it was an application to NRW by an external party).

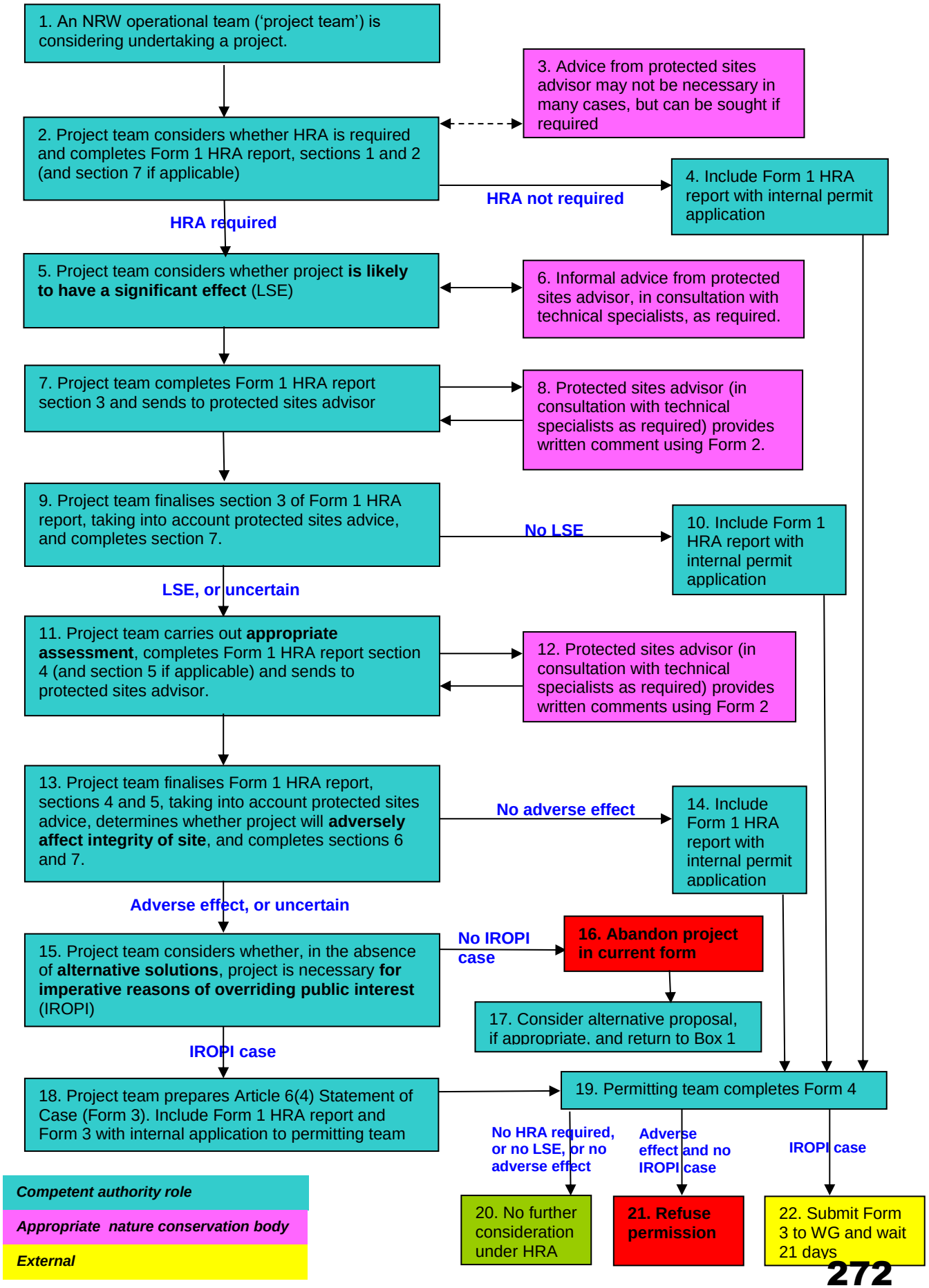
## Figure 3(a): HRA procedure for Category 3 projects: those undertaken by NRW and *which fall under our permitted development rights*



## Figure 3(b): HRA procedure for Category 3 projects: those undertaken by NRW and *which require consent from another competent authority* (e.g. planning permission)



## Figure 3(c): HRA procedure for Category 3 projects: those undertaken by NRW, *which only require us to 'self-consent'*



### 7.3 Where the project team and/or permitting team do not agree with the advice from the protected sites advisor, or where the HRAs conducted by the project team and permitting team reach different conclusions

In most cases, it is expected that the conclusions of the HRAs conducted by the project team (or others preparing HRAs on their behalf, such as EAT or Biodiversity officers in the Natural Resource Management (NRM) teams), and the permitting team will come to the same conclusion, and will reflect the protected sites advice. However, given the separation of roles of competent authority and nature conservation body, in principle it is possible that the project team and/or permitting team and/or protected sites advisors can reach different conclusions. In all cases there is a clear responsibility on the project team and permitting team to demonstrate how they have had regard to the protected sites advice, and this applies particularly if they are minded not to follow that advice. Where the HRA is prepared on behalf of a project team by Biodiversity officers within the Natural Resource Management (NRM) teams in Operations Directorates, it is particularly important that the HRA documents show clearly what the protected sites advice is and how it has been taken into consideration.

In these cases,the protected sites advice documented in Form 2 ahould clearly set out the protected sites advisor's views on the implications of the project for the designated Natura 2000 features concerned, and section 7 of Form 1 should clearly document how that advice has been considered by the project team and permitting team and why the conclusion of the HRA does not reflect that advice. The finalised HRA report should be sent to the protected sites advisor for information.

Where the protected sites advisor does not agree with a conclusion of no likely significant effect or no adverse effect on site integrity, the project team and permitting team should refer the case to their respective Leadership Group managers. The Leadership managers will then consider how to proceed, in discussion with the relevant Leadership manager for the protected sites advisor concerned. They may decide to proceed in a number of ways, including:

- accepting the position of one or other team and instructing the project team and permitting team accordingly;
- convening further discussions between the teams (and involving other technical specialists as appropriate), in an effort to resolve the difference of view;
- asking for the case to be independently reviewed.

The final decision and responsibility for signing off the HRA in these circumstances rests with the Leadership manager of the team exercising the competent authority role. It is not necessary to refer to Leadership unresolved differences of detail or emphasis that would not affect the overall conclusions of the HRA. In these circumstances after reasonable efforts have been made to reach agrement, the project team or permitting team should complete the Form 1 HRA report according to their best judgement.

Where, following the escalation process, the conclusion of the HRA is contrary to the protected sites advice, a brief record of the case should be added to a centrally held register of such cases held on the DMS. This should be done once the Leadership Manager(s) have signed off their teams' final HRAs, even if the final decision on whether to approve the project has not yet been made, and even if approval is subsequently refused or withheld for any reason.

**Click here to open the register**

## 7.4 Procedure for 'IROPI projects'

NRW, as a competent authority, may on occasion wish to take forward projects which, despite a negative outcome of the appropriate assessment (and where the project's adverse effects have been mitigated as far as is reasonably possible), are necessary for imperative reasons of over-riding public interest (IROPI). Provided there are no alternative solutions, and provided that any necessary compensatory measures are secured to ensure that the overall coherence of the Natura 2000 network is protected, such projects may proceed under the derogation allowed by Article 6(4) of the Habitats Directive (as transposed by Regulation 64[12] of the Habitats Regulations).

Where an NRW project does not require any form of permission from another authority, the determination of whether it should proceed for IROPI is a decision for NRW to make, subject to notifying Welsh Government that we are minded to authorise the project. Once WG have been notified we must wait 21 days before giving authorisation unless WG notify us that we may do so. WG may prohibit us from giving authorisation at all, or from doing so within a specified time period.

Where the project constitutes 'development' (as defined under town and country planning legislation) and falls within NRW's permitted development rights, it can only be taken forward as permitted development if the conclusion of NRW's HRA is either that it is not likely to have a significant effect on any Natura 2000 site or, following an appropriate assessment, that it will not adversely affect the integrity of any Natura 2000 site. Otherwise it cannot be taken forward as permitted development and requires NRW to submit a planning application.

Where the project requires NRW to obtain consent from another competent authority (e.g. planning permission), the determination of whether it should proceed for IROPI is a decision for that competent authority to make, again subject to notifying WG that they are minded to authorise the project. Once WG have been notified the competent authority must wait 21 days before giving authorisation unless WG notify them that they may do so. WG may prohibit the competent authority from giving authorisation at all, or from doing so within a specified time period.

There is a substantial amount of guidance on what constitutes IROPI in the various documents referenced in section 4.2 of this OGN. Deciding whether a project satisfies the Article 6(4) tests can be a complex matter, as it involves weighing the harm, or likely harm that the project will have on the Natura 2000 site, against its anticipated benefits, which may be entirely socio-economic, or relate to environmental objectives other than the Natura 2000 site conservation objectives, or a mixture. Where a SAC feature likely to be affected by a project is identified in Annexes to the Habitats Directive as a 'priority' habitat type or species[13], the only reasons which may constitute IROPI are those relating to public

[12] Formerly Regulation 62.
[13] 'Priority' habitat types and species are relevant only in relation to SACs. They do not apply to SPAs or Ramsar sites.

health, public safety, environmental benefits of primary importance, or other reasons which a competent authority considers to be IROPI having sought and had regard to the opinion of the European Commission. If NRW wishes to seek the opinion of the European Commission on whether there are imperative reasons of over-riding public interest, we can submit a request to WG who may then seek the EC's opinion and relay it back to NRW.

A project can only be considered for IROPI if it has undergone an appropriate assessment which has concluded that there will be adverse effects on the integrity of one or more Natura 2000 sites, or that such effects cannot be excluded. Therefore, in all cases, the relevant project team (or the team carrying out the HRA on their behalf) must have completed and signed off an appropriate assessment.

If approval of an NRW-owned project on IROPI grounds is being contemplated, or where NRW needs to submit a planning application for such a project (as described in steps N.1-N.3 above), a detailed 'Article 6(4) Statement of Case' (SoC) covering the tests in Article 6(4) of the Habitats Directive should be prepared by the project team (and permitting team where relevant). A generic template is given in **Form 3**. In practice, completing this form is likely to require the provision of additional information that has not formed part of the HRA up to this point (for example on the availability of alternative solutions, the social or economic importance of the project and the package of compensatory measures). The relevant protected sites advisors should be consulted as required on the potential impact of any alternative solutions, and to advise on the requirements for compensatory measures. In some cases, the likelihood that a project will need to be considered under Article 6(4)/Regulation 62 will be apparent at an early stage in the HRA process. Ideally, the early stages of project inception and discussion with the protected sites advisor (step A above) should identify whether a project is likely to need to progress on grounds of IROPI. In these cases the project team should not wait until the conclusion of the appropriate assessment before starting to assemble the information that will be needed to satisfy the requirements of Article 6(4).

For projects for which NRW is the competent authority and entitled to approve on IROPI grounds, the completed Form 3 SoC should be signed off at Leadership group level, copied to Executive Directors for information, and sent to Welsh Government. Copies should be emailed to both the Biodiversity and Nature Conservation Team and the Marine Conservation and Biodiversity Team in WG. Those teams will liaise, as required, with other WG departments. As noted above, approval for the project may then only be given if either 21 days have elapsed since WG received the SoC, or WG has notified us that we may approve the project. Within that 21 day period WG may prohibit us from approving the project either indefinitely or within a specified time period.

For IROPI projects which require planning permission (including development which cannot be taken forward as permitted development), the completed Form 3 SoC as prepared by the project team (and permitting team where relevant ) should be submitted to the planning authority as part of the planning application (along with the other HRA documents). If the planning authority, after carrying out its own HRA, agrees that the project should proceed for IROPI, they will need to notify WG accordingly, and may use NRW's SoC as the basis for their own submission to WG.

WG is required to inform the European Commission of the compensatory measures taken for projects which are approved on IROPI grounds, and will use the information provided in

the SoC for this purpose. Under the Habitats Regulations, it is WG's responsibility to ensure that any necessary compensatory measures are taken. Therefore, it is important that the notice given to WG using Form 3 contains sufficient information about the compensatory measures. The development of the compensatory measures will in most cases be a substantial task to be carried out before any SoC submission to WG can be made. It is beyond the scope of this OGN to provide guidance on developing compensatory measues, but further guidance may be developed in future.

### 7.5 HRA and 'emergency works'

The following guidance is given in recognition of the fact that NRW may encounter situations where urgent action is needed (for example to protect human life or to prevent damage to property or environmental assets) within a timescale which does not enable any meaningful HRA to be conducted prior to a decision to proceed. However, there are no explicit provisions in the Habitats Directive or Regulations for projects to escape scrutiny under HRA provisions on the grounds that they constitute 'emergencies'. Therefore, notwithstanding the following guidance, wherever possible legal advice should be sought before undertaking any 'urgently needed' project without prior application of the HRA requirements.

Provided the idea of 'emergency' is understood as incorporating **all** three of the following:

- a significant degree of public interest (e.g. protecting human life or health or preventing serious and irreparable damage to property or to natural assets), AND
- urgency of action required to protect those interests, AND
- absence of alternative courses of action capable of protecting those interests

then 'emergency works' can reasonably be considered as a type of IROPI capable in principle of satisfying the tests in Article 6(4) of the Habitats Directive. However, by definition it is not possible to carry out the HRA before the approval for the project can be given. Therefore the best that can reasonably be done in these circumstances is to undertake the operations in a way that causes as little damage as possible, and then to document an HRA retrospectively. This should include establishing as clearly as possible the scale and nature of any adverse effects on site integrity that occurred and to what extent they can be mitigated through further intervention (e.g. habitat restoration works) or through natural regeneration (or a combination of both). In some cases, damage to Natura 2000 features may be only temporary and amenable to rapid restoration, in which case the conclusion of a retrospective HRA could in principle be 'no adverse effect', provided any necessary restoration or reinstatement measures are taken and shown to be effective within a short period of time following the damage. Where rapid restoration or repair is not possible, the retrospective HRA will need to accept that damage has occurred, and to document the lack of alternative solutions to the course of action that was taken, the existence of IROPI that justified the works being undertaken, and what compensatory measures are needed.

## Annex 1
## Key elements of the legal framework for HRA of projects

- **Habitats and Species Directive (Council Directive 92/43/EEC)**
  **Article 6(3)**

  "Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

  **Article 6(4)**

  "If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

  Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

- **Conservation of Habitats and Species Regulations 2017 (SI 2017, No. 1012), the 'Habitats Regulations'**[14]

  These are the main regulations transposing Article 6 of the Habitats Directive in Wales. The full text of the Habitats Regulations is available from the legislation.gov.uk website. The main regulations dealing with the assessment of projects are:

  Regulation 24 (which applies to SSSI consents);

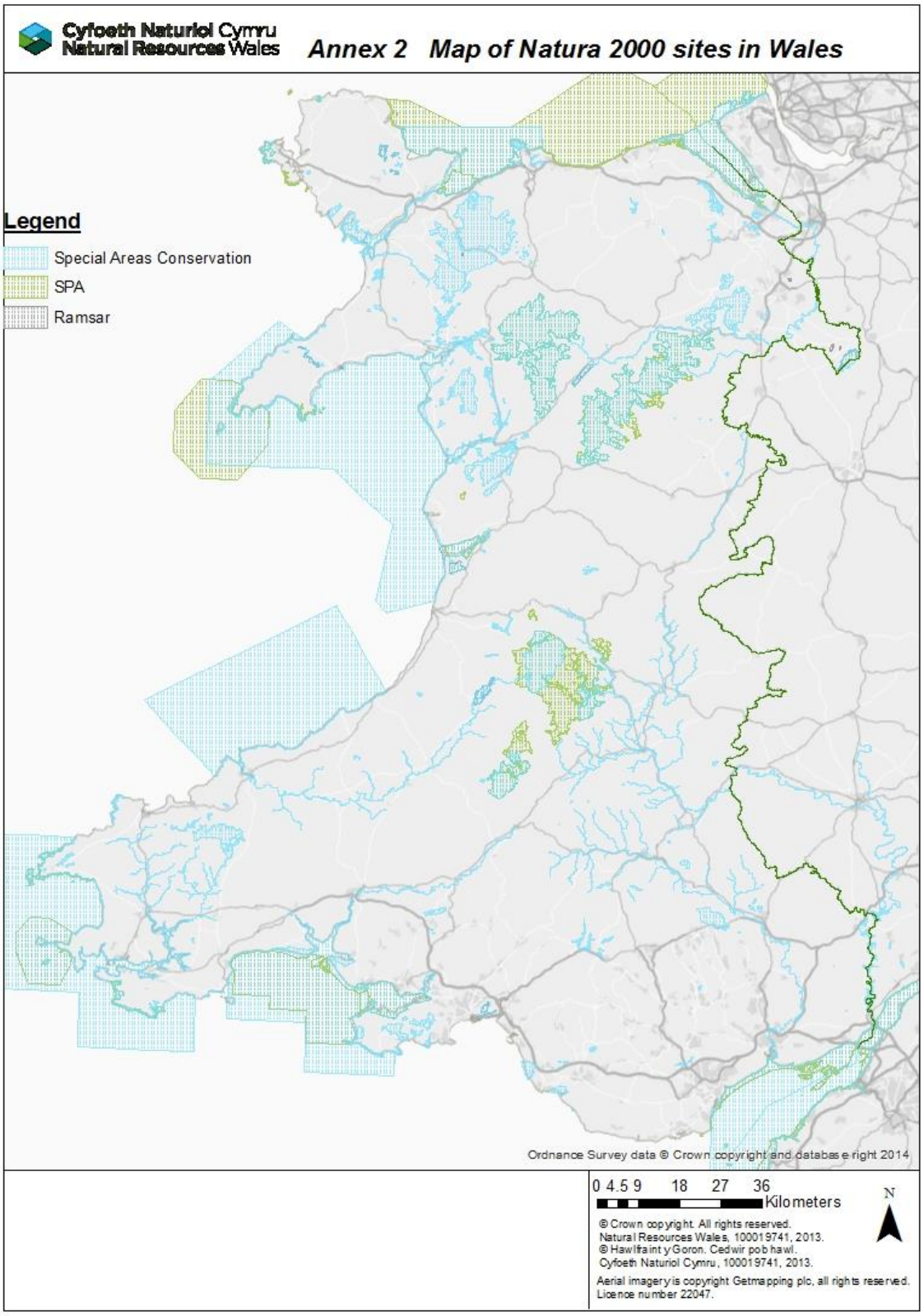
  Regulations 61-69 (which apply to almost all other types of authorisations or decisions to approve projects);

  Regulations 70-104 (which make various additional provisions concerning the assessment requirements for a range of consenting regimes);

[14] These regulations repealed and consolidated the 2010 Habitats Regulations

Regulations 75-78 (which apply to projects that may be carried out under permitted development rights).

## Annex 2
## Map of Natura 2000 and Ramsar sites in Wales



## Annex 3
## NRW legacy body guidelines and procedural instructions that are withdrawn and replaced by this OGN

**This section is currently being developed**

This OGN and its accompanying forms are intended in due course to replace a significant amount of extant legacy body guidance and templates relating to HRA.

However it is recognised that there may be a need for some function-specific guidance documents relating to HRA to be retained, updated and rebranded as NRW operational guidance. This may be the case for example where the legal or practical requirements of a given regime cannot be accommodated within the generic processes described in sections 5, 6 or 7 of this OGN.

The review process required to determine which legacy body HRA guidance/instruction can be withdrawn and which needs to be retained and updated is likely to take some time and require input from the teams and individuals involved.

Therefore users of this OGN are invited to identify any extant guidance or forms whose function is effectively covered by this OGN and which could therefore be withdrawn. Likewise users are invited to identify any function-specific HRA operational guidance which needs to be retained and updated and which could ideally be included in due course as additional Annexes to this OGN.

All suggestions should be emailed to the '**Habs Regs Assessment OGN**' mailbox. The information received will be used to periodically update the list of withdrawn guidance below, and to inform the future preparation of any function-specific Annexes to this OGN.

**If there are any conflicts between this OGN and any legacy body guidance relevant to HRA that has not yet been reviewed or withdrawn, this OGN should take precedence.**

### Guidance and forms which are withdrawn and should no longer be used:

- Conservation screening policy: taking nature conservation into account when screening consents, licenses and Environment Agency works (EA) 2007 - 325_07.doc
- Habitats Directive: Habitats and Species protected under the Habitats Directive - 42_06.doc
- Habitats Directive: Appropriate assessment for new applications - 220_04_SD01.doc
- Former Environment Agency Wales 'Appendix 11' and 'Appendix 12' forms, and any other forms or templates currently in use for recording HRAs (or particular stages thereof). These are all replaced by OGN 200 Form 1. This does not affect any HRAs already recorded on legacy forms and deemed to have been completed (signed off).
- Any forms or standard letters currently in use for providing protected sites advice to inform HRAs carried out by NRW. These are all replaced by OGN 200 Form 2

# Annex 4
# HRA procedure in relation to SSSI consents and 'assents'

## A4.1 SSSI consents issued by NRW to third party land owners/occupiers

SSSI consents are determined by teams in NRW Operations Directorates rather than by the Permitting Service in EPP. As long as these arrangements are retained, the procedural arrangements set out in section 6 of this OGN do not apply.

HRA of applications for SSSI consents is required under Regulation 24[15] of the Habitats Regulations rather than under Regulation 63, which covers all other types of project. Under Regulation 24, where NRW considers that an application from a land owner or occupier for consent to carry out a notifiable operation in an SSSI, is likely to have a significant effect on a SAC or SPA and is not directly connected with the management of that Natura 2000 site for conserving its features, NRW must carry out an appropriate assessment and can only give consent after having ascertained that the project will not adversely affect the integrity of the site. NRW cannot issue consents under Regulation 24 for imperative reasons of over-riding public interest (IROPI). Therefore unless it is determined either that the proposed operation is not likely to have a significant effect on a Natura 2000 site or, following appropriate assessment, that it will not adversely affect the integrity of a Natura 2000 site, consent must be refused.

Applications by SSSI owners/occupiers for consent under section 28E of the Wildlife & Countryside Act are made to the appropriate nature conservation body. For this reason, unlike in Habitats Regulation 63, there is no requirement under Regulation 24 to 'consult the appropriate nature conservation body.' Therefore there is no explicit or implicit statutory requirement to separate out the competent authority and nature conservation body roles in relation to HRA of SSSI consents. In practice therefore, applications for SSSI consent are received and determined by the relevant team in Operations responsible for the site concerned, normally the Natural Resource Management (NRM) team, which also assesses the nature conservation implications of the proposed operations, including in relation to Natura 2000 features where the SSSI is within a SAC or SPA. SSSI consents also require signing off by Conservation Technical Specialists.

Therefore the HRA of an application for SSSI consent should be carried out and recorded by the relevant NRM team, using the form 1 HRA Report section 1(a) and whichever of sections 2 to 6 are relevant. Any references to 'consultation with protected sites advisors' should be disregarded and section 7 of the form deleted. It is of course open to the team carrying out the HRA to seek advice from others, if required, for example specialists in EPP or other Operational teams.

A decision not to carry out an HRA should be recorded, and this can be done either using existing procedures/forms for handling of SSSI notices of intent, or by completing sections 1(a), 2 and 6 of a Form 1 HRA report and deleting the remaining sections. Some SSSI consents are issued to owners/occupiers for carrying out positive management activities

[15] Formerly Regulation 21.

on sites. Where those activities are entirely directed at the conservation management of a site's Natura 2000 features, the HRA requirements (if they are relevant at all) are complied with by determining that the project is directly connected with or necessary for site management, assuming that there are no conflicts between management of the site and the conservation of the features of another Natura 2000 site. In these cases, section 1(a), 2 and 6 of a Form 1 HRA report should be completed and the other sections deleted.

The HRA report (or other record of decision not to carry out an HRA) should be sent to the relevant Conservation Technical Specialist for comment and countersigning (section 8), as part of the process for signing off the SSSI consent itself. An HRA (where required) should not be deemed to have been completed until the Conservation Technical Specialist has confirmed that it is satisfactory.

### A4.2 Applications for SSSI 'assent' under Wildlife & Countryside Act, section 28H (internal and external)

Under section 28H of the Wildlife & Countryside Act (WCA) 1981 (as substituted), a 'section 28G authority' must give notice to the appropriate nature conservation body before carrying out, in the exercise of its functions, operations likely to damage the features of an SSSI. In response to receiving such notice, the nature conservation body may either give its 'assent' to the operations, or say that it does not assent to the operations. Since NRW is itself a section 28G authority, it should apply a similar procedure when proposing to carry out, in the exercise of its functions, operations likely to affect SSSIs. Such applications for 'assent' from operational teams within NRW should be treated in a similar way to applications for NRW assent made by other section 28G authorities.

It is the responsibility of the relevant Natural Resource Management (NRM) team to decide whether to give assent, whether the 'applicant' is another part of NRW or another section 28G authority. In either case, it is not necessary for a decision on whether to issue section 28H assent to be subject to HRA, even where the proposed operations are likely to significantly affect a Natura 2000 site. Responsibility for carrying out the HRA in such circumstances lies with the section 28G authority seeking assent. All section 28G authorities are also competent authorities under the Habitats Regulations, and therefore required under Regulation 63 to apply the HRA provisions to their own operations. Therefore where the project proponent is NRW itself, the relevant operational/project team – not the NRM team - is ultimately responsible for conducting the HRA (noting that they may be supported in this by other teams) and therefore the procedure in **section 7** of this OGN should be followed.

Where the project proponent is another authority (for example a highways authority), unless the project requires some form of statutory authorisation from NRW, that authority is responsible for conducting the HRA and consulting with NRW as the nature conservation body, and **section 5** of this OGN applies. The consultation in such cases should cover both the provision of nature conservation advice in accordance with Regulation 63(3) of the Habitats Regulations, and assent (or the withholding of assent if applicable) under section 28H of the Wildlife and Countryside Act, while making clear the distinction between advice in relation to Natura 2000 features and in relation to SSSI features.

### A4.3 Notifications under Wildlife & Countryside Act, section 28I (internal and external)

Under section 28I of the Wildlife & Countryside Act, a section 28G authority must give notice to the appropriate nature conservation body before issuing any form of permission for operations likely to damage the features of an SSSI, and have regard to the nature conservation body's advice in deciding whether to permit the operations. As with section 28H assents in section A4.2 above, NRW is itself a section 28G authority which issues permissions which may affect SSSIs, so in order to ensure transparency, section 28I should also be applied to NRW's own permitting functions, where they affect SSSIs.

As with section 28H 'assents', the representations, under section 28I, of NRW to another section 28G authority, or of an NRW protected sites advisor to an NRW permitting team, do not themselves constitute a form of permission and are therefore not themselves subject to HRA. Rather they constitute NRW's advice to another authority, or internal advice. Therefore, where another authority is considering issuing any kind of permission and potential impacts on a Natura 2000 site need to be considered, **section 5** of this OGN applies. Where a permitting team in NRW is considering any such application, **section 6** of this OGN applies. In both cases, the protected sites advice should cover both advice under section 28I of the WCA in relation to any impacts on SSSI features, and advice in relation to Natura 2000 impacts under Regulation 63 of the Habitats Regulations, while making clear the distinction between advice in relation to Natura 2000 features and in relation to SSSI features.

## Annex 5
## HRA procedure in relation to consents not determined in National Services

** This section is currently being developed. **

## OGN 200 Habitats Regulations Assessment of Projects

## Form 1
## Record of a Habitats Regulations Assessment for Category 2 or Category 3 projects

**The version of the form below is shown here for information and guidance only. An editable template is available separately on the NRW intranet.**

This form should be used to record HRAs of all **Category 2** and **Category 3** projects. Note that not all sections will be need to be completed in every case, and unused sections of the form should be deleted.

---

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Form

## Record of a Habitats Regulations Assessment of a project

## OGN 200 Form 1

**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | References to the 2010 Habitats Regulations updated to reflect new consolidated version of the regulations which entered into force on 30th November 2017;<br>References to KSP and National Services Directorates updated to EPP |
| 1.2 | 28 June 2018 | With marked up changes in light of ruling in CJEU case c-323/17 'People over Wind'. |
| 1.3 | 27 June 2019 | With marked up changes in light of ruling in CJEU case c-323/17 'People over Wind'. See Interim Guidance here |

**Review Date: April 2019**

## Notes on completing this form

- ***This form should be used for recording all project-level HRAs carried out NRW. It should be read in conjunction with section 6 or 7 (as applicable) of OGN 200.***

- ***All text in blue italic (this colour) throughout this form, including these notes, is guidance on completing the form, and should be deleted when using the form to record an actual HRA. All other text in this template, where relevant to the individual case concerned, should be retained in the record of an HRA.***

- ***The term 'project' covers both operations which are the subject of an application for any kind of permission, and proposed operations to be undertaken by NRW. It also includes statutory orders issued by NRW.***

- ***In this form, the term 'Natura 2000 site' covers SACs, SPAs and, as a matter of Welsh and UK Government policy, Ramsar sites. It also includes proposals for any such sites, or for extensions to existing sites, from the start of a formal public consultation on the proposal agreed to by WG or UK Government.***

- ***Not all sections of this form will need to be completed in every case. Only relevant sections should be completed and irrelevant sections can be deleted. There are guidance notes on this throughout the form.***

- ***If necessary you can insert additional rows in any of the Tables. If any separate documents are to form part of the record of this HRA, they should be clearly referenced at the relevant point(s) in this form.***

- ***There are different stages at which the HRA can be considered to have been completed and can be 'signed off'. In all cases responsibility for signing off the HRA is at the same grade/level as responsibility for approving the project/permission itself. Sections 6 and 7 (whichever applies) of OGN 200 contain further guidance on the circumstances when signing off an HRA should be escalated.***

***Contents***

***Section***

***1. Project details***

***- External applications to NRW***

***- NRW projects***

***2. Determining whether HRA is required***

***3. Test of likely significant effect***

***- Screening of renewals***

***- Identifying likely significant effects***

***4. Appropriate assessment***

***- In the absence of additional conditions or restrictions***

***- Taking into account additional conditions or restrictions***

***5. In combination assessment***

***6. Conclusion***

***7. Record of consultation with protected sites advisors***

***8. Conservation Technical Specialist's comments (only needs to be completed only where HRA sign off and protected sites advice are done by the same team)***

## 1. Project Details

***If this HRA relates to an application by an external party, complete section 1(a), delete section 1(b) and go to section 2.***

***If an NRW team is the proponent/instigator of the project, delete section 1(a), complete section 1(b) and go to section 2.***

| **1(a): Project details where an external party has applied to NRW for any form of authorisation** | |
|---|---|
| **Application reference number (if applicable)** | |
| **Date application received** | ***dd/mm/yyyy*** |
| **Applicant details** | ***Name of applicant*** |
| **Activity proposed** | ***Brief description of the activity for which authorisation is being sought*** |
| **Relevant legislation** | ***Specify the legislation under which the authorisation would be issued***<br>***Also note here any other permissions that are or may be required (from NRW or from other authorities), as far as you are aware*** |
| **Location** | ***As appropriate: name of application site, and/or grid reference, and/or longitude/latitude*** |
| **Application documents** | ***Reference the application documents*** |
| **Environmental Statement** | ***If an ES has been prepared, give reference. Otherwise 'N/A'*** |
| **Pre-application correspondence** | ***Reference any pre-application correspondence between NRW (and/or legacy body if applicable) and the applicant or their agent. Otherwise 'N/A'*** |
| **NRW team responsible for drafting this HRA report, and name of lead officer** | ***Name of team and officer*** |
| **1(b): Project details where NRW is the project proponent/instigator** | |

| | |
|---|---|
| **NRW Project reference** | ***If projects undertaken in the operational area concerned use a referencing system, give it here. Otherwise provide other information identifying unambiguously which project is the subject of this HRA*** |
| **Activity proposed** | ***Brief description of the activity*** |
| **Statutory basis** | ***Identify the statutory function under which this project would be undertaken*** |
| **Location** | ***Identify the location of the project (i.e. site name and /or grid reference and/or longitude/latitude, as appropriate)*** |
| **NRW team responsible for carrying out the project, and name of lead officer** | ***Name of team and officer*** |
| **NRW team responsible for drafting this HRA report, and name of lead officer** | ***This will in all cases be the project team or another team delegated to act on their behalf in carrying out the HRA (e.g. Environmental Assessment Team).***<br><br>***For NRW projects which require an NRW statutory authorisation, the team responsible for issuing that authorisation (normally one of the teams in Permitting Service in EPP) will need to carry out its own HRA, which may require completing its own HRA report in addition to the one completed by the project team. See section 7.1 of OGN 200*** |
| **Project documents** | ***Reference any relevant documents defining what the project is, as required*** |
| **Environmental Statement** | ***If an ES has been prepared, give reference. Otherwise 'N/A'*** |

## 2. Determining the need for a Habitats Regulations Assessment

| | |
|---|---|
| **2.1 Is the whole of the project directly connected with or necessary to the management of one or more Natura 2000 sites, for the purposes of conserving the habitats or species for which the Natura 2000 site(s) is/are designated?** | **Insert 'YES' *or* 'NO'. *Seek advice from protected sites advisors as required.***<br><br>***If Yes, provide brief explanation here and go to row 2.2.***<br><br>***If No, go to row 2.3*** |
| **2.2 Is there a possibility that the project could affect a different Natura 2000 site to the one(s) the project is intended to conserve?** | **Insert 'YES' *or* 'NO'. *Seek advice from protected sites advisors as required.***<br><br>***If YES, go to row 2.3.***<br><br>***If NO, HRA is not required. Strike out section 2.3, delete sections 3, 4, and 5 of the form and complete section 6. If any protected advice has been sought, complete section 7, and section 8 if applicable.*** |
| **2.3 Is it necessary to carry out an HRA?** | **'Insert 'YES' *or* 'NO'**<br><br>***If YES, go to section 3 of the form***<br><br>***If NO, provide brief explanation (e.g. no conceivable impact on any Natura 2000 site, by virtue of the scale or location or nature of the project), delete sections 3, 4, and 5 of the form and complete section 6. If any protected advice has been sought, complete section 7, and section 8 if applicable.***<br><br>***NB Screening of permit renewals on the same or more restrictive terms should be dealt with by answering 'YES' here, and completing section 3.1 of this form*** |

## 3. Considering the likelihood of a significant effect (LSE)

***The first stage of an HRA is a test of Likely Significant Effect (LSE), which is a 'screening' assessment to determine if an appropriate assessment is required.***

***Unless the LSE test enables significant effects on any Natura 2000 site to be ruled out, the project will need to be subject to an appropriate assessment.***

***The legislation requires consideration of plans and projects "either alone or in combination with other plans and projects". The test of likely significant effect is initially carried out by considering the proposal on its own (i.e. rather than in-combination with other plans or projects). If it is decided that the proposal alone is likely to have a significant effect, it is subject to appropriate assessment alone. An assessment in combination with other plans projects is only required if the proposal would be insignificant on its own, but has effects which may be significant if combined with the effects of other plans/projects which are also insignificant on their own. This is dealt with further in section 5.***

***When carrying out HRA of an application for consent of any kind, the LSE test is based on the application as submitted. If ~~additional~~ conditions or restrictions~~, not already incorporated into the specifications of the project,~~ would be needed to remove the risk of significant effects, the project should undergo an appropriate assessment.*** [16]

### 3.1 Renewal of a permission on the same or more restrictive terms as the extant permission

| | |
|---|---|
| **Is this project a renewal of a current permission which complies with NRW approved criteria for ruling out significant effects of renewals (see section 6.2A of OGN 200) without conducting a project-specific LSE test?** | ***Insert 'YES' or 'NO'***<br><br>***Seek advice from protected sites advisors if required.***<br><br>***If YES, reference the documentation which establishes those criteria and which confirms that this project complies with them. Delete sections 3, 4, and 5 of the form and complete section 6. If any protected advice has been sought, complete section 7, and section 8 if applicable.***<br><br>***If NO, go to section 3.2.*** |

[16] Highlighted text deleted in light of CEU ruling in case C-323/17 'People over Wind'.

## 3.2 Likelihood of significant effects (LSE) test

***Unless it has been established that the project does not need HRA (section 2) or that it is a renewal of a current permission for which LSE can be ruled out (section 3.1), the relevant protected sites advisor should always be consulted, and their advice taken into account, in completing sections 3.2.1 and 3.2.2 below. Their written advice (Form 2) should be appended to this form, and section 7 of this form completed.***

| | |
|---|---|
| **3.2.1 Which Natura 2000 sites might be affected by the proposal?** | ***Consult protected sites advisors***<br><br>Based on the project specification or information provided in the application, it is considered that the following Natura 2000 sites have features which could be affected by the project:<br><br>***Insert Natura 2000 site name(s) and standard Natura site code(s), if known.***<br><br>The potential for the project to affect the following Natura 2000 sites was also initially considered, but can be ruled out without further consideration:<br><br>***List any other Natura 2000 sites initially considered but immediately ruled out. If no sites other than those listed above were considered, put 'N/A' here.***<br><br>***Go to section 3.2.2.*** |

### 3.2.2 Screening assessment

***The screening assessment should indicate the possible pathways through which the project may impact upon relevant Natura 2000 site features. Each designated feature (taken from the official Natural 2000 designation documents) should be recorded in the left hand column below. If more than one Natura 2000 site is identified from section 3.2.1, deal with each Natura 2000 site separately.***

***The assessment should be made in view of the conservation objectives for the Natura 2000 site(s) concerned, as set out in either the current NRW Core Management Plan for a terrestrial Natura 2000 site, or in NRW's extant advice issued under Regulation 35 (now 37) of the Conservation of Habitats and Species Regulations 2010 (now 2017) for a marine Natura 2000 site.***

***Colour coding should be used in the 'impact pathway' column II as follows:***

***There is no impact pathway from the proposal to the designated feature***
***There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out***
***There is an impact pathway and significant effects cannot be ruled out***

***Examples of types of impact pathways that may be relevant:***

- ***Direct capture, damage or harm to a designated species feature***
- ***Damage to a designated habitat feature (including through direct physical impact, pollution, changes in thermal regime, hydrodynamics, light, etc.)***
- ***Damage to the habitat of designated species features (including through direct physical impact, pollution, changes in thermal regime, hydrodynamics, light, etc.)***
- ***Damage to a designated habitat feature via removal of, or other detrimental impact on, typical species***
- ***Removal of prey species of a designated species feature***
- ***Damage to habitat of prey species***
- ***Indirect effects on habitats and species***

***Note that several impact pathways may be relevant to the same designated feature***

| | Assessment of likelihood of significant effect | | |
|---|---|---|---|
| | **I**<br>**Relevant conservation objectives**<br>*Reference relevant conservation objectives from Natura 2000 site Core Management Plan, or NRW* | **II**<br>**Potential impact pathway**<br>*For each row assign appropriate colour (as above) and give short explanation as required* | ~~**III**~~<br>~~**Avoidance measure**~~<br>~~*Briefly describe any measures* **included within the project at this point** *that will ensure that the potential effects are avoided,*~~ |

| | | | |
|---|---|---|---|
| | *Regulation 35/37 advice (as applicable)* | | *~~are not significant or are not likely to occur. If none, put~~ ~~'N/A'~~ In light of the ruling of the CJEU in case C-323/17 'People over Wind', avoidance measures should not be considered at this stage of HRA, so this column is left blank.* |
| ***Name of Natura 2000 site*** | | | |
| ***Designated feature 1*** | | | |
| ***Designated feature 2*** | | | |
| ***...etc*** | | | |
| ***Name of Natura 2000 site*** | | | |
| ***…etc*** | | | |

| **3.2.3 Screening decision of the project 'alone'** | |
|---|---|
| **(a) If ALL rows in column II of Table 3.2.2 are GREEN** | The project is not likely to have a significant effect on any Natura 2000 site, because there is no impact pathway from the project to any Natura 2000 features, and no further consideration under the Habitats Directive/Regulations is required in order to determine the application.<br><br>***Strike out rows (b) and (c) below, delete sections 4 and 5 of the form and complete sections 6 and 7 (and section 8 if applicable).*** |
| **(b) If there are NO rows coloured RED in column II of Table 3.2.2, and there are ANY rows which are BLUE** | The project is not likely to have a significant effect on any Natura 2000 sites when considered alone, but the possibility of significant effects in combination with other plans and projects needs to be considered.<br><br>***Strike out row (a) above and row (c) below, delete section 4 of the form and go to Section 5.*** |
| | |

| | |
|---|---|
| **(c) If ANY rows in Column II of Table 3.2.2 are RED** | The project is likely have a significant effect on one or more Natura 2000 sites and therefore an appropriate assessment is required.<br><br>***Strike out rows (a) and (b) above, and go to section 4 of the form. If there also are any BLUE rows, list them in Table 5.1 below (we'll come back to them in the in-combination assessment)*** |

## 4. Appropriate assessment of the project when considered alone

***Tables 4.1 and 4.2 should document the appropriate assessment for the project. The two left hand columns should list the designated features and the impact pathways identified in RED from section 3.2.2 above, where likely significant effects are anticipated or cannot be ruled out. Any features recorded in section 3.2.2 as green should not be considered further. Any features recorded in section 3.2.2 as blue should not be considered at this stage, but only in section 5.***

***Table 4.1 should first consider the potential impact of the project as currently defined and in the absence of any ~~additional~~ mitigating measures, conditions or restrictions that may be applied ~~but are not currently included as part of the proposal~~. Table 4.2 should then consider ~~additional~~ measures to mitigate any adverse effects.[17]***

***Table 4.1, and 4.2 if applicable, MUST be completed having sought and had regard to the advice of the relevant protected sites advisor, and section 7 of the form must be completed.***

### 4.1 Assessment of project as currently defined

| Natura 2000 site feature (from Table 3.2.2 – RED rows only) | Impact pathway(s) (from Table 3.2.2) | Description of impacts | Assessment in view of conservation objectives | Can adverse effect on site integrity be ruled out? 'YES' or 'NO'* |
|---|---|---|---|---|
| ***Natura 2000 site name*** | | | | |
| ***Feature 1*** | | | | |

[17] Highlighted text deleted in light of CEU ruling in case C-323/17 'People over Wind'.

| | | | | |
|---|---|---|---|---|
| ***Feature 2*** | | | | |
| ***…etc*** | | | | |

**** If it is not known whether adverse effect can be ruled out, record 'NO' in the right hand column***
***If any rows in the right hand column are 'NO' go to section 4.2***
***If all adverse effects can be ruled out without the need for additional mitigation (i.e. the right hand column is 'YES' in all rows) go to section 4.3***

## 4.2 Assessment of the project taking into account ~~additional~~ mitigating measures, conditions or restrictions[18]

| Natura 2000 Feature (from Table 4.1 – 'NO' rows only) | Description of adverse effect(s) | Can adverse effect(s) be mitigated? *Insert* 'YES' *or* 'NO'* | Description of mitigation measures, and how they would be applied (e.g. contractual obligations, consent conditions) *If required, further details can be provided in separate clearly referenced documents.* | Can adverse effect on site integrity be ruled out? *Insert* 'YES' *or* 'NO' * |
|---|---|---|---|---|
| ***Feature 1*** | | | | |
| ***Feature 2*** | | | | |
| ***…etc*** | | | | |

**** If it is not known whether adverse effects can be mitigated, or whether adverse effect on site integrity can be ruled out, insert 'NO'***

***In all cases, go to section 4.3***

[18] Highlighted text deleted in light of CEU ruling in case C-323/17 'People over Wind'.

### 4.3 Concluding the appropriate assessment of the project alone

| | |
|---|---|
| **(a) If the right hand column of Table 4.1 and Table 4.2 (if applicable) is 'YES' for all features** | It has been ascertained that the proposal, when considered alone, will not adversely affect the integrity of any Natura 2000 sites.<br><br>***Strike out row (b) below and go to row (c)*** |
| **(b) If there are any 'NO's in the right hand column of Table 4.1 that have not been resolved to 'YES' through mitigation measures identified in Table 4.2** | It has not been ascertained that the proposal, when considered alone, will not adversely affect the integrity of one or more Natura 2000 sites.<br><br>***Strike out row (a) above and row (c) below, delete section 5 of the form and complete sections 6 and 7, and section 8 if applicable*** |
| **(c) Are there any residual effects of the project (net of any mitigation measures identified) which, though insignificant on their own, could be significant if considered in combination with the effects of other plans or projects?** | ***Insert 'YES' or' NO'***<br><br>***If 'YES' go to section 5 of the form***<br><br>***If 'NO' delete section 5 of the form and complete sections 6 and 7, and section 8 if applicable*** |

## 5 In combination assessment

### 5.1 Identifying possible in combination effects

***This section covers the in combination assessments for both the LSE test and the appropriate assessment.***

***The other plans or projects which should be considered for potential in-combination effects with the proposal under consideration are any of the following whose effects could interact with the residual (i.e. insignificant when considered alone) effects of the project described in section 1 of this form, for example by adding to or magnifying its effects, or by making a habitat or species feature more sensitive its effects.***

- ***projects started but not yet completed***
- ***projects consented but not started***
- ***ongoing projects subject to repeated authorisations (e.g. annual licences)***
- ***applications lodged but not yet determined***
- ***refusals subject to appeals procedures not yet determined***
- ***projects not requiring consent but which have been approved by the competent authority concerned***
- ***proposals in adopted plans***
- ***proposals in draft plans published for consultation***
- ***allocations or other forms of proposals in adopted development plans***
- ***allocations or other forms of proposals in draft development plans published for consultation***

***Do not include projects which have not yet been applied for, unless the project is well defined and there are solid reasons for believing that it will be taken forward. Do not include completed projects. Consult with protected sites advisors and others as required.***

***In the left hand column of the table below you should list, as applicable:***

- ***Any impact pathways recorded as BLUE in section 3.2 of this form (no LSE alone but potential for LSE in combination); and***
- ***Any residual effects from section 4.3 (no adverse effect alone, but residual effect may be significant).***

| **BLUE impact pathway from Table 3.2**<br><br>**and/or**<br><br>**Residual effect (from appropriate assessment in section 4)** | **Natura 2000 site feature(s) concerned** | **Other plans/projects with effects that might interact with the effects of the project to render its effects significant (if any)**<br>***If none, put 'N/A'*** | **Nature of the in-combination effect (if any)** | **Is there likely to be any significant in-combination effect, in view of the site's conservation objectives?**<br>***Insert 'YES' or 'NO' or 'DON'T KNOW'*** |
|---|---|---|---|---|
| | | | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

| | |
|---|---|
| **(a) If the right hand column is 'NO' for all rows** | The project, when considered in combination with other plans and projects, is either not likely to have a significant effect on, or will not adversely affect the integrity of any Natura 2000 site.<br><br>***Strikeout option (b) below, delete section 5.2 and complete sections 6 and 7, and section 8 if applicable.*** |
| **(b) If any rows in the right hand column are 'YES' or 'DON'T KNOW'** | The project is likely to have a significant effect in combination with other plans or projects.<br>***Strikeout option (a) above and go to section 5.2*** |

## 5.2 Addressing in-combination effects

| **In combination effect**<br>***List any 'YES' or 'DON'T KNOW' impacts from the right hand column of the table in section 5.1*** | **Describe any conditions, restrictions or other measures, if any, applicable to the subject project, and/or to the other plans/projects giving rise to the in combination effect, which could remove the risk of adverse effects on the Natura 2000 site features. Include details of how such measures would be applied, and who would be responsible for applying them.**<br>***If required, further details can be provided in separate clearly referenced documents.*** | **Taking into account any additional measures identified and how they would be applied, can adverse effects on site features from in-combination effects be ruled out?**<br>**'YES' *or* 'NO' *or* 'DON'T KNOW'** |
|---|---|---|
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| **(a) If the right hand column is 'YES' in all cases** | It can be concluded that the project will not adversely affect the integrity of any Natura 2000 sites, either alone or in combination with other plans or projects.<br><br>***Strike out option (b) below and complete sections 6 and 7, and section 8 if applicable.*** | |
| **(b) If any row is 'NO' in the right hand column** | It cannot be concluded that the project will not adversely affect the integrity of any Natura 2000 sites, when considered in combination with other plans or projects.<br><br>***Strike out option (a) above and complete sections 6 and 7, and section 8 if applicable.*** | |

## 6. Conclusion

***Where the conclusion is in accordance with the protected sites advice, this section should be completed by the team or individual responsible for carrying out and recording the HRA. This will normally be the same as the team/individual responsible for determining the permission or otherwise approving the project, unless responsibility for preparing the HRA has been delegated to another team (e.g. EAT or one of the NRM teams).***

***Where the HRA has been subject to an escalation process, due to significant unresolved differences of view between the protected sites advisors and the team preparing the HRA, this section of the form should be completed by the relevant Leadership Manager (see sections 6.3/7.3 of OGN 200). Any additional documents or correspondence forming part of the escalation process should be appended to this form, or reported in section 7.***

***Select which of the following conclusions applies by placing an X the right hand column. Only ONE option can apply. Sign and date the bottom of the table.***

| | |
|---|---|
| **HRA is not required because the whole of the project is directly connected with or necessary to the management of one or more Natura 2000/Ramsar sites, for the purposes of conserving the habitats or species for which the site(s) is/are designated, and the project is not likely to have a significant effect on any other Natura 2000/Ramsar sites.<br>(As documented in section 2.1 and 2.2 of this form)** | |
| **HRA is not required because there is no conceivable impact pathway to any Natura 2000/Ramsar site<br>(As documented in section 2.3 of this form)** | |

| | |
|---|---|
| | |
| **This project is a renewal of a current permission which complies with NRW agreed criteria for ruling out significant effects of a renewal without conducting a project-specific LSE test. Therefore it is considered not likely to have a significant effect on any Natura 2000/Ramsar sites, either alone or in-combination with other plans and projects.**<br>**(As documented in section 3.1 of this form)** | |
| **The project has been screened for likelihood of significant effects and, taking account of the advice received from protected sites advisors, is considered not likely to have a significant effect on any Natura 2000/Ramsar site**<br>**(As documented in section 3.2 of this form, or section 5 if applicable)** | |
| **In light of the conclusions of an appropriate assessment, and taking account of the advice received from protected sites advisors, it has been established that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects.**<br>**(As documented in section 4 of this form, and section 5 if applicable)** | |
| **In light of the conclusions of the appropriate assessment, it has <u>not</u> been ascertained that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, as documented in section 4 of this form, and section 5 is applicable.**<br><br>**Approval for the project <u>cannot</u> be given unless either:**<br>• **the project specification, and/or the terms under which it might be approved, are modified so as to remove the risk of adverse effects, and a revised HRA report is prepared, or**<br>• **the project satisfies the requirements of Article 6(4) of the Habitats Directive, an Article 6(4) Statement of Case is prepared (OGN 200 Form 3) and submitted for consideration by the appropriate authority, normally Welsh Ministers** | |
| **Signed:**<br><br>**Name:** | |

| |
|---|
| **Position:**<br><br>**Date:** |

## 7. Consultation with protected sites advisor(s) and how sections 2, 3, 4 and 5 of this HRA report (as applicable) take into account that advice.

***Delete any rows that do not apply.***

| Relevant section of the HRA report | Date(s) of correspondence* and any meeting(s) with protected sites advisor(s) | Description of how the comments from protected sites advisors have been taken into account |
|---|---|---|
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |

***Attach copies of all written representations (Form 2) received from protected sites advisor(s)***

## 8. Conservation Technical Specialist's comments

***This section should be completed in any cases where the protected sites advice and sign off of the HRA report (section 6) is within the same team. Otherwise this section should be deleted.***

I have reviewed the HRA documented in this form and confirm that I agree/do not agree* with its findings.
(*strike out as applicable)

**Additional comments (if any):**

**Signed:**

**Name:**

**Position:**

**Date:**

## OGN 200 Habitats Regulations Assessment of Projects

## Form 2
## Provision of nature conservation advice for Category 2 and Category 3 projects

**The version of the form below is shown here for information and guidance only. An editable template is available separately on the NRW intranet.**

For any **category 2** or **category 3** projects where protected sites advice is sought, this form should be completed by the officer (usually in the relevant Natural Resource Management team responsible for the Natura 2000 site concerned) preparing or coordinating the protected sites advice, and sent to the officer preparing the HRA, who should ensure that the advice is taken into account in completing sections 2, 3, 4 and 5 (whichever are applicable) of the Form 1 HRA report. All Form 2s relating to a particular project should be appended to the Form 1 HRA report.

---

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Form

## Protected sites advisor response to an internal consultation on the Habitats Regulations Assessment of a project

## OGN 200 Form 2
**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | Minor changes only |

**Next review date: April 2018**

## Protected sites advisor response to an internal consultation on the Habitats Regulations Assessment of a project

**TO:** [*name of officer in team carrying out the HRA]*

**FROM:** [*name of protected sites advisor and team]*

**SUBJECT:** Habitats Regulation Assessment of [*title/brief description of project and reference number if applicable*]

Thank you for consulting [*name of relevant team*] on the above project and sending us a copy of the draft Form 1 HRA report dated [*date*]. Our comments are as follows:

*Insert all comments here, which should be as concise or detailed as required.*

*If appropriate, this section could simply note that the HRA report has already been drafted with input from the protected sites advisor and confirm that the protected sites advisor agrees with the content and conclusions of the HRA report. Otherwise any outstanding comments on the content or conclusions of the HRA report should be noted here.*

*If necessary this form may be used more than once (for example if protected sites advice is sought on successive versions of a draft HRA report)*

Signed:

Date:

## OGN 200 Habitats Regulations Assessment of Projects

## Form 3
## Article 6(4) Statement of Case

**The version of the form below is shown here for information and guidance only. An editable template is available separately on the NRW intranet.**

A completed version of this form should be used to notify Welsh Government when NRW are considering giving approval to a **Category 2** or **Category 3** project under Article 6(4) of the Habitats Directive, namely where an appropriate assessment has been carried out, adverse effects on the integrity of one or more Natura 2000 sites are anticipated (or cannot be ruled out), we consider that there are no alternative solutions and that the project must be carried out for imperative reasons of over-riding public interest (IROPI), and compensatory measures have been identified.

This form should also be used to provide information in support of an application by NRW for planning permission for a project we wish to undertaken but which in our opinion needs to be approved on IROPI grounds.

---

Cyfoeth Naturiol Cymru
Natural Resources Wales

Form

## Notice to the Welsh Ministers under Regulation 64(5)(a) of the Conservation of Habitats and Species Regulations 2017

## OGN 200 Form 3
**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | References to the 2010 Habitats Regulations updated to reflect new consolidated version of the regulations which entered into force on 30th November 2017;<br>References to KSP and National Services Directorates updated to EPP |

**Next review date: April 2018**

## Notice to the Welsh Ministers under Regulation 64(5)(a) of the Conservation of Habitats and Species Regulations 2017

In accordance with Regulation 64(5)(a) of the Conservation of Habitats and Species Regulations 2017,Natural Resources Wales hereby notifies the Welsh Ministers, as the appropriate authority under the Regulations, that we propose to approve the plan/project described below, notwithstanding a negative assessment of its implications for one or more Natura 2000 sites.

We look forward to receiving any views or instructions from the Welsh Ministers on this matter.

**Signed**:

**Name:** [*insert name of relevant Leadership Group member*]

**Position:** [*insert job title*]

**Date:** [*dd/mm/yyyy. Insert the date on which this form is emailed to WG (Biodiversity & Nature Conservation Team / Marine Conservation & Biodiversity Team). NB This is the date on which the 21 day period of statutory notice will start*]

### 1. THE PLAN/PROJECT

**Name/title of the plan/project:**

*Include sufficient information to unambiguously identify the plan/project, e.g. including NRW reference number (if applicable), type of application etc*

**Promoted by:**

*Give name of proponent of the plan/project, i.e. the person, organisation or department within NRW seeking approval*

**Summary of the plan/project:**

*Give a brief description of the plan/project, including its nature, location (map(s) as appropriate) and main potential impacts. Attach maps/supporting documents as appropriate.*

## 2. ASSESSMENT OF NEGATIVE EFFECTS ON HABITATS OR SPECIES OF NATURA 2000 SITES

**Natura 2000 site(s) affected:**

*Give the name and EU site code of all Natura 2000 sites likely to be adversely affected and specify whether each affected site is:*

- *an SPA under the Birds Directive*
- *a SCI or SAC under the Habitats Directive*
- *a SCI or SAC hosting a priority habitat type or species*
- *whether any priority habitat/species are negatively affected by the plan/project*

**Site conservation objectives:**

*Summarise the conservation objectives of the Natura 2000 site(s) concerned*

**Habitats and/or species adversely affected:**

*Identify precisely the designated habitats and/or species that will be adversely affected (by reference to the qualifying features as recorded on official designation documents for the Natura 2000 site(s) concerned)*

*For each habitat/species indicate, as applicable: its representativity; its conservation status according to the most recent Article 17 report; degree of isolation; role and function in the site concerned).*

*Indicate the importance of the Natura 2000 site(s) concerned for the habitats and species affected (e.g. explain the role of the site within the national and biogeographical region and in the coherence of the Natura 2000 network).*

**Adverse effects expected:**

*Describe the adverse effects expected (e.g. loss, deterioration, disturbance, direct and indirect effects, etc.); extent of the effects (habitat surface and species numbers or areas of occurrence affected by the project); importance and magnitude (e.g. considering the affected area or population in relation to the total area and population in the site, and possibly in the region/country) and location (include maps as necessary). Describe potential cumulative impacts and other impacts likely to arise as a result of the combined effect of the plan/project under assessment and other plans or projects*.

**Mitigation:**

*Describe any mitigation measures included in the project (indicate how these will be secured and implemented and how they will avoid or reduce negative impacts on the site).*

## 3. ALTERNATIVE SOLUTIONS

*Identify and describe the possible alternative solutions considered, including the 'zero option' and indicate the procedure/method by which these were identified. Provide an evaluation of the alternative solutions considered and a justification of the option chosen. Give clear reasons why NRW has concluded that there are no alternative solutions.*

## 4. IMPERATIVE REASONS OF OVERRIDING PUBLIC INTEREST

*Describe what are the reasons for undertaking this plan/project despite a negative assessment of its implications for a Natura 2000 site(s), and provide justification for why those reasons are considered to be:*

- *imperative, and*
- *matters of public interest, and*
- *overriding*

*If priority habitats or species are affected by the plan/project (i.e. rather than where the Natura 2000 site(s) concerned hosts priority habitats/species but they are not affected), state which of the following public interests the reasons relate to:*

- *human health*
- *public safety*
- *beneficial consequences of primary importance for the environment*
- *other imperative reasons of overriding public interest (describe what these are)*

## 5. COMPENSATORY MEASURES

*This section should provide as complete an overview as possible of the compensatory measures to be taken, covering the following areas::*

*Objectives, target features (habitats and species) and ecological processes/functions to be compensated*

*Extent of the compensatory measures (e.g. surface area of habitats to be created, population numbers of species enhancement measures)*

*Location of compensatory areas (including maps)*

*Current status and conditions in the compensatory areas (existing habitats and their condition, relevant legal status/land ownership, type of land, existing land uses, etc.)*

*Expected results and explanation of how the proposed measures will compensate the adverse effects on the integrity of the site and will allow preserving the coherence of the Natura 2000 network*

*Time schedule for the implementation of the compensatory measures (including long-term implementation), indicating when the expected results will be achieved.*

*Methods and techniques proposed for the implementation of the compensatory measures, evaluation of their feasibility and possible effectiveness*

*Costs and financing of the proposed compensatory measures*

*Responsibilities for implementation of compensatory measures*

*Monitoring of the compensatory measures, where envisaged (e.g. if there are uncertainties concerning the effectiveness of the measures), how monitoring data will be assessed, what follow-up measures will be taken, etc)*

## OGN 200 Habitats Regulations Assessment of Projects

## Form 4
## Internal application for an NRW permission - Habitats Regulations Assessment by Permitting Service, EPP

**The version of the form below is shown here for information and guidance only. An editable template is available separately on the NRW intranet.**

This form should be completed by the relevant permitting team in EPP for all internal applications (**Category 3 projects**) which are accompanied by a Form 1 HRA report prepared by, or on behalf of, the NRW team making the application. If no HRA report has been provided, it will almost certainly be because the project team does not consider there to be any implications for any Natura 2000 sites. Permitting teams should in all such cases satisfy themselves that this is the case.

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Cyfoeth Naturiol Cymru
Natural Resources Wales

# Form

## Internal application for an NRW permission:
## Habitats Regulations Assessment by Permitting Service, EPP

## OGN 200 Form 4
**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | Minor changes only |

**Next review date: April 2018**

## Internal application for an NRW permission:
## Habitats Regulations Assessment by Permitting Service, EPP

**APPLICANT:** [*name of NRW project team and/or lead NRW officer*]

**TYPE OF PERMISSION:** [*type of permission being applied for*]

**PROJECT DETAILS:** [*NRW project reference (if applicable) and title/brief description*]

**APPLICATION DATE**: [*date application received by permitting team*]

**PERMITTING TEAM:** [*name of team responsible for determining the application*]

*Strike out whichever of the following paragraphs do not apply:*

1. We have carefully considered the Form 1 HRA report provided with this application, and we consider that it adequately addresses the potential implications for any Natura 2000 or Ramsar sites affected by the project. We note that, where relevant, the necessary consultation has taken place with the relevant protected sites advisor(s) and that their representations have been properly taken into account. On this basis, we adopt the reasoning and conclusions of the HRA report provided. Any additional comments are noted below.

2. We have carefully considered the HRA report provided with this application, and we are not satisfied that it adequately addresses the potential implications for Natura 2000 or Ramsar sites. Our main reasons for this are summarised below. We have carried out an HRA which is recorded in the attached HRA report. [*attach a completed Form 1 HRA report*]

3. We note that no HRA report has been provided with this application and we are satisfied that the project does not require an HRA. Any additional comments are noted below.

Signed:

Date:

**Additional comments by the permitting team:**

*Insert any additional comments here, including, if applicable, a summary of why the permtting team does not agree with the HRA report submitted by the project team.*

*If there are no additional comments, put N/A.*

## Lillywhite, Charlotte

**From:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>
**Sent:** 19 September 2019 13:10
**To:** Permit Receipt
**Subject:** New Authorisation Penarth Feeder (CRT_286) Swansea, Llangollen & Montgomery (2 of 4)
**Attachments:** WRH_CRT286_Penarth Feeder SIGNED.pdf; CRT286_Supporting Information.pdf; Letter of Authorisation- NRW.pdf

Good afternoon,

Please find the following documents for our transfer application for Penarth Feeder which forms part of the Swansea, Llangollen & Montgomery batch of feeders (2 of 4) –

- Form WRH
- Supporting information
- Letter of authorisation

As with our other applications, we wish to pay as a batch via BACS. Please could you email me confirming receipt of the batch of applications and the fee (expected to be £6000) which I can forward to our finance team for payment. If possible, please can this email be sent before 12pm on Monday 23rd September as payment can be arranged to be sent on Tuesday 24th September. Otherwise, payment will be sent the following Tuesday.

Kind regards,

Emily

**Emily Harris BSc (hons), MSc, MCIWEM, C.WEM, CEnv, CSci**
Project Manager
People's Champion Representative

**Please note**: I work a four day week, I do not work on Wednesdays

**Mobile:** 07717691368

Please visit our website to find out more about our 10 year strategy.

**Keep in touch**
Sign up for the Canal & River Trust e-newsletter https://canalrivertrust.org.uk/newsletter
Become a fan on https://www.facebook.com/canalrivertrust
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Canal & River Trust is a charitable company limited by guarantee registered in England & Wales with company number 7807276 and charity number 1146792. Registered office address First Floor North, Station House, 500 Elder Gate, Milton Keynes MK9 1BB.

**Cadw mewn cysylltiad**
Cofrestrwch i dderbyn e-gylchlythyr Glandŵr Cymru https://canalrivertrust.org.uk/newsletter
Cefnogwch ni ar https://www.facebook.com/canalrivertrust
Dilynwch ni ar https://twitter.com/canalrivertrust ac https://www.instagram.com/canalrivertrust

Mae'r e-bost hwn a'i atodiadau ar gyfer defnydd y derbynnydd bwriedig yn unig. Os nad chi yw derbynnydd bwriedig yr e-bost hwn a'i atodiadau, ni ddylech gymryd unrhyw gamau ar sail y cynnwys, ond yn hytrach dylech eu dileu heb eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

Mae Glandŵr Cymru yn gwmni cyfyngedig drwy warant a gofrestrwyd yng Nghymru a Lloegr gyda rhif cwmni 7807276 a rhif elusen gofrestredig 1146792. Swyddfa gofrestredig: First Floor North, Station House, 500 Elder Gate, Milton Keynes MK9 1BB.

# Application for a transitional water resources licence

# Form WRH

**Fill in this form if you are applying for a transitional water resources licence to continue a previously exempt abstraction.**

This form is available in both English and Welsh. Please check that this is the latest version of the form available from our website before submitting your application.

Please ensure you use Guidance Note WRH to help you.

All relevant guidance documents can be found on our website.

**Contents**


1 Application type and fee
2 Applicant and agent details
3 Site name
4 Entitlement to apply
5 Existing licence number(s)
6 Cross border applications
7 Abstraction details
8 Abstraction history and evidence
9 Discharge details
10 Eel considerations
11 Trickle irrigation
12 Planned abstractions
13 Other abstractions
14 Planning permissions
15 Environmental Impact Assessment
16 Licence duration
17 Application checklist


## 1. Application type and fee

### 1.1 Please select your application type from the list below.

A new transitional water resources full abstraction licence for a previously exempt abstraction ☐

A new transitional water resources transfer licence for a previously exempt abstraction ☒

A variation to an existing full abstraction licence to add a previously exempt abstraction ☐

A variation to an existing transfer licence to add a previously exempt abstraction ☐

### 1.2 Please indicate the amount and how you wish to pay your application

Amount paid

Cheque ☐

Credit or debit card ☐

BACS transfer ☒ BACS reference number PRC

## 2 Applicant and agent details

This is the individual or organisation any resulting licence will be issued to, and must be a legal entity. If you are an agent acting on behalf of an applicant, provide their details here and yours in section 2.2.

### 2.1 Applicant details

Individual ☐ Public body ☐

Registered company ☒ Organisation or group of individuals ☐

Other ☐ If 'Other', please specify

Title

| | |
|---|---|
| First name | |
| Last name | |
| Company, charity, body, or trading name (if relevant) | Canal & River Trust |
| Registered company or charity number (if relevant) | 7807276 |
| Address | Canal & River Trust |
| | First Floor North Station House |
| | 500 Elder Gate |
| | Milton Keynes |
| Postcode | MK9 1BB |
| Telephone - mobile | 07810 856554 |
| Telephone - office | 01926 626142 |
| Email address | new.authorisations@canalrivertrust.org.uk |

We will contact you by email unless you tick here. ☐

**2.2 Agent details**

This is who we will correspond with unless otherwise informed. If you are an agent applying on behalf of an applicant, please include a letter of authorisation from the applicant allowing you to act as signatory,and provide a reference for this document in the box below.

| | | |
|---|---|---|
| Document reference | | |
| Title | | |
| First name | | |
| Last name | | |
| Company or trading name | | |
| Position in company | | |
| Address | | |
| | | |

| | |
|---|---|
| | |
| | |
| Postcode | |
| Telephone - mobile | |
| Telephone - office | |
| Email address | |

We will contact you by email unless you tick here. ☐

**2.3 Site operation contact**

Please specify who we should contact with regard to your site operation.

Applicant ☒

Agent ☐

Other ☐ Please provide contact details for the operational contact on a separate referenced document, and tell us this reference below.

Document reference

**2.4 Abstraction invoices and records contact**

Please specify who we should contact for invoices and abstraction records (returns). Please note that these may not be not required for transfer licences.

**Invoice address**

Applicant ☒

Agent ☐

Other ☐ Please provide contact details for the operational contact on a separate referenced document, and tell us this reference below.

Document reference

**Abstraction records**

Applicant ☒

Agent ☐

Other ☐ Please provide contact details for the operational contact on a separate referenced document, and tell us this reference below.

Document reference

## 3. Site name

**3.1 Please provide the site name below:**

| | |
|---|---|
| Site name | CRT286_Penarth Feeder |

## 4. Entitlement to apply

**4.1 Have you abstracted water between 01 January 2011 and 31 December 2017 for the activity which you are applying to be licensed?**

Yes ☒

No ☐ Please see our water abstraction and impounding webpage for further information on the correct applicaton forms.

**4.2 What is your connection to the land where the abstraction takes place?**

Please provide a map outlining your land ownership/occupation and include all abstractions and discharges where relevant.

Owner ☒

Occupier ☐

Document reference | 4.2 CRT286_Penarth Feeder Access Map

**4.3 Do you have a legal right of access to the land where the abstraction take place?**

No ☐

Yes ☒ Please provide further detail in the box below. If necessary continue on a separate referenced document, and tell us this reference.

Document reference |

Absolute freehold – Title number CYM662578

## 5. Existing licence number(s)

If you are applying to change an existing licence please provide the licence number below.

Licence number(s) |

## 6. Cross border applications

As part of your site operation do you also abstract for a previously exempt activity in England?

No ☒

Yes ☐ Please provide detail of this cross border application in the box below. If possible, provide a reference or application number, or name of an Environment Agency contact with whom the application has been discussed.

Continue on a separate referenced sheet if necessary and tell us the reference for this document.

Document reference |

## 7. Abstraction details

### 7.1 Site map

Please provide a map with details of the location(s) you abstract water from (points reaches, or areas). Tell us the reference for this map, below.

| | |
|---|---|
| Site map reference | 7.1 CRT286_Penarth Feeder Location Map |

### 7.2 Please tell us details about the location(s) you abstract water from (points reaches, or areas) in the tables below.

The abstraction location, name, or reference must be the same as those used on the site map, in question 7.1. If you need more space, please continue on a separate referenced sheet if necessary and tell us the reference for this document

| | |
|---|---|
| Document reference | |

| Table 7. 1 - Surface water abstractions | | | | | | |
|---|---|---|---|---|---|---|
| Abstraction location name or reference<br>(As labelled on the site map) | Type of location (single point, reach, area) | Source of Supply | First National Grid Reference<br>(12 digits) | Second National Grid Reference<br>(12 digits) | Third National Grid Reference<br>(12 digits) | Fourth National Grid Reference<br>(12 digits) |
| A: Abstraction point from river | Single point | River | SO 13966 92623 | | | |
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If necessary, continue on a separate sheet and tell us the reference for this document.

Document reference(s)

| Table 7. 2 Ground water abstractions | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Abstraction location name or reference<br>(as labelled on map) | Source of Supply | National Grid Reference<br>(12 digit) | Overall depth (metres) | Maximum diameter (millimetres) or area of excavation (square metres) | Screened section (metres below ground level) | Drift geology | Solid geology | Rest pump water level | Pumped water level | Pump Depth |
| | | | | | | | | | | |
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If necessary, continue on a separate sheet and tell us the reference for this document.

Document reference(s)

## 8. Abstraction history and evidence

**8.1 Please complete table 8.1 to document that the abstraction(s) and transfer(s) has or have been taking place during the qualifying period.**

If necessary, continue on a separate sheet and tell us the reference for this document.

Document reference(s)

**Table 8.1**

| Year | Abstraction location name or reference (as labelled on map) | Purpose(s) water used for | Period of abstraction | Maximum quantities abstracted | | | | | | Means of measurement, or assessment of abstracted quantities | Are these the maximum quantities of water you wish to have licensed? (Yes or No) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | All year, or months, or days (provide specific dates) | Year (cubic metres) | Day (cubic metres) | Hour (cubic metres) | Peak instantaneous flow rate (litres per second) | Maximum number of hours of abstraction per day | Please indicate whether volume is actual (A) or estimated (E) | | |
| 01 January 2011 to 31 December 2011 | A | Transfer from one source of supply to another | All year | 1847326 | 12180 | 621.3 | 203.8 | 24 | A | Telemetry – see section 8.4 for further details | Yes |
| 01 January 2012 to 31 December 2012 | A | Transfer from one source of supply to another | All year | 1724199 | 10850 | 614.6 | 228.1 | 24 | A | Telemetry – see section 8.4 for further details | Yes |
| 01 January 2013 to 31 December 2013 | A | Transfer from one source of supply to another | All year | 1634000 | 8700 | 506.3 | 228.1 | 24 | A | Telemetry – see section 8.4 for further details | Yes |
| 01 January 2014 to 31 December 2014 | A | Transfer from one source of supply to another | All year | 1972762 | 9700 | 675.8 | 228.1 | 24 | A | Telemetry – see section 8.4 for further details | Yes |
| 01 January 2015 to 31 December 2015 | A | Transfer from one source of supply to another | All year | 2019893 | 11520 | 686.7 | 228.1 | 24 | A | Telemetry – see section 8.4 for further details | Yes |
| 01 January 2016 to 31 December 2016 | A | Transfer from one source of supply to another | All year | 2018226 | 14570 | 821.3 | 228.1 | 24 | A | Telemetry – see section 8.4 for further details | Yes |
| 01 January 2017 to 31 December 2017 | A | Transfer from one source of supply to another | All year | 2311216 | 10190 | 512.1 | 228.1 | 24 | A | Telemetry – see section 8.4 for further details | Yes |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |

**8.2 Please complete the table below if you wish a lesser quantity of water to be licensed than that detailed in table 8.1.**

If necessary, continue on a separate sheet and provide a reference for this document.

Document reference

**Table 8.2**

| Abstraction location name or reference (as labelled on map) | Purpose water is used for | Abstraction period | Maximum annual abstraction volume (cubic metres) | Maximum daily abstraction volume (cubic metres) | Maximum hourly abstraction volume (cubic metres) | Maximum number of hours of abstraction per day | Peak abstraction rate (litres per second) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |

**8.3 Do you wish your abstracted quantities to be aggregated?**

You can aggregate:

i) across some or all of the abstraction points, or reaches, or areas listed above.

ii) with other abstractions you wish to have licensed through the transitional process.

iii) abstractions you need to have licensed through the standard licensing process.

iv) with existing licences you hold.

No ☒

Yes ☐ Provide details of any proposed aggregation in the box below. If necessary, continue on a separate sheet and provide a reference for this document.

Document reference

**8.4 Please provide a detailed description of how the abstraction(s) has/have taken place**

Use the box below to tell us about your abstraction(s). The description should include the following:

- A diagram or schematic of how the activity has been undertaken, using your abstraction point references and including any discharge points
- Details of the structure and equipment involved in the abstraction. This should include dimensions.
- Details of your means of measurement or assessment of abstraction quantities method

If necessary, continue on a separate sheet and tell us the reference for this document.

Document reference 8.4 CRT286_Penarth Abstraction Details

Please refer to this section in supporting information document: CRT286_Supporting Information.pdf for a general description of the feeder, schematic of abstraction arrangement, details of the structures, means of measurement/assessment of abstraction quantities method and general principles of maintaining a level on Canal & River Trust Navigations.

**8.5 Please list the evidence you are providing to support your application**

Use the box below. The evidence should demonstrate the following:

- That abstraction has taken place at some time during the seven year qualifying period.
- The quantities of water you have abstracted during the qualifying period. For example, records of meter readings, or cropping plans.

If necessary, continue on a separate sheet and provide a reference for this document.

Document reference: 8.5 CRT286_Penarth Feeder Evidence of Abstraction

Evidence submitted to support this application includes:

- Telemetry/SCADA Data – chart of estimated daily mean abstraction quantities
- Photographic record

## 9. Discharge details

**9.1 Please provide details on any discharge of abstracted water in table 9.1 below and on the map used to show abstraction locations.**

If necessary, continue a separate sheet and provide a reference for this document.

Document reference: 7.1 CRT286_Penarth Feeder Location Map

**Table 9.1 - Details of any discharge of abstracted water**

| Discharge location name or reference (as labelled on map) | National Grid Reference of discharge point (12 digit) | Total volume discharged (cubic metres) | Environmental Permit number for Water Discharge Activity number (if applicable) |
|---|---|---|---|
| B Discharge to Canal | SO 13906 93017 | **14570** | N/A |
| | | | |
| | | | |
| | | | |

**9.2 Please provide a description of discharge structures and equipment**

Abstraction to the canal feeder is controlled by two adjacent sluices at Abstraction Point A. The abstraction discharges into an open channel and flows to a secondary sluice. Flow discharges to the Montgomery Canal though a short piped section at Point B. culvert immediately downstream of the sluice. Please see section 7.1 CRT286_Penarth Feeder Location Map in CRT286_Supporting Information.pdf showing the location of discharge point B.

If necessary, continue a separate sheet and provide a reference for this document.

Document reference:

## 10. Eel considerations

Does your abstraction include measures to safeguard eels?

No ☒

Yes ☐ Provide details below

| |
|---|
| |

## 11. Trickle Irrigation

If you are applying to licence a trickle irrigation abstraction, do you wish to apply for a Two-Part Tariff agreement with your application?

No ☐

Yes ☐ We will contact you during determination of your application to arrange this agreement.

## 12. Planned abstractions

**12.1 Do you expect to increase the current rate of abstraction for the activity you are applying to have licensed from 01January 2018 onwards or to carry out further new abstractions (both termed 'planned' abstractions) at this site in the future?**

No ☒

Yes ☐

**12.2 Have you submitted a licence application (s) for any planned abstraction(s) as a result of the Water Act 2003 changes?**

No ☒

Yes ☐ Provide a reference number if you have already submitted an application(s) to cover any planned abstractions.

Document reference

## 13. Other abstractions

Please provide details of any other abstraction(s) (licensed or exempt) that are associated with this application in table 13.1 below.

**Table 13.1 - Details of any other abstraction(s) (licensed or exempt) that are associated with this application**

| National Grid Reference (12 digit) of where you abstract water | Source name and type | Purpose of abstraction | Where do you use the water? | When do you abstract the water? | Is this a pending application, or already licensed?<br>Please provide the application or licence number as appropriate |
|---|---|---|---|---|---|
| SJ 25360 21817 | River Tanat – Single Point | Transfer from one source of supply to another | Montgomery Canal | All year | Pending application – CRT414_Tanat Feeder. Please see Section 13.1 in CRT286_Supporting Information.pdf |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

## 14. Planning permission

Complete table 14.1 below and provide details of any planning permissions or advice associated with the abstraction you are applying to have licensed where relevant. Provide a copy of any permissions or advice,providing a reference for this document below.

Document reference

**Table 14.1 – Planning permission**

| Abstraction location name or reference (as labelled on map | Is planning permission needed, Yes or No? | Planning permission status (if required) | Have you received any planning advice for the abstraction? |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

## 15. Environmental impact assessment(EIA)

Does your application require an EIA under The Water Resources (Environmental Impact Assessment) (England and Wales) Regulations 2003 (as amended)

No ☒

Yes ☐ Please provide a copy of your environmental impact assessment; provide a reference for this assessment below.

Document reference

## 16. Licence duration

**Tell us when you wish your abstraction licence to end**

Normally abstraction licences are granted for between 6 and 18 years in line with the catchment licence common end date. If you require a shorter or longer duration licence, please provide details and your justification in the box below.

If necessary, continue a separate sheet and provide a reference for this document.

Document reference

Normal duration, to appropriate CAMS CED.

## 17 Declaration and data protection and commercial confidentiality

**Data protection:**

Please read the guidance carefully for details on who can sign this section and note the information relating to the Data Protection Act 1998, our Public Register and exclusions.

**Commercial confidentiality:**

Do you think your application should be confidential, and that information should not be placed on the public register?

No ☒

Yes ☐ You must send us supporting information to tell us why. Use the box below or a separate sheet, and tell us the reference you have given this document.

Document reference

**Declaration:**

By signing below, you are declaring that as far as you know and believe the information given in this form, on any map and in any supporting or additional information is true.

A printed name in the 'signature' response box will be treated as the equivalent of an electronic signature.

| | |
|---|---|
| Title | Dr |
| First name | Adam |
| Last name | Comerford |
| Position | National Hydrology Manager |
| Today's date | 18/09/2019 |

Canal & River Trust

Permit Receipt Centre
Natural Resources Wales
Tŷ Cambria
29 Newport Road
Cardiff
CF24 0EY

12th June 2019

Dear Sirs

**Applications for Abstraction Licences for previously exempt abstractions- "New Authorisations"**

Under the Water Resources (Abstraction and Impounding) Regulations 2017, applications for abstraction licences must be made in the form specified by Natural Resources Wales in respect of applications made within its jurisdiction. Applications for New Authorisations must be made on application form WRH. The guidance note for form WRH specifies that applications made by a registered company must be signed by a Company Director or Company Secretary.

The Trust will be making a number of applications for New Authorisations over the next few months, which will be coordinated by our Hydrology team, based in Hatton.

Therefore, I can confirm that, as Company Secretary of the Canal & River Trust, I give authority for **Adam Comerford, National Hydrology Manager,** to sign application forms for New Authorisations on behalf of the Canal & River Trust.

Yours faithfully

**Tom Deards**
**Head of Legal and Governance Services, Company Secretary**

**Canal & River Trust**
First Floor North Station House 500 Elder Gate Milton Keynes MK9 1BB
T 0303 040 4040 E canalrivertrust.org.uk/contact-us

Patron: H.R.H. The Prince of Wales. Canal & River Trust, a charitable company limited by guarantee registered in England and Wales with company number 7807276 and registered charity number 1146792, registered office address First Floor North, Station House, 500 Elder Gate, Milton Keynes MK9 1BB

## Lillywhite, Charlotte

**From:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>
**Sent:** 17 December 2019 14:46
**To:** Pearce, Hannah
**Cc:** Beckett, Mary; WA 2003 New Authorisations; Mathew Wells; Adam Comerford
**Subject:** Invalid Applications - Montgomery, Llangollen & Swansea Canals
**Attachments:** Figure 1.pdf; Figure 2.pdf; CRT484_Ystalyfera Raw Data.xlsx; CRT414_Tanat Feeder Raw Data.xlsx; CRT236_Llantysilio Raw Data.xlsx; CRT286_Penarth Feeder Raw Data.xlsx

**Follow Up Flag:** Follow up
**Flag Status:** Completed

Good afternoon Hannah,

Please see below responses to your queries on the Monmouthshire & Brecon Canal applications.

**Rights of Access**

Penarth Feeder and Llantysilio Access

I can confirm that the abstraction points for both Penarth and Llantysilio feeders are within our land ownership. Please see Figures 1 and 2 attached showing the location of abstraction and land ownership boundary for each feeder. For Penarth, our land ownership starts at the head of the feeder channel. I have therefore corrected the NGR of the abstraction point to reflect this. Please can you ensure the NGR of Abstraction Point A is updated to SO 13965 92624 prior to determination of the licence? Similarly, for Llantysilio, our land ownership starts at the head of the feeder channel. I have therefore corrected the NGR of the abstraction point to SJ 19588 43283. Please can you ensure this is updated prior to determination of the licence?

Ystalyfera and Tanat Feeder

It is acknowledged that the Acts of Parliament giving legal rights of access for the above feeders may be requested during the determination period.

**Abstraction Quantities**

All sites

You note in your email that the instantaneous rates and annual quantities for each year do not correlate. This is the case for all sites. The abstractions do take place over 24 hours, but not at the maximum instantaneous flow rates for the whole day, every day of the year. For sites with SCADA, we have calculated the maximum peak instantaneous flow rate from the maximum daily abstraction on the day when the maximum hourly abstraction rate was recorded in each year i.e. PI = MD/0.0864, where the PI is the peak instantaneous flow in l/s and MD is the maximum daily abstraction in Ml/d. For those sites without SCADA, the maximum instantaneous flow rate has been estimated from the maximum daily abstraction in each year using the same formula above.

**Evidence**

Penarth Feeder, Ystalyfera, Tanat Feeder and Llantysilio

Please see attached documents providing raw data for the above sites.

**Means of measurement and structures**

Penarth Feeder

*Dimensions of the thin plate weir structure:*

The abstraction at Penarth is monitored at Byles Lock, approx. 2.5km downstream of the abstraction point. Bypass and lockage are monitored at this location. A thin plate weir is installed at the downstream end of the bypass channel around the lock. The dimensions of this weir are as follows:

b = 0.600m

B = 1.650m

P = 0.200m

H max = 0.360m

where b is the measured width of the notch in m, B is the width of the approach channel in m, p is the height of the crest relative to the floor in m and H max is the maximum head above crest level in m. The rating equation used to calculate flow from the recorded head over weir is as follows:

$Q = 3.794 \times h^{1.492}$

where Q is the volumetric rate of flow in $m^3/s$ and h is the head above crest level in m.

*Lockage Information: recorded lockage, lock volume and lock flow:*

Byles Lock is $121m^3$ or 0.121Ml in volume. The recorded lockage and calculated lockage flow data are given in the Raw Data file attached.

Ystalyfera

*Dimensions of the thin plate weir structure:*

The abstraction is monitored approximately 0.2km downstream of the abstraction point. A thin plate weir is installed in the feeder channel. The dimensions of this weir are as follows:

b = 2.000m

H max = 0.400m

where b is the measured width of the notch in m and H max is the maximum head above crest level in m. The rating equation used to calculate flow from the recorded head over weir is as follows:

$Q = 1.0599 \times h^{1.5037}$

where Q is the volumetric rate of flow in $m^3/s$ and h is the head above crest level in m.

*Please note – this is all the information we currently hold with regards to the dimensions of the structure.*

Tanat Feeder

*Dimensions of the broad crested weir structure and rectangular flume:*

The abstraction is monitored approx. 0.8km downstream of the abstraction point. A compound gauging structure consisting of a broad crested weir with critical depth flume is installed at this location. We do not currently hold any details of the dimensions of the structure except the following:

H max = 0.600m

where H max is the maximum head above crest level in m. The two stage rating equation used to calculate flow from the recorded head measurements is as follows:

0-0.311m $Q = 0.6101 \times h^{1.514}$

0.311m-0.6m $Q = 7.84181 \times h^{3.7}$

where Q is the volumetric rate of flow in $m^3/s$ and h is thehead above crest level in m.

*Please note – this is all the information we currently hold with regards to the dimensions of the structure.*

Llantysilio

*Dimensions of the Venturi Flume and upstream and downstream sluice gates:*

Flow is measured via a Venturi Flume. A bespoke rating was provided for this structure by the third party manufacturer of the flume. The rating used to calculate the flow is as follows:

$Q = 2.3487 \times h^{0.5919}$

where Q is the volumetric rate of flow in $m^3/s$ and h is thehead above crest level in m. Therefore, we do not currently hold any details of the dimensions of the structure except the following:

H max = 1.5m

where H max is the maximum head above crest level in m.

We do not currently hold any of the details of the dimensions of the upstream and downstream sluice however, this is not required to calculate the flows.

*Please note – this is all the information we currently hold with regards to the dimensions of the structure.*

As you will note, we have been able to provide most of the information requested and indeed, all of the information that we currently hold on details of the gauging structures used to measure the flow at each location. Unfortunately, we are unable to obtain the missing information for Tanat Feeder and Llantysilio due to the timescales required and accessibility issues, particularly in the case of Llantysilio Feeder where the relevant structures are below ground requiring confined space access.

For all four sites we have provided measured or estimated flows from continuous SCADA data recorded via telemetry between 2011 and 2017. This should be sufficient to validate the abstraction quantities applied for at this stage.

We are planning to undertake detailed surveys of all our abstraction structures during the determination stage of the process. We should therefore be able to provide technical drawings of all structures, once this exercise has been completed, and in time for the determination of each licence.

I hope this answers all your queries for now and that you are now able to validate the above applications. Please can you confirm this as soon as possible.

Kind regards,

Kathryn

**Kathryn Maye**
PhD BSc (Hons) MCIWEM C.WEM CEnv CSci
Senior Hydrologist
Water Management Team

**I work a 4 day week with reduced hours. My working days are Monday to Thursday.**

**T** 01926 626166 **M** 07824 473869
**E** kathryn.maye@canalrivertrust.org.uk

**Canal & River Trust**
Canal Lane, Hatton, Warwick, CV35 7JL

Please visit our website for more information about the water management of our canals.
We have published our fourth annual update on our Water Resources Strategy, take a look – Water Resources Strategy Annual Update 2019

Canal & River Trust

**CRT286_Penarth Feeder**

| Date | Daily Abstraction $m^3/d$ | Recorded Lockage | Lockage Flow $m^3/d$ |
|---|---|---|---|
| 01/01/2011 | 2256.00 | 0 | 0.00 |
| 02/01/2011 | 2165.00 | 0 | 0.00 |
| 03/01/2011 | 2116.00 | 0 | 0.00 |
| 04/01/2011 | 3927.00 | 0 | 0.00 |
| 05/01/2011 | 6017.00 | 0 | 0.00 |
| 06/01/2011 | 5835.00 | 0 | 0.00 |
| 07/01/2011 | 5773.00 | 0 | 0.00 |
| 08/01/2011 | 6043.00 | 0 | 0.00 |
| 09/01/2011 | 5766.00 | 0 | 0.00 |
| 10/01/2011 | 5853.00 | 0 | 0.00 |
| 11/01/2011 | 5806.00 | 0 | 0.00 |
| 12/01/2011 | 6518.00 | 0 | 0.00 |
| 13/01/2011 | 7293.00 | 0 | 0.00 |
| 14/01/2011 | 4389.00 | 0 | 0.00 |
| 15/01/2011 | 1400.00 | 0 | 0.00 |
| 16/01/2011 | 1171.00 | 0 | 0.00 |
| 17/01/2011 | 7011.00 | 0 | 0.00 |
| 18/01/2011 | 6917.00 | 0 | 0.00 |
| 19/01/2011 | 7916.00 | 0 | 0.00 |
| 20/01/2011 | 7670.00 | 0 | 0.00 |
| 21/01/2011 | 7362.00 | 0 | 0.00 |
| 22/01/2011 | 6945.00 | 0 | 0.00 |
| 23/01/2011 | 6863.00 | 0 | 0.00 |
| 24/01/2011 | 6727.00 | 0 | 0.00 |
| 25/01/2011 | 6685.00 | 0 | 0.00 |
| 26/01/2011 | 6539.00 | 0 | 0.00 |
| 27/01/2011 | 6415.00 | 0 | 0.00 |
| 28/01/2011 | 6366.00 | 0 | 0.00 |
| 29/01/2011 | 6203.00 | 0 | 0.00 |
| 30/01/2011 | 6072.00 | 0 | 0.00 |
| 31/01/2011 | 6415.00 | 0 | 0.00 |
| 01/02/2011 | 8172.00 | 0 | 0.00 |
| 02/02/2011 | 4766.00 | 0 | 0.00 |
| 03/02/2011 | 5965.00 | 0 | 0.00 |
| 04/02/2011 | 4725.00 | 0 | 0.00 |
| 05/02/2011 | 1007.00 | 0 | 0.00 |
| 06/02/2011 | 1455.00 | 0 | 0.00 |
| 07/02/2011 | 1450.00 | 0 | 0.00 |
| 08/02/2011 | 3125.00 | 0 | 0.00 |
| 09/02/2011 | 5291.00 | 0 | 0.00 |
| 10/02/2011 | 5827.00 | 0 | 0.00 |
| 11/02/2011 | 4699.00 | 0 | 0.00 |
| 12/02/2011 | 3335.00 | 0 | 0.00 |
| 13/02/2011 | 1531.00 | 0 | 0.00 |
| 14/02/2011 | 2349.00 | 0 | 0.00 |
| 15/02/2011 | 3232.00 | 0 | 0.00 |
| 16/02/2011 | 1289.00 | 0 | 0.00 |
| 17/02/2011 | 4425.00 | 0 | 0.00 |
| 18/02/2011 | 6918.00 | 0 | 0.00 |
| 19/02/2011 | 6763.00 | 0 | 0.00 |
| 20/02/2011 | 6528.00 | 0 | 0.00 |
| 21/02/2011 | 6317.00 | 0 | 0.00 |
| 22/02/2011 | 3368.00 | 0 | 0.00 |
| 23/02/2011 | 3258.00 | 0 | 0.00 |
| 24/02/2011 | 6883.00 | 0 | 0.00 |
| 25/02/2011 | 7551.00 | 0 | 0.00 |
| 26/02/2011 | 9735.00 | 0 | 0.00 |

| | | | |
|---|---|---|---|
| 27/02/2011 | 9184.00 | 0 | 0.00 |
| 28/02/2011 | 9028.00 | 0 | 0.00 |
| 01/03/2011 | 8819.00 | 0 | 0.00 |
| 02/03/2011 | 8538.00 | 0 | 0.00 |
| 03/03/2011 | 8367.00 | 0 | 0.00 |
| 04/03/2011 | 8244.00 | 0 | 0.00 |
| 05/03/2011 | 7934.00 | 0 | 0.00 |
| 06/03/2011 | 7612.00 | 0 | 0.00 |
| 07/03/2011 | 6665.00 | 0 | 0.00 |
| 08/03/2011 | 5840.00 | 0 | 0.00 |
| 09/03/2011 | 5604.00 | 0 | 0.00 |
| 10/03/2011 | 5071.00 | 0 | 0.00 |
| 11/03/2011 | 4598.00 | 0 | 0.00 |
| 12/03/2011 | 4907.00 | 0 | 0.00 |
| 13/03/2011 | 5756.00 | 0 | 0.00 |
| 14/03/2011 | 5232.00 | 0 | 0.00 |
| 15/03/2011 | 4028.00 | 0 | 0.00 |
| 16/03/2011 | 3761.00 | 0 | 0.00 |
| 17/03/2011 | 3370.00 | 0 | 0.00 |
| 18/03/2011 | 5713.00 | 0 | 0.00 |
| 19/03/2011 | 8336.00 | 0 | 0.00 |
| 20/03/2011 | 8050.00 | 0 | 0.00 |
| 21/03/2011 | 8087.00 | 0 | 0.00 |
| 22/03/2011 | 7895.00 | 0 | 0.00 |
| 23/03/2011 | 8452.00 | 0 | 0.00 |
| 24/03/2011 | 7614.00 | 0 | 0.00 |
| 25/03/2011 | 8533.00 | 0 | 0.00 |
| 26/03/2011 | 8396.00 | 0 | 0.00 |
| 27/03/2011 | 8260.00 | 0 | 0.00 |
| 28/03/2011 | 8366.00 | 0 | 0.00 |
| 29/03/2011 | 8534.00 | 0 | 0.00 |
| 30/03/2011 | 8551.00 | 0 | 0.00 |
| 31/03/2011 | 9173.00 | 0 | 0.00 |
| 01/04/2011 | 7803.00 | 0 | 0.00 |
| 02/04/2011 | 5850.00 | 0 | 0.00 |
| 03/04/2011 | 5638.00 | 0 | 0.00 |
| 04/04/2011 | 5630.00 | 0 | 0.00 |
| 05/04/2011 | 5589.00 | 0 | 0.00 |
| 06/04/2011 | 10130.00 | 0 | 0.00 |
| 07/04/2011 | 12185.00 | 0 | 0.00 |
| 08/04/2011 | 9670.00 | 0 | 0.00 |
| 09/04/2011 | 7702.00 | 0 | 0.00 |
| 10/04/2011 | 7325.00 | 0 | 0.00 |
| 11/04/2011 | 7084.00 | 0 | 0.00 |
| 12/04/2011 | 6905.00 | 0 | 0.00 |
| 13/04/2011 | 7039.00 | 0 | 0.00 |
| 14/04/2011 | 6985.00 | 0 | 0.00 |
| 15/04/2011 | 6937.00 | 0 | 0.00 |
| 16/04/2011 | 6766.00 | 0 | 0.00 |
| 17/04/2011 | 6663.00 | 0 | 0.00 |
| 18/04/2011 | 7714.00 | 0 | 0.00 |
| 19/04/2011 | 8344.00 | 0 | 0.00 |
| 20/04/2011 | 8019.00 | 0 | 0.00 |
| 21/04/2011 | 7947.00 | 0 | 0.00 |
| 22/04/2011 | 7907.00 | 0 | 0.00 |
| 23/04/2011 | 7401.00 | 0 | 0.00 |
| 24/04/2011 | 7069.00 | 0 | 0.00 |
| 25/04/2011 | 6393.00 | 0 | 0.00 |
| 26/04/2011 | 4952.00 | 0 | 0.00 |

| | | | |
|---|---|---|---|
| 27/04/2011 | 2524.00 | 0 | 0.00 |
| 28/04/2011 | 4747.00 | 0 | 0.00 |
| 29/04/2011 | 5647.00 | 0 | 0.00 |
| 30/04/2011 | 5324.00 | 0 | 0.00 |
| 01/05/2011 | 5186.00 | 0 | 0.00 |
| 02/05/2011 | 4997.00 | 0 | 0.00 |
| 03/05/2011 | 4891.00 | 0 | 0.00 |
| 04/05/2011 | 5135.00 | 0 | 0.00 |
| 05/05/2011 | 5013.00 | 0 | 0.00 |
| 06/05/2011 | 7843.00 | 0 | 0.00 |
| 07/05/2011 | 4758.00 | 0 | 0.00 |
| 08/05/2011 | 4154.00 | 0 | 0.00 |
| 09/05/2011 | 8129.00 | 0 | 0.00 |
| 10/05/2011 | 4416.00 | 0 | 0.00 |
| 11/05/2011 | 4598.00 | 0 | 0.00 |
| 12/05/2011 | 5861.00 | 0 | 0.00 |
| 13/05/2011 | 5662.00 | 0 | 0.00 |
| 14/05/2011 | 5947.00 | 0 | 0.00 |
| 15/05/2011 | 5749.00 | 0 | 0.00 |
| 16/05/2011 | 5708.00 | 0 | 0.00 |
| 17/05/2011 | 5335.00 | 0 | 0.00 |
| 18/05/2011 | 5017.00 | 0 | 0.00 |
| 19/05/2011 | 4488.00 | 0 | 0.00 |
| 20/05/2011 | 4155.00 | 0 | 0.00 |
| 21/05/2011 | 4142.00 | 0 | 0.00 |
| 22/05/2011 | 3433.00 | 0 | 0.00 |
| 23/05/2011 | 3464.00 | 0 | 0.00 |
| 24/05/2011 | 3073.00 | 0 | 0.00 |
| 25/05/2011 | 5045.00 | 0 | 0.00 |
| 26/05/2011 | 5512.00 | 0 | 0.00 |
| 27/05/2011 | 5806.00 | 0 | 0.00 |
| 28/05/2011 | 5738.00 | 0 | 0.00 |
| 29/05/2011 | 5639.00 | 0 | 0.00 |
| 30/05/2011 | 5041.00 | 0 | 0.00 |
| 31/05/2011 | 6043.00 | 0 | 0.00 |
| 01/06/2011 | 6728.00 | 0 | 0.00 |
| 02/06/2011 | 6389.00 | 0 | 0.00 |
| 03/06/2011 | 6204.00 | 0 | 0.00 |
| 04/06/2011 | 5358.00 | 0 | 0.00 |
| 05/06/2011 | 5216.00 | 0 | 0.00 |
| 06/06/2011 | 5323.00 | 0 | 0.00 |
| 07/06/2011 | 6041.00 | 0 | 0.00 |
| 08/06/2011 | 5604.00 | 0 | 0.00 |
| 09/06/2011 | 3923.00 | 0 | 0.00 |
| 10/06/2011 | 4246.00 | 0 | 0.00 |
| 11/06/2011 | 4151.00 | 0 | 0.00 |
| 12/06/2011 | 4225.00 | 0 | 0.00 |
| 13/06/2011 | 4146.00 | 0 | 0.00 |
| 14/06/2011 | 5192.00 | 0 | 0.00 |
| 15/06/2011 | 5023.00 | 0 | 0.00 |
| 16/06/2011 | 3087.00 | 0 | 0.00 |
| 17/06/2011 | 2862.00 | 0 | 0.00 |
| 18/06/2011 | 2517.00 | 0 | 0.00 |
| 19/06/2011 | 2375.00 | 0 | 0.00 |
| 20/06/2011 | 7182.00 | 0 | 0.00 |
| 21/06/2011 | 10100.00 | 0 | 0.00 |
| 22/06/2011 | 9802.00 | 0 | 0.00 |
| 23/06/2011 | 9029.00 | 1 | 121.00 |
| 24/06/2011 | 8745.00 | 0 | 0.00 |

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|---|---|---|---|
| 25/06/2011 | 9045.00 | 0 | 0.00 |
| 26/06/2011 | 8535.00 | 0 | 0.00 |
| 27/06/2011 | 7881.00 | 0 | 0.00 |
| 28/06/2011 | 7338.00 | 0 | 0.00 |
| 29/06/2011 | 7032.00 | 0 | 0.00 |
| 30/06/2011 | 6712.00 | 0 | 0.00 |
| 01/07/2011 | 4329.00 | 0 | 0.00 |
| 02/07/2011 | 2277.00 | 0 | 0.00 |
| 03/07/2011 | 2139.00 | 0 | 0.00 |
| 04/07/2011 | 2371.00 | 0 | 0.00 |
| 05/07/2011 | 2916.00 | 0 | 0.00 |
| 06/07/2011 | 3365.00 | 0 | 0.00 |
| 07/07/2011 | 3841.00 | 0 | 0.00 |
| 08/07/2011 | 4026.00 | 0 | 0.00 |
| 09/07/2011 | 3121.00 | 0 | 0.00 |
| 10/07/2011 | 2816.00 | 0 | 0.00 |
| 11/07/2011 | 2781.00 | 0 | 0.00 |
| 12/07/2011 | 5176.00 | 0 | 0.00 |
| 13/07/2011 | 9238.00 | 0 | 0.00 |
| 14/07/2011 | 5850.00 | 0 | 0.00 |
| 15/07/2011 | 1416.00 | 0 | 0.00 |
| 16/07/2011 | 1260.00 | 0 | 0.00 |
| 17/07/2011 | 1206.00 | 0 | 0.00 |
| 18/07/2011 | 1105.00 | 0 | 0.00 |
| 19/07/2011 | 954.00 | 0 | 0.00 |
| 20/07/2011 | 1289.00 | 0 | 0.00 |
| 21/07/2011 | 2159.00 | 0 | 0.00 |
| 22/07/2011 | 9440.00 | 0 | 0.00 |
| 23/07/2011 | 8718.00 | 0 | 0.00 |
| 24/07/2011 | 8245.00 | 0 | 0.00 |
| 25/07/2011 | 6272.00 | 0 | 0.00 |
| 26/07/2011 | 4737.00 | 0 | 0.00 |
| 27/07/2011 | 4501.00 | 0 | 0.00 |
| 28/07/2011 | 4376.00 | 0 | 0.00 |
| 29/07/2011 | 4232.00 | 0 | 0.00 |
| 30/07/2011 | 4035.00 | 0 | 0.00 |
| 31/07/2011 | 3988.00 | 0 | 0.00 |
| 01/08/2011 | 6335.00 | 0 | 0.00 |
| 02/08/2011 | 5329.00 | 0 | 0.00 |
| 03/08/2011 | 2040.00 | 0 | 0.00 |
| 04/08/2011 | 1959.00 | 0 | 0.00 |
| 05/08/2011 | 3812.00 | 0 | 0.00 |
| 06/08/2011 | 5705.00 | 0 | 0.00 |
| 07/08/2011 | 5564.00 | 0 | 0.00 |
| 08/08/2011 | 5879.00 | 0 | 0.00 |
| 09/08/2011 | 6532.00 | 0 | 0.00 |
| 10/08/2011 | 6830.00 | 0 | 0.00 |
| 11/08/2011 | 6886.00 | 0 | 0.00 |
| 12/08/2011 | 6625.00 | 0 | 0.00 |
| 13/08/2011 | 6508.00 | 0 | 0.00 |
| 14/08/2011 | 6461.00 | 0 | 0.00 |
| 15/08/2011 | 5662.00 | 0 | 0.00 |
| 16/08/2011 | 5546.00 | 0 | 0.00 |
| 17/08/2011 | 6329.00 | 0 | 0.00 |
| 18/08/2011 | 6381.00 | 0 | 0.00 |
| 19/08/2011 | 6476.00 | 0 | 0.00 |
| 20/08/2011 | 6431.00 | 0 | 0.00 |
| 21/08/2011 | 6516.00 | 0 | 0.00 |
| 22/08/2011 | 6641.00 | 0 | 0.00 |

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|---|---|---|---|
| 23/08/2011 | 6666.00 | 0 | 0.00 |
| 24/08/2011 | 5250.00 | 0 | 0.00 |
| 25/08/2011 | 2308.00 | 0 | 0.00 |
| 26/08/2011 | 4284.00 | 0 | 0.00 |
| 27/08/2011 | 6044.00 | 0 | 0.00 |
| 28/08/2011 | 6049.00 | 0 | 0.00 |
| 29/08/2011 | 6007.00 | 0 | 0.00 |
| 30/08/2011 | 6273.00 | 0 | 0.00 |
| 31/08/2011 | 6284.00 | 0 | 0.00 |
| 01/09/2011 | 6302.00 | 0 | 0.00 |
| 02/09/2011 | 4848.00 | 0 | 0.00 |
| 03/09/2011 | 4878.00 | 0 | 0.00 |
| 04/09/2011 | 4565.00 | 0 | 0.00 |
| 05/09/2011 | 3701.00 | 0 | 0.00 |
| 06/09/2011 | 3207.00 | 0 | 0.00 |
| 07/09/2011 | 3346.00 | 0 | 0.00 |
| 08/09/2011 | 2876.00 | 0 | 0.00 |
| 09/09/2011 | 2902.00 | 0 | 0.00 |
| 10/09/2011 | 2930.00 | 0 | 0.00 |
| 11/09/2011 | 2883.00 | 0 | 0.00 |
| 12/09/2011 | 2868.00 | 0 | 0.00 |
| 13/09/2011 | 2747.00 | 0 | 0.00 |
| 14/09/2011 | 3028.00 | 0 | 0.00 |
| 15/09/2011 | 3047.00 | 0 | 0.00 |
| 16/09/2011 | 3331.00 | 0 | 0.00 |
| 17/09/2011 | 3483.00 | 0 | 0.00 |
| 18/09/2011 | 3468.00 | 0 | 0.00 |
| 19/09/2011 | 3602.00 | 0 | 0.00 |
| 20/09/2011 | 3462.00 | 0 | 0.00 |
| 21/09/2011 | 3578.00 | 0 | 0.00 |
| 22/09/2011 | 4938.00 | 0 | 0.00 |
| 23/09/2011 | 5678.00 | 0 | 0.00 |
| 24/09/2011 | 5443.00 | 0 | 0.00 |
| 25/09/2011 | 5317.00 | 0 | 0.00 |
| 26/09/2011 | 4999.00 | 0 | 0.00 |
| 27/09/2011 | 4898.00 | 0 | 0.00 |
| 28/09/2011 | 5206.00 | 0 | 0.00 |
| 29/09/2011 | 5162.00 | 0 | 0.00 |
| 30/09/2011 | 4973.00 | 0 | 0.00 |
| 01/10/2011 | 3815.00 | 0 | 0.00 |
| 02/10/2011 | 3658.00 | 0 | 0.00 |
| 03/10/2011 | 3440.00 | 0 | 0.00 |
| 04/10/2011 | 3236.00 | 0 | 0.00 |
| 05/10/2011 | 5458.00 | 0 | 0.00 |
| 06/10/2011 | 6318.00 | 0 | 0.00 |
| 07/10/2011 | 5805.00 | 0 | 0.00 |
| 08/10/2011 | 5523.00 | 0 | 0.00 |
| 09/10/2011 | 5335.00 | 0 | 0.00 |
| 10/10/2011 | 4696.00 | 0 | 0.00 |
| 11/10/2011 | 4694.00 | 0 | 0.00 |
| 12/10/2011 | 3558.00 | 1 | 121.00 |
| 13/10/2011 | 2545.00 | 0 | 0.00 |
| 14/10/2011 | 2445.00 | 0 | 0.00 |
| 15/10/2011 | 2338.00 | 0 | 0.00 |
| 16/10/2011 | 2296.00 | 0 | 0.00 |
| 17/10/2011 | 2158.00 | 0 | 0.00 |
| 18/10/2011 | 4816.00 | 0 | 0.00 |
| 19/10/2011 | 4960.00 | 0 | 0.00 |
| 20/10/2011 | 4865.00 | 0 | 0.00 |

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|---|---|---|---|
| 21/10/2011 | 4896.00 | 0 | 0.00 |
| 22/10/2011 | 4772.00 | 0 | 0.00 |
| 23/10/2011 | 4730.00 | 0 | 0.00 |
| 24/10/2011 | 4584.00 | 0 | 0.00 |
| 25/10/2011 | 4177.00 | 0 | 0.00 |
| 26/10/2011 | 4087.00 | 0 | 0.00 |
| 27/10/2011 | 5279.00 | 0 | 0.00 |
| 28/10/2011 | 6420.00 | 0 | 0.00 |
| 29/10/2011 | 6317.00 | 0 | 0.00 |
| 30/10/2011 | 6121.00 | 0 | 0.00 |
| 31/10/2011 | 6175.00 | 0 | 0.00 |
| 01/11/2011 | 6217.00 | 0 | 0.00 |
| 02/11/2011 | 6103.00 | 0 | 0.00 |
| 03/11/2011 | 6078.00 | 0 | 0.00 |
| 04/11/2011 | 6364.00 | 4 | 484.00 |
| 05/11/2011 | 5849.00 | 0 | 0.00 |
| 06/11/2011 | 5668.00 | 0 | 0.00 |
| 07/11/2011 | 4365.00 | 0 | 0.00 |
| 08/11/2011 | 3533.00 | 0 | 0.00 |
| 09/11/2011 | 3185.00 | 0 | 0.00 |
| 10/11/2011 | 3618.00 | 0 | 0.00 |
| 11/11/2011 | 4447.00 | 0 | 0.00 |
| 12/11/2011 | 4012.00 | 0 | 0.00 |
| 13/11/2011 | 4026.00 | 0 | 0.00 |
| 14/11/2011 | 5179.00 | 0 | 0.00 |
| 15/11/2011 | 6009.00 | 0 | 0.00 |
| 16/11/2011 | 5944.00 | 0 | 0.00 |
| 17/11/2011 | 5922.00 | 0 | 0.00 |
| 18/11/2011 | 5636.00 | 0 | 0.00 |
| 19/11/2011 | 4987.00 | 0 | 0.00 |
| 20/11/2011 | 4837.00 | 0 | 0.00 |
| 21/11/2011 | 5222.00 | 0 | 0.00 |
| 22/11/2011 | 4618.00 | 0 | 0.00 |
| 23/11/2011 | 3947.00 | 0 | 0.00 |
| 24/11/2011 | 3734.00 | 0 | 0.00 |
| 25/11/2011 | 4147.00 | 0 | 0.00 |
| 26/11/2011 | 3805.00 | 0 | 0.00 |
| 27/11/2011 | 3527.00 | 0 | 0.00 |
| 28/11/2011 | 3683.00 | 0 | 0.00 |
| 29/11/2011 | 3529.00 | 0 | 0.00 |
| 30/11/2011 | 3709.00 | 0 | 0.00 |
| 01/12/2011 | 3735.00 | 0 | 0.00 |
| 02/12/2011 | 3606.00 | 0 | 0.00 |
| 03/12/2011 | 3584.00 | 0 | 0.00 |
| 04/12/2011 | 3548.00 | 0 | 0.00 |
| 05/12/2011 | 3554.00 | 0 | 0.00 |
| 06/12/2011 | 3560.00 | 0 | 0.00 |
| 07/12/2011 | 3461.00 | 0 | 0.00 |
| 08/12/2011 | 3457.00 | 0 | 0.00 |
| 09/12/2011 | 3152.00 | 0 | 0.00 |
| 10/12/2011 | 3039.00 | 0 | 0.00 |
| 11/12/2011 | 3242.00 | 0 | 0.00 |
| 12/12/2011 | 3218.00 | 0 | 0.00 |
| 13/12/2011 | 2254.00 | 0 | 0.00 |
| 14/12/2011 | 928.00 | 0 | 0.00 |
| 15/12/2011 | 908.00 | 0 | 0.00 |
| 16/12/2011 | 764.00 | 0 | 0.00 |
| 17/12/2011 | 633.00 | 0 | 0.00 |
| 18/12/2011 | 696.00 | 0 | 0.00 |

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|---|---|---|---|
| 19/12/2011 | 690.00 | 0 | 0.00 |
| 20/12/2011 | 674.00 | 0 | 0.00 |
| 21/12/2011 | 1627.00 | 0 | 0.00 |
| 22/12/2011 | 2125.00 | 0 | 0.00 |
| 23/12/2011 | 502.00 | 0 | 0.00 |
| 24/12/2011 | 463.00 | 0 | 0.00 |
| 25/12/2011 | 492.00 | 0 | 0.00 |
| 26/12/2011 | 1393.00 | 0 | 0.00 |
| 27/12/2011 | 2802.00 | 0 | 0.00 |
| 28/12/2011 | 2814.00 | 0 | 0.00 |
| 29/12/2011 | 2012.00 | 0 | 0.00 |
| 30/12/2011 | 1291.00 | 0 | 0.00 |
| 31/12/2011 | 1362.00 | 0 | 0.00 |
| 01/01/2012 | 1176.00 | 0 | 0.00 |
| 02/01/2012 | 1130.00 | 0 | 0.00 |
| 03/01/2012 | 3106.00 | 0 | 0.00 |
| 04/01/2012 | 2313.00 | 0 | 0.00 |
| 05/01/2012 | 3117.00 | 0 | 0.00 |
| 06/01/2012 | 1901.00 | 0 | 0.00 |
| 07/01/2012 | 1508.00 | 0 | 0.00 |
| 08/01/2012 | 1116.00 | 0 | 0.00 |
| 09/01/2012 | 1657.00 | 0 | 0.00 |
| 10/01/2012 | 2029.00 | 1 | 121.00 |
| 11/01/2012 | 2160.00 | 0 | 0.00 |
| 12/01/2012 | 2076.00 | 0 | 0.00 |
| 13/01/2012 | 1888.00 | 0 | 0.00 |
| 14/01/2012 | 1789.00 | 0 | 0.00 |
| 15/01/2012 | 1689.00 | 0 | 0.00 |
| 16/01/2012 | 1596.00 | 0 | 0.00 |
| 17/01/2012 | 5292.00 | 0 | 0.00 |
| 18/01/2012 | 6221.00 | 0 | 0.00 |
| 19/01/2012 | 1635.00 | 0 | 0.00 |
| 20/01/2012 | 1759.00 | 0 | 0.00 |
| 21/01/2012 | 1824.00 | 0 | 0.00 |
| 22/01/2012 | 1611.00 | 0 | 0.00 |
| 23/01/2012 | 1948.00 | 0 | 0.00 |
| 24/01/2012 | 1638.00 | 0 | 0.00 |
| 25/01/2012 | 1757.00 | 0 | 0.00 |
| 26/01/2012 | 1672.00 | 0 | 0.00 |
| 27/01/2012 | 1610.00 | 0 | 0.00 |
| 28/01/2012 | 1535.00 | 0 | 0.00 |
| 29/01/2012 | 1490.00 | 0 | 0.00 |
| 30/01/2012 | 1447.00 | 0 | 0.00 |
| 31/01/2012 | 1302.00 | 0 | 0.00 |
| 01/02/2012 | 1197.00 | 0 | 0.00 |
| 02/02/2012 | 2293.00 | 0 | 0.00 |
| 03/02/2012 | 2892.00 | 0 | 0.00 |
| 04/02/2012 | 2959.00 | 0 | 0.00 |
| 05/02/2012 | 2941.00 | 0 | 0.00 |
| 06/02/2012 | 2913.00 | 0 | 0.00 |
| 07/02/2012 | 2848.00 | 0 | 0.00 |
| 08/02/2012 | 2814.00 | 0 | 0.00 |
| 09/02/2012 | 2821.00 | 0 | 0.00 |
| 10/02/2012 | 2089.00 | 0 | 0.00 |
| 11/02/2012 | 1295.00 | 0 | 0.00 |
| 12/02/2012 | 1265.00 | 0 | 0.00 |
| 13/02/2012 | 1363.00 | 0 | 0.00 |
| 14/02/2012 | 2835.00 | 0 | 0.00 |
| 15/02/2012 | 3003.00 | 0 | 0.00 |

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|---|---|---|---|
| 16/02/2012 | 2066.00 | 0 | 0.00 |
| 17/02/2012 | 2047.00 | 0 | 0.00 |
| 18/02/2012 | 2097.00 | 0 | 0.00 |
| 19/02/2012 | 1979.00 | 0 | 0.00 |
| 20/02/2012 | 2112.00 | 0 | 0.00 |
| 21/02/2012 | 3985.00 | 0 | 0.00 |
| 22/02/2012 | 4391.00 | 0 | 0.00 |
| 23/02/2012 | 3123.00 | 0 | 0.00 |
| 24/02/2012 | 3492.00 | 0 | 0.00 |
| 25/02/2012 | 3483.00 | 0 | 0.00 |
| 26/02/2012 | 3435.00 | 0 | 0.00 |
| 27/02/2012 | 3551.00 | 0 | 0.00 |
| 28/02/2012 | 3898.00 | 0 | 0.00 |
| 29/02/2012 | 3541.00 | 0 | 0.00 |
| 01/03/2012 | 3503.00 | 0 | 0.00 |
| 02/03/2012 | 3444.00 | 0 | 0.00 |
| 03/03/2012 | 3416.00 | 0 | 0.00 |
| 04/03/2012 | 3425.00 | 0 | 0.00 |
| 05/03/2012 | 3184.00 | 1 | 121.00 |
| 06/03/2012 | 4380.00 | 0 | 0.00 |
| 07/03/2012 | 7498.00 | 0 | 0.00 |
| 08/03/2012 | 9576.00 | 0 | 0.00 |
| 09/03/2012 | 6313.00 | 0 | 0.00 |
| 10/03/2012 | 1759.00 | 0 | 0.00 |
| 11/03/2012 | 1845.00 | 0 | 0.00 |
| 12/03/2012 | 6951.00 | 0 | 0.00 |
| 13/03/2012 | 9048.00 | 0 | 0.00 |
| 14/03/2012 | 8203.00 | 0 | 0.00 |
| 15/03/2012 | 5498.00 | 0 | 0.00 |
| 16/03/2012 | 3636.00 | 0 | 0.00 |
| 17/03/2012 | 3529.00 | 0 | 0.00 |
| 18/03/2012 | 3525.00 | 0 | 0.00 |
| 19/03/2012 | 3590.00 | 0 | 0.00 |
| 20/03/2012 | 3653.00 | 0 | 0.00 |
| 21/03/2012 | 5702.00 | 0 | 0.00 |
| 22/03/2012 | 7191.00 | 0 | 0.00 |
| 23/03/2012 | 7166.00 | 0 | 0.00 |
| 24/03/2012 | 7136.00 | 0 | 0.00 |
| 25/03/2012 | 7015.00 | 0 | 0.00 |
| 26/03/2012 | 6882.00 | 0 | 0.00 |
| 27/03/2012 | 7173.00 | 0 | 0.00 |
| 28/03/2012 | 7038.00 | 0 | 0.00 |
| 29/03/2012 | 10001.00 | 0 | 0.00 |
| 30/03/2012 | 8489.00 | 0 | 0.00 |
| 31/03/2012 | 5620.00 | 0 | 0.00 |
| 01/04/2012 | 5494.00 | 0 | 0.00 |
| 02/04/2012 | 6573.00 | 0 | 0.00 |
| 03/04/2012 | 7470.00 | 0 | 0.00 |
| 04/04/2012 | 5615.00 | 0 | 0.00 |
| 05/04/2012 | 4642.00 | 0 | 0.00 |
| 06/04/2012 | 6826.00 | 0 | 0.00 |
| 07/04/2012 | 5574.00 | 0 | 0.00 |
| 08/04/2012 | 3187.00 | 0 | 0.00 |
| 09/04/2012 | 3354.00 | 0 | 0.00 |
| 10/04/2012 | 3163.00 | 0 | 0.00 |
| 11/04/2012 | 6631.00 | 0 | 0.00 |
| 12/04/2012 | 7451.00 | 0 | 0.00 |
| 13/04/2012 | 5853.00 | 0 | 0.00 |
| 14/04/2012 | 4056.00 | 0 | 0.00 |

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|---|---|---|---|
| 15/04/2012 | 3848.00 | 0 | 0.00 |
| 16/04/2012 | 3752.00 | 0 | 0.00 |
| 17/04/2012 | 3797.00 | 0 | 0.00 |
| 18/04/2012 | 3561.00 | 0 | 0.00 |
| 19/04/2012 | 3305.00 | 0 | 0.00 |
| 20/04/2012 | 4212.00 | 0 | 0.00 |
| 21/04/2012 | 4693.00 | 0 | 0.00 |
| 22/04/2012 | 4619.00 | 0 | 0.00 |
| 23/04/2012 | 4536.00 | 0 | 0.00 |
| 24/04/2012 | 4485.00 | 0 | 0.00 |
| 25/04/2012 | 4101.00 | 0 | 0.00 |
| 26/04/2012 | 3050.00 | 0 | 0.00 |
| 27/04/2012 | 4023.00 | 0 | 0.00 |
| 28/04/2012 | 3658.00 | 0 | 0.00 |
| 29/04/2012 | 4571.00 | 0 | 0.00 |
| 30/04/2012 | 3659.00 | 0 | 0.00 |
| 01/05/2012 | 3383.00 | 0 | 0.00 |
| 02/05/2012 | 2722.00 | 0 | 0.00 |
| 03/05/2012 | 3260.00 | 0 | 0.00 |
| 04/05/2012 | 2937.00 | 0 | 0.00 |
| 05/05/2012 | 2549.00 | 0 | 0.00 |
| 06/05/2012 | 2298.00 | 0 | 0.00 |
| 07/05/2012 | 2248.00 | 0 | 0.00 |
| 08/05/2012 | 3554.00 | 0 | 0.00 |
| 09/05/2012 | 4842.00 | 0 | 0.00 |
| 10/05/2012 | 4688.00 | 0 | 0.00 |
| 11/05/2012 | 4313.00 | 1 | 121.00 |
| 12/05/2012 | 3849.00 | 0 | 0.00 |
| 13/05/2012 | 3835.00 | 0 | 0.00 |
| 14/05/2012 | 5217.00 | 0 | 0.00 |
| 15/05/2012 | 6220.00 | 0 | 0.00 |
| 16/05/2012 | 6051.00 | 1 | 121.00 |
| 17/05/2012 | 5964.00 | 0 | 0.00 |
| 18/05/2012 | 6032.00 | 0 | 0.00 |
| 19/05/2012 | 6010.00 | 0 | 0.00 |
| 20/05/2012 | 6538.00 | 0 | 0.00 |
| 21/05/2012 | 6068.00 | 0 | 0.00 |
| 22/05/2012 | 6262.00 | 0 | 0.00 |
| 23/05/2012 | 7106.00 | 0 | 0.00 |
| 24/05/2012 | 6605.00 | 0 | 0.00 |
| 25/05/2012 | 6437.00 | 0 | 0.00 |
| 26/05/2012 | 6278.00 | 0 | 0.00 |
| 27/05/2012 | 5788.00 | 0 | 0.00 |
| 28/05/2012 | 5681.00 | 0 | 0.00 |
| 29/05/2012 | 5666.00 | 0 | 0.00 |
| 30/05/2012 | 5575.00 | 0 | 0.00 |
| 31/05/2012 | 5685.00 | 0 | 0.00 |
| 01/06/2012 | 7576.00 | 0 | 0.00 |
| 02/06/2012 | 8351.00 | 0 | 0.00 |
| 03/06/2012 | 7063.00 | 0 | 0.00 |
| 04/06/2012 | 5537.00 | 0 | 0.00 |
| 05/06/2012 | 5395.00 | 0 | 0.00 |
| 06/06/2012 | 5372.00 | 0 | 0.00 |
| 07/06/2012 | 5156.00 | 0 | 0.00 |
| 08/06/2012 | 6043.00 | 0 | 0.00 |
| 09/06/2012 | 6478.00 | 0 | 0.00 |
| 10/06/2012 | 6986.00 | 0 | 0.00 |
| 11/06/2012 | 5330.00 | 0 | 0.00 |
| 12/06/2012 | 5222.00 | 0 | 0.00 |

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|---|---|---|---|
| 13/06/2012 | 6394.00 | 0 | 0.00 |
| 14/06/2012 | 6432.00 | 0 | 0.00 |
| 15/06/2012 | 6171.00 | 0 | 0.00 |
| 16/06/2012 | 5849.00 | 0 | 0.00 |
| 17/06/2012 | 5465.00 | 0 | 0.00 |
| 18/06/2012 | 5602.00 | 0 | 0.00 |
| 19/06/2012 | 5622.00 | 0 | 0.00 |
| 20/06/2012 | 5773.00 | 0 | 0.00 |
| 21/06/2012 | 5809.00 | 0 | 0.00 |
| 22/06/2012 | 5915.00 | 0 | 0.00 |
| 23/06/2012 | 5900.00 | 0 | 0.00 |
| 24/06/2012 | 5794.00 | 0 | 0.00 |
| 25/06/2012 | 5736.00 | 0 | 0.00 |
| 26/06/2012 | 5753.00 | 0 | 0.00 |
| 27/06/2012 | 4168.00 | 0 | 0.00 |
| 28/06/2012 | 5173.00 | 1 | 121.00 |
| 29/06/2012 | 5503.00 | 0 | 0.00 |
| 30/06/2012 | 1971.00 | 0 | 0.00 |
| 01/07/2012 | 3410.00 | 0 | 0.00 |
| 02/07/2012 | 10745.00 | 0 | 0.00 |
| 03/07/2012 | 6288.00 | 0 | 0.00 |
| 04/07/2012 | 4229.00 | 0 | 0.00 |
| 05/07/2012 | 6593.00 | 0 | 0.00 |
| 06/07/2012 | 5075.00 | 0 | 0.00 |
| 07/07/2012 | 4466.00 | 0 | 0.00 |
| 08/07/2012 | 8632.00 | 0 | 0.00 |
| 09/07/2012 | 2916.00 | 0 | 0.00 |
| 10/07/2012 | 2367.00 | 0 | 0.00 |
| 11/07/2012 | 3542.00 | 0 | 0.00 |
| 12/07/2012 | 7436.00 | 0 | 0.00 |
| 13/07/2012 | 6138.00 | 0 | 0.00 |
| 14/07/2012 | 3930.00 | 0 | 0.00 |
| 15/07/2012 | 3269.00 | 0 | 0.00 |
| 16/07/2012 | 3358.00 | 0 | 0.00 |
| 17/07/2012 | 3324.00 | 0 | 0.00 |
| 18/07/2012 | 3066.00 | 0 | 0.00 |
| 19/07/2012 | 7178.00 | 0 | 0.00 |
| 20/07/2012 | 7045.00 | 0 | 0.00 |
| 21/07/2012 | 4593.00 | 0 | 0.00 |
| 22/07/2012 | 4407.00 | 0 | 0.00 |
| 23/07/2012 | 7287.00 | 0 | 0.00 |
| 24/07/2012 | 7770.00 | 0 | 0.00 |
| 25/07/2012 | 7252.00 | 0 | 0.00 |
| 26/07/2012 | 6568.00 | 0 | 0.00 |
| 27/07/2012 | 6483.00 | 0 | 0.00 |
| 28/07/2012 | 6381.00 | 0 | 0.00 |
| 29/07/2012 | 6299.00 | 0 | 0.00 |
| 30/07/2012 | 6380.00 | 0 | 0.00 |
| 31/07/2012 | 7661.00 | 0 | 0.00 |
| 01/08/2012 | 8740.00 | 0 | 0.00 |
| 02/08/2012 | 8754.00 | 0 | 0.00 |
| 03/08/2012 | 7046.00 | 0 | 0.00 |
| 04/08/2012 | 4569.00 | 0 | 0.00 |
| 05/08/2012 | 4578.00 | 0 | 0.00 |
| 06/08/2012 | 6694.00 | 0 | 0.00 |
| 07/08/2012 | 9845.00 | 0 | 0.00 |
| 08/08/2012 | 10847.00 | 0 | 0.00 |
| 09/08/2012 | 8760.00 | 0 | 0.00 |
| 10/08/2012 | 6101.00 | 0 | 0.00 |

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|---|---|---|---|
| 11/08/2012 | 5964.00 | 0 | 0.00 |
| 12/08/2012 | 5818.00 | 0 | 0.00 |
| 13/08/2012 | 7318.00 | 0 | 0.00 |
| 14/08/2012 | 8602.00 | 0 | 0.00 |
| 15/08/2012 | 6971.00 | 0 | 0.00 |
| 16/08/2012 | 4451.00 | 0 | 0.00 |
| 17/08/2012 | 3311.00 | 0 | 0.00 |
| 18/08/2012 | 2190.00 | 0 | 0.00 |
| 19/08/2012 | 6534.00 | 0 | 0.00 |
| 20/08/2012 | 9592.00 | 0 | 0.00 |
| 21/08/2012 | 8444.00 | 0 | 0.00 |
| 22/08/2012 | 6347.00 | 0 | 0.00 |
| 23/08/2012 | 6194.00 | 0 | 0.00 |
| 24/08/2012 | 4585.00 | 0 | 0.00 |
| 25/08/2012 | 2501.00 | 0 | 0.00 |
| 26/08/2012 | 2512.00 | 0 | 0.00 |
| 27/08/2012 | 2479.00 | 0 | 0.00 |
| 28/08/2012 | 6314.00 | 0 | 0.00 |
| 29/08/2012 | 7270.00 | 0 | 0.00 |
| 30/08/2012 | 1965.00 | 0 | 0.00 |
| 31/08/2012 | 3975.00 | 0 | 0.00 |
| 01/09/2012 | 5402.00 | 0 | 0.00 |
| 02/09/2012 | 5297.00 | 0 | 0.00 |
| 03/09/2012 | 7470.00 | 0 | 0.00 |
| 04/09/2012 | 7877.00 | 0 | 0.00 |
| 05/09/2012 | 8650.00 | 0 | 0.00 |
| 06/09/2012 | 8393.00 | 0 | 0.00 |
| 07/09/2012 | 8109.00 | 0 | 0.00 |
| 08/09/2012 | 7966.00 | 0 | 0.00 |
| 09/09/2012 | 7791.00 | 0 | 0.00 |
| 10/09/2012 | 6277.00 | 0 | 0.00 |
| 11/09/2012 | 4348.00 | 0 | 0.00 |
| 12/09/2012 | 4905.00 | 0 | 0.00 |
| 13/09/2012 | 7865.00 | 0 | 0.00 |
| 14/09/2012 | 7880.00 | 0 | 0.00 |
| 15/09/2012 | 4674.00 | 0 | 0.00 |
| 16/09/2012 | 4642.00 | 0 | 0.00 |
| 17/09/2012 | 4636.00 | 0 | 0.00 |
| 18/09/2012 | 4610.00 | 0 | 0.00 |
| 19/09/2012 | 4512.00 | 0 | 0.00 |
| 20/09/2012 | 6265.00 | 0 | 0.00 |
| 21/09/2012 | 8934.00 | 0 | 0.00 |
| 22/09/2012 | 9265.00 | 0 | 0.00 |
| 23/09/2012 | 9197.00 | 0 | 0.00 |
| 24/09/2012 | 6062.00 | 0 | 0.00 |
| 25/09/2012 | 1542.00 | 0 | 0.00 |
| 26/09/2012 | 1401.00 | 0 | 0.00 |
| 27/09/2012 | 6226.00 | 0 | 0.00 |
| 28/09/2012 | 9470.00 | 0 | 0.00 |
| 29/09/2012 | 4334.00 | 0 | 0.00 |
| 30/09/2012 | 4334.00 | 0 | 0.00 |
| 01/10/2012 | 4917.00 | 0 | 0.00 |
| 02/10/2012 | 4832.00 | 0 | 0.00 |
| 03/10/2012 | 6229.00 | 0 | 0.00 |
| 04/10/2012 | 5807.00 | 0 | 0.00 |
| 05/10/2012 | 3379.00 | 0 | 0.00 |
| 06/10/2012 | 5646.00 | 0 | 0.00 |
| 07/10/2012 | 5681.00 | 0 | 0.00 |
| 08/10/2012 | 6164.00 | 0 | 0.00 |

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|---|---|---|---|
| 09/10/2012 | 7749.00 | 0 | 0.00 |
| 10/10/2012 | 5728.00 | 0 | 0.00 |
| 11/10/2012 | 2742.00 | 0 | 0.00 |
| 12/10/2012 | 3044.00 | 0 | 0.00 |
| 13/10/2012 | 7461.00 | 0 | 0.00 |
| 14/10/2012 | 7444.00 | 0 | 0.00 |
| 15/10/2012 | 5052.00 | 0 | 0.00 |
| 16/10/2012 | 3169.00 | 0 | 0.00 |
| 17/10/2012 | 2876.00 | 0 | 0.00 |
| 18/10/2012 | 1729.00 | 0 | 0.00 |
| 19/10/2012 | 3096.00 | 0 | 0.00 |
| 20/10/2012 | 8194.00 | 0 | 0.00 |
| 21/10/2012 | 7302.00 | 0 | 0.00 |
| 22/10/2012 | 7111.00 | 4 | 484.00 |
| 23/10/2012 | 6176.00 | 0 | 0.00 |
| 24/10/2012 | 5752.00 | 0 | 0.00 |
| 25/10/2012 | 6161.00 | 0 | 0.00 |
| 26/10/2012 | 6498.00 | 0 | 0.00 |
| 27/10/2012 | 6545.00 | 0 | 0.00 |
| 28/10/2012 | 6387.00 | 0 | 0.00 |
| 29/10/2012 | 5956.00 | 0 | 0.00 |
| 30/10/2012 | 4316.00 | 0 | 0.00 |
| 31/10/2012 | 6900.00 | 0 | 0.00 |
| 01/11/2012 | 4971.00 | 0 | 0.00 |
| 02/11/2012 | 5359.00 | 0 | 0.00 |
| 03/11/2012 | 8104.00 | 0 | 0.00 |
| 04/11/2012 | 549.00 | 0 | 0.00 |
| 05/11/2012 | 6067.00 | 0 | 0.00 |
| 06/11/2012 | 8861.00 | 0 | 0.00 |
| 07/11/2012 | 6243.00 | 0 | 0.00 |
| 08/11/2012 | 6149.00 | 0 | 0.00 |
| 09/11/2012 | 5673.00 | 0 | 0.00 |
| 10/11/2012 | 4686.00 | 0 | 0.00 |
| 11/11/2012 | 4486.00 | 0 | 0.00 |
| 12/11/2012 | 6174.00 | 0 | 0.00 |
| 13/11/2012 | 6695.00 | 0 | 0.00 |
| 14/11/2012 | 2854.00 | 0 | 0.00 |
| 15/11/2012 | 4455.00 | 0 | 0.00 |
| 16/11/2012 | 6711.00 | 0 | 0.00 |
| 17/11/2012 | 6670.00 | 0 | 0.00 |
| 18/11/2012 | 6519.00 | 0 | 0.00 |
| 19/11/2012 | 4795.00 | 0 | 0.00 |
| 20/11/2012 | 3067.00 | 0 | 0.00 |
| 21/11/2012 | 3541.00 | 0 | 0.00 |
| 22/11/2012 | 2162.00 | 0 | 0.00 |
| 23/11/2012 | 1392.00 | 0 | 0.00 |
| 24/11/2012 | 1447.00 | 0 | 0.00 |
| 25/11/2012 | 3132.00 | 0 | 0.00 |
| 26/11/2012 | 1891.00 | 0 | 0.00 |
| 27/11/2012 | 2570.00 | 0 | 0.00 |
| 28/11/2012 | 1712.00 | 0 | 0.00 |
| 29/11/2012 | 1340.00 | 0 | 0.00 |
| 30/11/2012 | 1239.00 | 0 | 0.00 |
| 01/12/2012 | 951.00 | 0 | 0.00 |
| 02/12/2012 | 866.00 | 0 | 0.00 |
| 03/12/2012 | 2956.00 | 0 | 0.00 |
| 04/12/2012 | 5923.00 | 0 | 0.00 |
| 05/12/2012 | 4710.00 | 0 | 0.00 |
| 06/12/2012 | 3011.00 | 0 | 0.00 |

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|---|---|---|---|
| 07/12/2012 | 3006.00 | 0 | 0.00 |
| 08/12/2012 | 1943.00 | 0 | 0.00 |
| 09/12/2012 | 952.00 | 0 | 0.00 |
| 10/12/2012 | 5010.00 | 0 | 0.00 |
| 11/12/2012 | 7266.00 | 0 | 0.00 |
| 12/12/2012 | 3812.00 | 0 | 0.00 |
| 13/12/2012 | 4116.00 | 0 | 0.00 |
| 14/12/2012 | 1423.00 | 0 | 0.00 |
| 15/12/2012 | 1768.00 | 0 | 0.00 |
| 16/12/2012 | 1609.00 | 0 | 0.00 |
| 17/12/2012 | 1741.00 | 0 | 0.00 |
| 18/12/2012 | 3623.00 | 0 | 0.00 |
| 19/12/2012 | 3552.00 | 0 | 0.00 |
| 20/12/2012 | 4036.00 | 0 | 0.00 |
| 21/12/2012 | 2702.00 | 0 | 0.00 |
| 22/12/2012 | 2812.00 | 0 | 0.00 |
| 23/12/2012 | 2774.00 | 0 | 0.00 |
| 24/12/2012 | 2169.00 | 0 | 0.00 |
| 25/12/2012 | 1928.00 | 0 | 0.00 |
| 26/12/2012 | 1576.00 | 0 | 0.00 |
| 27/12/2012 | 2264.00 | 0 | 0.00 |
| 28/12/2012 | 1957.00 | 0 | 0.00 |
| 29/12/2012 | 3341.00 | 0 | 0.00 |
| 30/12/2012 | 2821.00 | 0 | 0.00 |
| 31/12/2012 | 2227.00 | 0 | 0.00 |
| 01/01/2013 | 1639.00 | 0 | 0.00 |
| 02/01/2013 | 3095.00 | 0 | 0.00 |
| 03/01/2013 | 7480.00 | 0 | 0.00 |
| 04/01/2013 | 3988.00 | 0 | 0.00 |
| 05/01/2013 | 3749.00 | 0 | 0.00 |
| 06/01/2013 | 3426.00 | 0 | 0.00 |
| 07/01/2013 | 5490.00 | 0 | 0.00 |
| 08/01/2013 | 6472.00 | 0 | 0.00 |
| 09/01/2013 | 4354.00 | 0 | 0.00 |
| 10/01/2013 | 5283.00 | 0 | 0.00 |
| 11/01/2013 | 6373.00 | 0 | 0.00 |
| 12/01/2013 | 6876.00 | 0 | 0.00 |
| 13/01/2013 | 6493.00 | 0 | 0.00 |
| 14/01/2013 | 6049.00 | 0 | 0.00 |
| 15/01/2013 | 6953.00 | 0 | 0.00 |
| 16/01/2013 | 6865.00 | 0 | 0.00 |
| 17/01/2013 | 5295.00 | 0 | 0.00 |
| 18/01/2013 | 1801.00 | 0 | 0.00 |
| 19/01/2013 | 1734.00 | 0 | 0.00 |
| 20/01/2013 | 1735.00 | 0 | 0.00 |
| 21/01/2013 | 3107.00 | 0 | 0.00 |
| 22/01/2013 | 4423.00 | 0 | 0.00 |
| 23/01/2013 | 6423.00 | 0 | 0.00 |
| 24/01/2013 | 3459.00 | 0 | 0.00 |
| 25/01/2013 | 1363.00 | 0 | 0.00 |
| 26/01/2013 | 1468.00 | 0 | 0.00 |
| 27/01/2013 | 2930.00 | 0 | 0.00 |
| 28/01/2013 | 2349.00 | 0 | 0.00 |
| 29/01/2013 | 1979.00 | 0 | 0.00 |
| 30/01/2013 | 1970.00 | 0 | 0.00 |
| 31/01/2013 | 1865.00 | 0 | 0.00 |
| 01/02/2013 | 2308.00 | 0 | 0.00 |
| 02/02/2013 | 1594.00 | 0 | 0.00 |
| 03/02/2013 | 1202.00 | 0 | 0.00 |

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|---|---|---|---|
| 04/02/2013 | 1032.00 | 0 | 0.00 |
| 05/02/2013 | 1134.00 | 0 | 0.00 |
| 06/02/2013 | 1406.00 | 0 | 0.00 |
| 07/02/2013 | 740.00 | 0 | 0.00 |
| 08/02/2013 | 269.00 | 0 | 0.00 |
| 09/02/2013 | 299.00 | 0 | 0.00 |
| 10/02/2013 | 627.00 | 0 | 0.00 |
| 11/02/2013 | 1369.00 | 0 | 0.00 |
| 12/02/2013 | 605.00 | 0 | 0.00 |
| 13/02/2013 | 1252.00 | 0 | 0.00 |
| 14/02/2013 | 3229.00 | 0 | 0.00 |
| 15/02/2013 | 2407.00 | 0 | 0.00 |
| 16/02/2013 | 2214.00 | 0 | 0.00 |
| 17/02/2013 | 1969.00 | 0 | 0.00 |
| 18/02/2013 | 3903.00 | 0 | 0.00 |
| 19/02/2013 | 5149.00 | 0 | 0.00 |
| 20/02/2013 | 4297.00 | 0 | 0.00 |
| 21/02/2013 | 3626.00 | 0 | 0.00 |
| 22/02/2013 | 3342.00 | 0 | 0.00 |
| 23/02/2013 | 4065.00 | 0 | 0.00 |
| 24/02/2013 | 3549.00 | 0 | 0.00 |
| 25/02/2013 | 3346.00 | 0 | 0.00 |
| 26/02/2013 | 3745.00 | 0 | 0.00 |
| 27/02/2013 | 4741.00 | 0 | 0.00 |
| 28/02/2013 | 4665.00 | 0 | 0.00 |
| 01/03/2013 | 5142.00 | 0 | 0.00 |
| 02/03/2013 | 5720.00 | 0 | 0.00 |
| 03/03/2013 | 5545.00 | 0 | 0.00 |
| 04/03/2013 | 5446.00 | 0 | 0.00 |
| 05/03/2013 | 5686.00 | 0 | 0.00 |
| 06/03/2013 | 5500.00 | 0 | 0.00 |
| 07/03/2013 | 6006.00 | 0 | 0.00 |
| 08/03/2013 | 4841.00 | 0 | 0.00 |
| 09/03/2013 | 654.00 | 0 | 0.00 |
| 10/03/2013 | 548.00 | 0 | 0.00 |
| 11/03/2013 | 3546.00 | 0 | 0.00 |
| 12/03/2013 | 5644.00 | 0 | 0.00 |
| 13/03/2013 | 6830.00 | 0 | 0.00 |
| 14/03/2013 | 6577.00 | 0 | 0.00 |
| 15/03/2013 | 6221.00 | 0 | 0.00 |
| 16/03/2013 | 6320.00 | 0 | 0.00 |
| 17/03/2013 | 6106.00 | 0 | 0.00 |
| 18/03/2013 | 5318.00 | 0 | 0.00 |
| 19/03/2013 | 4022.00 | 0 | 0.00 |
| 20/03/2013 | 3256.00 | 0 | 0.00 |
| 21/03/2013 | 1710.00 | 0 | 0.00 |
| 22/03/2013 | 2653.00 | 0 | 0.00 |
| 23/03/2013 | 1978.00 | 0 | 0.00 |
| 24/03/2013 | 1492.00 | 0 | 0.00 |
| 25/03/2013 | 1821.00 | 0 | 0.00 |
| 26/03/2013 | 2378.00 | 0 | 0.00 |
| 27/03/2013 | 3193.00 | 0 | 0.00 |
| 28/03/2013 | 2995.00 | 0 | 0.00 |
| 29/03/2013 | 2872.00 | 0 | 0.00 |
| 30/03/2013 | 2745.00 | 0 | 0.00 |
| 31/03/2013 | 2592.00 | 0 | 0.00 |
| 01/04/2013 | 2523.00 | 0 | 0.00 |
| 02/04/2013 | 3990.00 | 0 | 0.00 |
| 03/04/2013 | 5674.00 | 0 | 0.00 |

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|---|---|---|---|
| 04/04/2013 | 5655.00 | 0 | 0.00 |
| 05/04/2013 | 5658.00 | 0 | 0.00 |
| 06/04/2013 | 5602.00 | 0 | 0.00 |
| 07/04/2013 | 5599.00 | 0 | 0.00 |
| 08/04/2013 | 3671.00 | 0 | 0.00 |
| 09/04/2013 | 545.00 | 0 | 0.00 |
| 10/04/2013 | 489.00 | 0 | 0.00 |
| 11/04/2013 | 4439.00 | 0 | 0.00 |
| 12/04/2013 | 5123.00 | 0 | 0.00 |
| 13/04/2013 | 5016.00 | 0 | 0.00 |
| 14/04/2013 | 5094.00 | 0 | 0.00 |
| 15/04/2013 | 5022.00 | 0 | 0.00 |
| 16/04/2013 | 5102.00 | 0 | 0.00 |
| 17/04/2013 | 5070.00 | 0 | 0.00 |
| 18/04/2013 | 4378.00 | 0 | 0.00 |
| 19/04/2013 | 4024.00 | 0 | 0.00 |
| 20/04/2013 | 5632.00 | 0 | 0.00 |
| 21/04/2013 | 8207.00 | 0 | 0.00 |
| 22/04/2013 | 4039.00 | 0 | 0.00 |
| 23/04/2013 | 3873.00 | 0 | 0.00 |
| 24/04/2013 | 4595.00 | 0 | 0.00 |
| 25/04/2013 | 5248.00 | 0 | 0.00 |
| 26/04/2013 | 5226.00 | 0 | 0.00 |
| 27/04/2013 | 5004.00 | 0 | 0.00 |
| 28/04/2013 | 4739.00 | 0 | 0.00 |
| 29/04/2013 | 4579.00 | 0 | 0.00 |
| 30/04/2013 | 4463.00 | 0 | 0.00 |
| 01/05/2013 | 4405.00 | 0 | 0.00 |
| 02/05/2013 | 4231.00 | 0 | 0.00 |
| 03/05/2013 | 3714.00 | 0 | 0.00 |
| 04/05/2013 | 4155.00 | 0 | 0.00 |
| 05/05/2013 | 5379.00 | 0 | 0.00 |
| 06/05/2013 | 4593.00 | 0 | 0.00 |
| 07/05/2013 | 4204.00 | 0 | 0.00 |
| 08/05/2013 | 3696.00 | 3 | 363.00 |
| 09/05/2013 | 3876.00 | 0 | 0.00 |
| 10/05/2013 | 5696.00 | 0 | 0.00 |
| 11/05/2013 | 5556.00 | 0 | 0.00 |
| 12/05/2013 | 5569.00 | 0 | 0.00 |
| 13/05/2013 | 5677.00 | 0 | 0.00 |
| 14/05/2013 | 5950.00 | 0 | 0.00 |
| 15/05/2013 | 3029.00 | 0 | 0.00 |
| 16/05/2013 | 1409.00 | 0 | 0.00 |
| 17/05/2013 | 2412.00 | 0 | 0.00 |
| 18/05/2013 | 1656.00 | 0 | 0.00 |
| 19/05/2013 | 776.00 | 0 | 0.00 |
| 20/05/2013 | 2179.00 | 0 | 0.00 |
| 21/05/2013 | 8210.00 | 0 | 0.00 |
| 22/05/2013 | 8017.00 | 0 | 0.00 |
| 23/05/2013 | 6481.00 | 0 | 0.00 |
| 24/05/2013 | 4951.00 | 0 | 0.00 |
| 25/05/2013 | 4659.00 | 0 | 0.00 |
| 26/05/2013 | 4332.00 | 0 | 0.00 |
| 27/05/2013 | 3864.00 | 0 | 0.00 |
| 28/05/2013 | 3565.00 | 0 | 0.00 |
| 29/05/2013 | 2342.00 | 0 | 0.00 |
| 30/05/2013 | 245.00 | 0 | 0.00 |
| 31/05/2013 | 3877.00 | 0 | 0.00 |
| 01/06/2013 | 663.00 | 0 | 0.00 |

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|---|---|---|---|
| 02/06/2013 | 2315.00 | 0 | 0.00 |
| 03/06/2013 | 4445.00 | 1 | 121.00 |
| 04/06/2013 | 4087.00 | 0 | 0.00 |
| 05/06/2013 | 5452.00 | 0 | 0.00 |
| 06/06/2013 | 4134.00 | 0 | 0.00 |
| 07/06/2013 | 5416.00 | 0 | 0.00 |
| 08/06/2013 | 6137.00 | 0 | 0.00 |
| 09/06/2013 | 6137.00 | 0 | 0.00 |
| 10/06/2013 | 5628.00 | 0 | 0.00 |
| 11/06/2013 | 5043.00 | 1 | 121.00 |
| 12/06/2013 | 5163.00 | 0 | 0.00 |
| 13/06/2013 | 5029.00 | 0 | 0.00 |
| 14/06/2013 | 4817.00 | 0 | 0.00 |
| 15/06/2013 | 4444.00 | 0 | 0.00 |
| 16/06/2013 | 4116.00 | 0 | 0.00 |
| 17/06/2013 | 3774.00 | 0 | 0.00 |
| 18/06/2013 | 5121.00 | 0 | 0.00 |
| 19/06/2013 | 6434.00 | 0 | 0.00 |
| 20/06/2013 | 2552.00 | 0 | 0.00 |
| 21/06/2013 | 4368.00 | 0 | 0.00 |
| 22/06/2013 | 6956.00 | 0 | 0.00 |
| 23/06/2013 | 6141.00 | 0 | 0.00 |
| 24/06/2013 | 4710.00 | 0 | 0.00 |
| 25/06/2013 | 4711.00 | 0 | 0.00 |
| 26/06/2013 | 5278.00 | 0 | 0.00 |
| 27/06/2013 | 6114.00 | 0 | 0.00 |
| 28/06/2013 | 5954.00 | 0 | 0.00 |
| 29/06/2013 | 5878.00 | 0 | 0.00 |
| 30/06/2013 | 5671.00 | 0 | 0.00 |
| 01/07/2013 | 5565.00 | 0 | 0.00 |
| 02/07/2013 | 5746.00 | 0 | 0.00 |
| 03/07/2013 | 5692.00 | 1 | 121.00 |
| 04/07/2013 | 5617.00 | 0 | 0.00 |
| 05/07/2013 | 5603.00 | 0 | 0.00 |
| 06/07/2013 | 5723.00 | 0 | 0.00 |
| 07/07/2013 | 5699.00 | 0 | 0.00 |
| 08/07/2013 | 5451.00 | 0 | 0.00 |
| 09/07/2013 | 5537.00 | 1 | 121.00 |
| 10/07/2013 | 7730.00 | 0 | 0.00 |
| 11/07/2013 | 7264.00 | 0 | 0.00 |
| 12/07/2013 | 5804.00 | 0 | 0.00 |
| 13/07/2013 | 5543.00 | 0 | 0.00 |
| 14/07/2013 | 5393.00 | 0 | 0.00 |
| 15/07/2013 | 5394.00 | 0 | 0.00 |
| 16/07/2013 | 5223.00 | 0 | 0.00 |
| 17/07/2013 | 6722.00 | 1 | 121.00 |
| 18/07/2013 | 8453.00 | 0 | 0.00 |
| 19/07/2013 | 7876.00 | 0 | 0.00 |
| 20/07/2013 | 5701.00 | 0 | 0.00 |
| 21/07/2013 | 5668.00 | 0 | 0.00 |
| 22/07/2013 | 4551.00 | 0 | 0.00 |
| 23/07/2013 | 5533.00 | 0 | 0.00 |
| 24/07/2013 | 6239.00 | 0 | 0.00 |
| 25/07/2013 | 5505.00 | 0 | 0.00 |
| 26/07/2013 | 6157.00 | 1 | 121.00 |
| 27/07/2013 | 5707.00 | 0 | 0.00 |
| 28/07/2013 | 3398.00 | 0 | 0.00 |
| 29/07/2013 | 4496.00 | 0 | 0.00 |
| 30/07/2013 | 6097.00 | 0 | 0.00 |

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|---|---|---|---|
| 31/07/2013 | 6090.00 | 0 | 0.00 |
| 01/08/2013 | 5468.00 | 0 | 0.00 |
| 02/08/2013 | 4867.00 | 0 | 0.00 |
| 03/08/2013 | 4377.00 | 0 | 0.00 |
| 04/08/2013 | 4149.00 | 0 | 0.00 |
| 05/08/2013 | 3994.00 | 0 | 0.00 |
| 06/08/2013 | 5858.00 | 0 | 0.00 |
| 07/08/2013 | 6866.00 | 0 | 0.00 |
| 08/08/2013 | 6661.00 | 0 | 0.00 |
| 09/08/2013 | 6381.00 | 0 | 0.00 |
| 10/08/2013 | 6310.00 | 0 | 0.00 |
| 11/08/2013 | 6208.00 | 0 | 0.00 |
| 12/08/2013 | 6128.00 | 0 | 0.00 |
| 13/08/2013 | 6099.00 | 0 | 0.00 |
| 14/08/2013 | 3911.00 | 1 | 121.00 |
| 15/08/2013 | 2565.00 | 0 | 0.00 |
| 16/08/2013 | 2693.00 | 0 | 0.00 |
| 17/08/2013 | 4294.00 | 0 | 0.00 |
| 18/08/2013 | 4025.00 | 0 | 0.00 |
| 19/08/2013 | 5303.00 | 0 | 0.00 |
| 20/08/2013 | 5985.00 | 0 | 0.00 |
| 21/08/2013 | 6644.00 | 0 | 0.00 |
| 22/08/2013 | 7383.00 | 0 | 0.00 |
| 23/08/2013 | 6903.00 | 0 | 0.00 |
| 24/08/2013 | 6020.00 | 1 | 121.00 |
| 25/08/2013 | 5797.00 | 0 | 0.00 |
| 26/08/2013 | 5745.00 | 0 | 0.00 |
| 27/08/2013 | 6031.00 | 0 | 0.00 |
| 28/08/2013 | 6041.00 | 0 | 0.00 |
| 29/08/2013 | 6116.00 | 0 | 0.00 |
| 30/08/2013 | 6098.00 | 0 | 0.00 |
| 31/08/2013 | 6032.00 | 0 | 0.00 |
| 01/09/2013 | 6215.00 | 0 | 0.00 |
| 02/09/2013 | 6260.00 | 0 | 0.00 |
| 03/09/2013 | 6278.00 | 0 | 0.00 |
| 04/09/2013 | 5975.00 | 1 | 121.00 |
| 05/09/2013 | 5634.00 | 0 | 0.00 |
| 06/09/2013 | 5946.00 | 0 | 0.00 |
| 07/09/2013 | 4601.00 | 1 | 121.00 |
| 08/09/2013 | 4272.00 | 0 | 0.00 |
| 09/09/2013 | 4635.00 | 0 | 0.00 |
| 10/09/2013 | 4369.00 | 0 | 0.00 |
| 11/09/2013 | 4502.00 | 0 | 0.00 |
| 12/09/2013 | 4455.00 | 0 | 0.00 |
| 13/09/2013 | 4321.00 | 0 | 0.00 |
| 14/09/2013 | 4050.00 | 0 | 0.00 |
| 15/09/2013 | 4040.00 | 0 | 0.00 |
| 16/09/2013 | 4249.00 | 0 | 0.00 |
| 17/09/2013 | 4211.00 | 0 | 0.00 |
| 18/09/2013 | 4090.00 | 0 | 0.00 |
| 19/09/2013 | 3939.00 | 0 | 0.00 |
| 20/09/2013 | 4704.00 | 0 | 0.00 |
| 21/09/2013 | 4779.00 | 1 | 121.00 |
| 22/09/2013 | 4816.00 | 0 | 0.00 |
| 23/09/2013 | 3238.00 | 0 | 0.00 |
| 24/09/2013 | 2748.00 | 0 | 0.00 |
| 25/09/2013 | 6436.00 | 0 | 0.00 |
| 26/09/2013 | 6674.00 | 0 | 0.00 |
| 27/09/2013 | 4437.00 | 0 | 0.00 |

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|---|---|---|---|
| 28/09/2013 | 4529.00 | 0 | 0.00 |
| 29/09/2013 | 4430.00 | 0 | 0.00 |
| 30/09/2013 | 4433.00 | 0 | 0.00 |
| 01/10/2013 | 4574.00 | 0 | 0.00 |
| 02/10/2013 | 4495.00 | 0 | 0.00 |
| 03/10/2013 | 3469.00 | 0 | 0.00 |
| 04/10/2013 | 2845.00 | 0 | 0.00 |
| 05/10/2013 | 3557.00 | 0 | 0.00 |
| 06/10/2013 | 3283.00 | 0 | 0.00 |
| 07/10/2013 | 4631.00 | 0 | 0.00 |
| 08/10/2013 | 5765.00 | 0 | 0.00 |
| 09/10/2013 | 5693.00 | 0 | 0.00 |
| 10/10/2013 | 5711.00 | 0 | 0.00 |
| 11/10/2013 | 5552.00 | 0 | 0.00 |
| 12/10/2013 | 5576.00 | 0 | 0.00 |
| 13/10/2013 | 5569.00 | 0 | 0.00 |
| 14/10/2013 | 5444.00 | 0 | 0.00 |
| 15/10/2013 | 4665.00 | 0 | 0.00 |
| 16/10/2013 | 4402.00 | 0 | 0.00 |
| 17/10/2013 | 4767.00 | 0 | 0.00 |
| 18/10/2013 | 7006.00 | 0 | 0.00 |
| 19/10/2013 | 5262.00 | 0 | 0.00 |
| 20/10/2013 | 5394.00 | 0 | 0.00 |
| 21/10/2013 | 6132.00 | 0 | 0.00 |
| 22/10/2013 | 6198.00 | 0 | 0.00 |
| 23/10/2013 | 6152.00 | 0 | 0.00 |
| 24/10/2013 | 5932.00 | 0 | 0.00 |
| 25/10/2013 | 5998.00 | 0 | 0.00 |
| 26/10/2013 | 5663.00 | 0 | 0.00 |
| 27/10/2013 | 4722.00 | 0 | 0.00 |
| 28/10/2013 | 1258.00 | 0 | 0.00 |
| 29/10/2013 | 5412.00 | 3 | 363.00 |
| 30/10/2013 | 6536.00 | 0 | 0.00 |
| 31/10/2013 | 5403.00 | 0 | 0.00 |
| 01/11/2013 | 4720.00 | 1 | 121.00 |
| 02/11/2013 | 2331.00 | 0 | 0.00 |
| 03/11/2013 | 2042.00 | 0 | 0.00 |
| 04/11/2013 | 3621.00 | 0 | 0.00 |
| 05/11/2013 | 4802.00 | 1 | 121.00 |
| 06/11/2013 | 1458.00 | 0 | 0.00 |
| 07/11/2013 | 1556.00 | 0 | 0.00 |
| 08/11/2013 | 1893.00 | 0 | 0.00 |
| 09/11/2013 | 2357.00 | 0 | 0.00 |
| 10/11/2013 | 3559.00 | 0 | 0.00 |
| 11/11/2013 | 6047.00 | 0 | 0.00 |
| 12/11/2013 | 5424.00 | 0 | 0.00 |
| 13/11/2013 | 5228.00 | 0 | 0.00 |
| 14/11/2013 | 4741.00 | 0 | 0.00 |
| 15/11/2013 | 5310.00 | 0 | 0.00 |
| 16/11/2013 | 5943.00 | 0 | 0.00 |
| 17/11/2013 | 4528.00 | 0 | 0.00 |
| 18/11/2013 | 2234.00 | 0 | 0.00 |
| 19/11/2013 | 1939.00 | 0 | 0.00 |
| 20/11/2013 | 960.00 | 0 | 0.00 |
| 21/11/2013 | 3477.00 | 0 | 0.00 |
| 22/11/2013 | 5447.00 | 0 | 0.00 |
| 23/11/2013 | 856.00 | 0 | 0.00 |
| 24/11/2013 | 859.00 | 0 | 0.00 |
| 25/11/2013 | 2957.00 | 0 | 0.00 |

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|---|---|---|---|
| 26/11/2013 | 7002.00 | 0 | 0.00 |
| 27/11/2013 | 6899.00 | 0 | 0.00 |
| 28/11/2013 | 5609.00 | 0 | 0.00 |
| 29/11/2013 | 4539.00 | 0 | 0.00 |
| 30/11/2013 | 4493.00 | 0 | 0.00 |
| 01/12/2013 | 4163.00 | 0 | 0.00 |
| 02/12/2013 | 5457.00 | 0 | 0.00 |
| 03/12/2013 | 7041.00 | 0 | 0.00 |
| 04/12/2013 | 2182.00 | 1 | 121.00 |
| 05/12/2013 | 1680.00 | 0 | 0.00 |
| 06/12/2013 | 4312.00 | 0 | 0.00 |
| 07/12/2013 | 8323.00 | 0 | 0.00 |
| 08/12/2013 | 8696.00 | 0 | 0.00 |
| 09/12/2013 | 6354.00 | 0 | 0.00 |
| 10/12/2013 | 5441.00 | 0 | 0.00 |
| 11/12/2013 | 6810.00 | 0 | 0.00 |
| 12/12/2013 | 6701.00 | 0 | 0.00 |
| 13/12/2013 | 6952.00 | 0 | 0.00 |
| 14/12/2013 | 7049.00 | 0 | 0.00 |
| 15/12/2013 | 4751.00 | 0 | 0.00 |
| 16/12/2013 | 2860.00 | 0 | 0.00 |
| 17/12/2013 | 8222.00 | 0 | 0.00 |
| 18/12/2013 | 8245.00 | 0 | 0.00 |
| 19/12/2013 | 3668.00 | 0 | 0.00 |
| 20/12/2013 | 3331.00 | 0 | 0.00 |
| 21/12/2013 | 3314.00 | 0 | 0.00 |
| 22/12/2013 | 2609.00 | 0 | 0.00 |
| 23/12/2013 | 3701.00 | 0 | 0.00 |
| 24/12/2013 | 4023.00 | 0 | 0.00 |
| 25/12/2013 | 2138.00 | 0 | 0.00 |
| 26/12/2013 | 1447.00 | 0 | 0.00 |
| 27/12/2013 | 1666.00 | 0 | 0.00 |
| 28/12/2013 | 972.00 | 0 | 0.00 |
| 29/12/2013 | 761.00 | 0 | 0.00 |
| 30/12/2013 | 1005.00 | 0 | 0.00 |
| 31/12/2013 | 1268.00 | 0 | 0.00 |
| 01/01/2014 | 3404.00 | 0 | 0.00 |
| 02/01/2014 | 2764.00 | 0 | 0.00 |
| 03/01/2014 | 2181.00 | 0 | 0.00 |
| 04/01/2014 | 1612.00 | 0 | 0.00 |
| 05/01/2014 | 1430.00 | 0 | 0.00 |
| 06/01/2014 | 2294.00 | 0 | 0.00 |
| 07/01/2014 | 1902.00 | 0 | 0.00 |
| 08/01/2014 | 1930.00 | 0 | 0.00 |
| 09/01/2014 | 3325.00 | 0 | 0.00 |
| 10/01/2014 | 2016.00 | 0 | 0.00 |
| 11/01/2014 | 1363.00 | 0 | 0.00 |
| 12/01/2014 | 1016.00 | 0 | 0.00 |
| 13/01/2014 | 923.00 | 0 | 0.00 |
| 14/01/2014 | 3361.00 | 0 | 0.00 |
| 15/01/2014 | 5493.00 | 0 | 0.00 |
| 16/01/2014 | 4856.00 | 1 | 121.00 |
| 17/01/2014 | 4558.00 | 0 | 0.00 |
| 18/01/2014 | 4883.00 | 0 | 0.00 |
| 19/01/2014 | 5144.00 | 0 | 0.00 |
| 20/01/2014 | 4896.00 | 0 | 0.00 |
| 21/01/2014 | 4680.00 | 0 | 0.00 |
| 22/01/2014 | 4063.00 | 0 | 0.00 |
| 23/01/2014 | 3878.00 | 0 | 0.00 |

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|---|---|---|---|
| 24/01/2014 | 4008.00 | 0 | 0.00 |
| 25/01/2014 | 3667.00 | 0 | 0.00 |
| 26/01/2014 | 2809.00 | 0 | 0.00 |
| 27/01/2014 | 1810.00 | 0 | 0.00 |
| 28/01/2014 | 4731.00 | 0 | 0.00 |
| 29/01/2014 | 2889.00 | 0 | 0.00 |
| 30/01/2014 | 2152.00 | 0 | 0.00 |
| 31/01/2014 | 2156.00 | 0 | 0.00 |
| 01/02/2014 | 2629.00 | 0 | 0.00 |
| 02/02/2014 | 2145.00 | 0 | 0.00 |
| 03/02/2014 | 1754.00 | 0 | 0.00 |
| 04/02/2014 | 2260.00 | 0 | 0.00 |
| 05/02/2014 | 4949.00 | 0 | 0.00 |
| 06/02/2014 | 4616.00 | 0 | 0.00 |
| 07/02/2014 | 4157.00 | 0 | 0.00 |
| 08/02/2014 | 8566.00 | 0 | 0.00 |
| 09/02/2014 | 7011.00 | 0 | 0.00 |
| 10/02/2014 | 4144.00 | 0 | 0.00 |
| 11/02/2014 | 5566.00 | 0 | 0.00 |
| 12/02/2014 | 6874.00 | 0 | 0.00 |
| 13/02/2014 | 3860.00 | 0 | 0.00 |
| 14/02/2014 | 4224.00 | 0 | 0.00 |
| 15/02/2014 | 6795.00 | 0 | 0.00 |
| 16/02/2014 | 3635.00 | 0 | 0.00 |
| 17/02/2014 | 2892.00 | 0 | 0.00 |
| 18/02/2014 | 2442.00 | 0 | 0.00 |
| 19/02/2014 | 1904.00 | 0 | 0.00 |
| 20/02/2014 | 2105.00 | 0 | 0.00 |
| 21/02/2014 | 2658.00 | 0 | 0.00 |
| 22/02/2014 | 3647.00 | 0 | 0.00 |
| 23/02/2014 | 4840.00 | 0 | 0.00 |
| 24/02/2014 | 4589.00 | 0 | 0.00 |
| 25/02/2014 | 4525.00 | 0 | 0.00 |
| 26/02/2014 | 4384.00 | 0 | 0.00 |
| 27/02/2014 | 4423.00 | 0 | 0.00 |
| 28/02/2014 | 5633.00 | 0 | 0.00 |
| 01/03/2014 | 6841.00 | 0 | 0.00 |
| 02/03/2014 | 6956.00 | 0 | 0.00 |
| 03/03/2014 | 6889.00 | 0 | 0.00 |
| 04/03/2014 | 6863.00 | 0 | 0.00 |
| 05/03/2014 | 6792.00 | 0 | 0.00 |
| 06/03/2014 | 5178.00 | 1 | 121.00 |
| 07/03/2014 | 5010.00 | 0 | 0.00 |
| 08/03/2014 | 5472.00 | 0 | 0.00 |
| 09/03/2014 | 3764.00 | 0 | 0.00 |
| 10/03/2014 | 3195.00 | 0 | 0.00 |
| 11/03/2014 | 4316.00 | 0 | 0.00 |
| 12/03/2014 | 6736.00 | 0 | 0.00 |
| 13/03/2014 | 7825.00 | 0 | 0.00 |
| 14/03/2014 | 7723.00 | 0 | 0.00 |
| 15/03/2014 | 7592.00 | 0 | 0.00 |
| 16/03/2014 | 7517.00 | 0 | 0.00 |
| 17/03/2014 | 7409.00 | 1 | 121.00 |
| 18/03/2014 | 7758.00 | 1 | 121.00 |
| 19/03/2014 | 7627.00 | 0 | 0.00 |
| 20/03/2014 | 6051.00 | 0 | 0.00 |
| 21/03/2014 | 3310.00 | 0 | 0.00 |
| 22/03/2014 | 7327.00 | 0 | 0.00 |
| 23/03/2014 | 7326.00 | 0 | 0.00 |

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|---|---|---|---|
| 24/03/2014 | 7225.00 | 0 | 0.00 |
| 25/03/2014 | 7240.00 | 0 | 0.00 |
| 26/03/2014 | 7275.00 | 0 | 0.00 |
| 27/03/2014 | 7393.00 | 0 | 0.00 |
| 28/03/2014 | 7571.00 | 0 | 0.00 |
| 29/03/2014 | 7508.00 | 0 | 0.00 |
| 30/03/2014 | 7522.00 | 0 | 0.00 |
| 31/03/2014 | 7659.00 | 0 | 0.00 |
| 01/04/2014 | 6189.00 | 0 | 0.00 |
| 02/04/2014 | 5234.00 | 0 | 0.00 |
| 03/04/2014 | 6846.00 | 0 | 0.00 |
| 04/04/2014 | 7160.00 | 0 | 0.00 |
| 05/04/2014 | 7185.00 | 0 | 0.00 |
| 06/04/2014 | 7758.00 | 0 | 0.00 |
| 07/04/2014 | 9698.00 | 0 | 0.00 |
| 08/04/2014 | 9441.00 | 0 | 0.00 |
| 09/04/2014 | 7358.00 | 0 | 0.00 |
| 10/04/2014 | 7378.00 | 0 | 0.00 |
| 11/04/2014 | 9268.00 | 0 | 0.00 |
| 12/04/2014 | 7523.00 | 0 | 0.00 |
| 13/04/2014 | 7154.00 | 0 | 0.00 |
| 14/04/2014 | 7977.00 | 0 | 0.00 |
| 15/04/2014 | 5826.00 | 0 | 0.00 |
| 16/04/2014 | 8338.00 | 0 | 0.00 |
| 17/04/2014 | 7870.00 | 0 | 0.00 |
| 18/04/2014 | 7838.00 | 0 | 0.00 |
| 19/04/2014 | 9209.00 | 0 | 0.00 |
| 20/04/2014 | 9150.00 | 0 | 0.00 |
| 21/04/2014 | 9106.00 | 0 | 0.00 |
| 22/04/2014 | 8060.00 | 0 | 0.00 |
| 23/04/2014 | 7091.00 | 0 | 0.00 |
| 24/04/2014 | 7693.00 | 0 | 0.00 |
| 25/04/2014 | 8202.00 | 0 | 0.00 |
| 26/04/2014 | 6853.00 | 0 | 0.00 |
| 27/04/2014 | 6559.00 | 0 | 0.00 |
| 28/04/2014 | 6346.00 | 0 | 0.00 |
| 29/04/2014 | 5775.00 | 0 | 0.00 |
| 30/04/2014 | 5403.00 | 0 | 0.00 |
| 01/05/2014 | 5420.00 | 0 | 0.00 |
| 02/05/2014 | 5630.00 | 0 | 0.00 |
| 03/05/2014 | 5948.00 | 0 | 0.00 |
| 04/05/2014 | 5966.00 | 0 | 0.00 |
| 05/05/2014 | 7074.00 | 0 | 0.00 |
| 06/05/2014 | 8469.00 | 0 | 0.00 |
| 07/05/2014 | 7765.00 | 1 | 121.00 |
| 08/05/2014 | 7725.00 | 0 | 0.00 |
| 09/05/2014 | 6007.00 | 0 | 0.00 |
| 10/05/2014 | 6136.00 | 0 | 0.00 |
| 11/05/2014 | 6326.00 | 0 | 0.00 |
| 12/05/2014 | 7969.00 | 0 | 0.00 |
| 13/05/2014 | 7386.00 | 0 | 0.00 |
| 14/05/2014 | 5278.00 | 0 | 0.00 |
| 15/05/2014 | 7683.00 | 0 | 0.00 |
| 16/05/2014 | 9068.00 | 0 | 0.00 |
| 17/05/2014 | 8803.00 | 0 | 0.00 |
| 18/05/2014 | 8882.00 | 0 | 0.00 |
| 19/05/2014 | 7731.00 | 0 | 0.00 |
| 20/05/2014 | 6766.00 | 0 | 0.00 |
| 21/05/2014 | 6632.00 | 0 | 0.00 |

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|---|---|---|---|
| 22/05/2014 | 5306.00 | 0 | 0.00 |
| 23/05/2014 | 3749.00 | 0 | 0.00 |
| 24/05/2014 | 3853.00 | 0 | 0.00 |
| 25/05/2014 | 4537.00 | 0 | 0.00 |
| 26/05/2014 | 6099.00 | 0 | 0.00 |
| 27/05/2014 | 6115.00 | 0 | 0.00 |
| 28/05/2014 | 5914.00 | 0 | 0.00 |
| 29/05/2014 | 5908.00 | 0 | 0.00 |
| 30/05/2014 | 5859.00 | 0 | 0.00 |
| 31/05/2014 | 5724.00 | 0 | 0.00 |
| 01/06/2014 | 5692.00 | 0 | 0.00 |
| 02/06/2014 | 5777.00 | 0 | 0.00 |
| 03/06/2014 | 5556.00 | 0 | 0.00 |
| 04/06/2014 | 6187.00 | 0 | 0.00 |
| 05/06/2014 | 5790.00 | 0 | 0.00 |
| 06/06/2014 | 5779.00 | 0 | 0.00 |
| 07/06/2014 | 3451.00 | 0 | 0.00 |
| 08/06/2014 | 3240.00 | 0 | 0.00 |
| 09/06/2014 | 4941.00 | 0 | 0.00 |
| 10/06/2014 | 7680.00 | 0 | 0.00 |
| 11/06/2014 | 7773.00 | 0 | 0.00 |
| 12/06/2014 | 7782.00 | 0 | 0.00 |
| 13/06/2014 | 7978.00 | 0 | 0.00 |
| 14/06/2014 | 7705.00 | 0 | 0.00 |
| 15/06/2014 | 7559.00 | 0 | 0.00 |
| 16/06/2014 | 7550.00 | 0 | 0.00 |
| 17/06/2014 | 7443.00 | 0 | 0.00 |
| 18/06/2014 | 6953.00 | 0 | 0.00 |
| 19/06/2014 | 6569.00 | 0 | 0.00 |
| 20/06/2014 | 6338.00 | 0 | 0.00 |
| 21/06/2014 | 6264.00 | 0 | 0.00 |
| 22/06/2014 | 6222.00 | 0 | 0.00 |
| 23/06/2014 | 6437.00 | 0 | 0.00 |
| 24/06/2014 | 6356.00 | 0 | 0.00 |
| 25/06/2014 | 6230.00 | 0 | 0.00 |
| 26/06/2014 | 6594.00 | 0 | 0.00 |
| 27/06/2014 | 6860.00 | 0 | 0.00 |
| 28/06/2014 | 6596.00 | 0 | 0.00 |
| 29/06/2014 | 6291.00 | 0 | 0.00 |
| 30/06/2014 | 5938.00 | 1 | 121.00 |
| 01/07/2014 | 5784.00 | 0 | 0.00 |
| 02/07/2014 | 5821.00 | 0 | 0.00 |
| 03/07/2014 | 5596.00 | 0 | 0.00 |
| 04/07/2014 | 4949.00 | 0 | 0.00 |
| 05/07/2014 | 4867.00 | 0 | 0.00 |
| 06/07/2014 | 4984.00 | 0 | 0.00 |
| 07/07/2014 | 5025.00 | 0 | 0.00 |
| 08/07/2014 | 5835.00 | 0 | 0.00 |
| 09/07/2014 | 5954.00 | 0 | 0.00 |
| 10/07/2014 | 5747.00 | 0 | 0.00 |
| 11/07/2014 | 6137.00 | 0 | 0.00 |
| 12/07/2014 | 5301.00 | 0 | 0.00 |
| 13/07/2014 | 5351.00 | 0 | 0.00 |
| 14/07/2014 | 5321.00 | 0 | 0.00 |
| 15/07/2014 | 5375.00 | 0 | 0.00 |
| 16/07/2014 | 5459.00 | 0 | 0.00 |
| 17/07/2014 | 5457.00 | 0 | 0.00 |
| 18/07/2014 | 5565.00 | 0 | 0.00 |
| 19/07/2014 | 4044.00 | 0 | 0.00 |

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|---|---|---|---|
| 20/07/2014 | 1234.00 | 0 | 0.00 |
| 21/07/2014 | 8057.00 | 0 | 0.00 |
| 22/07/2014 | 8794.00 | 1 | 121.00 |
| 23/07/2014 | 5533.00 | 0 | 0.00 |
| 24/07/2014 | 5356.00 | 0 | 0.00 |
| 25/07/2014 | 5520.00 | 0 | 0.00 |
| 26/07/2014 | 5275.00 | 0 | 0.00 |
| 27/07/2014 | 5185.00 | 0 | 0.00 |
| 28/07/2014 | 5281.00 | 0 | 0.00 |
| 29/07/2014 | 6917.00 | 0 | 0.00 |
| 30/07/2014 | 6496.00 | 0 | 0.00 |
| 31/07/2014 | 5733.00 | 0 | 0.00 |
| 01/08/2014 | 5311.00 | 0 | 0.00 |
| 02/08/2014 | 4707.00 | 0 | 0.00 |
| 03/08/2014 | 4443.00 | 0 | 0.00 |
| 04/08/2014 | 6730.00 | 0 | 0.00 |
| 05/08/2014 | 5864.00 | 0 | 0.00 |
| 06/08/2014 | 3356.00 | 0 | 0.00 |
| 07/08/2014 | 5862.00 | 0 | 0.00 |
| 08/08/2014 | 5312.00 | 0 | 0.00 |
| 09/08/2014 | 5575.00 | 0 | 0.00 |
| 10/08/2014 | 7770.00 | 0 | 0.00 |
| 11/08/2014 | 5399.00 | 0 | 0.00 |
| 12/08/2014 | 5199.00 | 0 | 0.00 |
| 13/08/2014 | 5860.00 | 0 | 0.00 |
| 14/08/2014 | 5642.00 | 0 | 0.00 |
| 15/08/2014 | 4688.00 | 0 | 0.00 |
| 16/08/2014 | 3812.00 | 0 | 0.00 |
| 17/08/2014 | 3868.00 | 0 | 0.00 |
| 18/08/2014 | 3819.00 | 0 | 0.00 |
| 19/08/2014 | 5552.00 | 0 | 0.00 |
| 20/08/2014 | 7174.00 | 0 | 0.00 |
| 21/08/2014 | 5992.00 | 0 | 0.00 |
| 22/08/2014 | 3334.00 | 0 | 0.00 |
| 23/08/2014 | 3207.00 | 0 | 0.00 |
| 24/08/2014 | 3237.00 | 0 | 0.00 |
| 25/08/2014 | 3147.00 | 0 | 0.00 |
| 26/08/2014 | 3699.00 | 0 | 0.00 |
| 27/08/2014 | 7497.00 | 1 | 121.00 |
| 28/08/2014 | 6995.00 | 0 | 0.00 |
| 29/08/2014 | 4672.00 | 0 | 0.00 |
| 30/08/2014 | 3145.00 | 0 | 0.00 |
| 31/08/2014 | 3161.00 | 0 | 0.00 |
| 01/09/2014 | 2851.00 | 0 | 0.00 |
| 02/09/2014 | 5750.00 | 0 | 0.00 |
| 03/09/2014 | 6247.00 | 0 | 0.00 |
| 04/09/2014 | 2668.00 | 0 | 0.00 |
| 05/09/2014 | 4320.00 | 0 | 0.00 |
| 06/09/2014 | 5346.00 | 0 | 0.00 |
| 07/09/2014 | 5222.00 | 0 | 0.00 |
| 08/09/2014 | 5208.00 | 0 | 0.00 |
| 09/09/2014 | 5183.00 | 0 | 0.00 |
| 10/09/2014 | 5229.00 | 0 | 0.00 |
| 11/09/2014 | 5313.00 | 0 | 0.00 |
| 12/09/2014 | 5113.00 | 0 | 0.00 |
| 13/09/2014 | 5129.00 | 0 | 0.00 |
| 14/09/2014 | 5095.00 | 0 | 0.00 |
| 15/09/2014 | 5070.00 | 0 | 0.00 |
| 16/09/2014 | 4960.00 | 0 | 0.00 |

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|---|---|---|---|
| 17/09/2014 | 5017.00 | 0 | 0.00 |
| 18/09/2014 | 4954.00 | 0 | 0.00 |
| 19/09/2014 | 4922.00 | 0 | 0.00 |
| 20/09/2014 | 4897.00 | 0 | 0.00 |
| 21/09/2014 | 4908.00 | 0 | 0.00 |
| 22/09/2014 | 5295.00 | 0 | 0.00 |
| 23/09/2014 | 5371.00 | 0 | 0.00 |
| 24/09/2014 | 4465.00 | 0 | 0.00 |
| 25/09/2014 | 5476.00 | 0 | 0.00 |
| 26/09/2014 | 4678.00 | 0 | 0.00 |
| 27/09/2014 | 4100.00 | 0 | 0.00 |
| 28/09/2014 | 4001.00 | 0 | 0.00 |
| 29/09/2014 | 4070.00 | 0 | 0.00 |
| 30/09/2014 | 3926.00 | 0 | 0.00 |
| 01/10/2014 | 3847.00 | 0 | 0.00 |
| 02/10/2014 | 4594.00 | 0 | 0.00 |
| 03/10/2014 | 4538.00 | 0 | 0.00 |
| 04/10/2014 | 3876.00 | 0 | 0.00 |
| 05/10/2014 | 4083.00 | 0 | 0.00 |
| 06/10/2014 | 3994.00 | 0 | 0.00 |
| 07/10/2014 | 5067.00 | 0 | 0.00 |
| 08/10/2014 | 4612.00 | 0 | 0.00 |
| 09/10/2014 | 4596.00 | 0 | 0.00 |
| 10/10/2014 | 4167.00 | 0 | 0.00 |
| 11/10/2014 | 4090.00 | 0 | 0.00 |
| 12/10/2014 | 4010.00 | 0 | 0.00 |
| 13/10/2014 | 5819.00 | 0 | 0.00 |
| 14/10/2014 | 6626.00 | 0 | 0.00 |
| 15/10/2014 | 5767.00 | 0 | 0.00 |
| 16/10/2014 | 5459.00 | 0 | 0.00 |
| 17/10/2014 | 3694.00 | 0 | 0.00 |
| 18/10/2014 | 4063.00 | 0 | 0.00 |
| 19/10/2014 | 5235.00 | 0 | 0.00 |
| 20/10/2014 | 4727.00 | 0 | 0.00 |
| 21/10/2014 | 4580.00 | 0 | 0.00 |
| 22/10/2014 | 4513.00 | 0 | 0.00 |
| 23/10/2014 | 5901.00 | 0 | 0.00 |
| 24/10/2014 | 8885.00 | 0 | 0.00 |
| 25/10/2014 | 7410.00 | 0 | 0.00 |
| 26/10/2014 | 7587.00 | 0 | 0.00 |
| 27/10/2014 | 7470.00 | 0 | 0.00 |
| 28/10/2014 | 6537.00 | 0 | 0.00 |
| 29/10/2014 | 6033.00 | 0 | 0.00 |
| 30/10/2014 | 5793.00 | 2 | 242.00 |
| 31/10/2014 | 5334.00 | 0 | 0.00 |
| 01/11/2014 | 5576.00 | 0 | 0.00 |
| 02/11/2014 | 5580.00 | 0 | 0.00 |
| 03/11/2014 | 5004.00 | 0 | 0.00 |
| 04/11/2014 | 4562.00 | 0 | 0.00 |
| 05/11/2014 | 4110.00 | 0 | 0.00 |
| 06/11/2014 | 3561.00 | 0 | 0.00 |
| 07/11/2014 | 4132.00 | 0 | 0.00 |
| 08/11/2014 | 3852.00 | 0 | 0.00 |
| 09/11/2014 | 4155.00 | 0 | 0.00 |
| 10/11/2014 | 4154.00 | 0 | 0.00 |
| 11/11/2014 | 4478.00 | 0 | 0.00 |
| 12/11/2014 | 4524.00 | 0 | 0.00 |
| 13/11/2014 | 3981.00 | 1 | 121.00 |
| 14/11/2014 | 3835.00 | 0 | 0.00 |

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|---|---|---|---|
| 15/11/2014 | 5173.00 | 1 | 121.00 |
| 16/11/2014 | 6175.00 | 0 | 0.00 |
| 17/11/2014 | 6259.00 | 0 | 0.00 |
| 18/11/2014 | 6125.00 | 0 | 0.00 |
| 19/11/2014 | 5995.00 | 0 | 0.00 |
| 20/11/2014 | 6044.00 | 0 | 0.00 |
| 21/11/2014 | 6380.00 | 0 | 0.00 |
| 22/11/2014 | 5947.00 | 0 | 0.00 |
| 23/11/2014 | 5004.00 | 0 | 0.00 |
| 24/11/2014 | 4844.00 | 0 | 0.00 |
| 25/11/2014 | 5068.00 | 0 | 0.00 |
| 26/11/2014 | 4799.00 | 0 | 0.00 |
| 27/11/2014 | 4759.00 | 0 | 0.00 |
| 28/11/2014 | 4617.00 | 0 | 0.00 |
| 29/11/2014 | 4658.00 | 0 | 0.00 |
| 30/11/2014 | 4625.00 | 0 | 0.00 |
| 01/12/2014 | 5076.00 | 0 | 0.00 |
| 02/12/2014 | 5350.00 | 0 | 0.00 |
| 03/12/2014 | 5421.00 | 0 | 0.00 |
| 04/12/2014 | 5374.00 | 0 | 0.00 |
| 05/12/2014 | 5300.00 | 0 | 0.00 |
| 06/12/2014 | 5597.00 | 0 | 0.00 |
| 07/12/2014 | 5442.00 | 0 | 0.00 |
| 08/12/2014 | 5440.00 | 0 | 0.00 |
| 09/12/2014 | 5192.00 | 0 | 0.00 |
| 10/12/2014 | 5441.00 | 0 | 0.00 |
| 11/12/2014 | 6108.00 | 0 | 0.00 |
| 12/12/2014 | 9207.00 | 0 | 0.00 |
| 13/12/2014 | 7436.00 | 0 | 0.00 |
| 14/12/2014 | 7209.00 | 0 | 0.00 |
| 15/12/2014 | 7097.00 | 0 | 0.00 |
| 16/12/2014 | 4977.00 | 0 | 0.00 |
| 17/12/2014 | 2134.00 | 0 | 0.00 |
| 18/12/2014 | 2305.00 | 0 | 0.00 |
| 19/12/2014 | 2195.00 | 0 | 0.00 |
| 20/12/2014 | 3239.00 | 0 | 0.00 |
| 21/12/2014 | 4940.00 | 0 | 0.00 |
| 22/12/2014 | 4813.00 | 0 | 0.00 |
| 23/12/2014 | 4785.00 | 0 | 0.00 |
| 24/12/2014 | 4311.00 | 0 | 0.00 |
| 25/12/2014 | 4205.00 | 0 | 0.00 |
| 26/12/2014 | 4396.00 | 0 | 0.00 |
| 27/12/2014 | 4415.00 | 0 | 0.00 |
| 28/12/2014 | 4261.00 | 0 | 0.00 |
| 29/12/2014 | 4241.00 | 0 | 0.00 |
| 30/12/2014 | 4083.00 | 0 | 0.00 |
| 31/12/2014 | 4045.00 | 0 | 0.00 |
| 01/01/2015 | 4196.00 | 0 | 0.00 |
| 02/01/2015 | 3999.00 | 0 | 0.00 |
| 03/01/2015 | 3364.00 | 0 | 0.00 |
| 04/01/2015 | 3338.00 | 0 | 0.00 |
| 05/01/2015 | 4335.00 | 0 | 0.00 |
| 06/01/2015 | 4207.00 | 0 | 0.00 |
| 07/01/2015 | 3186.00 | 0 | 0.00 |
| 08/01/2015 | 3109.00 | 0 | 0.00 |
| 09/01/2015 | 3268.00 | 0 | 0.00 |
| 10/01/2015 | 2365.00 | 0 | 0.00 |
| 11/01/2015 | 2669.00 | 0 | 0.00 |
| 12/01/2015 | 3788.00 | 0 | 0.00 |

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|---|---|---|---|
| 13/01/2015 | 5054.00 | 0 | 0.00 |
| 14/01/2015 | 4629.00 | 0 | 0.00 |
| 15/01/2015 | 4594.00 | 0 | 0.00 |
| 16/01/2015 | 2205.00 | 0 | 0.00 |
| 17/01/2015 | 1647.00 | 0 | 0.00 |
| 18/01/2015 | 1301.00 | 0 | 0.00 |
| 19/01/2015 | 2677.00 | 0 | 0.00 |
| 20/01/2015 | 4328.00 | 0 | 0.00 |
| 21/01/2015 | 4162.00 | 0 | 0.00 |
| 22/01/2015 | 3965.00 | 0 | 0.00 |
| 23/01/2015 | 4631.00 | 0 | 0.00 |
| 24/01/2015 | 5376.00 | 0 | 0.00 |
| 25/01/2015 | 5424.00 | 0 | 0.00 |
| 26/01/2015 | 5470.00 | 0 | 0.00 |
| 27/01/2015 | 5431.00 | 0 | 0.00 |
| 28/01/2015 | 5630.00 | 0 | 0.00 |
| 29/01/2015 | 5888.00 | 0 | 0.00 |
| 30/01/2015 | 5976.00 | 0 | 0.00 |
| 31/01/2015 | 5922.00 | 0 | 0.00 |
| 01/02/2015 | 5766.00 | 0 | 0.00 |
| 02/02/2015 | 5710.00 | 0 | 0.00 |
| 03/02/2015 | 5572.00 | 0 | 0.00 |
| 04/02/2015 | 5376.00 | 0 | 0.00 |
| 05/02/2015 | 4805.00 | 0 | 0.00 |
| 06/02/2015 | 4609.00 | 0 | 0.00 |
| 07/02/2015 | 3594.00 | 0 | 0.00 |
| 08/02/2015 | 2567.00 | 0 | 0.00 |
| 09/02/2015 | 4185.00 | 0 | 0.00 |
| 10/02/2015 | 7381.00 | 0 | 0.00 |
| 11/02/2015 | 6944.00 | 0 | 0.00 |
| 12/02/2015 | 6541.00 | 0 | 0.00 |
| 13/02/2015 | 6279.00 | 0 | 0.00 |
| 14/02/2015 | 6333.00 | 0 | 0.00 |
| 15/02/2015 | 6185.00 | 0 | 0.00 |
| 16/02/2015 | 6293.00 | 0 | 0.00 |
| 17/02/2015 | 6221.00 | 0 | 0.00 |
| 18/02/2015 | 6184.00 | 0 | 0.00 |
| 19/02/2015 | 6109.00 | 0 | 0.00 |
| 20/02/2015 | 5124.00 | 0 | 0.00 |
| 21/02/2015 | 5116.00 | 0 | 0.00 |
| 22/02/2015 | 5435.00 | 0 | 0.00 |
| 23/02/2015 | 5742.00 | 0 | 0.00 |
| 24/02/2015 | 5088.00 | 0 | 0.00 |
| 25/02/2015 | 4867.00 | 0 | 0.00 |
| 26/02/2015 | 4938.00 | 0 | 0.00 |
| 27/02/2015 | 4764.00 | 0 | 0.00 |
| 28/02/2015 | 4855.00 | 0 | 0.00 |
| 01/03/2015 | 4775.00 | 0 | 0.00 |
| 02/03/2015 | 4690.00 | 0 | 0.00 |
| 03/03/2015 | 4695.00 | 0 | 0.00 |
| 04/03/2015 | 5190.00 | 0 | 0.00 |
| 05/03/2015 | 6128.00 | 0 | 0.00 |
| 06/03/2015 | 6477.00 | 0 | 0.00 |
| 07/03/2015 | 6370.00 | 0 | 0.00 |
| 08/03/2015 | 6170.00 | 0 | 0.00 |
| 09/03/2015 | 6240.00 | 0 | 0.00 |
| 10/03/2015 | 6210.00 | 0 | 0.00 |
| 11/03/2015 | 6304.00 | 0 | 0.00 |
| 12/03/2015 | 6306.00 | 0 | 0.00 |

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|---|---|---|---|
| 13/03/2015 | 6578.00 | 0 | 0.00 |
| 14/03/2015 | 5822.00 | 0 | 0.00 |
| 15/03/2015 | 5756.00 | 0 | 0.00 |
| 16/03/2015 | 5830.00 | 0 | 0.00 |
| 17/03/2015 | 5825.00 | 0 | 0.00 |
| 18/03/2015 | 5471.00 | 0 | 0.00 |
| 19/03/2015 | 5289.00 | 0 | 0.00 |
| 20/03/2015 | 5133.00 | 0 | 0.00 |
| 21/03/2015 | 5498.00 | 0 | 0.00 |
| 22/03/2015 | 5424.00 | 0 | 0.00 |
| 23/03/2015 | 5003.00 | 0 | 0.00 |
| 24/03/2015 | 5077.00 | 0 | 0.00 |
| 25/03/2015 | 5337.00 | 0 | 0.00 |
| 26/03/2015 | 5509.00 | 0 | 0.00 |
| 27/03/2015 | 5793.00 | 0 | 0.00 |
| 28/03/2015 | 6372.00 | 0 | 0.00 |
| 29/03/2015 | 6346.00 | 0 | 0.00 |
| 30/03/2015 | 6536.00 | 0 | 0.00 |
| 31/03/2015 | 4511.00 | 0 | 0.00 |
| 01/04/2015 | 4856.00 | 0 | 0.00 |
| 02/04/2015 | 6345.00 | 0 | 0.00 |
| 03/04/2015 | 6254.00 | 0 | 0.00 |
| 04/04/2015 | 6091.00 | 0 | 0.00 |
| 05/04/2015 | 5760.00 | 0 | 0.00 |
| 06/04/2015 | 4480.00 | 0 | 0.00 |
| 07/04/2015 | 4798.00 | 0 | 0.00 |
| 08/04/2015 | 7540.00 | 0 | 0.00 |
| 09/04/2015 | 6109.00 | 0 | 0.00 |
| 10/04/2015 | 5970.00 | 0 | 0.00 |
| 11/04/2015 | 5808.00 | 0 | 0.00 |
| 12/04/2015 | 5784.00 | 0 | 0.00 |
| 13/04/2015 | 6501.00 | 0 | 0.00 |
| 14/04/2015 | 7308.00 | 0 | 0.00 |
| 15/04/2015 | 7280.00 | 0 | 0.00 |
| 16/04/2015 | 7102.00 | 0 | 0.00 |
| 17/04/2015 | 6856.00 | 0 | 0.00 |
| 18/04/2015 | 6767.00 | 0 | 0.00 |
| 19/04/2015 | 6572.00 | 0 | 0.00 |
| 20/04/2015 | 6419.00 | 0 | 0.00 |
| 21/04/2015 | 7600.00 | 0 | 0.00 |
| 22/04/2015 | 8494.00 | 0 | 0.00 |
| 23/04/2015 | 7243.00 | 0 | 0.00 |
| 24/04/2015 | 6929.00 | 0 | 0.00 |
| 25/04/2015 | 6467.00 | 0 | 0.00 |
| 26/04/2015 | 6511.00 | 0 | 0.00 |
| 27/04/2015 | 6557.00 | 0 | 0.00 |
| 28/04/2015 | 6541.00 | 0 | 0.00 |
| 29/04/2015 | 5490.00 | 0 | 0.00 |
| 30/04/2015 | 4832.00 | 0 | 0.00 |
| 01/05/2015 | 4571.00 | 0 | 0.00 |
| 02/05/2015 | 4409.00 | 0 | 0.00 |
| 03/05/2015 | 4349.00 | 0 | 0.00 |
| 04/05/2015 | 3895.00 | 0 | 0.00 |
| 05/05/2015 | 4072.00 | 0 | 0.00 |
| 06/05/2015 | 7100.00 | 0 | 0.00 |
| 07/05/2015 | 6849.00 | 0 | 0.00 |
| 08/05/2015 | 4145.00 | 0 | 0.00 |
| 09/05/2015 | 3669.00 | 0 | 0.00 |
| 10/05/2015 | 6164.00 | 0 | 0.00 |

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|---|---|---|---|
| 11/05/2015 | 8415.00 | 0 | 0.00 |
| 12/05/2015 | 8418.00 | 0 | 0.00 |
| 13/05/2015 | 8018.00 | 0 | 0.00 |
| 14/05/2015 | 7982.00 | 0 | 0.00 |
| 15/05/2015 | 7893.00 | 0 | 0.00 |
| 16/05/2015 | 7586.00 | 0 | 0.00 |
| 17/05/2015 | 7461.00 | 0 | 0.00 |
| 18/05/2015 | 6916.00 | 0 | 0.00 |
| 19/05/2015 | 5614.00 | 0 | 0.00 |
| 20/05/2015 | 7202.00 | 0 | 0.00 |
| 21/05/2015 | 8443.00 | 0 | 0.00 |
| 22/05/2015 | 8535.00 | 0 | 0.00 |
| 23/05/2015 | 8286.00 | 0 | 0.00 |
| 24/05/2015 | 8014.00 | 0 | 0.00 |
| 25/05/2015 | 7574.00 | 0 | 0.00 |
| 26/05/2015 | 7338.00 | 0 | 0.00 |
| 27/05/2015 | 7034.00 | 0 | 0.00 |
| 28/05/2015 | 6819.00 | 0 | 0.00 |
| 29/05/2015 | 6775.00 | 0 | 0.00 |
| 30/05/2015 | 6763.00 | 0 | 0.00 |
| 31/05/2015 | 6518.00 | 0 | 0.00 |
| 01/06/2015 | 6450.00 | 0 | 0.00 |
| 02/06/2015 | 6047.00 | 0 | 0.00 |
| 03/06/2015 | 5596.00 | 0 | 0.00 |
| 04/06/2015 | 5270.00 | 1 | 121.00 |
| 05/06/2015 | 5056.00 | 0 | 0.00 |
| 06/06/2015 | 4968.00 | 0 | 0.00 |
| 07/06/2015 | 5001.00 | 0 | 0.00 |
| 08/06/2015 | 5100.00 | 0 | 0.00 |
| 09/06/2015 | 4968.00 | 0 | 0.00 |
| 10/06/2015 | 5103.00 | 0 | 0.00 |
| 11/06/2015 | 5038.00 | 0 | 0.00 |
| 12/06/2015 | 5126.00 | 0 | 0.00 |
| 13/06/2015 | 5186.00 | 0 | 0.00 |
| 14/06/2015 | 4903.00 | 0 | 0.00 |
| 15/06/2015 | 4802.00 | 0 | 0.00 |
| 16/06/2015 | 5870.00 | 0 | 0.00 |
| 17/06/2015 | 7044.00 | 0 | 0.00 |
| 18/06/2015 | 7231.00 | 0 | 0.00 |
| 19/06/2015 | 7162.00 | 0 | 0.00 |
| 20/06/2015 | 6878.00 | 0 | 0.00 |
| 21/06/2015 | 6828.00 | 0 | 0.00 |
| 22/06/2015 | 6834.00 | 0 | 0.00 |
| 23/06/2015 | 6836.00 | 0 | 0.00 |
| 24/06/2015 | 6713.00 | 0 | 0.00 |
| 25/06/2015 | 6630.00 | 0 | 0.00 |
| 26/06/2015 | 6957.00 | 0 | 0.00 |
| 27/06/2015 | 6761.00 | 0 | 0.00 |
| 28/06/2015 | 6865.00 | 0 | 0.00 |
| 29/06/2015 | 6897.00 | 0 | 0.00 |
| 30/06/2015 | 6927.00 | 0 | 0.00 |
| 01/07/2015 | 6696.00 | 0 | 0.00 |
| 02/07/2015 | 6757.00 | 0 | 0.00 |
| 03/07/2015 | 6783.00 | 0 | 0.00 |
| 04/07/2015 | 6712.00 | 0 | 0.00 |
| 05/07/2015 | 6633.00 | 0 | 0.00 |
| 06/07/2015 | 6389.00 | 1 | 121.00 |
| 07/07/2015 | 6482.00 | 0 | 0.00 |
| 08/07/2015 | 6431.00 | 0 | 0.00 |

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|---|---|---|---|
| 09/07/2015 | 6373.00 | 0 | 0.00 |
| 10/07/2015 | 6354.00 | 0 | 0.00 |
| 11/07/2015 | 6481.00 | 0 | 0.00 |
| 12/07/2015 | 6668.00 | 0 | 0.00 |
| 13/07/2015 | 6831.00 | 0 | 0.00 |
| 14/07/2015 | 6604.00 | 0 | 0.00 |
| 15/07/2015 | 6350.00 | 0 | 0.00 |
| 16/07/2015 | 6661.00 | 0 | 0.00 |
| 17/07/2015 | 6723.00 | 0 | 0.00 |
| 18/07/2015 | 6671.00 | 0 | 0.00 |
| 19/07/2015 | 8354.00 | 0 | 0.00 |
| 20/07/2015 | 11520.00 | 0 | 0.00 |
| 21/07/2015 | 10411.00 | 0 | 0.00 |
| 22/07/2015 | 8004.00 | 0 | 0.00 |
| 23/07/2015 | 7910.00 | 0 | 0.00 |
| 24/07/2015 | 7979.00 | 0 | 0.00 |
| 25/07/2015 | 7898.00 | 0 | 0.00 |
| 26/07/2015 | 5920.00 | 0 | 0.00 |
| 27/07/2015 | 3083.00 | 0 | 0.00 |
| 28/07/2015 | 3756.00 | 0 | 0.00 |
| 29/07/2015 | 6462.00 | 0 | 0.00 |
| 30/07/2015 | 6329.00 | 0 | 0.00 |
| 31/07/2015 | 6014.00 | 0 | 0.00 |
| 01/08/2015 | 5916.00 | 0 | 0.00 |
| 02/08/2015 | 5734.00 | 0 | 0.00 |
| 03/08/2015 | 5700.00 | 0 | 0.00 |
| 04/08/2015 | 5580.00 | 0 | 0.00 |
| 05/08/2015 | 5622.00 | 0 | 0.00 |
| 06/08/2015 | 5747.00 | 0 | 0.00 |
| 07/08/2015 | 5731.00 | 0 | 0.00 |
| 08/08/2015 | 5669.00 | 0 | 0.00 |
| 09/08/2015 | 5558.00 | 0 | 0.00 |
| 10/08/2015 | 5470.00 | 0 | 0.00 |
| 11/08/2015 | 5294.00 | 0 | 0.00 |
| 12/08/2015 | 6779.00 | 0 | 0.00 |
| 13/08/2015 | 9486.00 | 0 | 0.00 |
| 14/08/2015 | 7477.00 | 0 | 0.00 |
| 15/08/2015 | 7162.00 | 0 | 0.00 |
| 16/08/2015 | 7152.00 | 0 | 0.00 |
| 17/08/2015 | 7095.00 | 0 | 0.00 |
| 18/08/2015 | 7203.00 | 0 | 0.00 |
| 19/08/2015 | 7249.00 | 0 | 0.00 |
| 20/08/2015 | 7028.00 | 0 | 0.00 |
| 21/08/2015 | 6632.00 | 0 | 0.00 |
| 22/08/2015 | 6410.00 | 0 | 0.00 |
| 23/08/2015 | 6956.00 | 0 | 0.00 |
| 24/08/2015 | 6225.00 | 0 | 0.00 |
| 25/08/2015 | 5971.00 | 0 | 0.00 |
| 26/08/2015 | 6085.00 | 0 | 0.00 |
| 27/08/2015 | 5883.00 | 0 | 0.00 |
| 28/08/2015 | 5855.00 | 0 | 0.00 |
| 29/08/2015 | 5761.00 | 0 | 0.00 |
| 30/08/2015 | 5453.00 | 0 | 0.00 |
| 31/08/2015 | 5586.00 | 0 | 0.00 |
| 01/09/2015 | 5431.00 | 0 | 0.00 |
| 02/09/2015 | 5334.00 | 0 | 0.00 |
| 03/09/2015 | 5205.00 | 0 | 0.00 |
| 04/09/2015 | 5329.00 | 0 | 0.00 |
| 05/09/2015 | 5289.00 | 0 | 0.00 |

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|---|---|---|---|
| 06/09/2015 | 5213.00 | 0 | 0.00 |
| 07/09/2015 | 4958.00 | 0 | 0.00 |
| 08/09/2015 | 4999.00 | 0 | 0.00 |
| 09/09/2015 | 5077.00 | 0 | 0.00 |
| 10/09/2015 | 6346.00 | 0 | 0.00 |
| 11/09/2015 | 6666.00 | 0 | 0.00 |
| 12/09/2015 | 4528.00 | 0 | 0.00 |
| 13/09/2015 | 4336.00 | 0 | 0.00 |
| 14/09/2015 | 4298.00 | 0 | 0.00 |
| 15/09/2015 | 4159.00 | 0 | 0.00 |
| 16/09/2015 | 3894.00 | 0 | 0.00 |
| 17/09/2015 | 3819.00 | 0 | 0.00 |
| 18/09/2015 | 5987.00 | | 0.00 |
| 19/09/2015 | 8169.00 | | 0.00 |
| 20/09/2015 | 8007.00 | | 0.00 |
| 21/09/2015 | 7988.00 | 0 | 0.00 |
| 22/09/2015 | 9099.00 | 1 | 121.00 |
| 23/09/2015 | 9856.00 | 0 | 0.00 |
| 24/09/2015 | 9549.00 | 0 | 0.00 |
| 25/09/2015 | 9535.00 | 0 | 0.00 |
| 26/09/2015 | 9971.00 | 0 | 0.00 |
| 27/09/2015 | 10116.00 | 0 | 0.00 |
| 28/09/2015 | 9937.00 | 0 | 0.00 |
| 29/09/2015 | 7955.00 | 0 | 0.00 |
| 30/09/2015 | 1290.00 | 0 | 0.00 |
| 01/10/2015 | 1996.00 | 0 | 0.00 |
| 02/10/2015 | 3269.00 | 0 | 0.00 |
| 03/10/2015 | 6573.00 | 0 | 0.00 |
| 04/10/2015 | 6538.00 | 0 | 0.00 |
| 05/10/2015 | 6420.00 | 0 | 0.00 |
| 06/10/2015 | 6447.00 | 0 | 0.00 |
| 07/10/2015 | 6365.00 | 0 | 0.00 |
| 08/10/2015 | 6175.00 | 0 | 0.00 |
| 09/10/2015 | 5900.00 | 0 | 0.00 |
| 10/10/2015 | 5813.00 | 0 | 0.00 |
| 11/10/2015 | 5853.00 | 0 | 0.00 |
| 12/10/2015 | 5793.00 | 0 | 0.00 |
| 13/10/2015 | 5789.00 | 0 | 0.00 |
| 14/10/2015 | 5830.00 | 0 | 0.00 |
| 15/10/2015 | 5847.00 | 0 | 0.00 |
| 16/10/2015 | 5819.00 | 0 | 0.00 |
| 17/10/2015 | 5791.00 | 0 | 0.00 |
| 18/10/2015 | 5779.00 | 0 | 0.00 |
| 19/10/2015 | 5731.00 | 0 | 0.00 |
| 20/10/2015 | 5682.00 | 0 | 0.00 |
| 21/10/2015 | 5771.00 | 0 | 0.00 |
| 22/10/2015 | 5902.00 | 0 | 0.00 |
| 23/10/2015 | 6505.00 | 0 | 0.00 |
| 24/10/2015 | 6526.00 | 0 | 0.00 |
| 25/10/2015 | 6417.00 | 0 | 0.00 |
| 26/10/2015 | 6284.00 | 0 | 0.00 |
| 27/10/2015 | 6266.00 | 0 | 0.00 |
| 28/10/2015 | 6039.00 | 0 | 0.00 |
| 29/10/2015 | 5988.00 | 0 | 0.00 |
| 30/10/2015 | 6127.00 | 0 | 0.00 |
| 31/10/2015 | 5935.00 | 0 | 0.00 |
| 01/11/2015 | 5659.00 | 0 | 0.00 |
| 02/11/2015 | 5658.00 | 0 | 0.00 |
| 03/11/2015 | 5759.00 | 0 | 0.00 |

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|---|---|---|---|
| 04/11/2015 | 5607.00 | 0 | 0.00 |
| 05/11/2015 | 5605.00 | 0 | 0.00 |
| 06/11/2015 | 5620.00 | 0 | 0.00 |
| 07/11/2015 | 5487.00 | 0 | 0.00 |
| 08/11/2015 | 4926.00 | 0 | 0.00 |
| 09/11/2015 | 5400.00 | 0 | 0.00 |
| 10/11/2015 | 5330.00 | 0 | 0.00 |
| 11/11/2015 | 5073.00 | 0 | 0.00 |
| 12/11/2015 | 5043.00 | 0 | 0.00 |
| 13/11/2015 | 5362.00 | 0 | 0.00 |
| 14/11/2015 | 4324.00 | 0 | 0.00 |
| 15/11/2015 | 815.00 | 0 | 0.00 |
| 16/11/2015 | 1913.00 | 0 | 0.00 |
| 17/11/2015 | 6087.00 | 0 | 0.00 |
| 18/11/2015 | 6055.00 | 0 | 0.00 |
| 19/11/2015 | 5748.00 | 0 | 0.00 |
| 20/11/2015 | 5427.00 | 0 | 0.00 |
| 21/11/2015 | 5186.00 | 0 | 0.00 |
| 22/11/2015 | 4270.00 | 0 | 0.00 |
| 23/11/2015 | 4131.00 | 0 | 0.00 |
| 24/11/2015 | 4105.00 | 0 | 0.00 |
| 25/11/2015 | 4229.00 | 0 | 0.00 |
| 26/11/2015 | 3921.00 | 0 | 0.00 |
| 27/11/2015 | 3893.00 | 0 | 0.00 |
| 28/11/2015 | 4029.00 | 0 | 0.00 |
| 29/11/2015 | 4381.00 | 0 | 0.00 |
| 30/11/2015 | 6049.00 | 0 | 0.00 |
| 01/12/2015 | 5332.00 | 0 | 0.00 |
| 02/12/2015 | 3602.00 | 0 | 0.00 |
| 03/12/2015 | 1055.00 | 0 | 0.00 |
| 04/12/2015 | 1350.00 | 0 | 0.00 |
| 05/12/2015 | 763.00 | 0 | 0.00 |
| 06/12/2015 | 380.00 | 0 | 0.00 |
| 07/12/2015 | 2026.00 | 0 | 0.00 |
| 08/12/2015 | 6927.00 | 0 | 0.00 |
| 09/12/2015 | 6867.00 | 0 | 0.00 |
| 10/12/2015 | 5815.00 | 0 | 0.00 |
| 11/12/2015 | 939.00 | 0 | 0.00 |
| 12/12/2015 | 1618.00 | 0 | 0.00 |
| 13/12/2015 | 2177.00 | 0 | 0.00 |
| 14/12/2015 | 1744.00 | 0 | 0.00 |
| 15/12/2015 | 1270.00 | 0 | 0.00 |
| 16/12/2015 | 1293.00 | 0 | 0.00 |
| 17/12/2015 | 1000.00 | 0 | 0.00 |
| 18/12/2015 | 814.00 | 0 | 0.00 |
| 19/12/2015 | 834.00 | 0 | 0.00 |
| 20/12/2015 | 1127.00 | 0 | 0.00 |
| 21/12/2015 | 981.00 | 0 | 0.00 |
| 22/12/2015 | 1106.00 | 0 | 0.00 |
| 23/12/2015 | 1101.00 | 0 | 0.00 |
| 24/12/2015 | 1050.00 | 0 | 0.00 |
| 25/12/2015 | 906.00 | 0 | 0.00 |
| 26/12/2015 | 979.00 | 0 | 0.00 |
| 27/12/2015 | 1294.00 | 0 | 0.00 |
| 28/12/2015 | 1040.00 | 0 | 0.00 |
| 29/12/2015 | 788.00 | 0 | 0.00 |
| 30/12/2015 | 1013.00 | 0 | 0.00 |
| 31/12/2015 | 1845.00 | 0 | 0.00 |
| 01/01/2016 | 1491.00 | 0 | 0.00 |

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|---|---|---|---|
| 02/01/2016 | 1480.00 | 0 | 0.00 |
| 03/01/2016 | 2112.00 | 0 | 0.00 |
| 04/01/2016 | 1825.00 | 0 | 0.00 |
| 05/01/2016 | 1243.00 | 0 | 0.00 |
| 06/01/2016 | 838.00 | 0 | 0.00 |
| 07/01/2016 | 1816.00 | 0 | 0.00 |
| 08/01/2016 | 1182.00 | 0 | 0.00 |
| 09/01/2016 | 1820.00 | 0 | 0.00 |
| 10/01/2016 | 2356.00 | 0 | 0.00 |
| 11/01/2016 | 1548.00 | 0 | 0.00 |
| 12/01/2016 | 1245.00 | 0 | 0.00 |
| 13/01/2016 | 1010.00 | 0 | 0.00 |
| 14/01/2016 | 1060.00 | 0 | 0.00 |
| 15/01/2016 | 1816.00 | 0 | 0.00 |
| 16/01/2016 | 4032.00 | 0 | 0.00 |
| 17/01/2016 | 4014.00 | 0 | 0.00 |
| 18/01/2016 | 3947.00 | 0 | 0.00 |
| 19/01/2016 | 3704.00 | 0 | 0.00 |
| 20/01/2016 | 3457.00 | 0 | 0.00 |
| 21/01/2016 | 3344.00 | 0 | 0.00 |
| 22/01/2016 | 3555.00 | 0 | 0.00 |
| 23/01/2016 | 3342.00 | 0 | 0.00 |
| 24/01/2016 | 3396.00 | 0 | 0.00 |
| 25/01/2016 | 3269.00 | 0 | 0.00 |
| 26/01/2016 | 3551.00 | 0 | 0.00 |
| 27/01/2016 | 3693.00 | 0 | 0.00 |
| 28/01/2016 | 3533.00 | 0 | 0.00 |
| 29/01/2016 | 3670.00 | 0 | 0.00 |
| 30/01/2016 | 3803.00 | 0 | 0.00 |
| 31/01/2016 | 3620.00 | 0 | 0.00 |
| 01/02/2016 | 3617.00 | 0 | 0.00 |
| 02/02/2016 | 3167.00 | 0 | 0.00 |
| 03/02/2016 | 3058.00 | 0 | 0.00 |
| 04/02/2016 | 2997.00 | 0 | 0.00 |
| 05/02/2016 | 3007.00 | 0 | 0.00 |
| 06/02/2016 | 3666.00 | 0 | 0.00 |
| 07/02/2016 | 4047.00 | 0 | 0.00 |
| 08/02/2016 | 7044.00 | 0 | 0.00 |
| 09/02/2016 | 3594.00 | 0 | 0.00 |
| 10/02/2016 | 2592.00 | 0 | 0.00 |
| 11/02/2016 | 1657.00 | 0 | 0.00 |
| 12/02/2016 | 1186.00 | 0 | 0.00 |
| 13/02/2016 | 850.00 | 0 | 0.00 |
| 14/02/2016 | 556.00 | 0 | 0.00 |
| 15/02/2016 | 2797.00 | 0 | 0.00 |
| 16/02/2016 | 1974.00 | 0 | 0.00 |
| 17/02/2016 | 307.00 | 0 | 0.00 |
| 18/02/2016 | 6467.00 | 0 | 0.00 |
| 19/02/2016 | 2150.00 | 0 | 0.00 |
| 20/02/2016 | 2807.00 | 0 | 0.00 |
| 21/02/2016 | 9316.00 | 0 | 0.00 |
| 22/02/2016 | 436.00 | 0 | 0.00 |
| 23/02/2016 | 3483.00 | 0 | 0.00 |
| 24/02/2016 | 8145.00 | 0 | 0.00 |
| 25/02/2016 | 79.00 | 0 | 0.00 |
| 26/02/2016 | 1201.00 | 0 | 0.00 |
| 27/02/2016 | 2745.00 | 0 | 0.00 |
| 28/02/2016 | 1288.00 | 0 | 0.00 |
| 29/02/2016 | 299.00 | 0 | 0.00 |

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|---|---|---|---|
| 01/03/2016 | 933.00 | 0 | 0.00 |
| 02/03/2016 | 524.00 | 0 | 0.00 |
| 03/03/2016 | 3252.00 | 0 | 0.00 |
| 04/03/2016 | 9156.00 | 0 | 0.00 |
| 05/03/2016 | 8434.00 | 0 | 0.00 |
| 06/03/2016 | 7189.00 | 0 | 0.00 |
| 07/03/2016 | 6877.00 | 0 | 0.00 |
| 08/03/2016 | 6767.00 | 0 | 0.00 |
| 09/03/2016 | 5709.00 | 0 | 0.00 |
| 10/03/2016 | 368.00 | 0 | 0.00 |
| 11/03/2016 | 277.00 | 0 | 0.00 |
| 12/03/2016 | 379.00 | 0 | 0.00 |
| 13/03/2016 | 182.00 | 0 | 0.00 |
| 14/03/2016 | 137.00 | 0 | 0.00 |
| 15/03/2016 | 112.00 | 0 | 0.00 |
| 16/03/2016 | 84.00 | 0 | 0.00 |
| 17/03/2016 | 1006.00 | 0 | 0.00 |
| 18/03/2016 | 1368.00 | 0 | 0.00 |
| 19/03/2016 | 1722.00 | 0 | 0.00 |
| 20/03/2016 | 2272.00 | 0 | 0.00 |
| 21/03/2016 | 1959.00 | 0 | 0.00 |
| 22/03/2016 | 2228.00 | 0 | 0.00 |
| 23/03/2016 | 1140.00 | 0 | 0.00 |
| 24/03/2016 | 830.00 | 0 | 0.00 |
| 25/03/2016 | 1196.00 | 0 | 0.00 |
| 26/03/2016 | 1902.00 | 0 | 0.00 |
| 27/03/2016 | 14197.00 | 0 | 0.00 |
| 28/03/2016 | 10320.00 | 0 | 0.00 |
| 29/03/2016 | 2094.00 | 0 | 0.00 |
| 30/03/2016 | 2739.00 | 0 | 0.00 |
| 31/03/2016 | 2207.00 | 0 | 0.00 |
| 01/04/2016 | 1697.00 | 0 | 0.00 |
| 02/04/2016 | 1423.00 | 0 | 0.00 |
| 03/04/2016 | 1302.00 | 0 | 0.00 |
| 04/04/2016 | 3052.00 | 0 | 0.00 |
| 05/04/2016 | 1667.00 | 0 | 0.00 |
| 06/04/2016 | 293.00 | 0 | 0.00 |
| 07/04/2016 | 1501.00 | 0 | 0.00 |
| 08/04/2016 | 3373.00 | 0 | 0.00 |
| 09/04/2016 | 1987.00 | 0 | 0.00 |
| 10/04/2016 | 2838.00 | 0 | 0.00 |
| 11/04/2016 | 3037.00 | 0 | 0.00 |
| 12/04/2016 | 2726.00 | 0 | 0.00 |
| 13/04/2016 | 2542.00 | 0 | 0.00 |
| 14/04/2016 | 2471.00 | 0 | 0.00 |
| 15/04/2016 | 2482.00 | 0 | 0.00 |
| 16/04/2016 | 2376.00 | 0 | 0.00 |
| 17/04/2016 | 2329.00 | 0 | 0.00 |
| 18/04/2016 | 4424.00 | 0 | 0.00 |
| 19/04/2016 | 2263.00 | 0 | 0.00 |
| 20/04/2016 | 1665.00 | 0 | 0.00 |
| 21/04/2016 | 1011.00 | 0 | 0.00 |
| 22/04/2016 | 1592.00 | 0 | 0.00 |
| 23/04/2016 | 1728.00 | 0 | 0.00 |
| 24/04/2016 | 4171.00 | 0 | 0.00 |
| 25/04/2016 | 5810.00 | 0 | 0.00 |
| 26/04/2016 | 5794.00 | 1 | 121.00 |
| 27/04/2016 | 5714.00 | 0 | 0.00 |
| 28/04/2016 | 6049.00 | 0 | 0.00 |

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|---|---|---|---|
| 29/04/2016 | 8769.00 | 0 | 0.00 |
| 30/04/2016 | 9619.00 | 0 | 0.00 |
| 01/05/2016 | 7264.00 | 0 | 0.00 |
| 02/05/2016 | 1022.00 | 0 | 0.00 |
| 03/05/2016 | 3098.00 | 0 | 0.00 |
| 04/05/2016 | 7409.00 | 0 | 0.00 |
| 05/05/2016 | 6425.00 | 0 | 0.00 |
| 06/05/2016 | 5426.00 | 0 | 0.00 |
| 07/05/2016 | 4590.00 | 0 | 0.00 |
| 08/05/2016 | 6449.00 | 0 | 0.00 |
| 09/05/2016 | 6882.00 | 0 | 0.00 |
| 10/05/2016 | 7225.00 | 0 | 0.00 |
| 11/05/2016 | 7589.00 | 0 | 0.00 |
| 12/05/2016 | 7641.00 | 0 | 0.00 |
| 13/05/2016 | 7386.00 | 0 | 0.00 |
| 14/05/2016 | 6734.00 | 0 | 0.00 |
| 15/05/2016 | 6224.00 | 0 | 0.00 |
| 16/05/2016 | 5661.00 | 0 | 0.00 |
| 17/05/2016 | 5024.00 | 0 | 0.00 |
| 18/05/2016 | 4905.00 | 0 | 0.00 |
| 19/05/2016 | 5236.00 | 0 | 0.00 |
| 20/05/2016 | 5458.00 | 0 | 0.00 |
| 21/05/2016 | 6871.00 | 0 | 0.00 |
| 22/05/2016 | 7344.00 | 0 | 0.00 |
| 23/05/2016 | 7182.00 | 0 | 0.00 |
| 24/05/2016 | 7244.00 | 0 | 0.00 |
| 25/05/2016 | 5472.00 | 0 | 0.00 |
| 26/05/2016 | 3482.00 | 0 | 0.00 |
| 27/05/2016 | 3140.00 | 0 | 0.00 |
| 28/05/2016 | 5996.00 | 0 | 0.00 |
| 29/05/2016 | 8995.00 | 0 | 0.00 |
| 30/05/2016 | 10180.00 | 0 | 0.00 |
| 31/05/2016 | 5172.00 | 0 | 0.00 |
| 01/06/2016 | 3104.00 | 0 | 0.00 |
| 02/06/2016 | 1929.00 | 0 | 0.00 |
| 03/06/2016 | 2943.00 | 0 | 0.00 |
| 04/06/2016 | 5601.00 | 0 | 0.00 |
| 05/06/2016 | 5342.00 | 0 | 0.00 |
| 06/06/2016 | 6166.00 | 0 | 0.00 |
| 07/06/2016 | 6739.00 | 0 | 0.00 |
| 08/06/2016 | 6140.00 | 0 | 0.00 |
| 09/06/2016 | 6653.00 | 0 | 0.00 |
| 10/06/2016 | 8311.00 | 0 | 0.00 |
| 11/06/2016 | 9959.00 | 0 | 0.00 |
| 12/06/2016 | 10634.00 | 0 | 0.00 |
| 13/06/2016 | 10984.00 | 0 | 0.00 |
| 14/06/2016 | 13925.00 | 0 | 0.00 |
| 15/06/2016 | 14537.00 | 0 | 0.00 |
| 16/06/2016 | 10449.00 | 0 | 0.00 |
| 17/06/2016 | 1843.00 | 0 | 0.00 |
| 18/06/2016 | 1273.00 | 0 | 0.00 |
| 19/06/2016 | 1185.00 | 0 | 0.00 |
| 20/06/2016 | 1093.00 | 0 | 0.00 |
| 21/06/2016 | 941.00 | 0 | 0.00 |
| 22/06/2016 | 3557.00 | 0 | 0.00 |
| 23/06/2016 | 8037.00 | 0 | 0.00 |
| 24/06/2016 | 7910.00 | 0 | 0.00 |
| 25/06/2016 | 7730.00 | 0 | 0.00 |
| 26/06/2016 | 7811.00 | 0 | 0.00 |

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|---|---|---|---|
| 27/06/2016 | 7617.00 | 0 | 0.00 |
| 28/06/2016 | 7387.00 | 0 | 0.00 |
| 29/06/2016 | 7510.00 | 0 | 0.00 |
| 30/06/2016 | 7253.00 | 0 | 0.00 |
| 01/07/2016 | 7090.00 | 0 | 0.00 |
| 02/07/2016 | 6874.00 | 0 | 0.00 |
| 03/07/2016 | 6448.00 | 0 | 0.00 |
| 04/07/2016 | 6233.00 | 0 | 0.00 |
| 05/07/2016 | 6117.00 | 0 | 0.00 |
| 06/07/2016 | 6139.00 | 0 | 0.00 |
| 07/07/2016 | 6102.00 | 0 | 0.00 |
| 08/07/2016 | 6948.00 | 0 | 0.00 |
| 09/07/2016 | 9362.00 | 0 | 0.00 |
| 10/07/2016 | 8992.00 | 0 | 0.00 |
| 11/07/2016 | 8949.00 | 0 | 0.00 |
| 12/07/2016 | 9086.00 | 0 | 0.00 |
| 13/07/2016 | 8972.00 | 0 | 0.00 |
| 14/07/2016 | 8803.00 | 0 | 0.00 |
| 15/07/2016 | 8776.00 | 0 | 0.00 |
| 16/07/2016 | 8606.00 | 0 | 0.00 |
| 17/07/2016 | 8669.00 | 0 | 0.00 |
| 18/07/2016 | 8564.00 | 0 | 0.00 |
| 19/07/2016 | 8431.00 | 0 | 0.00 |
| 20/07/2016 | 8268.00 | 0 | 0.00 |
| 21/07/2016 | 8011.00 | 2 | 242.00 |
| 22/07/2016 | 8179.00 | 1 | 121.00 |
| 23/07/2016 | 8508.00 | 0 | 0.00 |
| 24/07/2016 | 8460.00 | 0 | 0.00 |
| 25/07/2016 | 8103.00 | 0 | 0.00 |
| 26/07/2016 | 8146.00 | 1 | 121.00 |
| 27/07/2016 | 8199.00 | 0 | 0.00 |
| 28/07/2016 | 8196.00 | 0 | 0.00 |
| 29/07/2016 | 8044.00 | 0 | 0.00 |
| 30/07/2016 | 7813.00 | 0 | 0.00 |
| 31/07/2016 | 7489.00 | 0 | 0.00 |
| 01/08/2016 | 7319.00 | 0 | 0.00 |
| 02/08/2016 | 7446.00 | 0 | 0.00 |
| 03/08/2016 | 7439.00 | 0 | 0.00 |
| 04/08/2016 | 7356.00 | 0 | 0.00 |
| 05/08/2016 | 7545.00 | 0 | 0.00 |
| 06/08/2016 | 7115.00 | 0 | 0.00 |
| 07/08/2016 | 6867.00 | 0 | 0.00 |
| 08/08/2016 | 6536.00 | 0 | 0.00 |
| 09/08/2016 | 5939.00 | 0 | 0.00 |
| 10/08/2016 | 6490.00 | 0 | 0.00 |
| 11/08/2016 | 9254.00 | 0 | 0.00 |
| 12/08/2016 | 9959.00 | 0 | 0.00 |
| 13/08/2016 | 9357.00 | 0 | 0.00 |
| 14/08/2016 | 10001.00 | 0 | 0.00 |
| 15/08/2016 | 10198.00 | 0 | 0.00 |
| 16/08/2016 | 9719.00 | 0 | 0.00 |
| 17/08/2016 | 9073.00 | 0 | 0.00 |
| 18/08/2016 | 8574.00 | 0 | 0.00 |
| 19/08/2016 | 5802.00 | 0 | 0.00 |
| 20/08/2016 | 1507.00 | 0 | 0.00 |
| 21/08/2016 | 1290.00 | 0 | 0.00 |
| 22/08/2016 | 4780.00 | 0 | 0.00 |
| 23/08/2016 | 9841.00 | 0 | 0.00 |
| 24/08/2016 | 9576.00 | 0 | 0.00 |

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|---|---|---|---|
| 25/08/2016 | 6712.00 | 0 | 0.00 |
| 26/08/2016 | 1247.00 | 0 | 0.00 |
| 27/08/2016 | 4715.00 | 0 | 0.00 |
| 28/08/2016 | 8527.00 | 0 | 0.00 |
| 29/08/2016 | 8454.00 | 0 | 0.00 |
| 30/08/2016 | 8223.00 | 0 | 0.00 |
| 31/08/2016 | 7880.00 | 0 | 0.00 |
| 01/09/2016 | 7667.00 | 0 | 0.00 |
| 02/09/2016 | 8373.00 | 0 | 0.00 |
| 03/09/2016 | 8866.00 | 0 | 0.00 |
| 04/09/2016 | 9300.00 | 0 | 0.00 |
| 05/09/2016 | 9398.00 | 0 | 0.00 |
| 06/09/2016 | 9355.00 | 0 | 0.00 |
| 07/09/2016 | 8855.00 | 0 | 0.00 |
| 08/09/2016 | 8719.00 | 0 | 0.00 |
| 09/09/2016 | 7052.00 | 0 | 0.00 |
| 10/09/2016 | 4098.00 | 0 | 0.00 |
| 11/09/2016 | 3939.00 | 0 | 0.00 |
| 12/09/2016 | 4992.00 | 0 | 0.00 |
| 13/09/2016 | 8018.00 | 0 | 0.00 |
| 14/09/2016 | 8238.00 | 0 | 0.00 |
| 15/09/2016 | 7773.00 | 5 | 605.00 |
| 16/09/2016 | 7480.00 | 1 | 121.00 |
| 17/09/2016 | 7373.00 | 0 | 0.00 |
| 18/09/2016 | 7394.00 | 0 | 0.00 |
| 19/09/2016 | 7803.00 | 0 | 0.00 |
| 20/09/2016 | 8119.00 | 1 | 121.00 |
| 21/09/2016 | 8269.00 | 0 | 0.00 |
| 22/09/2016 | 9695.00 | 1 | 121.00 |
| 23/09/2016 | 11245.00 | 0 | 0.00 |
| 24/09/2016 | 11660.00 | 0 | 0.00 |
| 25/09/2016 | 9839.00 | 0 | 0.00 |
| 26/09/2016 | 7615.00 | 0 | 0.00 |
| 27/09/2016 | 7593.00 | 0 | 0.00 |
| 28/09/2016 | 7465.00 | 0 | 0.00 |
| 29/09/2016 | 7458.00 | 0 | 0.00 |
| 30/09/2016 | 7595.00 | 0 | 0.00 |
| 01/10/2016 | 7569.00 | 0 | 0.00 |
| 02/10/2016 | 7695.00 | 0 | 0.00 |
| 03/10/2016 | 7652.00 | 0 | 0.00 |
| 04/10/2016 | 7632.00 | 0 | 0.00 |
| 05/10/2016 | 7534.00 | 0 | 0.00 |
| 06/10/2016 | 7394.00 | 0 | 0.00 |
| 07/10/2016 | 7300.00 | 0 | 0.00 |
| 08/10/2016 | 7549.00 | 0 | 0.00 |
| 09/10/2016 | 8958.00 | 0 | 0.00 |
| 10/10/2016 | 10838.00 | 0 | 0.00 |
| 11/10/2016 | 12146.00 | 0 | 0.00 |
| 12/10/2016 | 13430.00 | 0 | 0.00 |
| 13/10/2016 | 14574.00 | 0 | 0.00 |
| 14/10/2016 | 8150.00 | 0 | 0.00 |
| 15/10/2016 | 1407.00 | 0 | 0.00 |
| 16/10/2016 | 1404.00 | 0 | 0.00 |
| 17/10/2016 | 1358.00 | 0 | 0.00 |
| 18/10/2016 | 1373.00 | 0 | 0.00 |
| 19/10/2016 | 4459.00 | 2 | 242.00 |
| 20/10/2016 | 10509.00 | 0 | 0.00 |
| 21/10/2016 | 8123.00 | 0 | 0.00 |
| 22/10/2016 | 5376.00 | 0 | 0.00 |

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|---|---|---|---|
| 23/10/2016 | 5223.00 | 0 | 0.00 |
| 24/10/2016 | 5172.00 | 0 | 0.00 |
| 25/10/2016 | 5108.00 | 0 | 0.00 |
| 26/10/2016 | 5097.00 | 0 | 0.00 |
| 27/10/2016 | 4720.00 | 0 | 0.00 |
| 28/10/2016 | 4723.00 | 0 | 0.00 |
| 29/10/2016 | 4875.00 | 0 | 0.00 |
| 30/10/2016 | 4956.00 | 0 | 0.00 |
| 31/10/2016 | 4678.00 | 0 | 0.00 |
| 01/11/2016 | 4614.00 | 0 | 0.00 |
| 02/11/2016 | 4483.00 | 0 | 0.00 |
| 03/11/2016 | 4463.00 | 0 | 0.00 |
| 04/11/2016 | 4476.00 | 0 | 0.00 |
| 05/11/2016 | 4369.00 | 0 | 0.00 |
| 06/11/2016 | 4325.00 | 0 | 0.00 |
| 07/11/2016 | 4205.00 | 0 | 0.00 |
| 08/11/2016 | 4210.00 | 0 | 0.00 |
| 09/11/2016 | 4338.00 | 0 | 0.00 |
| 10/11/2016 | 4292.00 | 0 | 0.00 |
| 11/11/2016 | 4184.00 | 0 | 0.00 |
| 12/11/2016 | 4371.00 | 0 | 0.00 |
| 13/11/2016 | 4352.00 | 0 | 0.00 |
| 14/11/2016 | 5104.00 | 1 | 121.00 |
| 15/11/2016 | 5691.00 | 0 | 0.00 |
| 16/11/2016 | 4287.00 | 0 | 0.00 |
| 17/11/2016 | 4468.00 | 0 | 0.00 |
| 18/11/2016 | 4449.00 | 0 | 0.00 |
| 19/11/2016 | 4448.00 | 0 | 0.00 |
| 20/11/2016 | 4459.00 | 0 | 0.00 |
| 21/11/2016 | 3864.00 | 0 | 0.00 |
| 22/11/2016 | 2067.00 | 0 | 0.00 |
| 23/11/2016 | 883.00 | 0 | 0.00 |
| 24/11/2016 | 2770.00 | 0 | 0.00 |
| 25/11/2016 | 6927.00 | 0 | 0.00 |
| 26/11/2016 | 4033.00 | 0 | 0.00 |
| 27/11/2016 | 4007.00 | 0 | 0.00 |
| 28/11/2016 | 3942.00 | 0 | 0.00 |
| 29/11/2016 | 3976.00 | 0 | 0.00 |
| 30/11/2016 | 4020.00 | 0 | 0.00 |
| 01/12/2016 | 3989.00 | 0 | 0.00 |
| 02/12/2016 | 3978.00 | 0 | 0.00 |
| 03/12/2016 | 4084.00 | 0 | 0.00 |
| 04/12/2016 | 6040.00 | 0 | 0.00 |
| 05/12/2016 | 7867.00 | | 0.00 |
| 06/12/2016 | 7801.00 | | 0.00 |
| 07/12/2016 | 7845.00 | | 0.00 |
| 08/12/2016 | 8085.00 | 0 | 0.00 |
| 09/12/2016 | 8381.00 | 0 | 0.00 |
| 10/12/2016 | 8351.00 | 0 | 0.00 |
| 11/12/2016 | 8420.00 | 0 | 0.00 |
| 12/12/2016 | 8133.00 | 0 | 0.00 |
| 13/12/2016 | 8107.00 | 0 | 0.00 |
| 14/12/2016 | 8461.00 | 0 | 0.00 |
| 15/12/2016 | 8200.00 | 0 | 0.00 |
| 16/12/2016 | 7998.00 | 0 | 0.00 |
| 17/12/2016 | 7921.00 | 0 | 0.00 |
| 18/12/2016 | 7941.00 | 0 | 0.00 |
| 19/12/2016 | 7877.00 | 0 | 0.00 |
| 20/12/2016 | 8203.00 | 0 | 0.00 |

| | | | |
|---|---|---|---|
| 21/12/2016 | 7906.00 | 0 | 0.00 |
| 22/12/2016 | 7946.00 | 0 | 0.00 |
| 23/12/2016 | 7980.00 | 0 | 0.00 |
| 24/12/2016 | 7865.00 | 0 | 0.00 |
| 25/12/2016 | 7667.00 | 0 | 0.00 |
| 26/12/2016 | 7749.00 | 0 | 0.00 |
| 27/12/2016 | 7444.00 | 0 | 0.00 |
| 28/12/2016 | 7345.00 | 0 | 0.00 |
| 29/12/2016 | 7264.00 | 0 | 0.00 |
| 30/12/2016 | 7004.00 | 0 | 0.00 |
| 31/12/2016 | 6845.00 | 0 | 0.00 |
| 01/01/2017 | 7389.00 | 0 | 0.00 |
| 02/01/2017 | 7558.00 | 0 | 0.00 |
| 03/01/2017 | 7185.00 | 0 | 0.00 |
| 04/01/2017 | 7058.00 | 0 | 0.00 |
| 05/01/2017 | 6873.00 | 0 | 0.00 |
| 06/01/2017 | 6937.00 | 0 | 0.00 |
| 07/01/2017 | 6977.00 | 0 | 0.00 |
| 08/01/2017 | 6873.00 | 0 | 0.00 |
| 09/01/2017 | 6956.00 | 0 | 0.00 |
| 10/01/2017 | 7385.00 | 0 | 0.00 |
| 11/01/2017 | 7130.00 | 0 | 0.00 |
| 12/01/2017 | 6922.00 | 0 | 0.00 |
| 13/01/2017 | 7108.00 | 0 | 0.00 |
| 14/01/2017 | 7025.00 | 0 | 0.00 |
| 15/01/2017 | 7777.00 | 0 | 0.00 |
| 16/01/2017 | 7382.00 | 0 | 0.00 |
| 17/01/2017 | 6995.00 | 0 | 0.00 |
| 18/01/2017 | 6892.00 | 0 | 0.00 |
| 19/01/2017 | 6785.00 | 0 | 0.00 |
| 20/01/2017 | 6582.00 | 0 | 0.00 |
| 21/01/2017 | 6318.00 | 0 | 0.00 |
| 22/01/2017 | 6220.00 | 0 | 0.00 |
| 23/01/2017 | 6167.00 | 0 | 0.00 |
| 24/01/2017 | 6169.00 | 0 | 0.00 |
| 25/01/2017 | 6030.00 | 0 | 0.00 |
| 26/01/2017 | 5940.00 | 0 | 0.00 |
| 27/01/2017 | 5826.00 | 0 | 0.00 |
| 28/01/2017 | 6088.00 | 0 | 0.00 |
| 29/01/2017 | 6567.00 | 0 | 0.00 |
| 30/01/2017 | 7168.00 | 0 | 0.00 |
| 31/01/2017 | 7159.00 | 0 | 0.00 |
| 01/02/2017 | 6098.00 | 0 | 0.00 |
| 02/02/2017 | 3430.00 | 0 | 0.00 |
| 03/02/2017 | 3490.00 | 1 | 121.00 |
| 04/02/2017 | 3277.00 | 0 | 0.00 |
| 05/02/2017 | 3166.00 | 0 | 0.00 |
| 06/02/2017 | 3199.00 | 0 | 0.00 |
| 07/02/2017 | 5945.00 | 0 | 0.00 |
| 08/02/2017 | 8418.00 | 0 | 0.00 |
| 09/02/2017 | 8174.00 | 0 | 0.00 |
| 10/02/2017 | 7893.00 | 0 | 0.00 |
| 11/02/2017 | 7611.00 | 0 | 0.00 |
| 12/02/2017 | 7526.00 | 0 | 0.00 |
| 13/02/2017 | 7298.00 | 0 | 0.00 |
| 14/02/2017 | 7180.00 | 0 | 0.00 |
| 15/02/2017 | 7034.00 | 0 | 0.00 |
| 16/02/2017 | 6804.00 | 0 | 0.00 |
| 17/02/2017 | 6655.00 | 0 | 0.00 |

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|---|---|---|---|
| 18/02/2017 | 6550.00 | 0 | 0.00 |
| 19/02/2017 | 6324.00 | 0 | 0.00 |
| 20/02/2017 | 6185.00 | 0 | 0.00 |
| 21/02/2017 | 6967.00 | 0 | 0.00 |
| 22/02/2017 | 9110.00 | 0 | 0.00 |
| 23/02/2017 | 6180.00 | 0 | 0.00 |
| 24/02/2017 | 3593.00 | 0 | 0.00 |
| 25/02/2017 | 5307.00 | 0 | 0.00 |
| 26/02/2017 | 4876.00 | 0 | 0.00 |
| 27/02/2017 | 6070.00 | 0 | 0.00 |
| 28/02/2017 | 9549.00 | 0 | 0.00 |
| 01/03/2017 | 9845.00 | 0 | 0.00 |
| 02/03/2017 | 9942.00 | 1 | 121.00 |
| 03/03/2017 | 9351.00 | 0 | 0.00 |
| 04/03/2017 | 9046.00 | 0 | 0.00 |
| 05/03/2017 | 9199.00 | 0 | 0.00 |
| 06/03/2017 | 8914.00 | 0 | 0.00 |
| 07/03/2017 | 8220.00 | 0 | 0.00 |
| 08/03/2017 | 7853.00 | 0 | 0.00 |
| 09/03/2017 | 7674.00 | 0 | 0.00 |
| 10/03/2017 | 7292.00 | 0 | 0.00 |
| 11/03/2017 | 3683.00 | 0 | 0.00 |
| 12/03/2017 | 2757.00 | 0 | 0.00 |
| 13/03/2017 | 3783.00 | 0 | 0.00 |
| 14/03/2017 | 7754.00 | 0 | 0.00 |
| 15/03/2017 | 7561.00 | 0 | 0.00 |
| 16/03/2017 | 7741.00 | 0 | 0.00 |
| 17/03/2017 | 7929.00 | 0 | 0.00 |
| 18/03/2017 | 8059.00 | 0 | 0.00 |
| 19/03/2017 | 7908.00 | 0 | 0.00 |
| 20/03/2017 | 7982.00 | 0 | 0.00 |
| 21/03/2017 | 7756.00 | 0 | 0.00 |
| 22/03/2017 | 8275.00 | 0 | 0.00 |
| 23/03/2017 | 7367.00 | 0 | 0.00 |
| 24/03/2017 | 6651.00 | 0 | 0.00 |
| 25/03/2017 | 6513.00 | 0 | 0.00 |
| 26/03/2017 | 6286.00 | 0 | 0.00 |
| 27/03/2017 | 6048.00 | 0 | 0.00 |
| 28/03/2017 | 6027.00 | 0 | 0.00 |
| 29/03/2017 | 6043.00 | 0 | 0.00 |
| 30/03/2017 | 5901.00 | 0 | 0.00 |
| 31/03/2017 | 5762.00 | 0 | 0.00 |
| 01/04/2017 | 5837.00 | 0 | 0.00 |
| 02/04/2017 | 5761.00 | 0 | 0.00 |
| 03/04/2017 | 5570.00 | 0 | 0.00 |
| 04/04/2017 | 6005.00 | 0 | 0.00 |
| 05/04/2017 | 5923.00 | 0 | 0.00 |
| 06/04/2017 | 5871.00 | 0 | 0.00 |
| 07/04/2017 | 5808.00 | 0 | 0.00 |
| 08/04/2017 | 5496.00 | 0 | 0.00 |
| 09/04/2017 | 4462.00 | 0 | 0.00 |
| 10/04/2017 | 4688.00 | 0 | 0.00 |
| 11/04/2017 | 5245.00 | 0 | 0.00 |
| 12/04/2017 | 5460.00 | 0 | 0.00 |
| 13/04/2017 | 5701.00 | 0 | 0.00 |
| 14/04/2017 | 5432.00 | 0 | 0.00 |
| 15/04/2017 | 5614.00 | 0 | 0.00 |
| 16/04/2017 | 5734.00 | 0 | 0.00 |
| 17/04/2017 | 6042.00 | 0 | 0.00 |

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|---|---|---|---|
| 18/04/2017 | 5862.00 | 0 | 0.00 |
| 19/04/2017 | 5638.00 | 0 | 0.00 |
| 20/04/2017 | 5068.00 | 0 | 0.00 |
| 21/04/2017 | 4793.00 | 0 | 0.00 |
| 22/04/2017 | 4751.00 | 0 | 0.00 |
| 23/04/2017 | 4141.00 | 0 | 0.00 |
| 24/04/2017 | 4352.00 | 0 | 0.00 |
| 25/04/2017 | 5531.00 | 0 | 0.00 |
| 26/04/2017 | 6860.00 | 0 | 0.00 |
| 27/04/2017 | 6326.00 | 0 | 0.00 |
| 28/04/2017 | 5787.00 | 0 | 0.00 |
| 29/04/2017 | 5513.00 | 0 | 0.00 |
| 30/04/2017 | 5271.00 | 0 | 0.00 |
| 01/05/2017 | 5848.00 | 0 | 0.00 |
| 02/05/2017 | 5699.00 | 1 | 121.00 |
| 03/05/2017 | 5328.00 | 0 | 0.00 |
| 04/05/2017 | 5592.00 | 0 | 0.00 |
| 05/05/2017 | 6260.00 | 0 | 0.00 |
| 06/05/2017 | 6311.00 | 0 | 0.00 |
| 07/05/2017 | 6498.00 | 0 | 0.00 |
| 08/05/2017 | 6213.00 | 0 | 0.00 |
| 09/05/2017 | 5942.00 | 0 | 0.00 |
| 10/05/2017 | 5939.00 | 0 | 0.00 |
| 11/05/2017 | 9129.00 | 0 | 0.00 |
| 12/05/2017 | 8847.00 | 0 | 0.00 |
| 13/05/2017 | 5721.00 | 0 | 0.00 |
| 14/05/2017 | 5157.00 | 0 | 0.00 |
| 15/05/2017 | 4664.00 | 0 | 0.00 |
| 16/05/2017 | 4146.00 | 0 | 0.00 |
| 17/05/2017 | 4025.00 | 0 | 0.00 |
| 18/05/2017 | 3688.00 | 0 | 0.00 |
| 19/05/2017 | 5190.00 | 0 | 0.00 |
| 20/05/2017 | 6639.00 | 0 | 0.00 |
| 21/05/2017 | 6407.00 | 0 | 0.00 |
| 22/05/2017 | 6192.00 | 0 | 0.00 |
| 23/05/2017 | 6025.00 | 0 | 0.00 |
| 24/05/2017 | 6368.00 | 0 | 0.00 |
| 25/05/2017 | 6151.00 | 0 | 0.00 |
| 26/05/2017 | 6643.00 | 0 | 0.00 |
| 27/05/2017 | 6841.00 | 0 | 0.00 |
| 28/05/2017 | 6757.00 | 0 | 0.00 |
| 29/05/2017 | 6753.00 | 0 | 0.00 |
| 30/05/2017 | 6643.00 | 0 | 0.00 |
| 31/05/2017 | 6615.00 | 0 | 0.00 |
| 01/06/2017 | 6694.00 | 0 | 0.00 |
| 02/06/2017 | 6492.00 | 0 | 0.00 |
| 03/06/2017 | 6412.00 | 0 | 0.00 |
| 04/06/2017 | 6325.00 | 0 | 0.00 |
| 05/06/2017 | 6352.00 | 0 | 0.00 |
| 06/06/2017 | 6822.00 | 0 | 0.00 |
| 07/06/2017 | 6658.00 | 0 | 0.00 |
| 08/06/2017 | 6593.00 | 0 | 0.00 |
| 09/06/2017 | 6591.00 | 0 | 0.00 |
| 10/06/2017 | 6598.00 | 0 | 0.00 |
| 11/06/2017 | 6660.00 | 0 | 0.00 |
| 12/06/2017 | 6590.00 | 0 | 0.00 |
| 13/06/2017 | 6555.00 | 0 | 0.00 |
| 14/06/2017 | 6707.00 | 0 | 0.00 |
| 15/06/2017 | 6678.00 | 0 | 0.00 |

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|---|---|---|---|
| 16/06/2017 | 6547.00 | 0 | 0.00 |
| 17/06/2017 | 6485.00 | 0 | 0.00 |
| 18/06/2017 | 6593.00 | 0 | 0.00 |
| 19/06/2017 | 6472.00 | 0 | 0.00 |
| 20/06/2017 | 7061.00 | 0 | 0.00 |
| 21/06/2017 | 9570.00 | 0 | 0.00 |
| 22/06/2017 | 9899.00 | 0 | 0.00 |
| 23/06/2017 | 10149.00 | 0 | 0.00 |
| 24/06/2017 | 10186.00 | 0 | 0.00 |
| 25/06/2017 | 10066.00 | 0 | 0.00 |
| 26/06/2017 | 9663.00 | 0 | 0.00 |
| 27/06/2017 | 9462.00 | 0 | 0.00 |
| 28/06/2017 | 9461.00 | 0 | 0.00 |
| 29/06/2017 | 9480.00 | 0 | 0.00 |
| 30/06/2017 | 9523.00 | 0 | 0.00 |
| 01/07/2017 | 8549.00 | 0 | 0.00 |
| 02/07/2017 | 7036.00 | 0 | 0.00 |
| 03/07/2017 | 7979.00 | 0 | 0.00 |
| 04/07/2017 | 9123.00 | 0 | 0.00 |
| 05/07/2017 | 9608.00 | 0 | 0.00 |
| 06/07/2017 | 9956.00 | 0 | 0.00 |
| 07/07/2017 | 6962.00 | 0 | 0.00 |
| 08/07/2017 | 5471.00 | 0 | 0.00 |
| 09/07/2017 | 7940.00 | 0 | 0.00 |
| 10/07/2017 | 7883.00 | 0 | 0.00 |
| 11/07/2017 | 7958.00 | 0 | 0.00 |
| 12/07/2017 | 7826.00 | 0 | 0.00 |
| 13/07/2017 | 7646.00 | 0 | 0.00 |
| 14/07/2017 | 7174.00 | 0 | 0.00 |
| 15/07/2017 | 7156.00 | 0 | 0.00 |
| 16/07/2017 | 7350.00 | 0 | 0.00 |
| 17/07/2017 | 7654.00 | 0 | 0.00 |
| 18/07/2017 | 7501.00 | 0 | 0.00 |
| 19/07/2017 | 7528.00 | 0 | 0.00 |
| 20/07/2017 | 7231.00 | 0 | 0.00 |
| 21/07/2017 | 7334.00 | 0 | 0.00 |
| 22/07/2017 | 7092.00 | 0 | 0.00 |
| 23/07/2017 | 7000.00 | 0 | 0.00 |
| 24/07/2017 | 6567.00 | 0 | 0.00 |
| 25/07/2017 | 6364.00 | 0 | 0.00 |
| 26/07/2017 | 6330.00 | 0 | 0.00 |
| 27/07/2017 | 6313.00 | 0 | 0.00 |
| 28/07/2017 | 6112.00 | 0 | 0.00 |
| 29/07/2017 | 6176.00 | 0 | 0.00 |
| 30/07/2017 | 6072.00 | 0 | 0.00 |
| 31/07/2017 | 5897.00 | 0 | 0.00 |
| 01/08/2017 | 5937.00 | 0 | 0.00 |
| 02/08/2017 | 6029.00 | 0 | 0.00 |
| 03/08/2017 | 5929.00 | 0 | 0.00 |
| 04/08/2017 | 5894.00 | 0 | 0.00 |
| 05/08/2017 | 5767.00 | 0 | 0.00 |
| 06/08/2017 | 5869.00 | 0 | 0.00 |
| 07/08/2017 | 5909.00 | 0 | 0.00 |
| 08/08/2017 | 5840.00 | 0 | 0.00 |
| 09/08/2017 | 5728.00 | 0 | 0.00 |
| 10/08/2017 | 5569.00 | 0 | 0.00 |
| 11/08/2017 | 5457.00 | 0 | 0.00 |
| 12/08/2017 | 5397.00 | 0 | 0.00 |
| 13/08/2017 | 6278.00 | 0 | 0.00 |

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|---|---|---|---|
| 14/08/2017 | 7031.00 | 0 | 0.00 |
| 15/08/2017 | 7719.00 | 0 | 0.00 |
| 16/08/2017 | 6813.00 | 0 | 0.00 |
| 17/08/2017 | 5435.00 | 0 | 0.00 |
| 18/08/2017 | 3932.00 | 0 | 0.00 |
| 19/08/2017 | 3619.00 | 0 | 0.00 |
| 20/08/2017 | 5027.00 | 0 | 0.00 |
| 21/08/2017 | 7032.00 | 0 | 0.00 |
| 22/08/2017 | 6910.00 | 0 | 0.00 |
| 23/08/2017 | 6703.00 | 0 | 0.00 |
| 24/08/2017 | 6549.00 | 0 | 0.00 |
| 25/08/2017 | 6405.00 | 0 | 0.00 |
| 26/08/2017 | 6326.00 | 0 | 0.00 |
| 27/08/2017 | 6203.00 | 0 | 0.00 |
| 28/08/2017 | 6072.00 | 0 | 0.00 |
| 29/08/2017 | 5991.00 | 0 | 0.00 |
| 30/08/2017 | 5696.00 | 0 | 0.00 |
| 31/08/2017 | 5760.00 | 0 | 0.00 |
| 01/09/2017 | 5746.00 | 0 | 0.00 |
| 02/09/2017 | 5665.00 | 0 | 0.00 |
| 03/09/2017 | 5594.00 | 0 | 0.00 |
| 04/09/2017 | 5761.00 | 0 | 0.00 |
| 05/09/2017 | 5881.00 | 0 | 0.00 |
| 06/09/2017 | 6029.00 | 0 | 0.00 |
| 07/09/2017 | 5789.00 | 0 | 0.00 |
| 08/09/2017 | 6022.00 | 0 | 0.00 |
| 09/09/2017 | 6156.00 | 0 | 0.00 |
| 10/09/2017 | 6228.00 | 0 | 0.00 |
| 11/09/2017 | 6277.00 | 0 | 0.00 |
| 12/09/2017 | 6304.00 | 0 | 0.00 |
| 13/09/2017 | 6270.00 | 0 | 0.00 |
| 14/09/2017 | 6299.00 | 0 | 0.00 |
| 15/09/2017 | 6096.00 | | 0.00 |
| 16/09/2017 | 6021.00 | | 0.00 |
| 17/09/2017 | 5916.00 | | 0.00 |
| 18/09/2017 | 6020.00 | | 0.00 |
| 19/09/2017 | 5816.00 | 0 | 0.00 |
| 20/09/2017 | 5730.00 | 0 | 0.00 |
| 21/09/2017 | 5774.00 | 0 | 0.00 |
| 22/09/2017 | 5813.00 | 0 | 0.00 |
| 23/09/2017 | 5931.00 | 0 | 0.00 |
| 24/09/2017 | 6039.00 | 0 | 0.00 |
| 25/09/2017 | 5957.00 | 0 | 0.00 |
| 26/09/2017 | 5892.00 | 0 | 0.00 |
| 27/09/2017 | 5912.00 | 0 | 0.00 |
| 28/09/2017 | 5817.00 | 0 | 0.00 |
| 29/09/2017 | 5719.00 | 0 | 0.00 |
| 30/09/2017 | 5858.00 | 0 | 0.00 |
| 01/10/2017 | 5768.00 | 0 | 0.00 |
| 02/10/2017 | 5581.00 | 0 | 0.00 |
| 03/10/2017 | 5249.00 | 0 | 0.00 |
| 04/10/2017 | 5136.00 | 0 | 0.00 |
| 05/10/2017 | 4972.00 | 0 | 0.00 |
| 06/10/2017 | 4909.00 | 0 | 0.00 |
| 07/10/2017 | 4909.00 | 0 | 0.00 |
| 08/10/2017 | 4925.00 | 0 | 0.00 |
| 09/10/2017 | 4833.00 | 0 | 0.00 |
| 10/10/2017 | 4398.00 | 0 | 0.00 |
| 11/10/2017 | 4247.00 | 0 | 0.00 |

| | | | |
|---|---|---|---|
| 12/10/2017 | 4852.00 | 0 | 0.00 |
| 13/10/2017 | 5917.00 | 0 | 0.00 |
| 14/10/2017 | 5925.00 | 0 | 0.00 |
| 15/10/2017 | 5787.00 | 0 | 0.00 |
| 16/10/2017 | 5564.00 | 0 | 0.00 |
| 17/10/2017 | 5292.00 | 0 | 0.00 |
| 18/10/2017 | 5164.00 | 0 | 0.00 |
| 19/10/2017 | 4979.00 | 0 | 0.00 |
| 20/10/2017 | 4655.00 | 0 | 0.00 |
| 21/10/2017 | 4817.00 | 0 | 0.00 |
| 22/10/2017 | 4246.00 | 0 | 0.00 |
| 23/10/2017 | 3785.00 | 0 | 0.00 |
| 24/10/2017 | 3746.00 | 0 | 0.00 |
| 25/10/2017 | 3515.00 | 0 | 0.00 |
| 26/10/2017 | 3465.00 | 0 | 0.00 |
| 27/10/2017 | 3756.00 | 0 | 0.00 |
| 28/10/2017 | 3610.00 | 0 | 0.00 |
| 29/10/2017 | 3617.00 | 0 | 0.00 |
| 30/10/2017 | 2780.00 | 0 | 0.00 |
| 31/10/2017 | 1346.00 | 0 | 0.00 |
| 01/11/2017 | 1117.00 | 0 | 0.00 |
| 02/11/2017 | 3705.00 | 0 | 0.00 |
| 03/11/2017 | 8666.00 | 0 | 0.00 |
| 04/11/2017 | 6359.00 | 0 | 0.00 |
| 05/11/2017 | 6758.00 | 0 | 0.00 |
| 06/11/2017 | 6746.00 | 0 | 0.00 |
| 07/11/2017 | 6878.00 | 0 | 0.00 |
| 08/11/2017 | 7121.00 | 0 | 0.00 |
| 09/11/2017 | 6816.00 | 0 | 0.00 |
| 10/11/2017 | 6951.00 | 0 | 0.00 |
| 11/11/2017 | 7574.00 | 0 | 0.00 |
| 12/11/2017 | 7694.00 | 0 | 0.00 |
| 13/11/2017 | 7348.00 | 0 | 0.00 |
| 14/11/2017 | 6605.00 | 3 | 363.00 |
| 15/11/2017 | 6562.00 | 0 | 0.00 |
| 16/11/2017 | 6575.00 | 0 | 0.00 |
| 17/11/2017 | 6584.00 | 0 | 0.00 |
| 18/11/2017 | 6576.00 | 0 | 0.00 |
| 19/11/2017 | 6566.00 | 0 | 0.00 |
| 20/11/2017 | 6528.00 | 0 | 0.00 |
| 21/11/2017 | 7264.00 | 0 | 0.00 |
| 22/11/2017 | 7460.00 | 0 | 0.00 |
| 23/11/2017 | 7401.00 | 0 | 0.00 |
| 24/11/2017 | 7268.00 | 0 | 0.00 |
| 25/11/2017 | 7571.00 | 0 | 0.00 |
| 26/11/2017 | 7523.00 | 0 | 0.00 |
| 27/11/2017 | 7936.00 | 0 | 0.00 |
| 28/11/2017 | 7516.00 | 0 | 0.00 |
| 29/11/2017 | 7409.00 | 0 | 0.00 |
| 30/11/2017 | 7224.00 | 0 | 0.00 |
| 01/12/2017 | 6746.00 | 0 | 0.00 |
| 02/12/2017 | 5711.00 | 0 | 0.00 |
| 03/12/2017 | 5446.00 | 0 | 0.00 |
| 04/12/2017 | 4788.00 | 0 | 0.00 |
| 05/12/2017 | 4926.00 | 0 | 0.00 |
| 06/12/2017 | 5270.00 | 0 | 0.00 |
| 07/12/2017 | 5051.00 | 0 | 0.00 |
| 08/12/2017 | 5175.00 | 0 | 0.00 |
| 09/12/2017 | 4941.00 | 0 | 0.00 |

| | | | |
|---|---|---|---|
| 10/12/2017 | 5082.00 | 0 | 0.00 |
| 11/12/2017 | 5002.00 | 0 | 0.00 |
| 12/12/2017 | 4888.00 | 0 | 0.00 |
| 13/12/2017 | 6256.00 | 0 | 0.00 |
| 14/12/2017 | 6490.00 | 0 | 0.00 |
| 15/12/2017 | 6033.00 | 0 | 0.00 |
| 16/12/2017 | 5562.00 | 0 | 0.00 |
| 17/12/2017 | 4769.00 | 0 | 0.00 |
| 18/12/2017 | 4999.00 | 0 | 0.00 |
| 19/12/2017 | 7040.00 | 0 | 0.00 |
| 20/12/2017 | 7077.00 | 0 | 0.00 |
| 21/12/2017 | 6971.00 | 0 | 0.00 |
| 22/12/2017 | 7078.00 | 0 | 0.00 |
| 23/12/2017 | 6879.00 | 0 | 0.00 |
| 24/12/2017 | 6560.00 | 0 | 0.00 |
| 25/12/2017 | 6247.00 | 0 | 0.00 |
| 26/12/2017 | 6306.00 | 0 | 0.00 |
| 27/12/2017 | 6454.00 | 0 | 0.00 |
| 28/12/2017 | 5989.00 | 0 | 0.00 |
| 29/12/2017 | 6142.00 | 0 | 0.00 |
| 30/12/2017 | 6246.00 | 0 | 0.00 |
| 31/12/2017 | 6387.00 | 0 | 0.00 |

**Figure 1:** CRT286_Penarth Feeder – Abstraction Point A

## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 05 May 2022 11:10
**To:** Kathryn.Maye@canalrivertrust.org.uk
**Cc:** Adam.Comerford@canalrivertrust.org.uk; new.authorisations@canalrivertrust.org.uk
**Subject:** PAN-007395 & PAN-007397 New Authorisation Applications update and request for further clarification
**Attachments:** PAN-007395 and PAN-007397 NA applications update.doc; PAN-007395 & 7397 NA advertisement applicant update.doc; Invalid Applications - Montgomery, Llangollen & Swansea Canals

Hi Kathryn,

Thank you for agreeing to discuss the questions in the attached letter with me this afternoon. I shall send the appointment through to you now.

Kind regards

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

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cyfoethnaturiol.cymru / naturalresources.wales

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Cyfoeth Naturiol Cymru
Natural Resources Wales

Our refs:

PAN-007395 & PAN-007397

Dr Adam Comerford
Canal & River Trust
First Floor North Station House
500 Elder Gate
Milton Keynes
MK9 1BB

By email: new.authorisations@canalrivertrust.org.uk
(CC: Adam.Comerford@canalrivertrust.org.uk &
Kathryn.Maye@canalrivertrust.org.uk)

05 May 2022

Dear Adam,

**Update on transfer transitional abstraction licences**
**Application numbers:** PAN-007395 & PAN-007397
**Applicant:** Canal & River Trust
**Sites:** Abstraction from River Severn 'CRT286_Penarth Feeder' & Abstraction from Afon Tanat 'CRT414_Tanat Feeder'

Following our letter dated 28/04/2021 (attached) we are writing to you to provide a further update regarding your applications.

I will be the officer responsible for determining your applications. For any queries regarding your application please contact me using the details provided below.

I have now begun to determine your application and will keep you updated on the progress and likely date of issue. Please note that the legislation requires us to determine your application by 31 December 2022.

We can confirm that your applications were advertised 18/06/2021 in the County Times and no responses were received following this.

If there have been any changes to your abstraction activity (e.g., land ownership, abstraction quantities etc.) please let us know.

Following initial review of your application please can you provide further information on the following aspects of your proposals:

General questions for both proposals

**1. Maximum Abstraction Quantities**

You provided 'raw data' collected using SCADA systems at the above sites, evidenced as daily abstraction totals in cubic metres per day ($m^3$/day).

In your email dated 17/12/2019 (attached), you explained that maximum instantaneous abstraction rates were calculated *'from the maximum daily abstraction on the day when the maximum hourly abstraction rate was recorded in*

*each year i.e. PI = MD/0.0864, where the PI is the peak instantaneous flow in l/s and MD is the maximum daily abstraction in Ml/d'*.

I have the following questions:

- How frequently does the SCADA system record data?
- Is the 'raw data' provided in $m^3$/day unprocessed, i.e., is the recorded data in its original format?
  OR
  Is the 'raw data' processed to provide daily totals? If so, would this data be available, along with any calculations used to process the data?
- Are you able to provide records of the maximum hourly abstraction rates, to support the calculations of the instantaneous abstraction rates as detailed in your above explanation?

**2. British Waterways Bill – Agreement Respecting the Montgomery Canal 19/10/1987, Section 9 – Regulation of Flows**

The Bill specifies the maximum abstraction / flow rates associated with the Canal during a period of river regulation. It also specifies that no water shall enter the canal when the storage of water in Llyn Clywedog is at or less than 25% of its capacity (at the date of the agreement).

I have the following questions:

- How do you currently ensure you meet with the conditions set out under 9 (b), (c), (d)?
- During river regulation, Condition 9 (f) specifies a max level within canal, how do you ensure this?
- Condition (m) states that during a period of river regulation, you are to be notified in writing when water is being released from Llyn Clywedog to support flow in the River Severn. Is this still the case, or how does this arrangement work in practice?
- The Bill details that no water is to be abstracted when the capacity of Llyn Clywedog is at or below 25% capacity. What is the capacity of the reservoir and how does this requirement work in practice?

CRT286 Penarth Feeder

- From the maps provided as supporting information, it appears that the Penarth Feeder discharges at the start of the Montgomery Canal, is this assumption correct?
- The bypass and lockage flows are measured and recorded using telemetry / SCADA system at Byles Lock, which is approximately 2.5 kilometres (km) downstream of the point of abstraction from the River Severn. How representative are the measured flows (at Byles Lock) of the water abstracted at the Penarth Feeder?

CRT414 Tanat Feeder

- In the supporting information, you include the following note:

  > SCADA data for the period 23 May 2015 to 11 October 2017 inclusive were considered to be inaccurate. Data for this period were therefore estimated using the average daily average flow recorded on SCADA for each day over the remaining qualifying period i.e. 1 January 2011 to 22 May 2015, and 12 October to 31 December 2017.

  Are you able to provide further detail / equations to demonstrate how the quantities were estimated?

Following an initial review of your applications, we believe your abstraction is considered to have the potential to be impacting on the River Severn Estuary Special Area of Conservation and Ramsar. We are looking into what this means for your

application and will keep you informed of whether any changes to your operation are likely to be required.

You may also be required to measure and report the quantity of water you abstract. We will discuss these requirements with you during the determination of your application. Even if you have not taken any water, you must submit a nil return if your licence states that you must report your water use. If you do not submit your record of actual abstraction when required to do so, we may take enforcement action.

You can continue to abstract the same quantities of water you have applied for until we have reached a decision on your application. It is an offence to abstract more water without a licence and we may take enforcement action. It is your responsibility to ensure you apply for the required licence(s).

If you wish to apply to increase your application abstraction quantities you should do this through our normal application procedure, details of which are available on the 'Apply for a water abstraction or impoundment licence' page of our website, or via the following file path: Home > Permits and Permissions > Water abstraction and impoundment licences > Apply for a water abstraction or impoundment licence.

If we cannot make a decision on your licence application by 31 December 2022, you can appeal to Planning and Environment Decisions Wales. You can get a standard notice for making an appeal from the following address:

Planning and Environment Decisions Wales
2nd Floor West
Crown Buildings
Cathays Park
Cardiff
CF10 3NQ

Telephone: 0300 0604400
Email: PEDW.Casework@gov.wales

The notice of appeal must be sent to Planning and Environment Decisions Wales within **28 days** of the 31 December 2022 (or any agreed extended decision date). The notice must give the reasons for the appeal and you must also send a copy of:

- the application which it relates to;
- any information or reports you sent to us with the application; and
- any other relevant correspondence, including this acknowledgement letter.

You must also send us a copy of your notice of appeal.

You may withdraw an appeal at any time before a decision has been made. In exceptional circumstances, Planning and Environment Decisions Wales has the power to allow a longer period for serving a notice of appeal.

If you have any questions, please do not hesitate to contact us using the details below.

Yours sincerely

Charlotte Lillywhite

Water Resources Permitting Team
Natural Resources Wales

Direct phone line: 0300 065 3921
Direct email: Charlotte.Lillywhite@naturalresourceswales.gov.uk

Cyfoeth Naturiol Cymru
Natural Resources Wales

Ein cyf/Our ref: PAN-007395 & 7397

Canal & Rivers Trust

By email:
new.authorisations@canalrivertrust.org.uk
Cc: Kathryn.Maye@canalrivertrust.org.uk
Nicholas.Saiz@canalrivertrust.org.uk

Ebost/Email:
Ffôn/Phone:
Date: 28/04/2021

Dear Sir/Madam

**Update on transfer transitional abstraction licences**
**Application numbers: PAN-007395 & 7397**
**Applicant: CRT**
**Sites: Abstraction from River Severn - Penarth Feeder**
**Abstraction from Afon Tanat**

Following our letter dated 20/12/2019 (attached) we are writing to you to provide a further update regarding the above applications.

We can confirm that your applications are required to be advertised in a local newspaper and on our website in accordance with regulations. We will arrange for the advertisement; you will need to pay our costs of putting the notice in a local newspaper, plus a £100 administration fee.

We intend to start determining your application in July 2021. However this is subject to change and we will update you again once your application is allocated to a permitting officer. Please note that the legislation requires us to determine your application by 31 December 2022.

You can continue to abstract the same quantities of water you have applied for until we have reached a decision on your application. It is an offence to abstract more water without a licence and we may take enforcement action. It is your responsibility to ensure you apply for the required licence(s).

If you wish to apply to increase your application abstraction quantities you should do this through our normal application procedure, details of which are available from the 'Related document downloads' section of the following webpage:
Home > Permits and Permissions > Water abstraction and impoundment licences > Apply for a water abstraction or impoundment licence

If we cannot make a decision on your licence application by 31 December 2022, you can appeal to the Planning Inspectorate in Wales at the following address:

The Planning Inspectorate
Crown Buildings
Cathays Park
Cardiff

CF10 3NQ
Phone: 02920 823857

You can get a standard notice for making an appeal from the address above. The notice of appeal must be sent to the Planning Inspectorate **within 28 days** of the 31 December 2022 (or any agreed extended decision date). The notice must give the reasons for the appeal and you must also send a copy of:

- the application which it relates to;
- any information or reports you sent to us with the application; and
- any other relevant correspondence, including this acknowledgement letter.

You must also send us a copy of your notice of appeal.

You may withdraw an appeal at any time before a decision has been made. In exceptional circumstances, the Planning Inspectorate has the power to allow a longer period for serving a notice of appeal.

If you have any questions please do not hesitate to contact us using the details below.

Yours sincerely

Liz Cole
Water Resources Permitting Team
Natural Resources Wales

Direct email: liz.cole@naturalresourceswales.gov.uk

## Lillywhite, Charlotte

**From:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>
**Sent:** 17 December 2019 14:46
**To:** Pearce, Hannah
**Cc:** Beckett, Mary; WA 2003 New Authorisations; Mathew Wells; Adam Comerford
**Subject:** Invalid Applications - Montgomery, Llangollen & Swansea Canals
**Attachments:** Figure 1.pdf; Figure 2.pdf; CRT484_Ystalyfera Raw Data.xlsx; CRT414_Tanat Feeder Raw Data.xlsx; CRT236_Llantysilio Raw Data.xlsx; CRT286_Penarth Feeder Raw Data.xlsx

**Follow Up Flag:** Follow up
**Flag Status:** Completed

Good afternoon Hannah,

Please see below responses to your queries on the Monmouthshire & Brecon Canal applications.

**Rights of Access**

Penarth Feeder and Llantysilio Access

I can confirm that the abstraction points for both Penarth and Llantysilio feeders are within our land ownership. Please see Figures 1 and 2 attached showing the location of abstraction and land ownership boundary for each feeder. For Penarth, our land ownership starts at the head of the feeder channel. I have therefore corrected the NGR of the abstraction point to reflect this. Please can you ensure the NGR of Abstraction Point A is updated to SO 13965 92624 prior to determination of the licence? Similarly, for Llantysilio, our land ownership starts at the head of the feeder channel. I have therefore corrected the NGR of the abstraction point to SJ 19588 43283. Please can you ensure this is updated prior to determination of the licence?

Ystalyfera and Tanat Feeder

It is acknowledged that the Acts of Parliament giving legal rights of access for the above feeders may be requested during the determination period.

**Abstraction Quantities**

All sites

You note in your email that the instantaneous rates and annual quantities for each year do not correlate. This is the case for all sites. The abstractions do take place over 24 hours, but not at the maximum instantaneous flow rates for the whole day, every day of the year. For sites with SCADA, we have calculated the maximum peak instantaneous flow rate from the maximum daily abstraction on the day when the maximum hourly abstraction rate was recorded in each year i.e. PI = MD/0.0864, where the PI is the peak instantaneous flow in l/s and MD is the maximum daily abstraction in Ml/d. For those sites without SCADA, the maximum instantaneous flow rate has been estimated from the maximum daily abstraction in each year using the same formula above.

**Evidence**

Penarth Feeder, Ystalyfera, Tanat Feeder and Llantysilio

Please see attached documents providing raw data for the above sites.

**Means of measurement and structures**

Penarth Feeder

*Dimensions of the thin plate weir structure:*

The abstraction at Penarth is monitored at Byles Lock, approx. 2.5km downstream of the abstraction point. Bypass and lockage are monitored at this location. A thin plate weir is installed at the downstream end of the bypass channel around the lock. The dimensions of this weir are as follows:

b = 0.600m

B = 1.650m

P = 0.200m

H max = 0.360m

where b is the measured width of the notch in m, B is the width of the approach channel in m, p is the height of the crest relative to the floor in m and H max is the maximum head above crest level in m. The rating equation used to calculate flow from the recorded head over weir is as follows:

$Q = 3.794 \times h^{1.492}$

where Q is the volumetric rate of flow in $m^3/s$ and h is the head above crest level in m.

*Lockage Information: recorded lockage, lock volume and lock flow:*

Byles Lock is $121m^3$ or 0.121Ml in volume. The recorded lockage and calculated lockage flow data are given in the Raw Data file attached.

Ystalyfera

*Dimensions of the thin plate weir structure:*

The abstraction is monitored approximately 0.2km downstream of the abstraction point. A thin plate weir is installed in the feeder channel. The dimensions of this weir are as follows:

b = 2.000m

H max = 0.400m

where b is the measured width of the notch in m and H max is the maximum head above crest level in m. The rating equation used to calculate flow from the recorded head over weir is as follows:

$Q = 1.0599 \times h^{1.5037}$

where Q is the volumetric rate of flow in $m^3/s$ and h is the head above crest level in m.

*Please note – this is all the information we currently hold with regards to the dimensions of the structure.*

Tanat Feeder

*Dimensions of the broad crested weir structure and rectangular flume:*

The abstraction is monitored approx. 0.8km downstream of the abstraction point. A compound gauging structure consisting of a broad crested weir with critical depth flume is installed at this location. We do not currently hold any details of the dimensions of the structure except the following:

H max = 0.600m

where H max is the maximum head above crest level in m. The two stage rating equation used to calculate flow from the recorded head measurements is as follows:

0-0.311m $Q = 0.6101 \times h^{1.514}$

0.311m-0.6m $Q = 7.84181 \times h^{3.7}$

where Q is the volumetric rate of flow in $m^3/s$ and h is thehead above crest level in m.

*Please note – this is all the information we currently hold with regards to the dimensions of the structure.*

Llantysilio

*Dimensions of the Venturi Flume and upstream and downstream sluice gates:*

Flow is measured via a Venturi Flume. A bespoke rating was provided for this structure by the third party manufacturer of the flume. The rating used to calculate the flow is as follows:

$Q = 2.3487 \times h^{0.5919}$

where Q is the volumetric rate of flow in $m^3/s$ and h is thehead above crest level in m. Therefore, we do not currently hold any details of the dimensions of the structure except the following:

H max = 1.5m

where H max is the maximum head above crest level in m.

We do not currently hold any of the details of the dimensions of the upstream and downstream sluice however, this is not required to calculate the flows.

*Please note – this is all the information we currently hold with regards to the dimensions of the structure.*

As you will note, we have been able to provide most of the information requested and indeed, all of the information that we currently hold on details of the gauging structures used to measure the flow at each location. Unfortunately, we are unable to obtain the missing information for Tanat Feeder and Llantysilio due to the timescales required and accessibility issues, particularly in the case of Llantysilio Feeder where the relevant structures are below ground requiring confined space access.

For all four sites we have provided measured or estimated flows from continuous SCADA data recorded via telemetry between 2011 and 2017. This should be sufficient to validate the abstraction quantities applied for at this stage.

We are planning to undertake detailed surveys of all our abstraction structures during the determination stage of the process. We should therefore be able to provide technical drawings of all structures, once this exercise has been completed, and in time for the determination of each licence.

I hope this answers all your queries for now and that you are now able to validate the above applications. Please can you confirm this as soon as possible.

Kind regards,

Kathryn

**Kathryn Maye**
PhD BSc (Hons) MCIWEM C.WEM CEnv CSci
Senior Hydrologist
Water Management Team

**I work a 4 day week with reduced hours. My working days are Monday to Thursday.**

**T** 01926 626166 **M** 07824 473869
**E** kathryn.maye@canalrivertrust.org.uk

**Canal & River Trust**
Canal Lane, Hatton, Warwick, CV35 7JL

Please visit our website for more information about the water management of our canals.
We have published our fourth annual update on our Water Resources Strategy, take a look – Water Resources Strategy Annual Update 2019

Canal & River Trust

## Lillywhite, Charlotte

**From:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>
**Sent:** 05 May 2022 14:44
**To:** Lillywhite, Charlotte
**Cc:** Adam Comerford; WA 2003 New Authorisations
**Subject:** RE: PAN-007395 & PAN-007397 New Authorisation Applications update and request for further clarification
**Attachments:** River Severn Regulation Day 56; Severn Regulation Weekly Report

Good afternoon Charlotte,

It was good to speak to you just now.

Please see below, responses (in red) to your questions – as just discussed in our meeting:

General questions for both proposals

1. **Maximum Abstraction Quantities**
   You provided 'raw data' collected using SCADA systems at the above sites, evidenced as daily abstraction totals in cubic metres per day ($m^3$/day).

   In your email dated 17/12/2019 (attached), you explained that maximum instantaneous abstraction rates were calculated *'from the maximum daily abstraction on the day when the maximum hourly abstraction rate was recorded in each year i.e. PI = MD/0.0864, where the PI is the peak instantaneous flow in l/s and MD is the maximum daily abstraction in Ml/d'*.

   I have the following questions:
   - How frequently does the SCADA system record data?
     Tanat Feeder - Head over weir measured every minute, and averaged to produce 5 minute data
     Penarth Feeder – Head over weir measured every 5 minutes
   - Is the 'raw data' provided in $m^3$/day unprocessed, i.e., is the recorded data in its original format?
     No for both feeders.
     OR
     Is the 'raw data' processed to provide daily totals? If so, would this data be available, along with any calculations used to process the data?
     Tanat Feeder - The 'raw data' provided as part of the application is the daily mean flow/abstraction based on the instantaneous 1 minute data – details of the calculations used to determine flow/abstraction from the head measurements was provided in the supporting information document submitted with the application.
     Penarth Feeder – The 'raw data' provided as part of the application is the daily mean flow/abstraction based on the instantaneous 5 minute data – details of the calculations used to determine flow/abstraction from the head measurements was provided in the supporting information document submitted with the application.
   - Are you able to provide records of the maximum hourly abstraction rates, to support the calculations of the instantaneous abstraction rates as detailed in your above explanation?
     Yes for both feeders, although these files are huge and not sure how useful these data will be…

2. **British Waterways Bill – Agreement Respecting the Montgomery Canal 19/10/1987, Section 9 – Regulation of Flows**
   The Bill specifies the maximum abstraction / flow rates associated with the Canal during a period of river regulation. It also specifies that no water shall enter the canal when the storage of water in Llyn Clywedog is at or less than 25% of its capacity (at the date of the agreement).

   I have the following questions:
   - How do you currently ensure you meet with the conditions set out under 9 (b), (c), (d)?
     We receive daily regulation emails from the Environment Agency (MFDO-Birmingham – please see example attached) which state whether it is a regulation day or not, where the regulation is from i.e. Llyn Clywedog, Lake Vyrnwy or Shropshire Groundwater Scheme and how much from each. We also receive Severn Regulation Weekly Reports (MFDO-Birmingham – please see example attached) which state reservoir storage levels. We monitor our abstractions on SCADA and compliance with legal agreements on weekly and daily basis as necessary.
   - During river regulation, Condition 9 (f) specifies a max level within canal, how do you ensure this?
     We monitor water level at Trwstllewellyn via SCADA and check compliance on a weekly and daily basis as necessary.

- Condition (m) states that during a period of river regulation, you are to be notified in writing when water is being released from Llyn Clywedog to support flow in the River Severn. Is this still the case, or how does this arrangement work in practice?
  This is done through the daily regulation emails and weekly regulation reports detailed and examples attached above.
- The Bill details that no water is to be abstracted when the capacity of Llyn Clywedog is at or below 25% capacity. What is the capacity of the reservoir and how does this requirement work in practice?
  This is not our reservoir so I do not know the capacity. As noted above, we receive daily regulation emails and weekly regulation reports which state the capacity of Llyn Clywedog.

CRT286 Penarth Feeder

- From the maps provided as supporting information, it appears that the Penarth Feeder discharges at the start of the Montgomery Canal, is this assumption correct?
  Penarth Feeder discharges into the canal just upstream of Freestone Lock. As far as I am aware, the canal is dewatered upstream of our land ownership.
- The bypass and lockage flows are measured and recorded using telemetry / SCADA system at Byles Lock, which is approximately 2.5 kilometres (km) downstream of the point of abstraction from the River Severn. How representative are the measured flows (at Byles Lock) of the water abstracted at the Penarth Feeder?
  I am not sure of the history of this choice of site for the monitoring of Penarth Feeder but the Operating Agreement states the maximum abstraction and other associated requirements for Penarth Feeder should be monitored in relation to Byles Lock. For info: there are no significant inputs of outputs between the discharge point to the canal and the SCADA site at this location.

CRT414 Tanat Feeder

- In the supporting information, you include the following note:

  > SCADA data for the period 23 May 2015 to 11 October 2017 inclusive were considered to be inaccurate. Data for this period were therefore estimated using the average daily average flow recorded on SCADA for each day over the remaining qualifying period i.e. 1 January 2011 to 22 May 2015, and 12 October to 31 December 2017.

  Are you able to provide further detail / equations to demonstrate how the quantities were estimated?
  Quantities between 23 May 2015 to 11 October 2017 were estimated based on the average daily mean flow/abstraction recorded on each day for which we have data for, over the remainder of the qualifying period. This was done using a pivot table in Excel.
  e.g. data for 23 May 2015 is estimated as the average of the daily mean flow for 23 May 2011, 23 May 2012, 23 May 2013 and 23 May 2014.

As also agreed in our meeting, I look forward to receiving a draft of these licences for review, prior to them being issued.

Kind regards,

Kathryn

**Kathryn Maye**
PhD BSc (Hons) MCIWEM C.WEM CEnv CSci
Senior Hydrologist
Water Management Team
**Canal & River Trust**

**I work a 4 day week with reduced hours – 9am to 3pm. My working days are Monday to Thursday.**

**T** 01926 626166 **M** 07824 473869
**E** kathryn.maye@canalrivertrust.org.uk

Please visit our website for more information about the water management of our canals.
We have published our fifth annual update on our Water Resources Strategy, take a look – Water Resources Annual Update 2020

Canal & River Trust

Rainbow Ally

**From:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Sent:** 05 May 2022 11:10
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>
**Cc:** Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>; WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>
**Subject:** PAN-007395 & PAN-007397 New Authorisation Applications update and request for further clarification

Some people who received this message don't often get email from charlotte.lillywhite@cyfoethnaturiolcymru.gov.uk. Learn why this is important

**CAUTION: This email originated from an external source. DO NOT CLICK/OPEN links or attachments unless you are certain of their origin.**

Hi Kathryn,

Thank you for agreeing to discuss the questions in the attached letter with me this afternoon. I shall send the appointment through to you now.

Kind regards

Charlotte
Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

cyfoethnaturiol.cymru / naturalresources.wales
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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

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**Keep in touch**
Sign up for the Canal & River Trust e-newsletter https://canalrivertrust.org.uk/newsletter
Become a fan on https://www.facebook.com/canalrivertrust
Follow us on https://twitter.com/canalrivertrust and https://www.instagram.com/canalrivertrust

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Canal & River Trust is a charitable company limited by guarantee registered in England & Wales with company number 7807276 and charity number 1146792. Registered office address National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

**Cadw mewn cysylltiad**
Cofrestrwch i dderbyn e-gylchlythyr Glandŵr Cymru https://canalrivertrust.org.uk/newsletter
Cefnogwch ni ar https://www.facebook.com/canalrivertrust
Dilynwch ni ar https://twitter.com/canalrivertrust ac https://www.instagram.com/canalrivertrust

Mae'r e-bost hwn a'i atodiadau ar gyfer defnydd y derbynnydd bwriedig yn unig. Os nad chi yw derbynnydd bwriedig yr e-bost hwn a'i atodiadau, ni ddylech gymryd unrhyw gamau ar sail y cynnwys, ond yn hytrach dylech eu dileu heb eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

Mae Glandŵr Cymru yn gwmni cyfyngedig drwy warant a gofrestrwyd yng Nghymru a Lloegr gyda rhif cwmni 7807276 a rhif elusen gofrestredig 1146792. Swyddfa gofrestredig: National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

## Lillywhite, Charlotte

**From:** MFDO-Birmingham <MFDO-Birmingham@environment-agency.gov.uk>
**Sent:** 25 April 2022 16:34
**Subject:** Severn Regulation Weekly Report
**Attachments:** Regulation weekly report 250422.pdf

**CAUTION: This email originated from an external source. DO NOT CLICK/OPEN links or attachments unless you are certain of their origin.**

Dear all,

Please find attached Severn Regulation report.

Regards,
Helen.

**Helen Colyer**
Monitoring & Forecasting Duty Officer
Birmingham
**Environment Agency**

FDO_Midlands@environment-agency.gov.uk
From 12th Oct 2020 : MFDO-Birmingham@environment-agency.gov.uk

Lead MFDO (Birmingham) | 0800 032 7857
West Midlands (SHWG) MFDO | 0800 731 1540
West Midlands (SWWM) MFDO | 0800 731 1543
East Midlands MFDO | 0800 731 1544

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## Lillywhite, Charlotte

**From:** MFDO-Birmingham <MFDO-Birmingham@environment-agency.gov.uk>
**Sent:** 23 September 2021 11:48
**To:** Andrew Hughes; Andy Ball (A.Ball@hrwallingford.com); Arlett, Rebecca; Armstrong, Phil; Austen, Richard; Sara Barsley; Baynton, Mark; Bleakley, Steve; 'Boswell, Robert'; Bowers, Mark; Brown, Beverley; 'Brunt, Andrew'; Burton, Andrea; Butcher, Richard; Water Information; Carter, Nicola; 'Cartwright, Olivia'; Chris.Giles@severntrent.co.uk; Clark, Paul; Clayton, Ian; Colyer, Helen; Adam Comerford; Cooper, Neil; Dearing, Richard; Drought National; Drought NRW; Drought WMD; Erin Holroyd; Evans, Kate; Evans, Peter J.; Sarah.Faulkner; MFDO-Birmingham; Ferguson, Emma; Ferreira, Martin; Flynn, Bethan; Forsyth, Sue; FWDO, Incident-NorthDee; Gamble, Stu; Garratt, Justin; Gavin, Helen; Gennarini, Antonio; Glover, Louise; Gration, Barry; Gray, Duncan; Hale, Alex; 'Hampton Lode Control Room'; 'Hancock, Matthew'; Hanks, Stuart; Harrison, Tim; 'harryharrison@south-staffs-water.co.uk'; Hayward, Paul; Mark Heath; Horsley, Kelly; Roger Howard; Hydrology West Midlands; Arrowsmith, Joanne; Kane Horton; Heede, Kevin; Matty Blakemore; Natalie Angelopoulos; Penelope Hearn; Richard Hughes; richardbell@south-staffs-water.co.uk; Bissell, Robert; Evans, Robert; Sarah Clark; Sarah Edwards; Barden, Thomas; Tom Hawken; Hawken, Tom; Valerie Houlden (v.houlden@hrwallingford.com)
**Subject:** River Severn Regulation Day 56

**CAUTION: This email originated from an external source. DO NOT CLICK/OPEN links or attachments unless you are certain of their origin.**

Dear all,

Today is day 56 of River Severn Regulation.

Releases from Clywedog remain at 200 Ml/d (182 ML/d for regulation and 18 Ml/d for compensation).

Releases from Lake Vyrnwy remain at 150 Ml/d (105 Ml/d for regulation and 45 Ml/d for compensation)

We are not making any Shropshire Groundwater Scheme releases.

The total aggregate regulation release today is 287 Ml/d.

Yesterday's one day mean flow at Bewdley was 1014 Ml/d, and the 5-day mean was 900 Ml/d.

Kind regards,

Neil.

_____

Neil Cooper.
Birmingham Forecasting Centre.
**Lead MFDO - 0800 032 7857**

WMD SHWG MFDO - 0800 731 1540
WMD SWWM MFDO - 0800 731 1543
EMD MFDO – 0800 731 1544

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## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 20 July 2022 13:02
**To:** New.Authorisations@canalrivertrust.org.uk
**Cc:** Kathryn.Maye@canalrivertrust.org.uk; Adam.Comerford@canalrivertrust.org.uk; Nicholas.Saiz@canalrivertrust.org.uk
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders New Authorisations Applications

Hi All,

Following the recent meeting and further discussions between CRT and Water Resources Permitting; I understand that you have agreed to provide technical drawings for the structures associated with the abstraction of water at the Penarth and Tanat Feeders. The drawing requirements are outlined below, as follows:

All drawings should:

- have a title describing the drawing
- include a site and project name
- be drawn to scale with scale specified in relation to paper size (e.g., 1:50 at A3)
- have a drawing date, author, and version number

We will require key levels and dimensions to be included on the drawings:

- Dimensions should be provided in metric units. In detailed drawings they should be provided in millimetres e.g.,1250mm.
- Levels should be provided as an absolute value in metres Above Ordnance Datum (mAOD) to 3 decimal places e.g., 68.395mAOD. Absolute levels can be derived from topographic survey using GPS surveying equipment **OR** transferred from a local benchmark. Details of the location and elevation of the local benchmark(s) should be included with your technical drawings.

Please note: any technical drawings submitted will be subject to further review.

If it would be possible to provide an estimate timeframe of when you will be able to submit the drawings, that would be greatly appreciated.

Habitats Regulations Assessment - update
It has been identified that the Penarth and Tanat Feeder points of abstraction are functionally linked to the Severn Estuary SAC and Ramsar. Therefore, we need to further assess the impacts on flows at these locations, on migratory species (including salmon), designated under the SAC and Ramsar, along with any screening requirements.

If you have any queries, please do not hesitate to contact me.

Kind regards,

Charlotte
Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

cyfoethnaturiol.cymru / naturalresources.wales
Twitter | Facebook | LinkedIn | Instagram

**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

## Lillywhite, Charlotte

**From:** Sarah Temple - Phillips <Sarah.Temple-Phillips@canalrivertrust.org.uk>
**Sent:** 28 September 2022 13:20
**To:** Lillywhite, Charlotte; WA 2003 New Authorisations
**Cc:** Kathryn Smith
**Subject:** RE: CRT286 Penarth Feeder
**Attachments:** 286 Penarth Feeder Diagrams v2.pdf

**Follow Up Flag:** Follow up
**Flag Status:** Completed

Hi,
Apologies, I have just noticed that some information that you asked to be included on the diagrams was missed off when converting the diagrams to a pdf. Please see the updated attached diagrams.
Kind regards,
Sarah

---

**From:** Sarah Temple - Phillips
**Sent:** 22 September 2022 20:20
**To:** charlotte.lillywhite@cyfoethnaturiolcymru.gov.uk; WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>
**Cc:** Kathryn Smith <Kathryn.Smith@canalrivertrust.org.uk>
**Subject:** CRT286 Penarth Feeder

Hi,
Please see attached diagrams showing the site setup at Penarth Feeder Abstraction. These drawings have all the key dimensions on them but please let me know if you have any further queries.
Kind regards,
Sarah

**Sarah Temple-Phillips**
BSc(Hons) MPhil DipSpan(Open) FRGS MCIWEM C.WEM
Senior Hydrologist

**M** 0788 4238640
**E** sarah.temple-phillips@canalrivertrust.org.uk

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**Cadw mewn cysylltiad**
Cofrestrwch i dderbyn e-gylchlythyr Glandŵr Cymru https://canalrivertrust.org.uk/newsletter
Cefnogwch ni ar https://www.facebook.com/canalrivertrust
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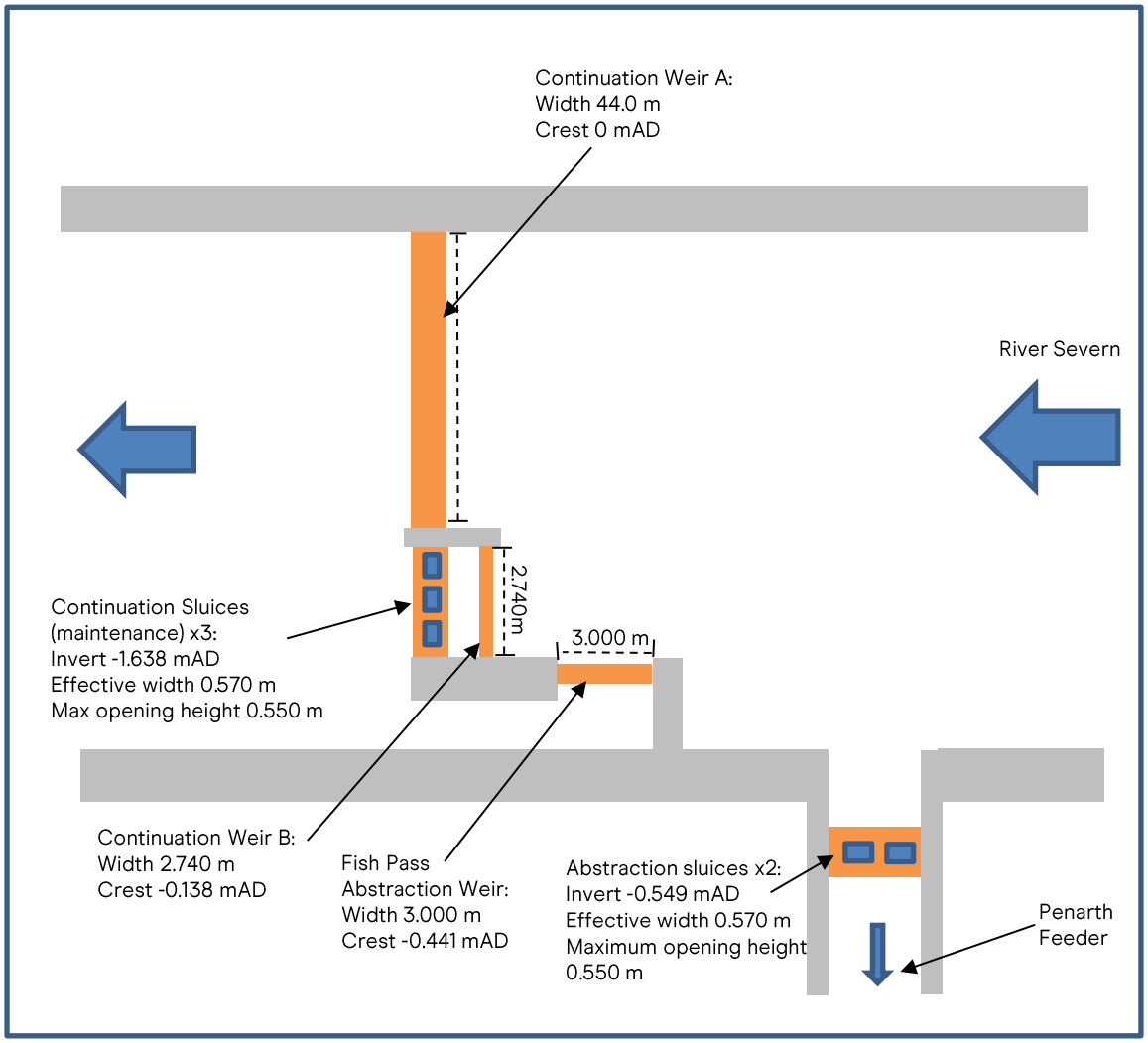
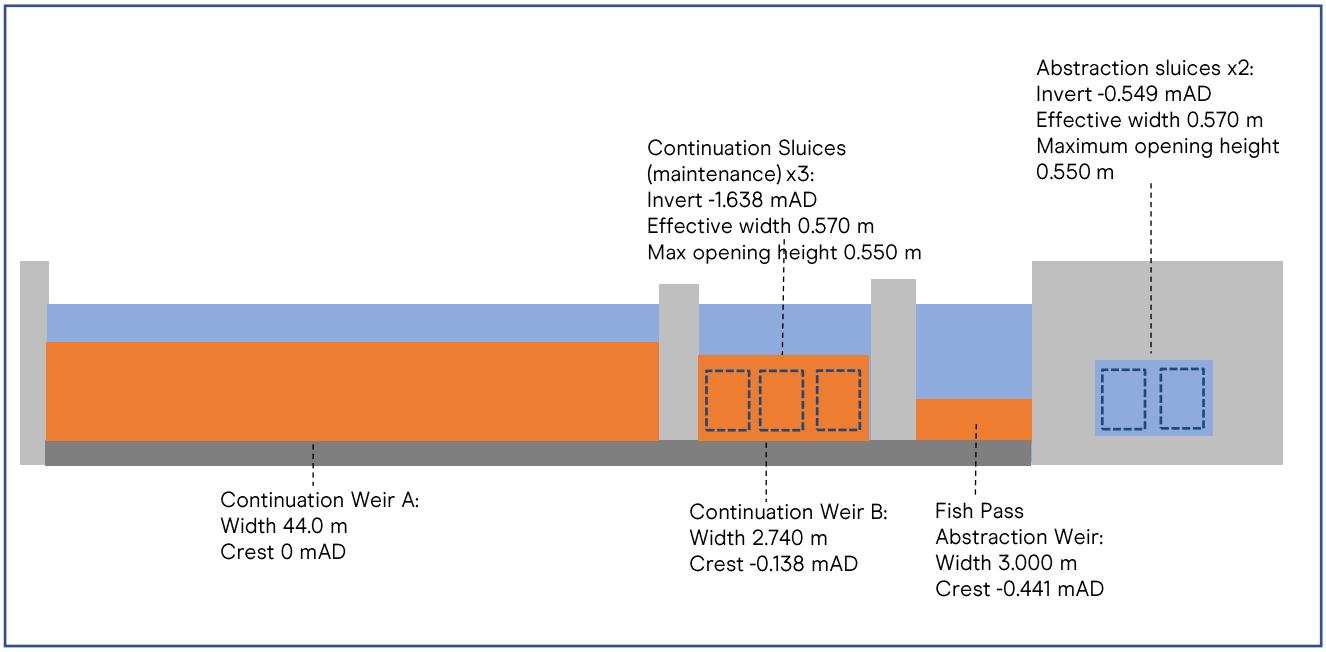
Mae'r e-bost hwn a'i atodiadau ar gyfer defnydd y derbynnydd bwriedig yn unig. Os nad chi yw derbynnydd bwriedig yr e-bost hwn a'i atodiadau, ni ddylech gymryd unrhyw gamau ar sail y cynnwys, ond yn hytrach dylech eu dileu heb eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

Mae Glandŵr Cymru yn gwmni cyfyngedig drwy warant a gofrestrwyd yng Nghymru a Lloegr gyda rhif cwmni 7807276 a rhif elusen gofrestredig 1146792. Swyddfa gofrestredig: National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

*Plan view of Penarth Feeder Abstraction Structures*
*22/09/2022 Drawn by: Sarah Temple-Phillips*
*Local datum: Crest of continuation weir*



*Cross section view of structures at Penarth Feeder*
*22/09/2022 Drawn by: Sarah Temple-Phillips*
*Local datum: Crest of continuation weir*



**Meeting with CRT 7/11/2022: Llangollen and Montgomery Canal NA apps**

**NRW:**
Mary Beckett
Charlotte Lillywhite
Ashley Lansdown
**CRT:**
Kathryn Maye
Adam Comerford
Nicholas Saiz

1. **PAN-007395 Transitional licence application – Montgomery canal - Penarth Feeder Access CRT286 (CL)**
   - AC queried proposed screening requirements i.e. is it 40mm or 10mm; it was confirmed that 10mm screening required for intake and 40mm for overflow (NS did confirm that overflow is accessible to fish).
   - CRT confirmed that there is currently no screen on outflow but trash screens are already in place for intake.
   - CRT have been undertaking site visits with consultants and advised screen design work would be complex due to siltation, location of intake inside of bend, no connection to mains power, need to maintain flow to nature reserve during works etc
   - Action for CL to discuss screening location / design with fisheries -
   - CRT concerned around ability to comply with licence conditions on day 1 and advised that in recognition of this EA are drafting an MoU to agree timeline to install screens etc. CRT suggested this was necessary to prevent appeal.
   - CRT referred to recent EA appeal and EA for not comply with regulators code – MB recommended CRT check for any more recent info on outcome of appeal.
   - AL / MB advised that NRW have recognised this issue and discussions are ongoing elsewhere in organisation with regards to compliance etc; ACTION for AL to provide CRT with contact name for compliance discussions going forward
   - Discussed inclusion of hourly and daily quantities on any licence issued, based on what was abstracted during 'qualifying period'.
   - Discussed need for abstraction quantities to be restricted at Q95 to 10% of flow; CL advised this equates to a flow of 1000 l/s at Dolwen GS - ACTION for CL to share draft condition wording / modelling info.
   - CL also advised that licence conditions would reflect requirements of Waterways Bill, where relevant
   - Discussed measurement requirements and CL confirmed this would be downstream of overflow point at Byles lock; AC queried if condition could be worded to retain some flexibility in where measurement location is i.e. "*or as otherwise agreed in writing with NRW*" – ACTION for CL to check. MB also suggested option of varying licence but CRT reluctant to do this due to costs.
   - CRT requested site of HRAs to ensure funding etc for screening etc is justified / evidenced; MB advised that HRAs would be available once determination complete.
   - CRT asked if NRW could share draft licence(s) for "operational review" and referred to a 10 day turn around for EA licences; MB / AL advised this would be subject to time constraints and 5 days may be more appropriate.

2. **PAN-007397 Transitional licence application – Montgomery canal - Tanat Feeder CRT414 (CL)**
   - Discussed fish screening condition – confirmed that 10mm screen required on intake only; CRT advised screening design should be less complex for this site than Penarth feeder above.

- Discussed need for abstraction quantities to be restricted at Q95 to 10% of flow; CL advised this equates to a flow of 1050 l/s at Llanyblodwel GS (equivalent to Q86) - ACTION for CL to share draft condition wording / modelling info.
- CL also advised that licence conditions would reflect requirements of Waterways Bill, where relevant

**3. PAN-007398 Transitional licence application - Llangollen Canal - Llantysilio Feeder CRT236 (MB)**

- MB confirmed instantaneous rate would not be included.
- MB acknowledged CRT's concern regarding inclusion of hourly, daily and annual quantities but referred to justification included in email dated 21/10/2022 i.e. requirement of HDRoC, DGD and consistency with UU licence.
- CRT minded to give further consideration to hourly and annual quantities but AL advised that due to late stage of determination period NRW are unable to discuss further.
- MB confirmed no requirement for conjunctive licence limit – UU and CRT would simply be subject to separate licence quantities.
- MB confirmed any non-compliance would only be flagged if total combined quantity is exceeded; acknowledged it would not be possible to assess which of the abstractions would be non-compliant if the combined total is exceeded and that UU and CRT would be jointly responsible; MB suggested licensing scenario would need to be reviewed in future (AC suggested CRT did not want sole responsibility for licence at this time due to desire to share cost / resources with UU to implement Eel reg requirements).
- MB advised that formal / automated returns requests are likely to request daily data but NRW can ask for hourly data if necessary through less formal routes. ACTION for MB to query returns process for UU / CRT licence scenario.
- Discussed intake screening requirement – MB confirmed that as eel screening arrangements have not yet been confirmed etc screening requirements will be in line with the conclusions of the HRA assessment; AC flagged that this means screens would need to be in place for a longer period than currently required under UU licence and suggested this could be appealed due to inconsistencies etc; also queried whether UU licence would need to be varied.
- AC reiterated request made above to have site of HRAs to be able to understand justification for this decision - ACTION for MB to share fisheries justification for longer screening period.
- AC acknowledged that as screening infrastructure is already in place at site it would be easier for CRT to comply with this condition than at other sites, however, MB acknowledged the practical and operational difficulties the proposed conditions may be present; AL reiterated point made above that compliance issues are being considered by other relevant teams in NRW.

**CRT New Authorisations licence applications: Severn @ Penarth and Tanat @ Carreghofa**

**Considering abstraction restrictions to protect low flows**

## Background

CRT have applied for licences based on evidenced abstraction rates. Those abstraction rates are high in the context of low flows for both sites. NRW are therefore considering what abstraction restrictions might be necessary to protect low flows. The Upper Severn provides supporting habitat for the Severn Estuary SAC. There are various sets of Flow Standards that can be applied to determine an appropriate scale of abstraction: WFD/UKTAG, CSMG, Habitats Directive ERF, CAMS licensing guidance. The Flow Standards broadly agree that abstraction of no more than 10% of the natural flow is appropriate for flows below Q95, and 15% for flows between approx Q95 and Q50. CRT already have to comply with abstraction restrictions set out in the British Waterways Bill, however those restrictions are primarily designed to protect the Severn Regulation Scheme and not localised low flows (and therefore the local environment). We have come up with some abstraction restrictions that aim to meet the Flow Standards, but we're also mindful of the impact those restrictions could have on the canal SAC and also CRT operations in terms of managing the abstractions.

## Severn @ Penarth

Flows in the River Severn are influenced by the Severn Regulation Scheme, which augments naturally low flows with reservoir releases to support large abstractions further downstream. As such, flows in the Severn at Penarth rarely fall as low as they would naturally. For example, the natural Q95 of 1.0$m^3$/s equates to < actual Q99. However, there are occasions when the Severn isn't being regulated and river flows can fall lower than this, so it's important to protect those very low flows.

CRT are applying for the following abstraction rates:
Instantaneous: 0.228$m^3$/s
Hourly: 821$m^3$/hr, which equates to average 0.228$m^3$/s
Daily: 14574 $m^3$/d, which equates to average 0.169$m^3$/s

Q95 (natural) at the point of abstraction = 1.0$m^3$/s
Q95 (actual) at the point of abstraction = 1.74$m^3$/s

The instantaneous and hourly abstraction rates equate to 18% of Q95 (nat) and 13% of Q95 (actual).

The abstraction restrictions in set out in the British Waterways Bill have not been modelled because the restrictions (when averaged) are generally higher than the abstraction rates applied for. The conditions regarding Clywedog storage and Drought Orders occur so rarely that they have not been modelled.

Table 1 (below) shows low flow percentiles and compares the impacts of the existing abstraction regime, with the proposed abstraction regime. The table demonstrates how low flows are augmented by the regulation scheme. With the current abstraction regime it's clear that abstraction exceeds 10% of the river flow at the lowest flows, equating to 44% of the flow at Q99. The x2

suggested abstraction regimes better protect low flows, with the 2 abstraction restriction scenario providing the better protection at flows below Q95. It should be noted that this assessment is based on CRT abstracting the maximum rates permitted/evidenced.

River flows at Penarth can fall as low as 0.6-0.7m3/s when the Severn is being regulated. The proposed 2 abstraction restrictions would limit abstraction to 50 l/s at the lowest flows, which equates to 8% of 0.6m3/s. It should be noted that flows have only fallen to 0.6m3/s for 17 days in a 52 year record.

The "2 abstraction restriction" would be applied as follows:-

1. When the river flow >= 1.5m3/s ($Q_n90$, $Q_{RA}97$), the max abstraction rate = 0.228m3/s
2. When the river flow >= 1.0m3/s ($Q_n95$, $Q_{RA}99$) and < 1.5m3/s, the max abstraction rate = 0.100m3/s
3. When the river flow < 1.0m3/s, the max abstraction rate = 0.050m3/s.

These flows/conditions will be linked to corresponding flows at Dolwen gauging station.

| Flow Percentile | Natural Flow (m3/s) | Current Situation | | With 1 Abstraction Restriction | | With 2 Abstraction Restrictions | |
|---|---|---|---|---|---|---|---|
| | | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow |
| 85 | 1.94 | 1.71 | 12% | 1.71 | 12% | 1.71 | 12% |
| 86 | 1.85 | 1.62 | 12% | 1.62 | 12% | 1.62 | 12% |
| 87 | 1.76 | 1.53 | 13% | 1.53 | 13% | 1.53 | 13% |
| 88 | 1.66 | 1.43 | 14% | 1.43 | 14% | 1.43 | 14% |
| 89 | 1.57 | 1.34 | 15% | 1.34 | 15% | 1.34 | 15% |
| 90 | 1.47 | 1.24 | 16% | 1.37 | 7% | 1.37 | 7% |
| 91 | 1.37 | 1.15 | 17% | 1.27 | 7% | 1.27 | 7% |
| 92 | 1.29 | 1.06 | 18% | 1.19 | 8% | 1.19 | 8% |
| 93 | 1.19 | 0.96 | 19% | 1.09 | 8% | 1.09 | 8% |
| 94 | 1.10 | 0.87 | 21% | 1.00 | 9% | 1.00 | 9% |
| 95 | 1.01 | 0.78 | 23% | 0.91 | 10% | 0.91 | 10% |
| 96 | 0.91 | 0.68 | 25% | 0.81 | 11% | 0.86 | 5% |
| 97 | 0.81 | 0.58 | 28% | 0.71 | 12% | 0.76 | 6% |
| 98 | 0.67 | 0.45 | 34% | 0.57 | 15% | 0.62 | 7% |
| 99 | 0.52 | 0.29 | 44% | 0.42 | 19% | 0.47 | 10% |

***Table 1.*** *Comparing impacts of existing abstraction regime vs proposed abstraction regime on NATURAL flow flows at Penarth*

The impacts are also shown in Figure 1, below.

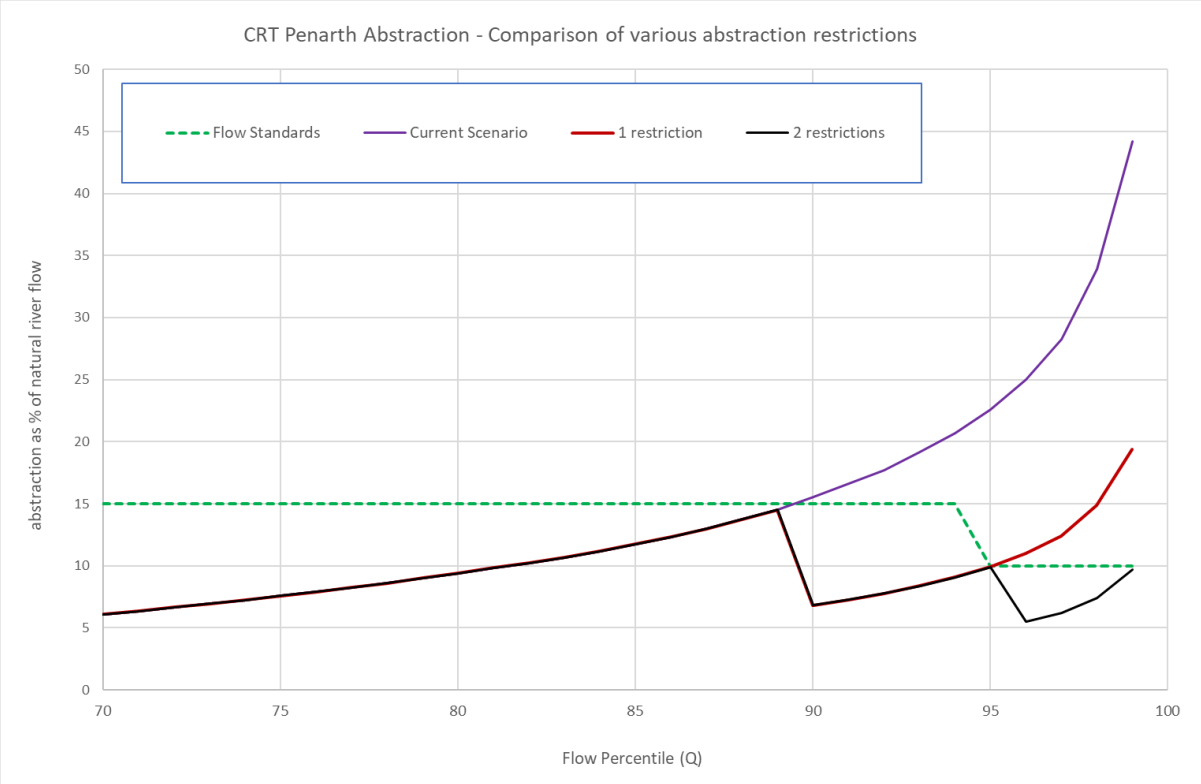



*Figure 1. Abstraction impacts as % of NATURAL river flow, vs flow standards.*

The impact of the proposed flow restriction has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 2, below demonstrates how the proposed restriction would reduce abstraction by an average of 3% in summer months, and up to 14% in July 2021.

| Year/Month | Existing scenario | With abstr restriction | |
|---|---|---|---|
| | Vol Abstr (Ml) | Vol Abstr (Ml) | % reduction |
| Jan-21 | 611 | 611 | 0% |
| Feb-21 | 552 | 552 | 0% |
| Mar-21 | 611 | 611 | 0% |
| Apr-21 | 591 | 558 | -6% |
| May-21 | 611 | 611 | 0% |
| Jun-21 | 591 | 580 | -2% |
| Jul-21 | 611 | 522 | -14% |
| Aug-21 | 611 | 589 | -4% |
| Sep-21 | 591 | 580 | -2% |
| Oct-21 | 611 | 611 | 0% |
| Nov-21 | 591 | 591 | 0% |
| Dec-21 | 611 | 611 | 0% |
| Jan-22 | 611 | 611 | 0% |
| Feb-22 | 552 | 552 | 0% |
| Mar-22 | 611 | 611 | 0% |
| Apr-22 | 591 | 547 | -7% |
| May-22 | 611 | 600 | -2% |
| Jun-22 | 591 | 591 | 0% |
| Jul-22 | 611 | 600 | -2% |
| Aug-22 | 611 | 611 | 0% |
| Sep-22 | 591 | 591 | 0% |
| Oct-22 | 217 | 217 | 0% |

*Table 2. Impact on abstraction volumes associated with proposed restriction.*

**Tanat @ Carreghofa**

Flows in the Tanat are considered natural upstream of the CRT abstraction at Carreghofa.

CRT are applying for the following abstraction rates:
Instantaneous: 0.376$m^3$/s
Hourly: 567.5$m^3$/hr, which equates to average 0.158$m^3$/s
Daily: 9100 $m^3$/d, which equates to average 0.105$m^3$/s

Q95 at the point of abstraction = 0.63$m^3$/s

The instantaneous rates of abstraction equates to 60% of Q95.
The hourly rate of abstraction equates to 25% of Q95.

The abstraction restrictions in set out in the British Waterways Bill include limiting abstraction to 49Ml over 7 days whenever the Severn is being regulated, or a lesser amount to maintain a residual flow of 15Ml/d downstream of Carreghof weir. The 49Ml over 7 days has been modelled as constant average abstraction of 0.081m3/s.

In order to protect low flows, NRW consider it necessary to apply x2 flow restrictions to the CRT abstraction. These will be linked to flows at Llanyblodwel Gauging Station, which is situated just upstream of the CRT intake.

- **When the river flow at Llanyblodwel equals or exceeds 1.06m$^3$/s (Q86), the CRT abstraction is as applied for (hourly rate 0.158m$^3$/s).**
- **When the river flow at Llanyblodwel is less than 1.06m3/s (Q86) *and* equal to or greater than 0.63m3/s (Q95), the CRT abstraction is restricted to 0.063m$^3$/s**
- **When the river flow at Llanyblodwel is less than 0.63m3/s (Q95, the CRT abstraction is restricted to 0.037m3/s.**

Figure 2 (below) shows low flow percentiles and compares the impacts of the existing abstraction regime, with the proposed abstraction regime. Also shown is an abstraction regime with just 1 restriction. Figure 2 shows that the current/existing scenario is not compliant with relevant flow standards at low flows, with abstraction exceeding 20% of the lowest flows. Applying only 1 abstraction restriction is also not sufficient to protect the lowest flows, with abstraction of up to 17% at Q99. Applying a second abstraction restriction at Q95 helps protect the lowest flows.

If CRT consider the abstraction cut-back at Q86 to be too severe, we could consider applying a 3rd restriction to enable them to abstract more water in the flow range Q86 to Q90. This is shown in Figure 3.

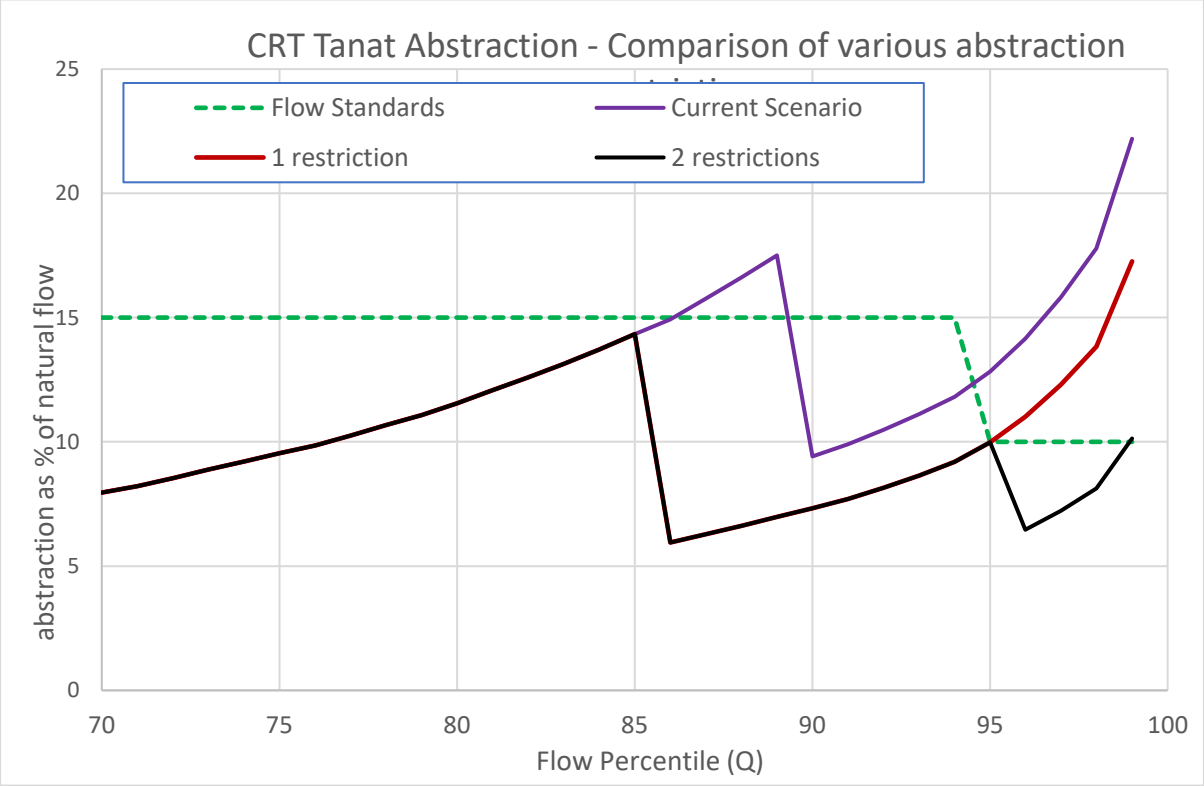



*Figure 2. Abstraction impacts as % of river flow, vs flow standards.*

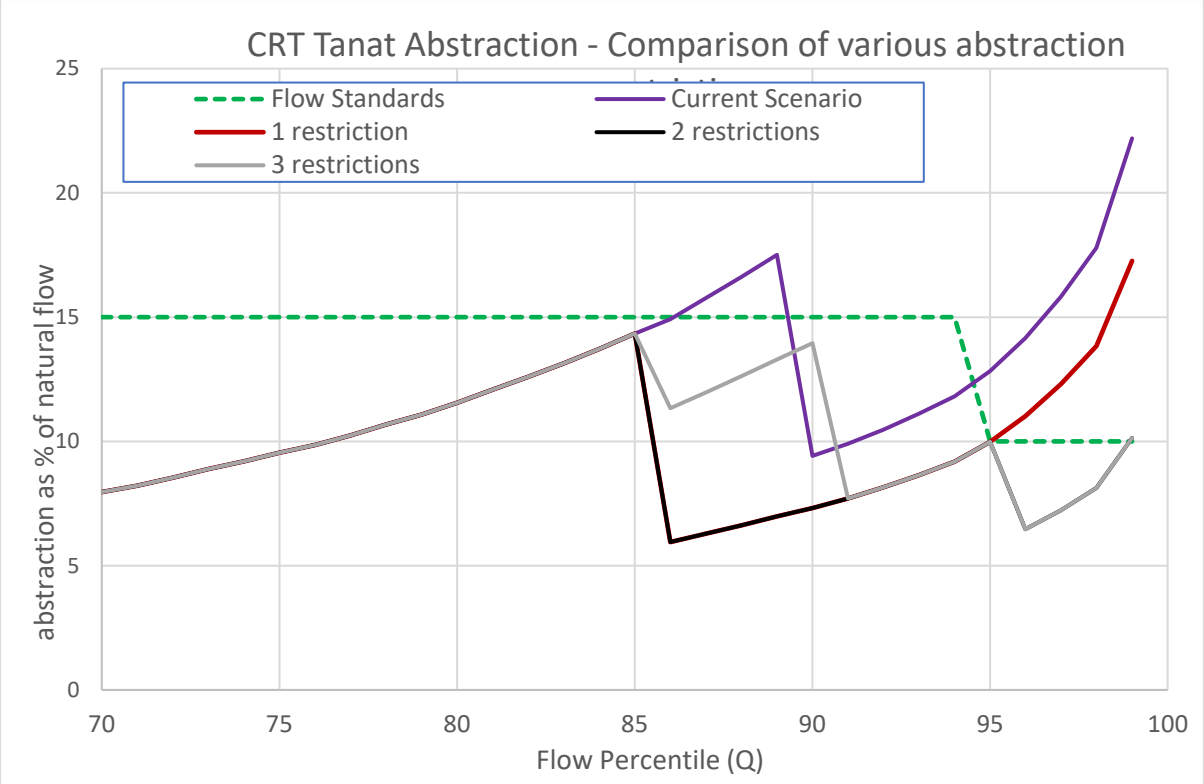



*Figure 3. Abstraction impacts as % of river flow, vs flow standards.*

The impact of the proposed flow restrictions has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 3, below shows that applying 1, 2 or 3 abstraction restrictions causes a relatively large reduction in water abstracted – particularly during the 2022 drought. Limiting abstraction rates to 0.037m3/s at flows below Q95 means in July 2022 (for example) CRT would be able to abstract approximately 44% less water than they currently theoretically could. Having a 3rd abstraction restriction allows CRT to abstract slightly more water in the flow range Q86 to Q90, which in some months offsets the impact of limiting abstraction to 0.037m3/s when flows are below Q95 (May 2022 for example). However it has little/no benefit during sustained periods of low flows, as were experienced in July-Sept 2022.

| Year/Month | Existing scenario | With 1 restriction | | With 2 restrictions | | With 3 restrictions | |
|---|---|---|---|---|---|---|---|
| | Vol Abstr (Ml) | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction |
| Jan-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-21 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Jun-21 | 403 | 403 | 0% | 403 | 0% | 403 | 0% |
| Jul-21 | 317 | 297 | -6% | 297 | -6% | 311 | -2% |
| Aug-21 | 303 | 283 | -7% | 283 | -7% | 293 | -4% |
| Sep-21 | 237 | 193 | -19% | 190 | -20% | 197 | -17% |
| Oct-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Nov-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Dec-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Jan-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-22 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-22 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-22 | 363 | 251 | -31% | 251 | -31% | 309 | -15% |
| Jun-22 | 250 | 205 | -18% | 190 | -24% | 196 | -21% |
| Jul-22 | 230 | 173 | -25% | 128 | -44% | 135 | -41% |
| Aug-22 | 237 | 177 | -25% | 114 | -52% | 114 | -52% |
| Sep-22 | 243 | 191 | -21% | 148 | -39% | 150 | -38% |
| Oct-22 | 164 | 164 | 0% | 164 | 0% | 164 | 0% |

*Table 3. Impact on abstraction volumes associated with proposed restriction*

## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 30 November 2022 16:43
**To:** Kathryn Maye; Nicholas Saiz; Adam Comerford
**Cc:** New.Authorisations@canalrivertrust.org.uk; Mary Beckett (Mary.Beckett@cyfoethnaturiolcymru.gov.uk); Hotchkiss, Alastair; Lansdown, Ashley
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation
**Attachments:** CRT New Authorisations licence applications_v2 CL Notes.docx

**Importance:** High

**Follow Up Flag:** Filed to: \\My DMS View\PAN-007397 Tanat Feeder

**Categories:** Filed

Hi All,

I have an update on the flow restrictions we consider necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar. The most plausible licensing scenario would be to include 2 flow restrictions on the River Severn at Penarth, and 3 flow restrictions on the River Tanat at Carreghofa. Please see attached document for further detail on these scenarios, as well as impacts on abstractable volumes for the Montgomery Canal.

We are keen to know whether you would have any further information or supplementary data to allow us to better understand how the proposed restrictions could impact on water levels within the canal (SAC). Would this information be available and if so, would you be able to provide it with some urgency please?

Kathryn, I note that you do not work on Fridays, would it be possible to give you a call tomorrow to discuss please?

Bes wishes,

Charlotte
Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

---

**From:** Lillywhite, Charlotte
**Sent:** 24 November 2022 10:33
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Cc:** New.Authorisations@canalrivertrust.org.uk; Mary Beckett (Mary.Beckett@cyfoethnaturiolcymru.gov.uk) <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Hi All,

At our last meeting you requested the modelling for our initial proposed low flow restrictions, I have been unable to send these, as we have continued our internal discussions around what flow restrictions are necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar, as well as to ensure sufficient water for the canal SAC during periods of low flows. I will receive further modelling by tomorrow and following this I will send an email to get your feedback on our proposed scenarios – i.e., the impact of the flow restriction proposals on how you have historically operated the canal e.g., volumes and depths.

I realise this is unlikely, but would you have any availability for a meeting next week to discuss the above? If not, I will request your feedback by email, and send you draft copies of the licences as soon as possible.

Internal consultees have confirmed the following screening (outlined in my email 18/10/2022) to be acceptable:

- The inclusion of a condition on both licences requiring a screen with spacing no greater than 10mm at the point of abstraction.
- The inclusion of a condition requiring a screen with spacing no greater than 40mm on the overflow weir (at the intake structure) at Penarth.

It would be useful to include the National Grid Reference for the overflow weir within the condition, please can you provide this.

I am sure you aware that the Penarth Feeder is a listed building and a historic monument, and the Tanat Feeder is a historic monument; I wanted to flag that you should engage with Cadw and the Local Authority to discuss the above screening requirements.

Best wishes

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

**CRT New Authorisations licence applications: Severn @ Penarth and Tanat @ Carreghofa Considering abstraction restrictions to protect low flows**

## Background

The maximum abstraction rates applied for are based on evidenced abstraction rates, which are high in the context of low flows for both sites. In order to mitigate against adverse effect on site integrity of the Severn Estuary SAC and Ramsar, NRW must consider what abstraction restrictions might be necessary to protect low flows. The Upper Severn provides supporting habitat for the Severn Estuary SAC and Ramsar. There are various sets of Flow Standards that can be applied to determine an appropriate scale of abstraction: WFD / UKTAG, CSMG, Habitats Directive ERF, CAMS licensing guidance. The Flow Standards broadly agree that abstraction of no more than 10% of the natural flow is appropriate for flows below Q95, and 15% for flows between approx. Q95 and Q50. CRT already have to comply with abstraction restrictions set out in the British Waterways Bill, however those restrictions are primarily designed to protect the Severn Regulation Scheme and not localised low flows (and therefore the local environment). We have developed abstraction restrictions that aim to meet the Flow Standards, but we are also mindful of the impact those restrictions could have on the Montgomery Canal SAC and also CRT operations in terms of managing the abstractions.

## Severn @ Penarth

Flows in the River Severn are influenced by the Severn Regulation Scheme, which augments naturally low flows with reservoir releases to support large abstractions further downstream. As such, flows in the Severn at Penarth rarely fall as low as they would naturally. For example, the natural Q95 of 1.0$m^3$/s equates to < actual Q99. However, there are occasions when the Severn is not being regulated and river flows can fall lower than this, so it's important to protect those very low flows.

CRT evidenced the following abstraction rates:
Instantaneous: 0.228$m^3$/s
Hourly: 821$m^3$/hr, which equates to average 0.228$m^3$/s
Daily: 14574 $m^3$/d, which equates to average 0.169$m^3$/s

Q95 (natural) at the point of abstraction = 1.0$m^3$/s
Q95 (actual) at the point of abstraction = 1.74$m^3$/s

The instantaneous and hourly abstraction rates equate to 18% of Q95 (nat) and 13% of Q95 (actual).

The abstraction restrictions set out in the British Waterways Bill have not been modelled because the restrictions (when averaged) are generally higher than the abstraction rates applied for. The conditions regarding Clywedog storage and Drought Orders occur so rarely that they have not been modelled.

**Further detail on abstraction regime with two restrictions, as follows:**

| Flow range in River Severn at point of abstraction $m^3$/s | Flow Range at Dolwen GS $m^3$/s | Maximum abstraction rates | | |
|---|---|---|---|---|
| | | IAR $m^3$/s (for info would not be included on licence) | Hourly $m^3$/hour | Daily $m^3$/day |
| Flows greater than or equal to Qn90 ($Q_{RA}$97) 1.50 | Flows greater than or equal to Qn90 ($Q_{RA}$97) 0.86 | 0.228* | 821* | 14,574* |
| | | *in line with historical volumes applied for | | |
| Flows less than Qn90 ($Q_{RA}$97) 1.50 and greater than or equal to Qn95 ($Q_{RA}$99) 1.0 | Flows less than Qn90 ($Q_{RA}$97) 0.86 and greater than or equal to Qn95 ($Q_{RA}$99) 0.7 | 0.100 | 360 | 8,640 |
| Flows less than Qn95 ($Q_{RA}$99) 1.0 | Flows less than Qn95 ($Q_{RA}$99) 0.7 | 0.050 | 180 | 4,320 |

Table 1 (below) shows low flow percentiles for naturalised flows (in line with the flow standards) and compares the impacts of the existing abstraction regime, with the proposed abstraction regimes: with one and two flow restrictions. The table demonstrates how low flows are augmented by the regulation scheme. With the current abstraction regime, it's clear that abstraction exceeds 10% of the river flow at the lowest flows, equating to 44% of the flow at Q99. It is clear that the abstraction regime with the two abstraction restrictions provides the better protection at flows below Q95 down to Q99 flows. It should be noted that this assessment is based on CRT abstracting the maximum rates permitted / evidenced.

River flows at Penarth can fall as low as 0.6-0.7$m^3$/s when the Severn is being regulated. The proposed 2 abstraction restrictions would limit abstraction to 50 l/s at the lowest flows, which equates to 8% of 0.6$m^3$/s. It should be noted that flows have only fallen to 0.6$m^3$/s for 17 days in a 52 year record.

| Flow Percentile | Natural Flow (m3/s) | Current Situation | | With 1 Abstraction Restriction | | With 2 Abstraction Restrictions | |
|---|---|---|---|---|---|---|---|
| | | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow |
| 85 | 1.94 | 1.71 | 12% | 1.71 | 12% | 1.71 | 12% |
| 86 | 1.85 | 1.62 | 12% | 1.62 | 12% | 1.62 | 12% |
| 87 | 1.76 | 1.53 | 13% | 1.53 | 13% | 1.53 | 13% |
| 88 | 1.66 | 1.43 | 14% | 1.43 | 14% | 1.43 | 14% |
| 89 | 1.57 | 1.34 | 15% | 1.34 | 15% | 1.34 | 15% |
| 90 | 1.47 | 1.24 | 16% | 1.37 | 7% | 1.37 | 7% |
| 91 | 1.37 | 1.15 | 17% | 1.27 | 7% | 1.27 | 7% |
| 92 | 1.29 | 1.06 | 18% | 1.19 | 8% | 1.19 | 8% |
| 93 | 1.19 | 0.96 | 19% | 1.09 | 8% | 1.09 | 8% |
| 94 | 1.10 | 0.87 | 21% | 1.00 | 9% | 1.00 | 9% |
| 95 | 1.01 | 0.78 | 23% | 0.91 | 10% | 0.91 | 10% |
| 96 | 0.91 | 0.68 | 25% | 0.81 | 11% | 0.86 | 5% |
| 97 | 0.81 | 0.58 | 28% | 0.71 | 12% | 0.76 | 6% |
| 98 | 0.67 | 0.45 | 34% | 0.57 | 15% | 0.62 | 7% |
| 99 | 0.52 | 0.29 | 44% | 0.42 | 19% | 0.47 | 10% |

***Table 1.*** *Comparing impacts of existing abstraction regime vs proposed abstraction regime on NATURAL flow flows at Penarth*

The impacts are also shown in Figure 1, below.

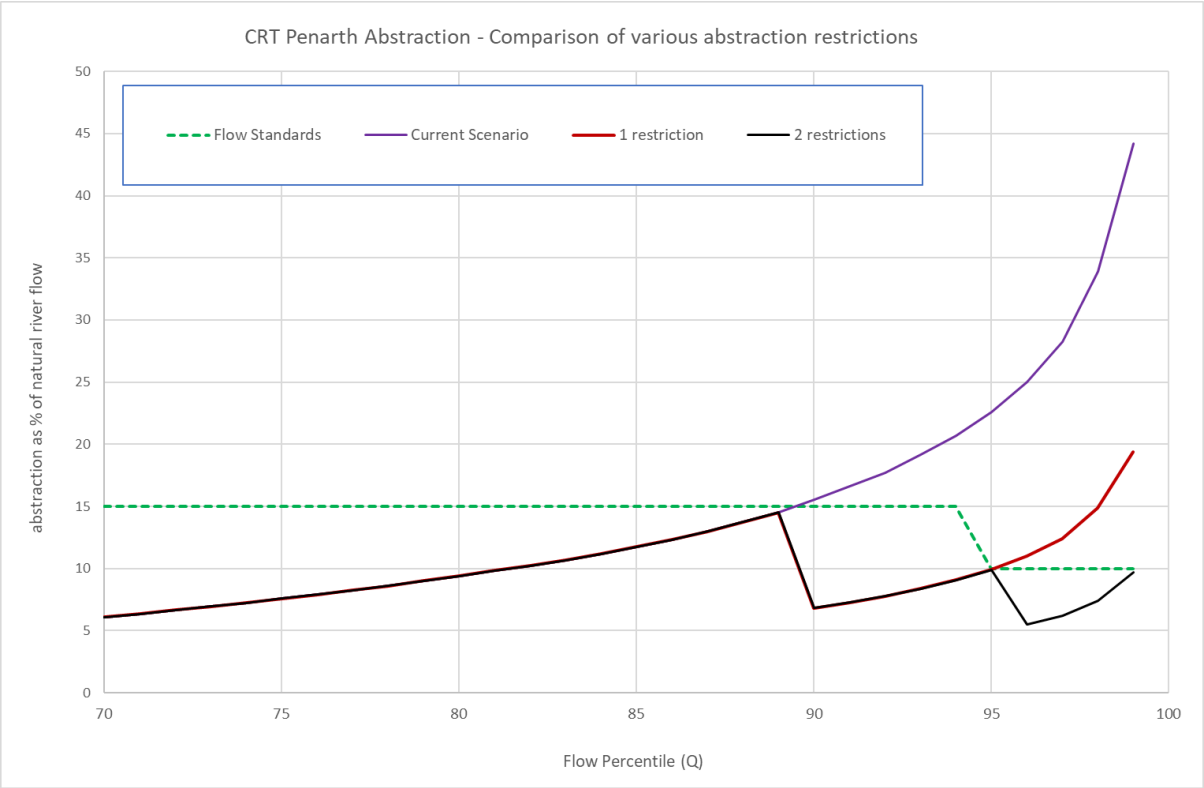


*Figure 1. Abstraction impacts as % of NATURAL river flow, vs flow standards.*

The impact of the proposed flow restriction has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 2 below demonstrates how the proposed restriction would reduce abstraction by an average of 3% in summer months, and up to 14% in July 2021.

| Year/Month | Existing scenario | With abstr restriction | |
|---|---|---|---|
| | Vol Abstr (Ml) | Vol Abstr (Ml) | % reduction |
| Jan-21 | 611 | 611 | 0% |
| Feb-21 | 552 | 552 | 0% |
| Mar-21 | 611 | 611 | 0% |
| Apr-21 | 591 | 558 | -6% |
| May-21 | 611 | 611 | 0% |
| Jun-21 | 591 | 580 | -2% |
| Jul-21 | 611 | 522 | -14% |
| Aug-21 | 611 | 589 | -4% |
| Sep-21 | 591 | 580 | -2% |
| Oct-21 | 611 | 611 | 0% |
| Nov-21 | 591 | 591 | 0% |
| Dec-21 | 611 | 611 | 0% |
| Jan-22 | 611 | 611 | 0% |
| Feb-22 | 552 | 552 | 0% |
| Mar-22 | 611 | 611 | 0% |
| Apr-22 | 591 | 547 | -7% |
| May-22 | 611 | 600 | -2% |
| Jun-22 | 591 | 591 | 0% |
| Jul-22 | 611 | 600 | -2% |
| Aug-22 | 611 | 611 | 0% |
| Sep-22 | 591 | 591 | 0% |
| Oct-22 | 217 | 217 | 0% |

*Table 2. Impact on abstraction volumes associated with proposed restriction.*

**Tanat @ Carreghofa**

Flows in the Tanat are considered natural upstream of the CRT abstraction at Carreghofa.

CRT evidenced the following abstraction rates:
Instantaneous: 0.376$m^3$/s
Hourly: 567.5$m^3$/hr, which equates to average 0.158$m^3$/s
Daily: 9100 $m^3$/d, which equates to average 0.105$m^3$/s

Q95 at the point of abstraction = 0.63$m^3$/s

The instantaneous rate of abstraction equates to 60% of Q95.
The hourly rate of abstraction equates to 25% of Q95.

The abstraction restrictions in set out in the British Waterways Bill include limiting abstraction to 49Ml over 7 days whenever the Severn is being regulated, or a lesser amount to maintain a residual flow of 15Ml/d downstream of Carreghofa weir. The 49Ml over 7 days has been modelled as constant average abstraction of 0.081m3/s.

**Initially an abstraction regime with two flow restrictions was considered, in order to protect low flows, as outlined below:**

- When the river flow at Llanyblodwel equals or exceeds 1.06$m^3$/s (Q86), the CRT abstraction is as applied for (hourly rate 0.158$m^3$/s).
- When the river flow at Llanyblodwel is less than 1.06m3/s (Q86) ***and*** equal to or greater than 0.63m3/s (Q95), the CRT abstraction is restricted to 0.063$m^3$/s
- When the river flow at Llanyblodwel is less than 0.63m3/s (Q95, the CRT abstraction is restricted to 0.037m3/s.

*The above would be linked to flows at Llanyblodwel Gauging Station, which is situated just upstream of the CRT intake.*

Figure 2 (below) shows low flow percentiles and compares the impacts of the existing abstraction regime, with the abstraction regime proposed above. Also shown is an abstraction regime with just 1 restriction (10% of Q86). Figure 2 shows that the current / existing scenario is not compliant with relevant flow standards at low flows, with abstraction exceeding 20% of the lowest flows. Applying only 1 abstraction restriction is also not sufficient to protect the lowest flows, with abstraction of up to 17% at Q99. Applying a second abstraction restriction at Q95 helps protect the lowest flows.

An additional abstraction regime with a third flow restriction enables additional abstraction of water in the flow range Q86 to Q90. This is also shown on Figure 2 below.

**Further detail on abstraction regime with three restrictions, as follows:**

| Flow range in River Tanat at point of abstraction $m^3$/s | Flow Range at Llanyblodwel GS $m^3$/s | Maximum abstraction rates | | |
|---|---|---|---|---|
| | | IAR $m^3$/s (for info would not be included on licence) | Hourly $m^3$/hour | Daily $m^3$/day |
| Flows greater than or equal to Q86 1.06 | Flows greater than or equal to Q86 1.03 | 0.376* | 568* | 9,100* |
| | | *in line with historical volumes applied for | | |
| Flows less than Q86 1.06 and greater than or equal to Q90 0.86 | Flows less than Q86 1.03 and greater than or equal to Q90 0.84 | 0.120 | 432 | 9,100 |
| Flows less than Q90 0.86 and greater than or equal to Q95 0.63 | Flows less than Q90 0.84 and greater than or equal to Q95 0.61 | 0.063 | 227 | 5,448 |
| Flows less than Q95 0.63 | Flows less than Q95 0.61 | 0.037 | 133 | 3,192 |

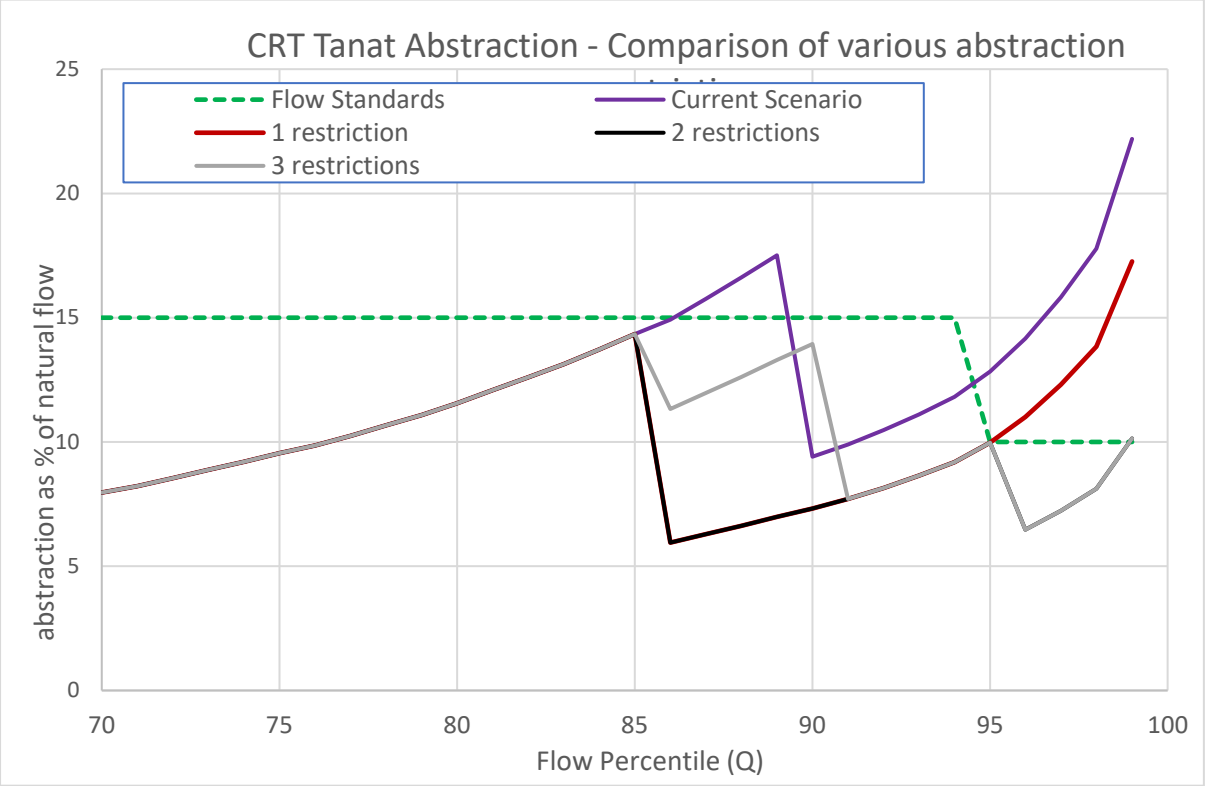


*Figure 2. Abstraction impacts as % of river flow, vs flow standards.*

The impact of the proposed flow restrictions has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 3 below shows that applying 1, 2 or 3 abstraction restrictions causes a relatively large reduction in water abstracted – particularly during the 2022 drought. Limiting abstraction rates to 0.037m$^3$/s at flows below Q95 means in July 2022 (for example) CRT would be able to abstract approximately 44% less water than they currently theoretically could. Having a 3$^{rd}$ abstraction restriction allows CRT to abstract slightly more water in the flow range Q86 to Q90, which in some months offsets the impact of limiting abstraction to 0.037m$^3$/s when flows are below Q95 (May 2022 for example). However, it has little/no benefit during sustained periods of low flows, as were experienced in July-Sept 2022.

| Year/Month | Existing scenario | With 1 restriction | | With 2 restrictions | | With 3 restrictions | |
|---|---|---|---|---|---|---|---|
| | Vol Abstr (Ml) | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction |
| Jan-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-21 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Jun-21 | 403 | 403 | 0% | 403 | 0% | 403 | 0% |
| Jul-21 | 317 | 297 | -6% | 297 | -6% | 311 | -2% |
| Aug-21 | 303 | 283 | -7% | 283 | -7% | 293 | -4% |
| Sep-21 | 237 | 193 | -19% | 190 | -20% | 197 | -17% |
| Oct-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Nov-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Dec-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Jan-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-22 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-22 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-22 | 363 | 251 | -31% | 251 | -31% | 309 | -15% |
| Jun-22 | 250 | 205 | -18% | 190 | -24% | 196 | -21% |
| Jul-22 | 230 | 173 | -25% | 128 | -44% | 135 | -41% |
| Aug-22 | 237 | 177 | -25% | 114 | -52% | 114 | -52% |
| Sep-22 | 243 | 191 | -21% | 148 | -39% | 150 | -38% |
| Oct-22 | 164 | 164 | 0% | 164 | 0% | 164 | 0% |

*Table 3. Impact on abstraction volumes associated with proposed restriction*

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Form

## Record of a Habitats Regulations Assessment of a project

## OGN 200 Form 1

**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | References to the 2010 Habitats Regulations updated to reflect new consolidated version of the regulations which entered into force on 30th November 2017;<br>References to KSP and National Services Directorates updated to EPP |
| 1.2 | 28 June 2018 | With marked up changes in light of ruling in CJEU case c-323/17 'People over Wind'. |
| 1.3 | 27 June 2019 | With marked up changes in light of ruling in CJEU case c-323/17 'People over Wind'. See Guidance here |

**Next review date: April 2019**

# Record of a Habitats Regulations Assessment of a project

## 1. Project Details

| 1(a): Project details where an external party has applied to NRW for any form of authorisation | |
|---|---|
| **Application reference numbers** | PAN-007395 (Penarth Feeder at Penarth on the River Severn), and PAN-007397 (Tanat Feeder at Carreghofa on the River Tanat) |
| **Date applications received** | 08/10/2019 |
| **Applicant details** | Canal & River Trust |
| **Activity proposed** | Under the Water Resources Act 1991 / Environment Act 1995 many abstractions were exempt from licensing control. These exempt abstractions could potentially take unlimited amounts of water, irrespective of availability and without regard to impacts on the environment or other abstractors. Transitional regulations came into force in January 2018 removing the exemptions for many of these activities. This will result in new licences, and variations to existing licences for these previously exempt abstractions (known as New Authorisations or transitional licences). These are existing activities and thus pose no new risks and can be considered as part of the baseline. Bringing them into regulation allows them to be regulated where currently there is no control.<br><br>The Canal & River Trust (Navigation Authority) have applied for two new transfer abstraction licences under the Water Abstraction (Transitional Provisions) Regulations 2017. The abstractions have been occurring for many years without a licensing requirement as abstraction for the purpose of navigation was a previously exempt activity under section 26 of the Water Resources Act 1991.<br><br><u>PAN-007395 (River Severn at Penarth)</u><br>The abstraction is from the River Severn at Penarth via a main river weir. The water flows under gravity via trash grilles into an open feeder channel via two sluice gates with dimensions not exceeding 570 millimetres (mm) by 550mm (which are generally operated alternately), any excess flow passing through the primary sluice gate(s) is discharged back into the River Severn via an overflow weir. The necessary abstracted water then follows through a secondary sluice as a final control before entering a culverted section of the feeder, which then discharges into the Montgomery Canal. |

| | |
|---|---|
| | The applicant evidenced the following maximum abstraction quantities:<br>· 821.3 cubic metres per hour ($m^3$/hour)<br>· 14,574 cubic metres per day ($m^3$/day)<br>· 2,311,216 cubic metres per year ($m^3$/year)<br>· 228.1 litres per second (l/s)<br><br><u>PAN-007397 (River Tanat)</u><br>The abstraction is from the River Tanat at Carreghofa via a main river weir. The water flows under gravity to an open channel controlled by a weir and two sluice gates with dimensions not exceeding 850mm by 558mm (which are generally operated alternately). The water then flows into an open channel, then through a compound gauging structure consisting of a broad crest weir with critical depth rectangular flume (used to measure abstraction volumes), before finally discharging into the Montgomery Canal upstream of Carreghofa Locks.<br><br>The applicant evidenced the following maximum abstraction quantities:<br>· 567.5$m^3$/hour<br>· 9,100$m^3$/day<br>· 1,911,066$m^3$/year<br>· 376l/s<br><br>Both abstractions are for the purpose of 'operations in the course of carrying out functions as a Navigation Authority'. The abstractions are necessary to maintain the water level within the canal within a 'Normal Operating Zone', to avoid business risk including damage to infrastructure (caused by overtopping, damage to canal lining and canal bank collapse), and maintaining a navigable depth. The Montgomery Canal is designated as a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI) and the abstracted water is necessary to maintain the designations, see section 2.1 below for further detail on the Canal SAC.<br><br>The applicant states that both abstractions are subject to section 9 of the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987, which details the following restrictions during a 'river regulation period' (which means any period of time that water is being or about to be released from Llyn Clywedog to support the flow in the River Severn):<br><u>Penarth and Tanat Feeders</u><br>· No abstraction is permitted when the capacity of Llyn Clywedog is less than 25% of its capacity; and |

| | |
|---|---|
| | · Other general requirements necessary for the operation of the canal.<br><br><u>Penarth Feeder</u><br>· Abstraction limited to 150 mega litres (Ml) over 7 days when discharges from Clywedog >300Ml/day and <500Ml/day,<br>· Abstraction limited to 115Ml over 7 days when discharges are equal to 500Ml/day; and<br>· Abstraction limited to 50Ml over 7 days when a drought order in force.<br><br><u>Tanat Feeder</u><br>· Abstraction limited to 49Ml over 7 days; OR a lesser amount in order to maintain a residual flow of 15Ml per day downstream of Carreghofa weir.<br><br>The Bill was provided as part of the supporting information document for both applications. |
| **Relevant legislation** | · Environment Act 1995<br>· Water Resources Act 1991 as amended by the Water Act 2003<br>· Water Resources (Abstraction and Impounding) Regulations 2006<br>· Natural Resources Body for Wales (Functions) Order 2012<br>· Water Abstraction (Transitional Provisions) Regulations 2017 |
| **Locations** | <u>Penarth Feeder</u><br>Point of Abstraction from River Severn: NGR SO 13965 92624<br>Point of Discharge into Montgomery Canal: NGR SO 13906 93017<br><br>From the point of abstraction, the River Severn flows for approximately 50 kilometres (km), before a main confluence with the River Vyrnwy.<br><br><u>Tanat Feeder</u><br>Point of Abstraction from River Tanat: NGR SJ 25360 21817<br>Point of Discharge into Montgomery Canal: NGR SJ 25474 20285<br><br>From the point of abstraction, the River Tanat flows for approximately 2km, before joining the River Vyrnwy, which then flows for 22km before a main confluence with the River Severn.<br><br>Both points of abstraction are well over 150km upstream of the Severn Estuary. |
| **Application documents** | · Application Form WRH<br>· Supporting information document<br>· Excel spreadsheet with total daily abstraction quantities |

| | |
|---|---|
| **Environmental Statement** | N/A |
| **Pre-application correspondence** | N/A |
| **NRW team responsible for drafting this HRA report, and name of lead officer** | Water Resources Permitting, Charlotte Lillywhite |

## 2. Determining the need for a Habitats Regulations Assessment

| | |
|---|---|
| **2.1 Is the whole of the project directly connected with or necessary to the management of one or more Natura 2000 sites, for the purposes of conserving the habitats or species for which the Natura 2000 site(s) is/are designated?** | **YES**<br>Both abstractions are necessary to ensure the Key Habitat of Open Water (Canal) Habitat, within Montgomery Canal SAC, UK0030213; which is designated for the Key Species of Floating water-plantain, *Luronium natans*. The location of the abstractions / discharges in relation to the SAC are detailed in the following map:<br> <br> |
| **2.2 Is there a possibility that the project could affect a different Natura 2000 site to the one the project is intended to conserve?** | **YES** |
| **2.3 Is it necessary to carry out an HRA?** | **YES** |

## 3. Considering the likelihood of a significant effect (LSE)

### 3.1 Renewal of a permission on the same or more restrictive terms as the extant permission

| | |
|---|---|
| **Is this project a renewal of a current permission which complies with NRW approved criteria for ruling out significant effects of renewals (see section 6.2A of OGN 200) without conducting a project-specific LSE test?** | **NO** |

## 3.2 Likelihood of significant effects (LSE) test

| | |
|---|---|
| **3.2.1 Which Natura 2000 sites might be affected by the proposal?** | Based on the project specification or information provided in the applications, it is considered that the following Natura 2000 sites have features which could be affected by the project:<br><br>· **UK0013030 Severn Estuary Special Area of Conservation (SAC)**<br>· **UK11081 Severn Estuary Ramsar**<br><br>The above designations are located over 150km downstream of both points of abstraction; however, it has been identified they are functionally linked.<br><br>The potential for the project to affect the following Natura 2000 site was also initially considered, but can be ruled out without further consideration:<br><br>· **UK9015022 Severn Estuary Special Protection Area (SPA)**<br><br>The Severn Estuary SPA was identified during MyMap Impact Assessment Screening well over 150km downstream of the points of abstraction. The above site was initially considered; however, it is designated for its assemblage of nationally important populations of waterfowl, internationally important populations of wintering bird species and migratory bird species. Therefore, given the nature of the designated features and their distance downstream from the proposals, it can be immediately ruled out. |

### 3.2.2 Screening assessment

**NB:** In light of the ruling of the CJEU in case C-323/17 'People over Wind', avoidance measures should not be considered at this stage of HRA. Therefore, the column previously included to allow for consideration in this section of the form has been removed.

| | Assessment of likelihood of significant effect | |
|---|---|---|
| | **I**<br>**Relevant conservation objectives** | **II**<br>**Potential impact pathway** |
| **UK0013030 Severn Estuary Special Area of Conservation**<br>This designation is located over 150km downstream of the points of abstractions; however, it has been identified they are functionally linked as some of the migratory fish species access the River Severn and the River Tanat at the points of abstraction, and upstream. | | |
| ***Estuaries**<br><br>**The designation includes an overarching "estuaries" feature within which subtidal sandbanks, intertidal mudflats and sandflats, Atlantic salt meadows and reefs (of Sabellaria alveolata) and **three species of migratory fish are defined as both features in their own right and as sub-features of the estuary feature.***<br><br>*In addition hard substrate habitats including eel grass beds, **the estuary-wide assemblage of fish species** and the assemblage of waterfowl species (for which the Ramsar Site and SPA are specifically designated) are identified as notable estuarine assemblages which are **an intrinsic part*** | vi.<br>The abundance of the notable estuarine species assemblages[7] is maintained or increased.<br><br>[7]Assemblage of migratory fish species:<br>• River and Sea Lamprey, Twaite shad (Annex 1 species) and Allis shad<br>• Sea trout, salmon, eel. | **<u>European Eel, Atlantic Salmon, Sea lamprey, River lamprey and Sea trout</u>**<br>Initial MyMap Impact Assessment Screening identified the following migratory fish species features, as follows:<br><u>Penarth Feeder</u><br>**At the point of abstraction** - European Eel and Atlantic Salmon migratory routes.<br>**Close proximity downstream** – River lamprey 1km and Brown / Sea Trout 3km.<br><br><u>Tanat Feeder</u><br>**At the point of abstraction** - European Eel, Atlantic Salmon, and River lamprey migratory routes.<br>**Close proximity downstream** – Brown / Sea Trout 0.5km.<br><br>**Technical fisheries confirmed the following:**<br>· The large historic weirs associated with both intake feeders, are significant barriers to migration for most fish species. Both weirs include historic fish passes to assist with the upstream migration of Salmon.<br>· NRW survey Salmon and Trout at three locations (1054, 1035 & 1024) upstream of the Penarth abstraction, and two locations on the Tanat (8583 & 1111) upstream of the abstraction point. For further detail, please see the summary of salmon and trout survey data located here and Appendix 1 of this form. **The summary data from between 2002 until 2021 demonstrates the presence of**:<br>➢ **Salmon upstream of both points of abstraction**. NRW are satisfied that the habitat at both intakes would be unsuitable for the early lifecycle stages of Salmon (from egg to parr), however, there is suitable habitat further upstream from both intake locations. Therefore, only smolt or adult Salmon would be able to access both intake locations. |

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| ***of the estuary ecosystem – these are therefore covered by the "estuaries" feature.*** | | ➢ **'Trout' upstream of both points of abstraction**. NRW are satisfied that the monitoring records should relate to native brown trout (which are not protected under this designation) rather than Sea trout which are. Sea trout are not anticipated to be present at either intake due to their lifecycles within the catchment and distance upstream from the estuary.<br><br>As native Brown trout are the same species as Sea trout, it is acknowledged that it would be possible for a small number of native Trout to choose to migrate to the sea to become Sea trout. It should also be noted that the habitat required for the early lifecycle stages of Sea trout (from egg to parr), would be the same as for Salmon (i.e., not at either intake location, but upstream) and that only smolts and adult Sea trout would be able to access both intake locations.<br><br>Therefore, based on the above, **we do not anticipate there would be many, or any Sea trout present at both intake locations.**<br>· **Eel:** have been identified upstream of the abstraction points, however, due the distance upstream in the catchment, as well as multiple downstream barriers, only **large adult Eel are considered able to reach both points of abstraction**.<br>· **Lamprey:** Sea lamprey eDNA has been identified in the Lower Vyrnwy indicating their presence at the Severn / Vyrnwy confluence. NRW do not routinely survey for the presence of Lamprey currently, however, due to barriers to migration **we do not anticipate there to be many or any Sea or River lamprey present at both intake locations**.<br><br>Therefore, based on the above information, there is potential for:<br>· **direct capture, damage, or harm to the following designated species features:**<br>➢ Salmon – smolt or adults<br>➢ Sea trout – smolts or adults<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>due to the presence of these migratory species, there is potential for entrapment, entrainment, or impingement i.e., removal from the supporting habitat, into feeder channels and Montgomery Canal.<br><br>For **Salmon** and **Eel**, this has potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact** |

| | | |
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| | | **pathway and significant effects cannot be ruled out.**<br><br>For **Sea trout** and **Lamprey**, due to the small potential numbers anticipated, if present at all, this does not have potential impact on the population size / assemblage of migratory fish species within the Severn Estuary. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.**<br><br>· **damage to the supporting habitat of the following designated species features through changes in flow:**<br>➢ Salmon<br>➢ Sea trout<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>**Penarth**: The instantaneous abstraction rate applied for (228l/s) equates to 18% of low flows, where Q95 equals 1,300l/s.<br>**Tanat:** The instantaneous abstraction rate applied for (376l/s) equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5$m^3$/hour, which equates to 25% of low flows.<br><br>Therefore, there is potential for both abstractions to impact on local hydrodynamics, through excessive fluctuations in flow and abstraction of a large percentage of the river flows during low flow conditions.<br><br>**Salmon** and **Eel** are known to be present at and downstream of these abstractions, therefore, this could impact on the movement of migratory fish species and subsequently population size / assemblage of these migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>The migratory limit and presence is not clear for **Sea trout** and **Lamprey**, therefore, there is potential that these abstractions could impact on the movement of migratory fish species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>**Twaite shad and Allis shad** |

| | | |
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| | | MyMap Impact Assessment Screening initially identified the migratory limits of Twaite shad and Allis shad to be to around Worcester, which is greater than 100km downstream, and in hydraulic connectivity with both points of abstraction. Technical Fisheries have confirmed that Shad have been recorded within the River Severn at Stourport (10km further upstream than Worcester), likely due to the recent completion of the 'Unlocking the Severn Project'. Therefore, flow assessments of potential impacts on Twaite shad and Allis shad are considered at Stourport.<br><br>The combined instantaneous abstraction rates applied for the Penarth and Tanat abstraction equals 604l/s, which equates to 6% of low flows at Stourport, where Q95 flows equals 10,000l/s. However, based on the fact that the instantaneous abstraction rate applied for on the Tanat could not be maintained for any length of time, it is more reasonable to consider the combined hourly abstraction rate, which equals 1,389$m^3$/hour, which equates to 3.9% of low flows at Worcester, where Q95 flows equal 36,000$m^3$/hour.<br><br>The Severn Regulation operating rules specify a minimum flow to be maintained at Bewdley Gauging Station (downstream of Stourport), therefore these abstractions will not cause the flow at Bewdley to drop below the minimum that should be maintained.<br><br>It is therefore considered unlikely that the existing abstractions would change the flows significantly at the point at which **Twaite shad** and **Allis shad** would be likely to migrate / spawn within the River Severn. Therefore, no impact on the population size / assemblage of migratory fish species within the Severn Estuary are anticipated. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.** |
| **Subtidal sandbanks** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Intertidal mudflats and sandflats** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Atlantic salt meadow / salt marshes** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Reefs** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **River lamprey** | i.<br>The migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and **any of their spawning rivers** is | **River and Sea Lamprey**<br>MyMap Impact Assessment Screening identified River lamprey at or close to the points of abstraction.<br><br>**Technical fisheries confirmed the following:** |

| | | |
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| | not obstructed or impeded by physical barriers, **changes in flows**, or poor water quality.<br><br>ii.<br>The size of the river lamprey population* in the Severn Estuary and **the rivers which drain into it**, is at least maintained and is at a level that is sustainable in the long term.<br><br>***River lamprey population:**<br>The size of the population is subject to non-anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and **breeding success in the River Severn and other rivers draining into the Severn Estuary.** | · The large historic weirs associated with both intake feeders, are significant barriers to migration for most fish species.<br>· **Lamprey:** Sea lamprey eDNA has been identified in the Lower Vyrnwy indicating their presence at the Severn / Vyrnwy confluence. NRW do not routinely survey for the presence of Lamprey currently, however, due to barriers to migration **we do not anticipate there to be many or any Sea or River lamprey present at both intake locations**.<br><br>Therefore, based on the above information, there is potential for:<br>· **<u>direct capture, damage, or harm to River and Sea lamprey</u>** due to the potential presence of these migratory species, there is potential for entrapment, entrainment, or impingement i.e., removal from the supporting habitat, into feeder channels and Montgomery Canal.<br>However, due to the small potential numbers anticipated, if present at all, this does not have potential impact on the population size / assemblage of migratory fish species within the Severn Estuary. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.**<br><br>· **<u>damage to the supporting habitat of River and Sea through changes in flow:</u>**<br>**Penarth**: The instantaneous abstraction rate applied for (228l/s) equates to 18% of low flows, where Q95 equals 1,300l/s.<br>**Tanat:** The instantaneous abstraction rate applied for (376l/s) equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5m$^3$/hour, which equates to 25% of low flows.<br><br>Therefore, there is potential for both abstractions to impact on local hydrodynamics, through excessive fluctuations in flow and abstraction of a large percentage of the river flows during low flow conditions.<br><br>The migratory limit and presence is not clear for **River and Sea lamprey**, therefore, there is potential that these abstractions could impact on the movement of migratory fish species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.** |
| **Sea lamprey** | i.<br>The migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and **any of their spawning rivers** is not obstructed or impeded by physical barriers, **changes in flows**, or poor water quality.<br><br>ii.<br>The size of the sea lamprey population* in the Severn Estuary | |

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| | and **the rivers which drain into it**, is at least maintained as is at a level that is sustainable in the long term.<br><br>**Sea lamprey population:**<br>The size of the population is subject to non-anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and **breeding success in the River Severn and other rivers draining into the Severn Estuary**. | |
| **Twaite shad** | i.<br>The migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and **their spawning rivers** is not obstructed or impeded by physical barriers, **changes in flows** or poor water quality.<br><br>ii.<br>The size of the twaite shad population within the Severn Estuary and **the rivers draining into it** is at least maintained and is at a level that is sustainable in the long term.<br><br>**Twaite shad population:**<br>The size of the population is subject to non-anthropogenic factors relating to natural fluctuations of external | **Twaite shad**<br>MyMap Impact Assessment Screening initially identified the migratory limits of Twaite shad to be to around Worcester, which is greater than 100km downstream, and in hydraulic connectivity with both points of abstraction. Technical Fisheries have confirmed that Shad have been recorded within the River Severn at Stourport (10km further upstream than Worcester), likely due to the recent completion of the 'Unlocking the Severn Project'. Therefore, flow assessments of potential impacts on Twaite shad are considered at Stourport.<br><br>The combined instantaneous abstraction rates applied for the Penarth and Tanat abstraction equals 604l/s, which equates to 6% of low flows at Stourport, where Q95 flows equals 10,000l/s. However, based on the fact that the instantaneous abstraction rate applied for on the Tanat could not be maintained for any length of time, it is more reasonable to consider the combined hourly abstraction rate, which equals 1,389$m^3$/hour, which equates to 3.9% of low flows at Worcester, where Q95 flows equal 36,000$m^3$/hour.<br><br>The Severn Regulation operating rules specify a minimum flow to be maintained at Bewdley Gauging Station (downstream of Stourport), therefore these abstractions will not cause the flow at Bewdley to drop below the minimum that should be maintained.<br><br>It is therefore considered unlikely that the existing abstractions would change the flows significantly at the point at which **Twaite shad** would be likely to migrate / spawn within the River Severn. Therefore, no impact on the population size / assemblage of migratory fish |

| | | |
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| | factors such as food availability in the Bristol Channel and more widely and **breeding success in the River Severn and other rivers draining into the Severn Estuary.** | species within the Severn Estuary are anticipated. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.** |
| **UK11081 Severn Estuary Ramsar**<br>This designation is located over 150km downstream of the points of abstraction; however, it has been identified they are functionally linked as some of the migratory fish species access the River Severn and the River Tanat at the points of abstraction and upstream. | | |
| **Estuaries**<br>· *Estuarine habitat communities*<br>· *Hard substrate communities*<br>· *Notable estuarine species assemblages**<br><br>**The wider estuarine fish assemblage is covered as a "notable species assemblage" sub feature of the SAC "Estuaries" feature.* ***The fish assemblage of the whole estuarine and river system*** *is one of the most diverse in Britain, with over 110 species recorded.* | Assemblage of fish species:<br><u>Migratory species</u><br>· River and Sea Lamprey, Twaite shad and Allis shad.<br>· Sea trout, salmon, eel. | **<u>European Eel, Atlantic Salmon, Sea lamprey, River lamprey and Sea trout</u>**<br>Initial MyMap Impact Assessment Screening identified the following migratory fish species features, as follows:<br><u>Penarth Feeder</u><br>**At the point of abstraction** - European Eel and Atlantic Salmon migratory routes.<br>**Close proximity downstream** – River lamprey 1km and Brown / Sea Trout 3km.<br><br><u>Tanat Feeder</u><br>**At the point of abstraction** - European Eel, Atlantic Salmon, and River lamprey migratory routes.<br>**Close proximity downstream** – Brown / Sea Trout 0.5km.<br><br>**Technical fisheries confirmed the following:**<br>· The large historic weirs associated with both intake feeders, are significant barriers to migration for most fish species. Both weirs include historic fish passes to assist with the upstream migration of Salmon.<br>· NRW survey Salmon and Trout at three locations (1054, 1035 & 1024) upstream of the Penarth abstraction, and two locations on the Tanat (8583 & 1111) upstream of the abstraction point. For further detail, please see the summary of salmon and trout survey data located here and Appendix 1 of this form. **The summary data from between 2002 until 2021 demonstrates the presence of**:<br>➢ **Salmon upstream of both points of abstraction**. NRW are satisfied that the habitat at both intakes would be unsuitable for the early lifecycle stages of Salmon (from egg to parr), however, there is suitable habitat further upstream from both intake locations. Therefore, only smolt or adult Salmon would be able to access both intake locations.<br>➢ **'Trout' upstream of both points of abstraction**. NRW are satisfied that the monitoring records should relate to native brown trout (which are not protected under this designation) rather than Sea trout which are. Sea trout are not anticipated to be |
| **Assemblage of migratory fish species:**<br>· Sea Lamprey<br>· River Lamprey<br>· Twaite Shad<br>· Allis Shad<br>· Salmon<br>· Sea Trout<br>· Eel | i.<br>the migratory passage of both adults and juveniles of the assemblage of migratory fish species through the Severn Estuary between the Bristol Channel and **any of their spawning rivers** is not obstructed or<br>impeded by physical barriers, **changes in flows**, or poor water | |

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| | quality.<br><br>ii.<br>the size of the populations of the assemblage species in the Severn Estuary and **the rivers which drain**<br>**into it**, is at least maintained and is at a level that is sustainable in the long term. | present at either intake due to their lifecycles within the catchment and distance upstream from the estuary.<br><br>As native Brown trout are the same species as Sea trout, it is acknowledged that it would be possible for a small number of native Trout to choose to migrate to the sea to become Sea trout. It should also be noted that the habitat required for the early lifecycle stages of Sea trout (from egg to parr), would be the same as for Salmon (i.e., not at either intake location, but upstream) and that only smolts and adult Sea trout would be able to access both intake locations.<br><br>Therefore, based on the above, **we do not anticipate there would be many, or any Sea trout present at both intake locations.**<br>· **Eel:** have been identified upstream of the abstraction points, however, due the distance upstream in the catchment, as well as multiple downstream barriers, only **large adult Eel are considered able to reach both points of abstraction**.<br>· **Lamprey:** Sea lamprey eDNA has been identified in the Lower Vyrnwy indicating their presence at the Severn / Vyrnwy confluence. NRW do not routinely survey for the presence of Lamprey currently, however, due to barriers to migration **we do not anticipate there to be many or any Sea or River lamprey present at both intake locations**.<br><br>Therefore, based on the above information, there is potential for:<br>· **direct capture, damage, or harm to the following designated species features:**<br>➢ Salmon – smolt or adults<br>➢ Sea trout – smolts or adults<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>due to the presence of these migratory species, there is potential for entrapment, entrainment, or impingement i.e., removal from the supporting habitat, into feeder channels and Montgomery Canal.<br><br>For **Salmon** and **Eel**, this has potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>For **Sea trout** and **Lamprey**, due to the small potential numbers anticipated, if present at |

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| | | all, this does not have potential impact on the population size / assemblage of migratory fish species within the Severn Estuary. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.**<br><br>· **<u>damage to the supporting habitat of the following designated species features through changes in flow:</u>**<br>➢ Salmon<br>➢ Sea trout<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>**Penarth**: The instantaneous abstraction rate applied for (228l/s) equates to 18% of low flows, where Q95 equals 1,300l/s.<br>**Tanat:** The instantaneous abstraction rate applied for (376l/s) equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5m$^3$/hour, which equates to 25% of low flows.<br><br>Therefore, there is potential for both abstractions to impact on local hydrodynamics, through excessive fluctuations in flow and abstraction of a large percentage of the river flows during low flow conditions.<br><br>**Salmon** and **Eel** are known to be present at and downstream of these abstractions, therefore, this could impact on the movement of migratory fish species and subsequently population size / assemblage of these migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>The migratory limit and presence is not clear for **Sea trout** and **Lamprey**, therefore, there is potential that these abstractions could impact on the movement of migratory fish species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>**<u>Twaite shad and Allis shad</u>**<br>MyMap Impact Assessment Screening initially identified the migratory limits of Twaite shad and Allis shad to be to around Worcester, which is greater than 100km downstream, and in hydraulic connectivity with both points of abstraction. Technical Fisheries have confirmed |

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| | | that Shad have been recorded within the River Severn at Stourport (10km further upstream than Worcester), likely due to the recent completion of the 'Unlocking the Severn Project'. Therefore, flow assessments of potential impacts on Twaite shad and Allis shad are considered at Stourport.<br><br>The combined instantaneous abstraction rates applied for the Penarth and Tanat abstraction equals 604l/s, which equates to 6% of low flows at Stourport, where Q95 flows equals 10,000l/s. However, based on the fact that the instantaneous abstraction rate applied for on the Tanat could not be maintained for any length of time, it is more reasonable to consider the combined hourly abstraction rate, which equals 1,389$m^3$/hour, which equates to 3.9% of low flows at Worcester, where Q95 flows equal 36,000$m^3$/hour.<br><br>The Severn Regulation operating rules specify a minimum flow to be maintained at Bewdley Gauging Station (downstream of Stourport), therefore these abstractions will not cause the flow at Bewdley to drop below the minimum that should be maintained.<br><br>It is therefore considered unlikely that the existing abstractions would change the flows significantly at the point at which **Twaite shad** and **Allis shad** would be likely to migrate / spawn within the River Severn. Therefore, no impact on the population size / assemblage of migratory fish species within the Severn Estuary are anticipated. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.** |
| **Internationally important <u>populations</u> of waterfowl:**<br>·Bewick's Swan<br>·European white-fronted goose<br>·Dunlin<br>·Redshank<br>·Shelduck<br>·Gadwall | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Internationally important <u>assemblage</u> of waterfowl:** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |

| | | |
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| · waterfowl which contribute to the total peak **winter** count<br>· the above internationally important **wintering** populations<br>· the migratory **passage** species<br>· the nationally important populations<br><br>The species are as follows :<br>(w = wintering and p = passage):<br>▪ Bewick's swan (w)<br>▪ European white-fronted goose (w)<br>▪ Shelduck (w)<br>▪ Dunlin (w, p)<br>▪ Redshank (w, p)<br>▪ Gadwall (w)<br>▪ Ringed plover (w, p)<br>▪ Whimbrel (p)<br>▪ Teal (w)<br>▪ Pintail (w)<br>▪ Wigeon (w)<br>▪ Pochard (w)<br>▪ Tufted duck (w)<br>▪ Grey plover (w)<br>▪ Curlew (w)<br>▪ Spotted redshank (w)<br><br>***Other notable features:*** *Nationally important wintering populations of: Wigeon, teal, pintail,* | | |

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| *pochard, tufted duck, ringed plover, grey plover, curlew, and spotted redshank. Also, nationally important breeding population of Lesser Black backed gull* | | |

| **3.2.3 Screening decision of the project 'alone'** | |
|---|---|
| **~~(a) If ALL rows in column II of Table 3.2.2 are GREEN~~** | ~~The project is not likely to have a significant effect on any Natura 2000 site, because there is no impact pathway from the project to any Natura 2000 features, and no further consideration under the Habitats Directive/Regulations is required in order to determine the application.~~ |
| **~~(b) If there are NO rows coloured RED in column II of Table 3.2.2, and there are ANY rows which are BLUE~~** | ~~The project is not likely to have a significant effect on any Natura 2000 sites when considered alone, but the possibility of significant effects in combination with other plans and projects needs to be considered.~~ |
| **(c) If ANY rows in Column II of Table 3.2.2 are RED** | The project is likely have a significant effect on one or more Natura 2000 sites and therefore an appropriate assessment is required. |

# 4. Appropriate assessment of the project when considered alone

## 4.1 Assessment of project as currently defined

| Natura 2000 site feature (from Table 3.2.2 – RED rows only) | Impact pathway(s) (from Table 3.2.2) | Description of impacts | Assessment in view of conservation objectives | Can adverse effect on site integrity be ruled out? |
|---|---|---|---|---|
| **UK0013030 Severn Estuary Special Area of Conservation** | | | | |
| **Estuaries**<br>Assemblage of migratory fish species:<br>Salmon and Eel*. | Direct capture, damage, or harm to the designated species features. | Based on the known presence of Salmon (smolt and adults), and large adult Eel at or close to the points of abstraction, there is potential for entrapment or entrainment i.e., removal from the supporting habitats, into the feeder channels and Montgomery Canal. This has potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. | The proposal is likely to have a significant effect. | NO |
| · **Estuaries**<br>Assemblage of migratory fish species:<br>- River and Sea lamprey**<br>- Sea trout, Salmon, and Eel<br>· **River lamprey**<br>· **Sea lamprey** | Damage to the supporting habitat of designated species features through changes in flow. | · The instantaneous abstraction rates applied for:<br>- **Penarth**: 228l/s equates to 18% of low flows, where Q95 equals 1,300l/s; and<br>- **Tanat:** 376l/s equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5m3/hour, which equates to 25% of low flows.<br>Could result in local hydrodynamic impacts from the proposals as follows:<br>- Excessive fluctuations in flows; and<br>- A large proportion of the flows could be abstracted during a period of low flows.<br>This could impact locally on the movement of migratory fish | The proposal is likely to have a significant effect. | NO |

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|---|---|---|---|---|
| | | species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. | | |
| **UK11081 Severn Estuary Ramsar** | | | | |
| · **Estuaries**<br>Assemblage of migratory fish species:<br>- Salmon and Eel*<br>· **Assemblage of migratory fish species:**<br>- Salmon and Eel* | Direct capture, damage, or harm to the designated species features. | As above for this impact pathway. | The proposal is likely to have a significant effect. | NO |
| · **Estuaries**<br>Assemblage of migratory fish species:<br>- River and Sea lamprey**<br>- Sea trout, Salmon, and Eel<br><br>· **Assemblage of migratory fish species**:**<br>- River lamprey<br>- Sea lamprey<br>- Salmon<br>- Sea trout<br>Eel | Damage to the supporting habitat of designated species features through changes in flow. | As above for this impact pathway. | The proposal is likely to have a significant effect. | NO |

***See section 5 below which considers Sea trout, River lamprey, Sea lamprey, Twaite shad and Allis shad.**
****See section 5 below which considers Twaite shad and Allis shad.**

## 4.2 Assessment of the project taking into account mitigating measures, conditions, or restrictions

| Natura 2000 Feature (from Table 4.1 – 'NO' rows only) | Description of adverse effects | Can adverse effects be mitigated? | Description of mitigation measures, and how they would be applied (e.g., contractual obligations, consent conditions) | Can adverse effect on site integrity be ruled out? |
|---|---|---|---|---|
| **UK0013030 Severn Estuary Special Area of Conservation** | | | | |
| **Severn Estuary SAC**<br>**Estuaries**<br>Assemblage of migratory fish species:<br>· Salmon and Eel*.<br><br>**Severn Estuary Ramsar**<br>· **Estuaries**<br>Assemblage of migratory fish species:<br>- Salmon and Eel*<br>· **Assemblage of migratory fish species:**<br>Salmon and Eel* | · Removal of migratory fish species from the riverine ecosystem, into the Penarth / Tanat Feeders and Montgomery Canal.<br>· Potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. | YES | Fish screens with an appropriate aperture size will prevent the adverse effects identified.<br><br>Intake screening must be adequate to prevent the entrapment, entrainment, or impingement of the following species, which could be present at both intake locations:<br>· **Salmon smolt** that would be migrating downstream*** towards the sea as part of their lifecycle, as well as **adult salmon**.<br>***As detailed under the LSE stage of the form NRW are satisfied that the habitat at both intakes would be unsuitable for the early lifecycle stages of Salmon (from egg to parr), however, there is suitable habitat further upstream of both intake locations. Therefore, the screening is not necessary to protect Salmon in their early lifecycle stage (egg to parr) as they would not be present at either intake locations.<br><br>Intake screens with spacing no greater than 10mm are appropriate for salmon smolt and adults.<br>· **Large adult Eel** which may become attracted to the discharge. Intake screens with spacing no greater than 15mm are appropriate for large adult Eel.<br><br>**Therefore, Technical fisheries have advised that intake screens with spacing no greater than 10mm are necessary and adequate at both points of abstraction to prevent the entrapment, entrainment or impingement of Salmon (smolt and adults) and large adult Eel, see email dated 12/10/2022.** | YES |

<table>
<tr>
<td></td>
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<td></td>
<td>As detailed under section 1 of this form, the abstraction from the River Severn at Penarth has an overflow weir incorporated into the intake design, so that any excess water passing through the primary sluice gate(s) is discharged back into the River Severn. The applicant confirmed that the overflow weir is approximately 2 to 3 metres above the water level downstream of the weir.<br><br>Discharge screening must be adequate to prevent the entrapment, entrainment, or impingement of the following species, which could be present at both intake locations:<br>· Adult Salmon could become attracted to the discharge as part of their upstream migration.<br>Salmon smolt would be migrating downstream towards the sea, rather than upstream, therefore, they would not be attracted to the discharge. Salmon in their early lifecycle stage (egg to parr) would not be present***, therefore, no concerns.<br>· Large adult Eel could be present and become attracted to the discharge.<br><br>Therefore, Technical Fisheries have advised that a screen with spacing no greater than 40mm screening is necessary on the discharge from the overflow weir at Penarth back into the River Severn; to prevent the entrapment, entrainment or impingement of adult Salmon and large Eel.</td>
<td></td>
</tr>
<tr>
<td><u>Severn Estuary SAC</u><br>· Estuaries<br>Assemblage of migratory fish species:<br>- River and Sea lamprey**<br>- Sea trout, Salmon, and Eel<br>· River lamprey<br>· Sea lamprey<br><br><u>Severn Estuary</u></td>
<td>· Potential to impact locally on hydrodynamics of the Severn and Tanat at the points of abstraction, through excessive fluctuations in flow; and as a large proportion of the flows could be abstracted during a period of low flows. This could impact on the movement of migratory fish species present / close to the abstraction locations.</td>
<td></td>
<td>The following flow restrictions will be conditioned to ensure no more than 10% of the naturalised low flows can be abstracted down to Q99 low flows, at each location as confirmed in revised hydrology report dated 29/11/2022 and email dated 30/11/2022:<br><br><u>River Severn at Penarth</u><br>When the flow in the River Severn as gauged at Dolwen Gauging Station is less than 0.86 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:
<table>
<tr><th rowspan="2">Flow Range at Dolwen Gauging Station</th><th colspan="2">Maximum abstraction rates</th></tr>
<tr><th>Hourly</th><th>Daily</th></tr>
</table>
</td>
<td>YES</td>
</tr>
</table>

**Ramsar**

· **Estuaries**
Assemblage of migratory fish species:
- River and Sea lamprey**
- Sea trout, Salmon, and Eel

· **Assemblage of migratory fish species**:**
- River lamprey
- Sea lamprey
- Salmon
- Sea trout

· Potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary.

| $m^3/s$ | $m^3$/hour | $m^3$/day |
|---|---|---|
| Flows less than 0.86 and greater than or equal to 0.7 | 360 | 8,640 |
| Flows less than 0.7 | 180 | 4,320 |

**River Tanat at Carreghofa**

When the flow in the River Tanat as gauged at Llanyblodwel Gauging Station is less than 1.03 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

| Flow Range at Llanyblodwel Gauging Station $m^3/s$ | Maximum abstraction rates | |
|---|---|---|
| | Hourly $m^3$/hour | Daily $m^3$/day |
| Flows less than 1.03 and greater than or equal to 0.84 | 432 | 9,100 |
| Flows less than 0.84 and greater than or equal to 0.61 | 227 | 5,448 |
| Flows less than 0.61 | 133 | 3,192 |

It is considered necessary to include hourly and daily low flow restriction rates for both abstractions to prevent excessive fluctuations in flow during periods of low flows.

When the rivers are not in a period of low flows as defined below:
**River Severn at Penarth:** Flows equal to or greater than 0.86$m^3$/s at Dolwen Gauging Station.
**River Tanat at Carreghofa:** Flows equal to or greater than 1.03$m^3$/s at Llanyblodwel Gauging Station.
In order to prevent risk of excessive fluctuations in flow when the rivers are not in a period of low flows, maximum hourly, daily and annual abstraction quantities shall be included on the licence, which are be based on abstraction quantities evidenced during the qualifying period, as follows:
**River Severn at Penarth:** 821.3$m^3$/hour, 14,574$m^3$/day and 2,311,216$m^3$/year

| | | | | |
|---|---|---|---|---|
| | | | **River Tanat at Carreghofa:** 567.5m$^3$/hour, 9,100m$^3$/day and 1,911,066m$^3$/year<br><br>The above low flow restrictions and maximum abstraction quantities (when the rivers are not in a period of low flows) are in line with relevant flow standards (down to Q99 low flows) as detailed in Appendix 2; further detail on this modelling can be seen in Appendices 3 (Penarth) and 4 (Tanat) or in revised hydrology report dated 29/11/2022 and email dated 30/11/2022.<br><br>Appendix 5 demonstrates that the low flow restrictions considered necessary to mitigate against impacts to the Severn Estuary SAC and Ramsar will reduce the water that can be abstracted for the Montgomery Canal SAC during periods of low flows, which will likely lower the water levels within the canal during these periods. The Conservation Office for the Canal SAC confirmed that based on the potential durations of reduced abstraction periods (using 2021/2022 data which showed the impacts of more sustained low flow conditions) / potential reductions in the water level of the canal: the designated feature of Floating water-plantain will be robust enough to sustain these periods, and there should not be sufficient opportunity or duration for competing vegetation to grow. The Conservation Officer notes that longer durations than those demonstrated would result in the growth of competing vegetation, however, the modelling has not indicated this to be the case.<br><br>Therefore, based on the requirement to protect low flows in the River Severn and Tanat which are supporting habitat for the Severn Estuary designations; and the recent flow modelling data showing the impacts of more sustained low flow conditions:<br>**NRW are satisfied that the flow restriction mitigation measures detailed above will not adversely affect the integrity of the Montgomery Canal SAC.** | |

## 4.3 Concluding the appropriate assessment of the project alone

| | |
|---|---|
| ~~**(a) If the right hand column of Table 4.1 and Table 4.2 (if applicable) is 'YES' for all features**~~ | ~~It has been ascertained that the proposal, when considered alone, will not adversely affect the integrity of any Natura 2000 sites.~~ |
| ~~**(b) If there are any 'NO's in the right hand column of Table 4.1 that have not been resolved to 'YES' through mitigation measures identified in Table 4.2**~~ | ~~It has not been ascertained that the proposal, when considered alone, will not adversely affect the integrity of one or more Natura 2000 sites.~~ |
| **(c) Are there any residual effects of the project (net of any mitigation measures identified) which, though insignificant on their own, could be significant if considered in combination with the effects of other plans or projects?** | **YES** |

# 5 In combination assessment

## 5.1 Identifying possible in combination effects

| **BLUE impact pathway from Table 3.2**<br><br>**and/or**<br><br>**Residual effect (from appropriate assessment in section 4)** | **Natura 2000 site features concerned** | **Other plans/projects with effects that might interact with the effects of the project to render its effects significant (if any)** | **Nature of the in-combination effect (if any)** | **Is there likely to be any significant in-combination effect, in view of the site's conservation objectives?** |
|---|---|---|---|---|
| Direct capture, damage, or harm to the designated species features. | **Severn Estuary SAC**<br>- **Estuaries**<br>Assemblage of migratory fish species: Sea lamprey, River lamprey and Sea trout<br>- **River Lamprey**<br>- **Sea Lamprey**<br><br>**Severn Estuary Ramsar**<br>- **Estuaries**<br>*Notable estuarine migratory fish assemblage:*<br>Sea trout, River lamprey and Sea lamprey<br>- **Assemblage of migratory fish species:**<br>· Sea Lamprey<br>· River Lamprey<br>· Sea trout | Canal & Rivers Trust New Authorisation applications being determined by the Environment Agency within the Severn Corridor (all surface water):<br>- **NPS/NA/000428 Transfer between sources Diglis Lock 1, backpump (surface water). Feeds the Worcester and Birmingham Canal at NGR SO 84835 53819.**<br>Determination / HRA not complete, however EA currently intend to licence as per existing operation; no loss to the to the catchment as pumps recirculate water that is lost from the canal at Diglis Lock, back to the canal.<br>- **NPS/NA/000928 Transfer between sources Gloucester Pumps. Feeds the Gloucester and Sharpness Canal at NGR SO 82596 18323.**<br>Determination / HRA not complete, | No in combination effect is anticipated for the following reasons:<br>· The New Authorisation abstractions have been occurring legally without a licensing requirement for many years.<br>· The New Authorisation abstractions are already considered as part of the baseline flow conditions within the Severn Corridor catchment.<br>· New Authorisation applications must be determined in line with the Transitional Regulations 2017 and the 2017 Government response, which states that applications will only be significantly curtailed or refused to protect the environment from 'serious damage'. Which also allows for the implementation of fish screening, where historically screens may not have been present.<br>· Where required maximum abstraction volumes shall be conditioned in line with evidenced abstraction rates. | **NO** |

| | | | | |
|---|---|---|---|---|
| Potential for damage to the supporting habitat of designated species through changes in flow. | **<u>Severn Estuary SAC</u>**<br>- **Estuaries**<br>Assemblage of migratory fish species: Twaite shad (Annex 1 species) and Allis shad<br>- **Twaite shad**<br><br>**<u>Severn Estuary Ramsar</u>**<br>- **Estuaries**<br>*Notable estuarine migratory fish assemblage:*<br>Twaite shad and Allis shad<br>- **Assemblage of migratory fish species:**<br>· Twaite Shad<br>· Allis Shad | however EA currently intend to licence as per existing operation and in line with flow and tide related conditions as set out in the canal operating agreement.<br>- **NPS/NA/000933 Transfer between sources River Frome at Whitminster. Feeds the Gloucester and Sharpness Canal at NGR SO 76039 08783.**<br>Determination / HRA not complete, however EA currently intend to licence as per existing operation, which includes compensation flow of 0.14 cumecs to the River Frome at the point of abstraction. | | |
| **(a) If the right hand column is 'NO' for all rows** | | The project, when considered in combination with other plans and projects, is either not likely to have a significant effect on, or will not adversely affect the integrity of any Natura 2000 site. | | |
| ~~**(b) If any rows in the right hand column are 'YES' or 'DON'T KNOW'**~~ | | ~~The project is likely to have a significant effect in combination with other plans or projects.~~ | | |

## 6. Conclusion

| | |
|---|---|
| **HRA is not required because the whole of the project is directly connected with or necessary to the management of one or more Natura 2000/Ramsar sites, for the purposes of conserving the habitats or species for which the site(s) is/are designated, and the project is not likely to have a significant effect on any other Natura 2000/Ramsar sites.<br>(As documented in section 2.1 and 2.2 of this form)** | |
| **HRA is not required because there is no conceivable impact pathway to any Natura 2000/Ramsar site<br>(As documented in section 2.3 of this form)** | |
| **This project is a renewal of a current permission which complies with NRW agreed criteria for ruling out significant effects of a renewal without conducting a project-specific LSE test. Therefore, it is considered not likely to have a significant effect on any Natura 2000/Ramsar sites, either alone or in-combination with other plans and projects.<br>(As documented in section 3.1 of this form)** | |
| **The project has been screened for likelihood of significant effects and, taking account of the advice received from protected sites advisors, is considered not likely to have a significant effect on any Natura 2000/Ramsar site<br>(As documented in section 3.2 of this form, or section 5 if applicable)** | |
| **In light of the conclusions of an appropriate assessment, and taking account of the advice received from protected sites advisors, it has been established that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects.<br>(As documented in section 4 of this form, and section 5 if applicable)** | **X** |
| **In light of the conclusions of the appropriate assessment, it has not been ascertained that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, as documented in section 4 of this form, and section 5 is applicable.**<br><br>**Approval for the project cannot be given unless either:**<br>• **the project specification, and/or the terms under which it might be approved, are modified so as to remove the risk of adverse effects, and a revised HRA report is prepared, or**<br>• **the project satisfies the requirements of Article 6(4) of the Habitats Directive, an Article 6(4) Statement of Case is prepared** | |

| (OGN 200 Form 3) and submitted for consideration by the appropriate authority, normally Welsh Ministers | |
|---|---|

**Signed:** Charlotte Lillywhite

**Name:** Charlotte Lillywhite

**Position:** Water Resources Permitting Officer 2

**Date:** 30/11/2022

HRA Escalation in accordance with OGN200;

Signed:

Name: John Wheadon

Position: Acting Head of Regulation and Permitting

Date: 7 December 2022

## 7. Consultation with protected sites advisor(s) and how sections 2, 3, 4 and 5 of this HRA report (as applicable) take into account that advice.

| Relevant section of the HRA report | Date(s) of correspondence* and any meeting(s) with protected sites advisor(s) | Description of how the comments from protected sites advisors have been taken into account |
|---|---|---|
| **NRW - Statutory Nature Conservation Body for the Montgomery Canal SAC** | | |
| 4.2 | **30/11/2022** Advice from North Powys Environment Team on Form 2, regarding the effect of the abstraction with mitigation measures on the Montgomery Canal SAC. The Montgomery Canal SAC is designated for the key species *Luronium natans*.<br>The advice received states:<br>- Abstractions are required and necessary to the management of the Montgomery Canal SAC<br>- There is a fundamental need for a sufficient level of water to be maintained within the canal<br>- Proposed restrictions on abstraction as mitigation for the Severn Estuary SAC may have the potential to impact on the integrity of the Montgomery Canal SAC<br>- Longer durations or regular/repeat episodes of lower water levels, could result in growth of swamp/marginal vegetation, and *Luronium* may become outcompeted<br>- There is concern that not enough information is provided to demonstrate that restrictions, as mitigation for the Severn Estuary SAC, will not adversely affect the integrity of the Montgomery Canal SAC. As such, the North Powys Environment Team is unable to agree with the conclusion reached by permitting which is that "NRW is satisfied that the | **Permitting made the following amendments to Form 1:**<br>Updated wording relating to the Montgomery Canal SAC as follows:<br>**FROM** 'NRW are satisfied that the flow restriction mitigation measures detailed above are considered not likely to have a significant effect on the Montgomery Canal SAC.' - yellow highlighted text in column to the left.<br>**TO** 'NRW are satisfied that the flow restriction mitigation measures detailed above will not adversely affect the integrity of the Montgomery Canal SAC.'.<br><br>Change necessary, as the legal test at this stage of the form is whether the abstractions (with mitigation measures) are likely to have an adverse effect on the integrity of the site, not likely significant effect.<br><br>Permitting sent Protected Sites Advisor (PSA) for the Montgomery Canal SAC (cc in Severn Estuary designations PSA) an email highlighting this 08/02/2022.<br><br>**Further detail on Permitting (Competent Authority) decision making:**<br>**River Regulation**<br>The River Severn is subject to river regulation, which means water is released from Llyn Clywedog (and other sources) to offset / support large abstractions from the Severn further downstream. Regulation results in increased flows in the Severn than would naturally be observed. The flows in the Severn at Penarth are higher during periods of river regulation than would typically be expected, as the abstraction is downstream of the releases and upstream of the large abstractions. It is important to note that the River Severn could be in a period of low flows, without regulation taking place. The Tanat is a tributary of the Vyrnwy, which then flows into the Severn. The flows in the Tanat are not influenced by periods of river regulation and can be considered natural.<br><br>**Modelling (Appendix 5 of this form)**<br>Flow data was utilised from 2021 (months Jan - Dec) and 2022 (months Jan – October) to provide an indication of how abstraction volumes from the Severn and Tanat abstractions could |

| | | |
|---|---|---|
| | flow restriction mitigation measures are considered not likely to have a significant effect on the Montgomery Canal". The officer also states that he does not believe the HRA conclusion in section 6 of Form 1 can be reached. | be affected by the proposed restrictions, on the assumption that the applicant abstracts at the maximum permitted rates (in line with the qualifying period), regardless of intake limitations (i.e., the maximum permitted rates may not be possible). These years were assessed as NRW were confident which days the Severn was being regulated. See hydrology report dated 29/11/2022 for further detail. The 2021 data used demonstrates potential impacts during a more typical year; whilst the 2022 data demonstrates potential impacts during a period of sustained low flows / drought conditions.<br><br>**Tanat:**<br>Potential impacts on abstractable volumes for the Montgomery Canal, shown as a percentage reduction in abstractable volumes over a month:<br>- **2021:** between 2-17% reduction (potentially affecting 3 months, and 0% on 9 months), and<br>- **2022:** between15-52% reduction (potentially affecting 5 months, and 0% on 5 months).<br>The 2022 data demonstrated that the proposed low flow restrictions could have a larger impact on the abstractable volumes during a period of drought, when compared with a more typical year such as 2021 - % reduction and number of months.<br><br>**Severn:**<br>Potential impacts on abstractable volumes for the Montgomery Canal, shown as a percentage reduction in abstractable volumes over a month:<br>- **2021:** between 2-14% reduction (potentially affecting 5 months, and 0% on 7 months), and<br>- **2022:** between 2-7% reduction (potentially affecting 3 months, and 0% on 7 months).<br>The 2022 data demonstrated that the proposed low flow restrictions could have less of an impact on the abstractable volumes during a period of drought, when compared with a more typical year as demonstrated by the 2021 data - % reduction and number of months affected. The reason the proposed restrictions could have has less of an impact on abstractable volumes for the canal is due to additional flows in the Severn during a period of river regulation. River regulations means that the flows within the Severn at Penarth would be less likely to be sufficiently low for the proposed low flow restrictions to apply, even during a period of drought.<br><br>**Summary**<br>- **2021 assessment of potential reductions in abstractable volumes, a more typical year:** The modelling showed a potential reduction of between 2-17% for the Tanat abstraction (3 months), which are comparable with a potential reduction of between 2 – 14% for the abstraction from the Severn (5 months) when the impact of river regulation is less pronounced.<br>- **2022 assessment of potential reductions in abstractable volumes, a period of sustained low flows / drought conditions:** The modelling showed a potential reduction of between 15-52% for the Tanat abstraction (5 months), compared with a potential reduction of between 2 – 7% for the abstraction from the Severn (3 months) when the impact of river regulation was more pronounced. |

| | | |
|---|---|---|
| | | - Therefore, during a typical year the above modelling indicates a small potential reduction in abstractable volumes for the canal as a result of the low flow restrictions and Permitting do not anticipate that this would translate into significant reductions in water levels within the canal.<br>- Similar reductions in abstraction volumes were detailed in appendix 5 of Version 1 of Form 1 dated 21/10/2022 were previously agreed in Version 1 of Form 2 dated 08/11/2022 with Protected Sites advisor for the Montgomery Canal SAC, which informed this current Version 2 of Form 1.<br><br>Permitting acknowledged the concerns from the Protected Sites Advisor that not enough information / sufficient data is provided to demonstrate that restrictions, as mitigation for the Severn Estuary SAC, will not adversely affect the integrity of the Montgomery Canal SAC and took the following steps:<br>· Permitting sent an updated modelling report to the applicant and enquired whether any further information or supplementary data to allow us to better understand how the proposed restrictions could impact on water levels within the canal (SAC) was available (see email dated 30/11/2022).<br>· The applicant requested additional data to allow them to assess the potential impacts of HRA version 2 flow restrictions (see email dated 01/12/2022).<br>· Permitting confirmed that there will be a delay in sending the requested data and updated them on our current determination progress, following discussion with Team Leader and Permitting Service Manager (see email dated 02/12/2022).<br><br>Following the email sent 30/11/2022, the applicant also confirmed the following in an email dated 09/12/2022:<br>*'Our abstraction is not pumped, it is a gravity feed abstraction, the volume of which is determined by the opening of the abstraction sluices and the driving head which is also a function of the varying river level. As the river flow decreases so does the river level and thus so does our abstraction. As the river flow increases, our abstraction increases.* ***The maximum instantaneous flow will have coincided with a period of HIGH river flow, and not LOW river flow. It will have also only occurred over a short period of the abstraction. It does not reflect our continuous abstraction rate. Therefore, it appears that you have miscalculated our abstraction and consider it to be greater than it is****, resulting in unnecessary regulatory constraints.'.*<br>The above response from the applicant further indicates that the 2021 / 2022 modelling to provide an indication of how abstraction volumes from the Severn and Tanat abstractions could be affected by the proposed restrictions, demonstrate the worst 'potential' scenario. The applicant confirms that the maximum abstraction rates used in the modelling would not be possible during a period of low flows. Therefore, our proposed low flow restrictions should have a much lower potential impact on abstractable volumes than our modelling suggests and thus, a lower potential impact on water levels within the canal. |

| | | |
|---|---|---|
| | | As the Competent Authority, Permitting is required to make a decision on the basis of the best scientific knowledge available. Having considered the best scientific knowledge available, there is no reasonable scientific doubt that the project will not adversely affect the integrity of the Montgomery Canal SAC. Permitting have exercised evaluative judgement, considering the potential effects of the project on the protected species, and whether those effects presented a real risk to the maintenance of their favourable conservation status. Permitting are satisfied that that the project poses no real risk to the integrity of the Montgomery Canal SAC.<br><br>Permitting can therefore conclude the following:<br>*In light of the conclusions of an appropriate assessment and taking account of the advice received from protected sites advisors, it has been established that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects. (As documented in section 4 of this form, and section 5 if applicable)*<br><br>In accordance with OGN200, this matter was escalated for a decision on 07/12/2022 (in attendance: Gavin Bown (Head of Mid Wales Operations), Dave Lee (North Powys Environment Team Leader), Ann Weedy (Operations Manager Mid), John Wheadon (Permitting Centre Manager) acting on behalf of Nadia De Longhi (Head of Regulation and Permitting) in line with the scheme of delegation and Ashley Lansdown (Water Resources Team Leader).<br><br>Gavin Bown, confirmed the following by email:<br>*'Thanks for our meeting on the 7th December where the options were summarised, and escalation approach (as per OGN200) explained by Ashley. It's clear there has been constructive engagement with the local Environment Team on this application. Given the evidence available, and that refusal of the application (the 'do nothing' option) presents a higher likelihood of adverse impact to the integrity of the canal SAC than the other options and that our evidence indicates options 1 and 2 present a higher likelihood of adverse impact on the relevant SACs than option 3, as Head of Mid Ops I support Option 3 within the options appraisal summary. This would involve the licences for Tanat and Penarth being issued with flow restriction conditions and screening at the intakes. We would want CRT to monitor levels in the canal so that we can use the data to help establish protective levels required.'.* |
| **NRW - Statutory Nature Conservation Body for the Severn Estuary designations and Montgomery Canal SAC** | | |
| Form 2 | The Form 2 response, completed by Severn Estuary designations and Montgomery Canal SAC PSAs was confirmed via emails on 30/11/2022, however, the form was undated. So that there is a clear date for the purposes of audit trail in decision making, permitting added the correct date | N/A |

| | | |
|---|---|---|
| | (30/11/2022) to the forms and sent an email highlighting this to the PSAs on 08/02/2022. | |
| **See HRA Form 1 Version 1 dated 21/10/2022 and HRA Form 2 Version 1 for further details of discussions which informed this current version (2).** | | |
| **Natural England - Statutory Nature Conservation Body for the Seven Estuary SAC, SPA and Ramsar English Sites** | | |
| HRA Form 1 Version 1 dated 21/10/2022: Questions initially received via emails regarding version 1 of the assessment, for further detail, please see section 7 of that form, or 'Record of correspondence between NRA and Natural England' dated 14/12/2022.<br><br>This current version of Form 1 – Version 2 along with the record of questions asked on Form 1 Version 1 sent to Natural England 16/12/2022. | | |

**The following responses were received from Statutory Nature Conservation Body for the Montgomery Canal SAC and Severn Estuary SAC, SPA, Ramsar on HRA Form 2 Version 2:**

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Form

## Protected sites advisor response to an internal consultation on the Habitats Regulations Assessment of a project

## OGN 200 Form 2

**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | Minor changes only |

**Next review date: April 2018**

Cyfoeth Naturiol Cymru
Natural Resources Wales

## Protected sites advisor response to an internal consultation on the Habitats Regulations Assessment of a project

**TO:** Charlotte Lillywhite, Water Resources Permitting

**FROM:** Sarah Revill, Marine Area Advice and Management Team
Alastair Hotchkiss, North Powys Environment Team

**SUBJECT:** Habitats Regulation Assessment of transfer water abstraction licence applications PAN-007395 (Penarth Feeder at Penarth on the River Severn), and PAN-007397 (Tanat Feeder at Carreghofa on the River Tanat):

Montgomery Canal SAC
Severn Estuary SAC and Ramsar

Thank you for consulting the Marine Area Advice and Management Team and North Powys Environment Team on the above project and sending us a copy of the draft Form 1 HRA report dated 30 November 2022. Our comments are as follows:

*Marine Area Advice and Management Team comments:*
We welcome the further information provided to address our previous concerns relating to abstraction limits and screen sizes. We note the latest modelling undertaken by Robert Bissell referred to within the HRA, with mitigation of 2 cutback restrictions to abstraction volumes at Penarth Weir and 3 cutback restrictions at Tanat. Given the mitigation stated, we can concur with the conclusion of the HRA that the proposal will not adversely affect the integrity of the Severn Estuary SAC, SPA and Ramsar Site.

*North Powys Environment Team comments:*
We have reconsidered the HRA based on the changes and further information. The abstractions, as a project (i.e., without considering any restrictions as mitigation for Severn Estuary SAC) are required and necessary to the management of the Montgomery Canal SAC. There is a fundamental need for a sufficient level of water to be maintained within the canal.

However, the proposed restrictions on abstractions as mitigation for the Severn Estuary SAC may have the potential to impact the integrity of the Montgomery Canal SAC, and therefore the likely significant effect of restrictions on the Montgomery Canal SAC should be considered.

We note the comment on page 26 of the HRA (based on advice we provided) about floating water-plantain *Luronium natans* tolerating some periods of lower water levels, so long as these are followed by periods of deeper water later in the year, which would be the expectation every winter. But longer durations or regular/repeat episodes of lower water levels, could result in growth of swamp/marginal vegetation, and *Luronium* may become outcompeted. Whilst we recognise the comments on this form relate to the SAC feature (*Luronium*), it is important to note that SSSI features (including some of the *Potamogeton* spp.) may be at even greater risk by periods of low levels.

We are of therefore of the opinion that it would be difficult for NRW to conclude no likely significant effect without information as to how actual water levels in the canal would be affected by different abstraction restriction scenarios (and potentially future climate scenarios). Although the modelling provided in Appendix 5 is informative of changes in volumes entering the canal, this would also require information on how the canal retains water levels during prolonged periods of restricted abstraction for example.

We acknowledge that this is going to be influenced by significant canal dredging works happening over next 3 years (particularly around Tanat feeder end), and planned repairs to the leaking Vyrnwy aqueduct, etc. These projects (which will be subject to CRTs own HRAs, as competent authority), in combination, would be expected to make canal features more resilient in drought periods and any periods of lower abstraction rates.

Despite that, we are concerned that not enough information is provided to demonstrate that the restrictions, as mitigation for the Severn Estuary SAC, will not adversely affect the integrity of the Montgomery Canal SAC. We are therefore unable to agree with the comment at the top of page 27 that “NRW are satisfied that the flow restriction mitigation measures detailed above are considered not likely to have a significant effect on the Montgomery Canal SAC.” Consequently, we do not believe the HRA conclusion (section 6) can be reached.

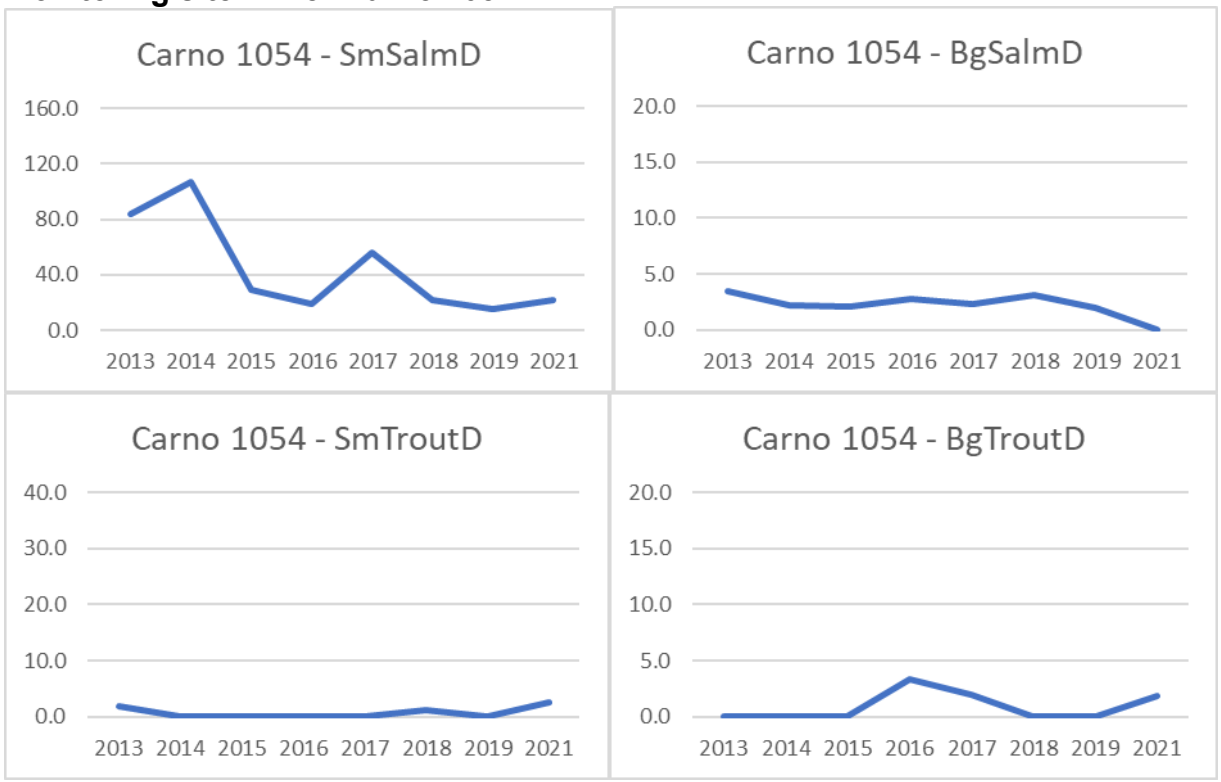
Signed: Alastair Hotchkiss (North Powys Environment Team)
Sarah Revill (Marine Area Advice and Management Team)

Date: 30/11/2022

**Appendix 1:** Graphs showing numbers and tables showing overall grade of salmon and trout survey data from between 2002 and 2021, for monitoring sites upstream of the point of abstractions on the River Severn and River Tanat. For further detail, please see the summary of salmon and trout survey data located here.

- No summary graphs or overall grade data included for monitoring site 1035 at Clywedog.

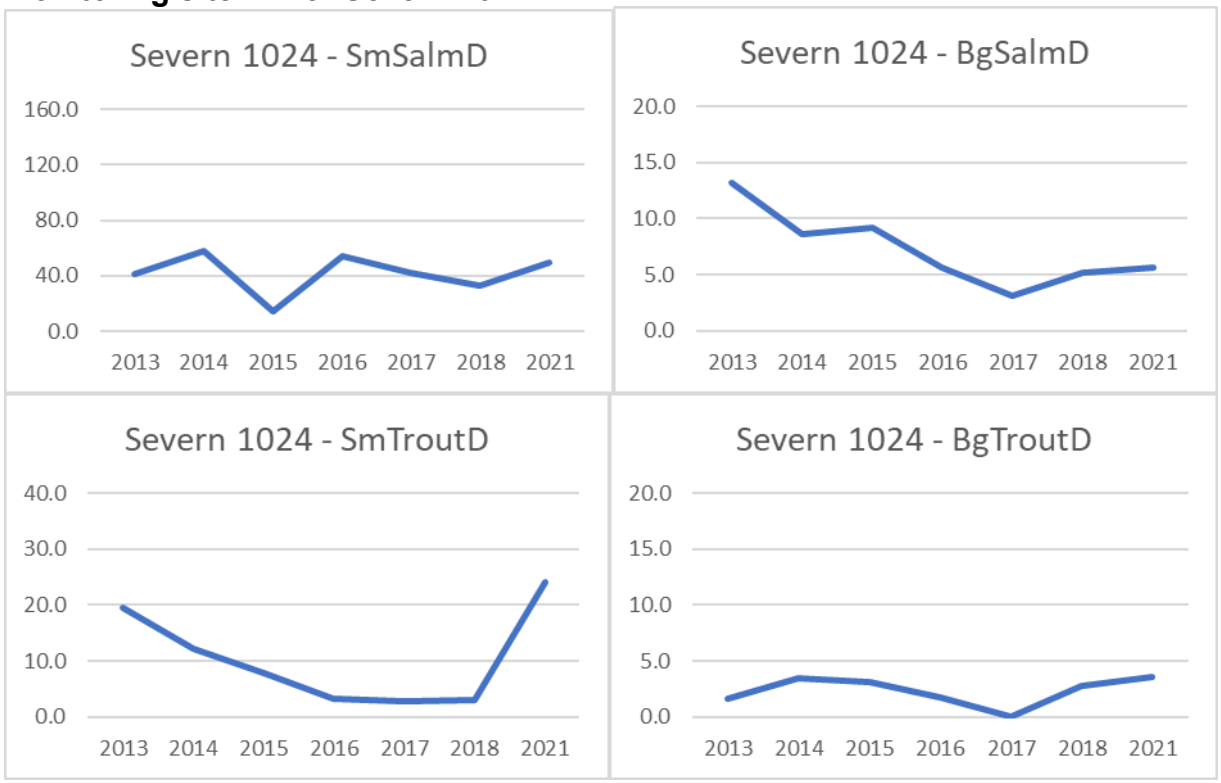
**Monitoring site: River Carno 1054**




**Overall Grade**

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 |
|---|---|---|---|---|---|---|---|---|
| Salmon | B | B | D | D | C | D | D | D |
| Trout | E | F | F | E | E | E | E | E |

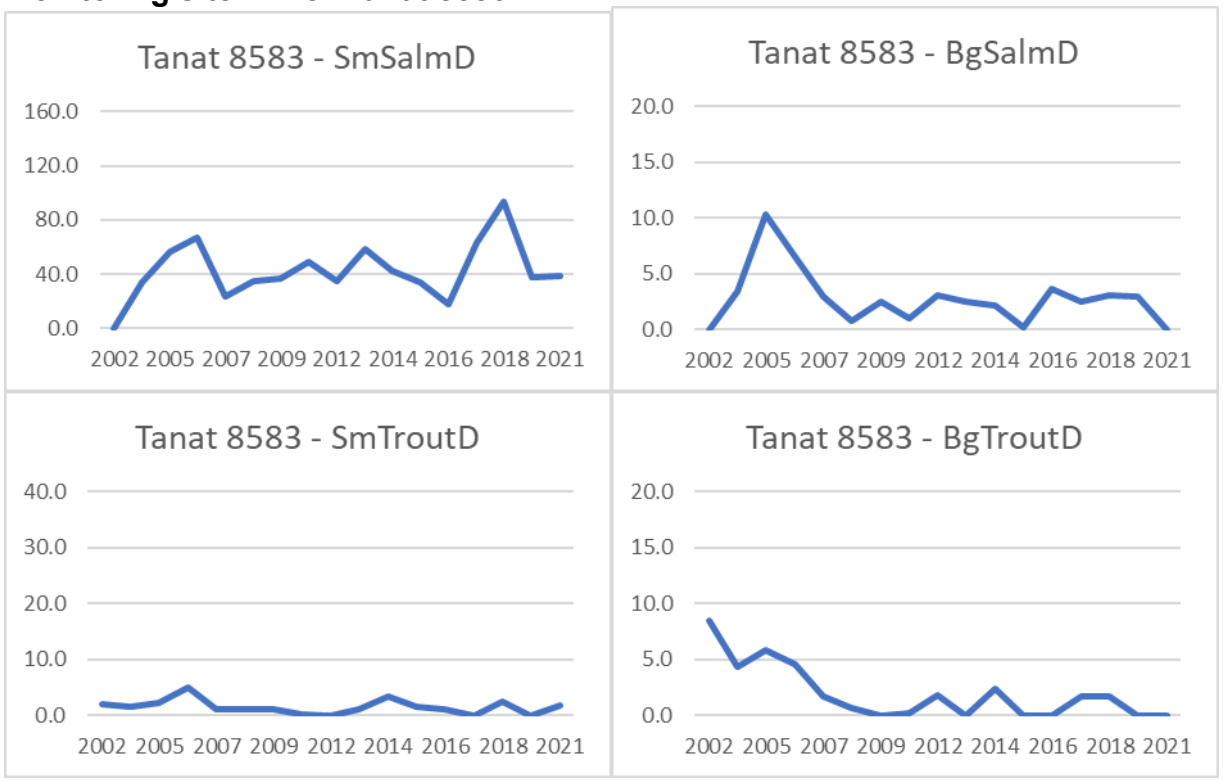
**Monitoring site: River Severn 1024**




**Overall Grade**

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2021 |
|---|---|---|---|---|---|---|---|
| Salmon | B | B | D | C | C | C | C |
| Trout | D | D | D | E | E | E | C |

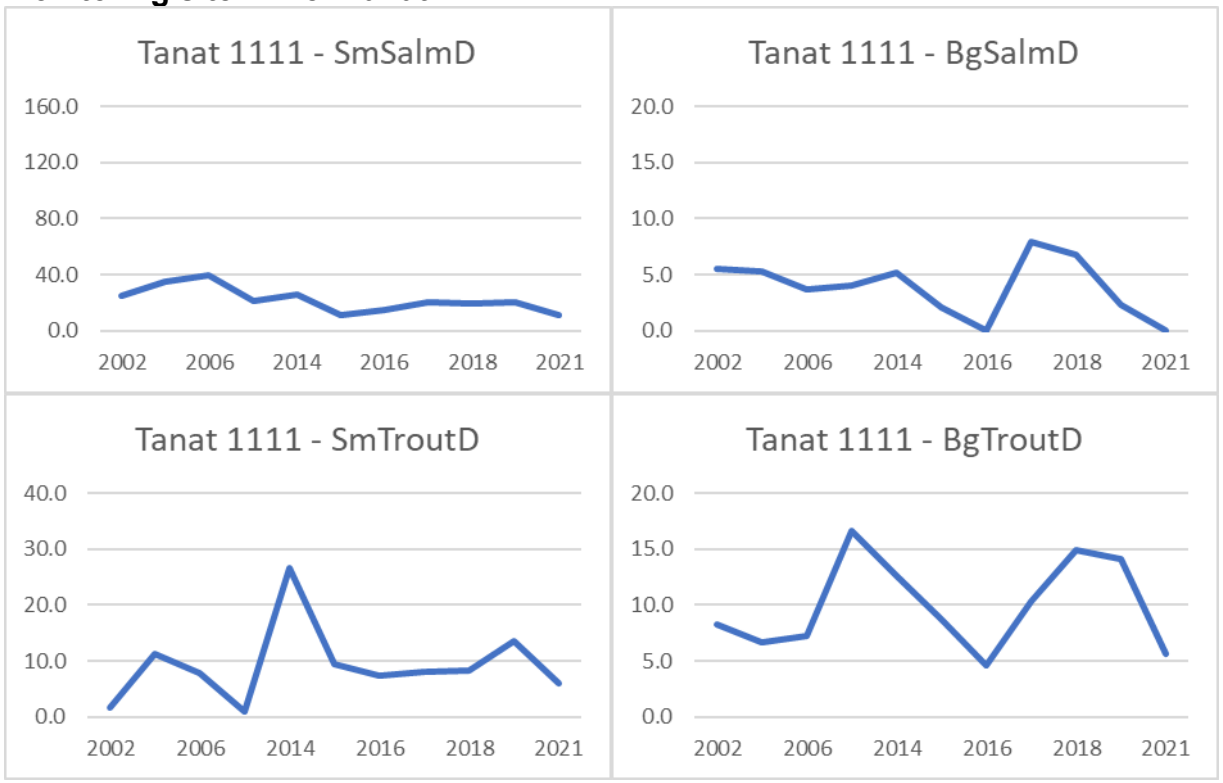
**Monitoring site: River Tanat 8583**




**Overall Grade**

| | 2002 | 2003 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Salmon | F | D | B | B | D | D | D | C | D | C | C | D | D | C | B | D | D |
| Trout | D | E | D | D | E | E | E | E | E | E | E | E | E | E | E | F | E |

**Monitoring site: River Tanat 1111**




**Overall Grade**

| | 2002 | 2003 | 2006 | 2011 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Salmon | D | C | C | D | D | E | E | C | D | D | E |
| Trout | D | D | D | C | B | C | D | C | C | C | D |

## Appendix 2: Flow standards

**Table 1:** based on Water Framework Directive (WFD) Ecological Flow Indicators (EFI)

| River type | Flow > Q95 | | Flow < Q95 | |
|---|---|---|---|---|
| | *Mar - Jun* | *Jul - Feb* | *Mar - Jun* | *Jul - Feb* |
| *Predominantly clay. South East England, East Anglia and Cheshire plain* | 25% | 30% | 15% | 20% |
| *Chalk catchments; predominantly gravel beds; base-rich* | 15% | 20% | 10% | 15% |
| *Hard limestone and sandstone; low-medium altitude; some oligotrophic hard rock* | 20% | 25% | 15% | 20% |
| *Non-calcareous shales; pebble bedrock; Oligomeso-trophic; Stream order 1 and 2 bed rock and boulder; ultra-oligo trophic torrential* | 15% | 20% | 10% | 15% |
| | *Oct – Apr* | *May – Sep* | *Oct - Apr* | *May - Sep* |
| *Salmon spawning & nursery (not chalk rivers)* | 15% | 20% | 10% | 15% |

**Table 1: Flow standards for UK river types for supporting good ecological status given as the percentage allowable abstraction of natural flow (UKTAG, 2008).**

| | high flow → | | | low flow |
|---|---|---|---|---|
| **Abstraction Sensitivity Band** | **Q30** | **Q50** | **Q70** | **Q95** |
| ASB3. high sensitivity | 24% | 20% | 15% | 10% |
| ASB2. moderate sensitivity | 26% | 24% | 20% | 15% |
| ASB1. low sensitivity | 30% | 26% | 24% | 20% |

**Table 2: Percentage allowable abstraction from natural flows at different abstraction sensitivity bands.**

**Table 2:** based on CAMS EFI, developed from WFD EFI

**Table 3:** based on Common Standards Monitoring Guidance (CSMG)

**rCSMG Table 3 Flow targets in relation to river size and discharge**

| River size | < Qn95 (low flows) | Qn50-95 (low to moderate flows) | QN10-50 (moderate to high flows) | >Qn10 (high flows) |
|---|---|---|---|---|
| Headwater | 5 | 10 | 15 | 15 |
| River | 10 | 15 | 20 | 10 |
| Large river | 15 | 20 | 20 | 20 |

Qn: daily naturalised flows. Figures are percentage deviation for daily naturalised flow

| EW band (sensitivity) | Maximum % reduction from daily naturalised (benchmark) flow | | |
|---|---|---|---|
| | **<Qn50** | **Qn50-95** | **>Qn95** |
| Very High | 10 | 10 | 1-5 |
| High | 15 | 10 | 5-10 |
| Moderate | 20 | 15 | 10-15 |
| Low | 20 | 15 | 15 |
| Very Low | 20 | 20 | 15 |

*Table 8.4: Derivation of HD ERF based on acceptable deviation from natural flows*

**Table 4:** based on Habitats Directive Ecological River Flow Objectives (HD ERFO)

The existing abstractions fall under the following classes: Table 1: '*Salmon spawning & nursery (not chalk rivers)*' or '*Non-calcareous shales; pebble bedrock; Oligomeso-tophic; Stream order 1 and 2 bed rock and boulder; Ultra-oligo trophic torrential*', Table 2: '*ASB3 High sensitivity*', Table 3: '*River*'; and Table 4: not considered relevant as the River Penarth and River Tanat are not designated SAC rivers. The maximum abstraction rates applied for, and the low flow restrictions proposed are considered necessary and in line with all of the above flow standards until Q99 flows (see appendix 3 and 4). It is important to note that the flow restrictions to be applied to the licences have potential to reduce abstractable volumes for the Montgomery Canal SAC - see Appendix 5 below for more information. We are satisfied that the proposed flow restrictions are appropriate to protect all designations and features identified.

**Appendix 3: Modelling of flow restrictions for the River Severn at Penarth**

The flows in the River Severn are influenced by the Severn Regulation Scheme, which augments naturally low flows with reservoir releases to support large abstractions further downstream. As such, flows in the Severn at Penarth rarely fall as low as they would naturally. For example, the natural Q95 of 1.0$m^3$/s equates to less than Q99 of actual river flows. However, there are occasions when the Severn is not being regulated and river flows can fall lower than this, so it's important to protect those very low flows.

CRT are applying for the following abstraction rates:

- Instantaneous: 0.228$m^3$/s
- Hourly: 821$m^3$/hr, which equates to average 0.228$m^3$/s
- Daily: 14574 $m^3$/d, which equates to average 0.169$m^3$/s

How the above rates compare with Q95 low flows:

- Q95 (natural) at the point of abstraction = 1.0$m^3$/s
- Q95 (actual) at the point of abstraction = 1.74$m^3$/s

The instantaneous and hourly abstraction rates equate to 18% of Q95 (nat) and 13% of Q95 (actual).

The abstraction restrictions in set out in the British Waterways Bill have not been modelled because the restrictions (when averaged) are generally higher than the evidenced maximum abstraction rates applied for, which will supersede these Bill restrictions. The conditions regarding Clywedog storage and Drought Orders occur so rarely that they have not been modelled, although they will be replicated as condition on the licence.

Therefore, the following restrictions are proposed:
When the flow in the River Severn as gauged at Dolwen Gauging Station is less than 0.86 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

| **Flow Range at Dolwen Gauging Station $m^3$/s** | **Maximum abstraction rates** | |
|---|---|---|
| | **Hourly $m^3$/hour** | **Daily $m^3$/day** |
| Flows less than 0.86 and greater than or equal to 0.7 | 360 | 8,640 |
| Flows less than 0.7 | 180 | 4,320 |

When the river is not in a period of low flows, i.e., flows equal to or greater than 0.86$m^3$/s at Dolwen Gauging Station.
In order to prevent risk of excessive fluctuations in flow when the rivers are not in a period of low flows, maximum hourly, daily and annual abstraction quantities shall be included on the licence, which are be based on abstraction quantities evidenced during the qualifying period, as follows: 821.3$m^3$/hour, 14,574$m^3$/day and 2,311,216$m^3$/year

Table 1 (below) shows low flow percentiles of naturalised flows, and compares the impacts of the existing abstraction regime, with the proposed abstraction regime. The table demonstrates how low flows are augmented by the regulation scheme. With the current abstraction regime, it's clear

that abstraction exceeds 10% of the river flow at the lowest flows, equating to 44% of the flow at Q99. The abstraction regime proposed during a period of low flows, with two restrictions better protect low flows at flows below Q95 than with one restriction. It should be noted that this assessment is based on CRT abstracting the maximum rates permitted/evidenced.

River flows at Penarth can fall as low as 0.6-0.7$m^3$/s when the Severn is being regulated. The proposed 2 abstraction restrictions would limit abstraction to 50l/s at the lowest flows, which equates to 8% of 0.6$m^3$/s. It should be noted that flows have only fallen to 0.6$m^3$/s for 17 days in a 52 year record.

| Flow Percentile | Natural Flow (m3/s) | Current Situation | | With 1 Abstraction Restriction | | With 2 Abstraction Restrictions | |
|---|---|---|---|---|---|---|---|
| | | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow |
| 85 | 1.94 | 1.71 | 12% | 1.71 | 12% | 1.71 | 12% |
| 86 | 1.85 | 1.62 | 12% | 1.62 | 12% | 1.62 | 12% |
| 87 | 1.76 | 1.53 | 13% | 1.53 | 13% | 1.53 | 13% |
| 88 | 1.66 | 1.43 | 14% | 1.43 | 14% | 1.43 | 14% |
| 89 | 1.57 | 1.34 | 15% | 1.34 | 15% | 1.34 | 15% |
| 90 | 1.47 | 1.24 | 16% | 1.37 | 7% | 1.37 | 7% |
| 91 | 1.37 | 1.15 | 17% | 1.27 | 7% | 1.27 | 7% |
| 92 | 1.29 | 1.06 | 18% | 1.19 | 8% | 1.19 | 8% |
| 93 | 1.19 | 0.96 | 19% | 1.09 | 8% | 1.09 | 8% |
| 94 | 1.10 | 0.87 | 21% | 1.00 | 9% | 1.00 | 9% |
| 95 | 1.01 | 0.78 | 23% | 0.91 | 10% | 0.91 | 10% |
| 96 | 0.91 | 0.68 | 25% | 0.81 | 11% | 0.86 | 5% |
| 97 | 0.81 | 0.58 | 28% | 0.71 | 12% | 0.76 | 6% |
| 98 | 0.67 | 0.45 | 34% | 0.57 | 15% | 0.62 | 7% |
| 99 | 0.52 | 0.29 | 44% | 0.42 | 19% | 0.47 | 10% |

***Table 1.*** *Comparing impacts of existing abstraction regime vs proposed abstraction regime on NATURAL flow flows at Penarth*

The impacts are also shown in Figure 1, below.

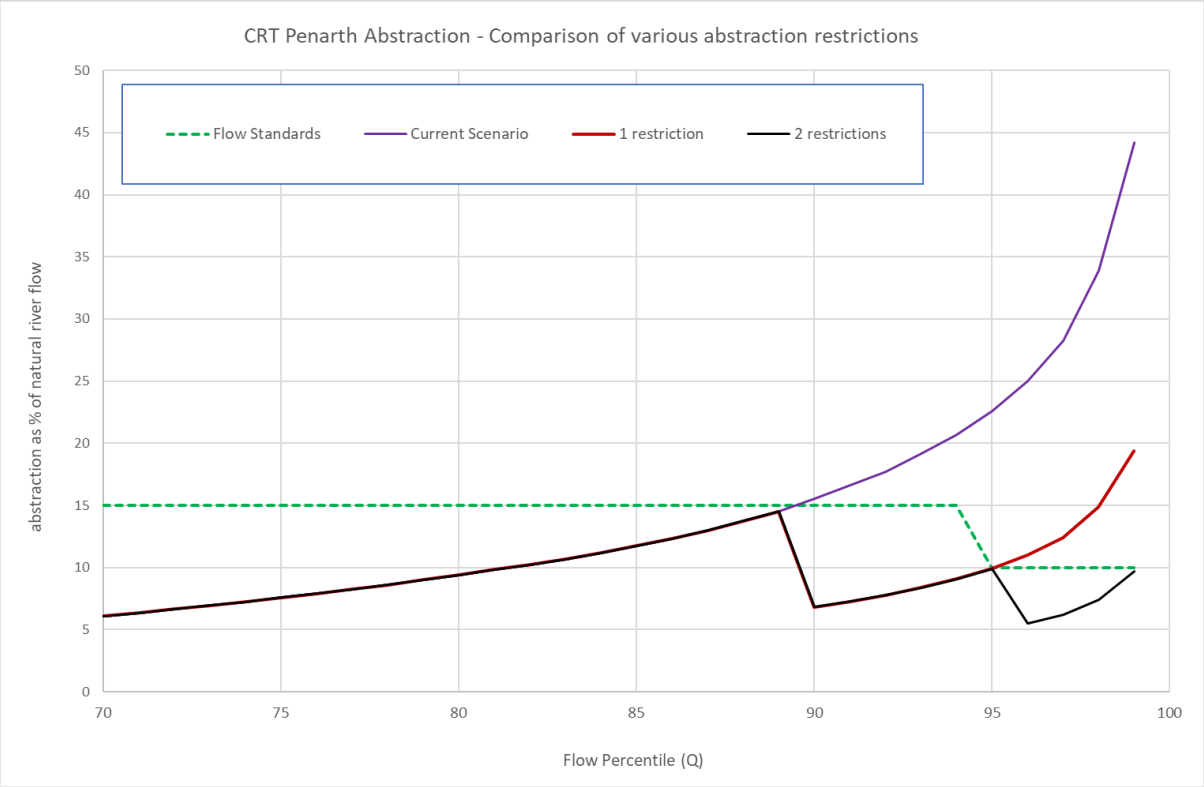



*Figure 1. Abstraction impacts as % of NATURAL river flow, vs flow standards.*

**Appendix 4: Modelling of flow restrictions for the River Tanat at Carreghofa**
Flows in the Tanat are considered natural upstream of the CRT abstraction at Carreghofa.

CRT are applying for the following abstraction rates:

- Instantaneous: 0.376$m^3$/s
- Hourly: 567.5$m^3$/hr, which equates to average 0.158$m^3$/s
- Daily: 9100 $m^3$/d, which equates to average 0.105$m^3$/s

How the above rates compare with Q95 low flows, where Q95 at the point of abstraction = 0.63$m^3$/s

- The instantaneous rate of abstraction equates to 60% of Q95.
- The hourly rate of abstraction equates to 25% of Q95.

The abstraction restrictions in set out in the British Waterways Bill include limiting abstraction to 49Ml over 7 days whenever the Severn is being regulated, or a lesser amount to maintain a residual flow of 15Ml/d downstream of Carreghofa weir. The 49Ml over 7 days has been modelled as constant average abstraction of 0.081$m^3$/s.

In order to protect low flows, NRW have modelled two and three flow restrictions to the CRT abstraction, as detailed in figure 2 and 3 below. These will be linked to flows at Llanyblodwel Gauging Station, which is situated just upstream of the CRT intake.

Figure 2 (below) shows low flow percentiles and compares the impacts of the existing abstraction regime, with the proposed abstraction regime. Also shown is an abstraction regime with just 1 restriction. Figure 2 shows that the current/existing scenario is not compliant with relevant flow standards at low flows, with abstraction exceeding 20% of the lowest flows. Applying only 1 abstraction restriction is also not sufficient to protect the lowest flows, with abstraction of up to 17% at Q99. Applying a second abstraction restriction at Q95 helps protect the lowest flows.

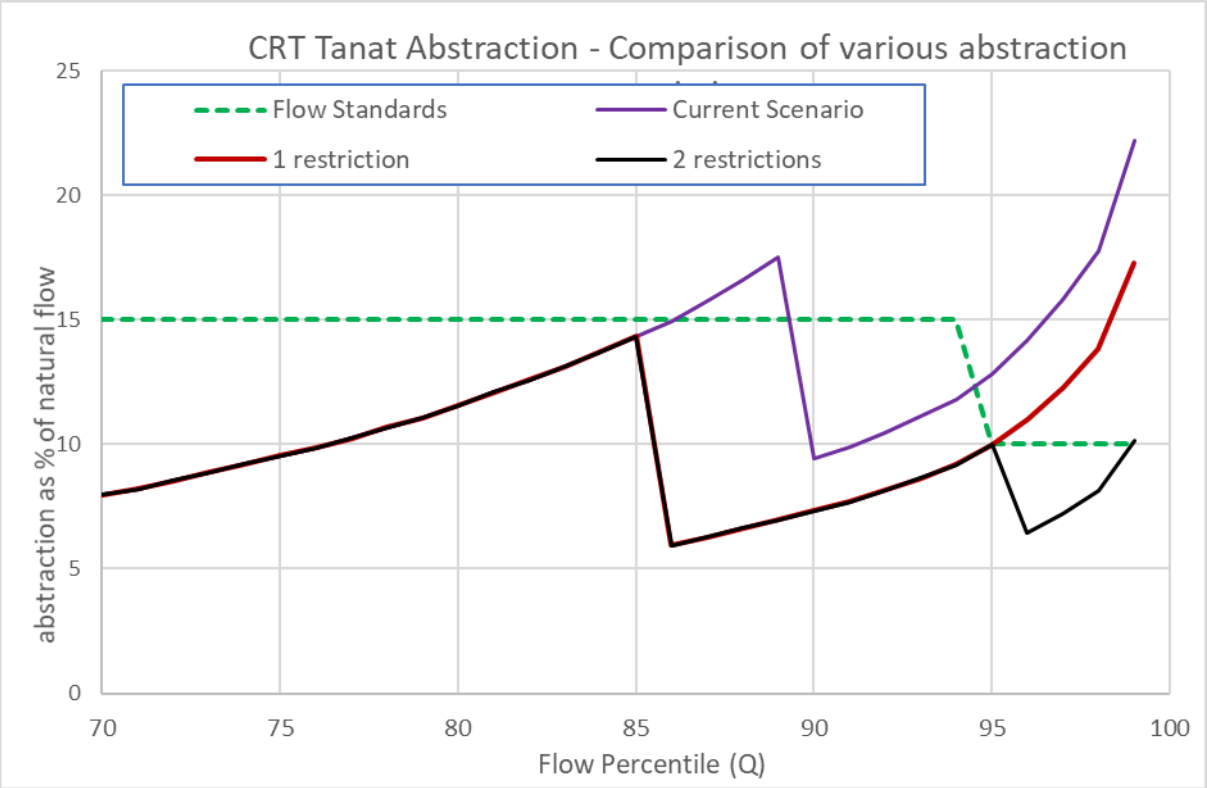



*Figure 2. Abstraction impacts as % of river flow, vs flow standards.*

**Considering the impact of applying a third low flow restriction, as outlined below:**
When the flow in the River Tanat as gauged at Llanyblodwel Gauging Station is less than 1.03 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

| Flow Range at Llanyblodwel Gauging Station $m^3/s$ | Maximum abstraction rates | |
|---|---|---|
| | Hourly $m^3$/hour | Daily $m^3$/day |
| Flows less than 1.03 and greater than or equal to 0.84 | 432 | 9,100 |
| Flows less than 0.84 and greater than or equal to 0.61 | 227 | 5,448 |
| Flows less than 0.61 | 133 | 3,192 |

Three flow restrictions would allow additional abstraction in the flow range Q86 to Q90, when compared to the two flow restrictions modelled above.

When the river is not in a period of low flows, i.e., flows equal to or greater than 1.03m$^3$/s at Llanyblodwel Gauging Station.
In order to prevent risk of excessive fluctuations in flow when the rivers are not in a period of low flows, maximum hourly, daily and annual abstraction quantities shall be included on the licence, which are be based on abstraction quantities evidenced during the qualifying period, as follows: 567.5m$^3$/hour, 9,100m$^3$/day and 1,911,066m$^3$/year

Figure 3 below shows the impact of applying a third low flow restriction:

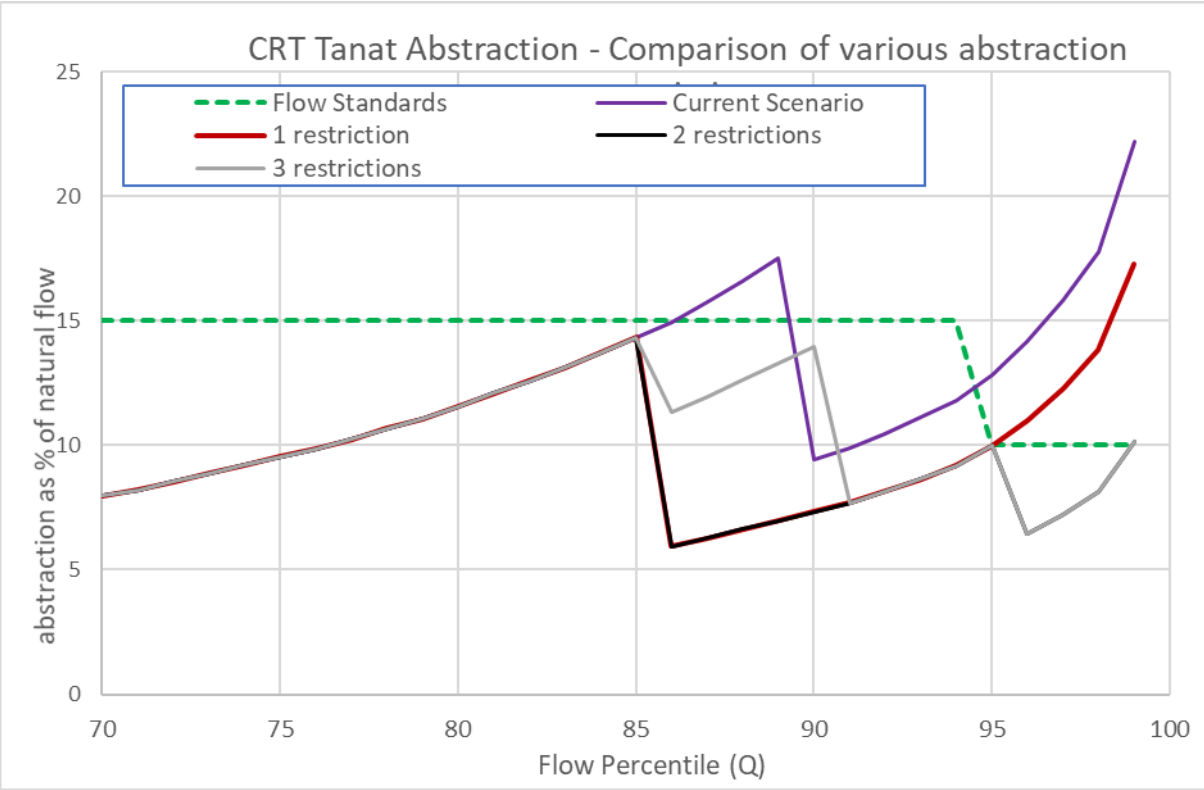



*Figure 3. Abstraction impacts as % of river flow, vs flow standards.*

**Appendix 5:** Monthly abstraction volumes possible from the points of abstraction (Penarth and Tanat), comparison of current situation (no low flow restrictions), versus proposed licence restrictions, using recent flow data (years 2021 and 2022)

**Penarth**

The impact of the proposed flow restriction has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 2 below demonstrates how the proposed restriction would reduce abstraction by an average of 3% in summer months, and up to 14% in July 2021.

| Year/Month | Existing scenario Vol Abstr (Ml) | With abstr restriction Vol Abstr (Ml) | % reduction |
|---|---|---|---|
| Jan-21 | 611 | 611 | 0% |
| Feb-21 | 552 | 552 | 0% |
| Mar-21 | 611 | 611 | 0% |
| Apr-21 | 591 | 558 | -6% |
| May-21 | 611 | 611 | 0% |
| Jun-21 | 591 | 580 | -2% |
| Jul-21 | 611 | 522 | -14% |
| Aug-21 | 611 | 589 | -4% |
| Sep-21 | 591 | 580 | -2% |
| Oct-21 | 611 | 611 | 0% |
| Nov-21 | 591 | 591 | 0% |
| Dec-21 | 611 | 611 | 0% |
| Jan-22 | 611 | 611 | 0% |
| Feb-22 | 552 | 552 | 0% |
| Mar-22 | 611 | 611 | 0% |
| Apr-22 | 591 | 547 | -7% |
| May-22 | 611 | 600 | -2% |
| Jun-22 | 591 | 591 | 0% |
| Jul-22 | 611 | 600 | -2% |
| Aug-22 | 611 | 611 | 0% |
| Sep-22 | 591 | 591 | 0% |
| Oct-22 | 217 | 217 | 0% |

*Table 2. Impact on abstraction volumes associated with proposed restriction.*

**Tanat**

The impact of the proposed flow restrictions has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 3 below shows that applying 1, 2 or 3 abstraction restrictions causes a relatively large reduction in water abstracted – particularly during the 2022 drought. Limiting abstraction rates to 0.037m3/s at flows below Q95 means in July 2022 (for example) CRT would be able to abstract approximately 44% less water than they currently theoretically could. Having a 3rd abstraction restriction allows CRT to abstract slightly more water in the flow range Q86 to Q90, which in some months offsets the impact of limiting abstraction to 0.037m3/s when flows are below Q95 (May 2022 for example). However, it has little/no benefit during sustained periods of low flows, as were experienced in July-Sept 2022.

| Year/Month | Existing scenario | With 1 restriction | | With 2 restrictions | | With 3 restrictions | |
|---|---|---|---|---|---|---|---|
| | Vol Abstr (Ml) | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction |
| Jan-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-21 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Jun-21 | 403 | 403 | 0% | 403 | 0% | 403 | 0% |
| Jul-21 | 317 | 297 | -6% | 297 | -6% | 311 | -2% |
| Aug-21 | 303 | 283 | -7% | 283 | -7% | 293 | -4% |
| Sep-21 | 237 | 193 | -19% | 190 | -20% | 197 | -17% |
| Oct-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Nov-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Dec-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Jan-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-22 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-22 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-22 | 363 | 251 | -31% | 251 | -31% | 309 | -15% |
| Jun-22 | 250 | 205 | -18% | 190 | -24% | 196 | -21% |
| Jul-22 | 230 | 173 | -25% | 128 | -44% | 135 | -41% |
| Aug-22 | 237 | 177 | -25% | 114 | -52% | 114 | -52% |
| Sep-22 | 243 | 191 | -21% | 148 | -39% | 150 | -38% |
| Oct-22 | 164 | 164 | 0% | 164 | 0% | 164 | 0% |

*Table 3. Impact on abstraction volumes associated with proposed restriction*

## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 14 December 2022 14:10
**To:** WA 2003 New Authorisations; Beckett, Mary; Hotchkiss, Alastair; Lansdown, Ashley
**Cc:** Kathryn Maye; Adam Comerford; Kathryn Smith; Sarah Temple - Phillips; Helen Sillitto
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation
**Attachments:** PAN-007395 and 7 Final response to CRT Email dated 09 Dec 2022 CL.docx; PAN-007395 - Supporting Information.pdf; PAN-007397 - CRT414_Supporting Information.pdf; RE: PAN-007395 & PAN-007397 New Authorisation Applications update and request for further clarification

Hi Nicholas,

Please find our response to your questions in the attached word document.

Best wishes,

Charlotte
Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

cyfoethnaturiol.cymru / naturalresources.wales
Twitter | Facebook | LinkedIn | Instagram

**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

---

**From:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>
**Sent:** 09 December 2022 15:21
**To:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>; Beckett, Mary

<Mary.Beckett@cyfoethnaturiolcymru.gov.uk>; Hotchkiss, Alastair <Alastair.Hotchkiss@cyfoethnaturiolcymru.gov.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Cc:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>; Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>; Kathryn Smith <Kathryn.Smith@canalrivertrust.org.uk>; Sarah Temple - Phillips <Sarah.Temple-Phillips@canalrivertrust.org.uk>; Helen Sillitto <Helen.Sillitto@canalrivertrust.org.uk>
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

*Hi Charlotte,*

*Further to Adam's email on 1st December, in response to yours email of 30th November setting out NRW's proposals for the Tanat and Penarth abstractions, the Trust have more closely reviewed these proposals.*

*We wish to query why at this stage the River Severn operating agreement ("Operating Rules for the River Severn Resource/ Supply System, February 2012 (Version 6") appears to have been disregarded in the derivation of the proposed flow restrictions. The provisions of the operating agreement already protect the River Severn by limiting our abstractions when flows in the River Severn are regulated by releases from Llyn Clywedog or when reservoir storage is less than 25%. We do not consider therefore that the additional flow restrictions placed on the licences are necessary.*

*Additionally, we have been through the Word document entitled "CRT New Authorisations licence applications: Severn @ Penarth and Tanat @ Carreghofa - Considering abstraction restrictions to protect low flows". We have a few initial comments to make ahead of receiving the flow data as requested by Adam, and also our review of the draft licences for Penarth and Tanat.*

1. *The abstraction restrictions set out in the Operating Agreement provide protection for the local environment. For example, the clause which sets out the maximum height of spill over the weir at Trwstllewellyn (25mm) ensures that the Trust does not abstract more water than is required to maintain the environment and water level within the canal SSSI and SAC, but also protects the continuation flow in the river. This is not referenced as a condition in the draft licence or the previously received proposal but as this already provides adequate protections we would request this is included as a condition rather than the three staged HOF conditions proposed.*

2. *The flow standards that you quote go beyond a light touch regulation and should not be applied under new authorisations for water which has long been abstracted and was previously exempt.*

3. *The headline figures which are quoted to show the proportion of river flow that we abstract at low flows (Q95) are incorrect. These calculations have been made using the maximum instantaneous volumes applied for in our application. Our abstraction is not pumped, it is a gravity feed abstraction, the volume of which is determined by the opening of the abstraction sluices and the driving head which is also a function of the varying river level. As the river flow decreases so does the river level and thus so does our abstraction. As the river flow increases, our abstraction increases. The maximum instantaneous flow will have coincided with a period of HIGH river flow, and not LOW river flow. It will have also only occurred over a short period of the abstraction. It does not reflect our continuous abstraction rate. Therefore, it appears that you have miscalculated our abstraction and consider it to be greater than it is, resulting in unnecessary regulatory constraints. If you recalculate our abstraction using a mean abstraction rate, you will find that the River Severn operating guidelines provide sufficient protection to the downstream donor water courses, based on a reduced abstraction rate.*

4. *The conversion of the hourly and daily maximum flows to an average instantaneous flow, which is then used to compare our abstraction to proposed abstraction rates, does not make hydrological sense.*

5. *The numbers given in Table 1 for the Penarth abstraction, as well as Figure 1, are incorrect as these figures are based on the maximum applied for abstraction rate. It is noted in the text that the assessment is based on the Trust abstracting the maximum applied for volume however as previously stated this is not possible*

*and furthermore, as can be seen in figures 8.51 in our Supporting Information for Penarth and Tanat our abstractions vary enormously over time. These figures and graphs are therefore misleading and incorrect. NRW's assessment of our maximum abstraction is not correctly calculated based on the hydrology and hydraulics at this site. It is crucial to express that these abstraction quantities are not physically possible at all times. For our max instantaneous rate to be achieved the upstream driving head would need to be much higher than it is for the majority of the time, this will only occur during periods of high flow. The structures at these locations limit our abstraction to a rate much lower than the max instantaneous rate for the majority of the time, based on the varying river level.*

6. *The abstraction figures for the initial abstraction regime considered at Tanat with two flow restrictions includes a limit of the maximum hourly rate applied for, rather than the maximum instantaneous flow. This does not therefore replicate the abstraction during the qualifying period, for the reasons explained above. At flows above Q86 it is proposed to limit our abstraction to 0.158 m3/s, the maximum hourly abstraction rate. This limit is considerably less than the maximum instantaneous abstraction of 0.376 m3/s that was evidenced during the qualifying period and would kick in during periods of high flow. This would make more sense if the abstraction was by means of pump rather than a gravity feed of which it is.*

7. *The abstraction figures for the initial abstraction regime considered at Tanat with two flow restrictions includes an abstraction limit of 5.9% of the river flow at the second trigger point. This is inconsistent with the statement on the first page of the document which stated: The Flow Standards broadly agree that abstraction of no more than 10% of the natural flow is appropriate for flows below Q95, and 15% for flows between approx. Q95 and Q50. This proposal is therefore inconsistent with NRW's own statement.*

8. *Tables 2 and Tables 3 showing the impact that the different flow restrictions would have had on our abstraction at Penarth and Tanat, respectively, during 2021 and 2022 are not an accurate representation of our abstraction, as the data has been aggregated to give monthly totals. We would also question why data outside of the qualifying period has been used in your analysis. In the proposals set out in this document our abstraction limits are based on daily mean flows however the assessment has been done on monthly totals. This approach masks any variation in river flow over the month and is thus not representative, especially given the fact that the rivers in both these locations are very responsive to local weather conditions and river flows can vary dramatically over very small time periods. The canal has a daily requirement in order to maintain its equilibrium and important natural environment. A long period of low abstraction due to low river levels cannot be "offset" by a permitting a slightly higher abstraction rate when river levels increase. Furthermore, any HOF restriction will also be implemented, by you on a daily interval, to provide a higher resolution of protection to the downstream watercourse.*

9. *The volumes of abstraction stated in tables 2 and 3 for Penarth and Tanat varies dramatically from our own abstraction records for this period. We would therefore like to reiterate Adam's request that the flow data used for this analysis is sent to us for our review.*

*We have today received the draft licences for these abstractions and this email is not intended to be the Trusts comprehensive response and there may be other issues we wish to explore once we have received the recently requested information including the data sets and HRA etc. However following a high level initial screening of the drafts received today we are concerned that that these licences will be operationally challenging and potentially impossible to implement.*

*We will carry out our operator review and respond to the draft licence issued next week following receipt of the outstanding requested information. We will aspire to respond to you by 15th December, but this will only be possible if we receive the requested flow data on Monday.*

All the best,

**Nicholas Saiz**

Project Manager
**M** 07584 543214
**E** nicholas.saiz@canalrivertrust.org.uk

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**From:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Sent:** 30 November 2022 16:43
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Cc:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>; Beckett, Mary <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>; Hotchkiss, Alastair <Alastair.Hotchkiss@cyfoethnaturiolcymru.gov.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation
**Importance:** High

**CAUTION: This email originated from an external source. DO NOT CLICK/OPEN links or attachments unless you are certain of their origin.**

Hi All,

I have an update on the flow restrictions we consider necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar. The most plausible licensing scenario would be to include 2 flow restrictions on the River Severn at Penarth, and 3 flow restrictions on the River Tanat at Carreghofa. Please see attached document for further detail on these scenarios, as well as impacts on abstractable volumes for the Montgomery Canal.

We are keen to know whether you would have any further information or supplementary data to allow us to better understand how the proposed restrictions could impact on water levels within the canal (SAC). Would this information be available and if so, would you be able to provide it with some urgency please?

Kathryn, I note that you do not work on Fridays, would it be possible to give you a call tomorrow to discuss please?

Bes wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

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**From:** Lillywhite, Charlotte
**Sent:** 24 November 2022 10:33
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Cc:** New.Authorisations@canalrivertrust.org.uk; Mary Beckett (Mary.Beckett@cyfoethnaturiolcymru.gov.uk) <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Hi All,

At our last meeting you requested the modelling for our initial proposed low flow restrictions, I have been unable to send these, as we have continued our internal discussions around what flow restrictions are necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar, as well as to ensure sufficient water for the canal SAC during periods of low flows. I will receive further modelling by tomorrow and following this I will send an email to get your feedback on our proposed scenarios – i.e., the impact of the flow restriction proposals on how you have historically operated the canal e.g., volumes and depths.

I realise this is unlikely, but would you have any availability for a meeting next week to discuss the above? If not, I will request your feedback by email, and send you draft copies of the licences as soon as possible.

Internal consultees have confirmed the following screening (outlined in my email 18/10/2022) to be acceptable:

- The inclusion of a condition on both licences requiring a screen with spacing no greater than 10mm at the point of abstraction.
- The inclusion of a condition requiring a screen with spacing no greater than 40mm on the overflow weir (at the intake structure) at Penarth.

It would be useful to include the National Grid Reference for the overflow weir within the condition, please can you provide this.

I am sure you aware that the Penarth Feeder is a listed building and a historic monument, and the Tanat Feeder is a historic monument; I wanted to flag that you should engage with Cadw and the Local Authority to discuss the above screening requirements.

Best wishes

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

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**Cadw mewn cysylltiad**
Cofrestrwch i dderbyn e-gylchlythyr Glandŵr Cymru https://canalrivertrust.org.uk/newsletter
Cefnogwch ni ar https://www.facebook.com/canalrivertrust
Dilynwch ni ar https://twitter.com/canalrivertrust ac https://www.instagram.com/canalrivertrust

Mae'r e-bost hwn a'i atodiadau ar gyfer defnydd y derbynnydd bwriedig yn unig. Os nad chi yw derbynnydd bwriedig yr e-bost hwn a'i atodiadau, ni ddylech gymryd unrhyw gamau ar sail y cynnwys, ond yn hytrach dylech eu dileu heb eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

Mae Glandŵr Cymru yn gwmni cyfyngedig drwy warant a gofrestrwyd yng Nghymru a Lloegr gyda rhif cwmni 7807276 a rhif elusen gofrestredig 1146792. Swyddfa gofrestredig: National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

**14/12/2022 Response to questions raised in CRT email dated 09/12/2022.**

RE_ PAN-007395 &
7 Penarth and Tanat

**Original email with questions from CRT:**

CRT questions in *black italic*
NRW Permitting Response in green

*We wish to query why at this stage the River Severn operating agreement ("Operating Rules for the River Severn Resource/ Supply System, February 2012 (Version 6") appears to have been disregarded in the derivation of the proposed flow restrictions. The provisions of the operating agreement already protect the River Severn by limiting our abstractions when flows in the River Severn are regulated by releases from Llyn Clywedog or when reservoir storage is less than 25%. We do not consider therefore that the additional flow restrictions placed on the licences are necessary*.

Based on the following:

- Supporting information (attached) and screen shots below.
- Discussions around the application / 'British Waterways Bill – Agreement Respecting the Montgomery Canal 19/10/1987, Section 9 – Regulation of Flows' dated 05/05/2022 (attached).

RE_ PAN-007395 &
PAN-007397 New Au

- "Operating Rules for the River Severn Resource / Supply System, February 2012 (Version 6)" was not provided as supporting information with the applications. From the supporting information provided, NRW understood the operating rules to mean the conditions set out in the Bill detailed above.
- The Operating Rules / river regulation relate to releases made to offset large downstream abstractions rather than to ensure sufficient flow to protect migratory species of the Severn Estuary SAC and Ramsar. The River Severn could be in a period of low flows and river regulation may not be taking place. The Tanat at Carreghofa is on a tributary of the Vyrnwy, which then flows into the Severn. The flows in the Tanat are not influenced by periods of river regulation and can be considered natural.

13.1 CRT286 Penarth Feeder - Other Abstractions

Penarth Feeder is one of three controlled feeders included within the Montgomery Canal Operating Agreement 1987 between the Trust, Natural Resources Wales and the Environment Agency, along with Tanat Feeder and Maesbury Mill. A separate application has been submitted for Tanat Feeder (CRT141).

An application will not be submitted for Maesbury Mill as we have not used the feeder during the qualifying period 2011-17. We do not own the existing sluice on site nor the land on which it is located. The sluice is owned and operated primarily by a third party, and any water transferred into the Montgomery Canal during the qualifying period has been done so by the third party and not by the Trust to support navigation. The existing infrastructure is currently in disrepair and temporary measures have been put in place to stop any feed from entering the canal.

Please see attached Operating Agreement and below for the requirements of this Operating Agreement relevant to this application:

- Section 9 (b) – 'The Board *[now the Canal & River Trust]* shall limit the amount of water entering the canal during any river regulation period to such extent that the maximum flows specified in paragraphs (c), (d) and (e) below are not exceeded and shall not cause or permit any water to enter the canal by means of the 'Penarth'.....'Feeder'.....'during any such period of time when the storage of water in Llyn Clywedog is less than 25% of its capacity at the date of this agreement.'
- Section 9 (c) – 'The maximum flow passing down the canal at Byles Lock including any flow in any bypass channel at that point during any river regulation period shall be –
  - (i) 150Ml in any period of 7 days when no order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged by the water authority from Llyn Clywedog and the amount of water released from Llyn Clywedog exceeds 300Ml per day but does not attain 500Ml per day;
  - (ii) 115Ml in any period of 7 days when such releases attain 500Ml per day; and;
  - (iii) 50Ml in any period of 7 days during which an order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged by the water authority from Llyn Clywedog.

13.1 CRT414 Tanat Feeder - Other Abstractions

Tanat Feeder is one of three controlled feeders included within the Montgomery Canal Operating Agreement 1987 between the Trust, Natural Resources Wales and the Environment Agency, along with Penarth Feeder and Maesbury Mill. A separate application has been submitted for Penarth Feeder (CRT286).

An application will not be submitted for Maesbury Mill as we have not used the feeder during the qualifying period 2011-17. We do not own the existing sluice on site nor the land on which it is located. The sluice is owned and operated primarily by a third party, and any water transferred into the Montgomery Canal during the qualifying period has been done so by the third party and not by the Trust to support navigation. The existing infrastructure is currently in disrepair and temporary measures have been put in place to stop any feed from entering the canal.

Please see attached Operating Agreement and below for the requirements of this Operating Agreement relevant to this application:

- Section 9 (b) – 'The Board *[now the Canal & River Trust]* shall limit the amount of water entering the canal during any river regulation period to such extent that the maximum flows specified in paragraphs (c), (d) and (e) below are not exceeded and shall not cause or permit any water to enter the canal by means of the 'Tanat'.....'Feeder'.....'during any such period of time when the storage of water in Llyn Clywedog is less than 25% of its capacity at the date of this agreement.'
- Section 9 (d) – 'The maximum flow passing down the feeder channel from the river Tanat to the Canal at Carreghofa lock during any river regulation period shall be –
  - (i) 49Ml in any period of 7 days; or
  - (ii) such lesser amount as may be specified by the water authority in order to maintain at any time a residual flow of 15Ml per day downstream of the weir known as the Carreghofa or Tanat Weir, to be calculated by reference to the water authority's river gauge at Llanyblodwell and by reference to gaugings taken by the water authority below such weir.

*Additionally, we have been through the Word document entitled "CRT New Authorisations licence applications: Severn @ Penarth and Tanat @ Carreghofa - Considering abstraction restrictions to protect low flows". We have a few initial comments to make ahead of receiving the flow data as requested by Adam, and also our review of the draft licences for Penarth and Tanat.*

1. *The abstraction restrictions set out in the Operating Agreement provide protection for the local environment. For example, the clause which sets out the maximum height of spill over the weir at Trwstllewellyn (25mm) ensures that the Trust does not abstract more water than is required to maintain the environment and water level within the canal SSSI and SAC, but also protects the continuation flow in the river. This is not referenced as a condition in the draft licence or the previously received proposal but as this already provides adequate protections we would request this is included as a condition rather than the three staged HOF conditions proposed.*

- As above NRW understood the operating agreement / rules to mean the conditions set out in the Bill. The Operating Rules / river regulation relate to releases made to offset large downstream abstractions rather than to ensure sufficient flow to protect migratory species of the Severn Estuary SAC and Ramsar.
- We are unclear what 25mm equates to in terms of flow, and abstraction as a percentage of flow in the river.

2. *The flow standards that you quote go beyond a light touch regulation and should not be applied under new authorisations for water which has long been abstracted and was previously exempt.*

- Under the 2017 Government response and Transitional Regulations 2017, applications are only expected to be significantly curtailed to protect the environment from 'serious damage'.
- NRW considers serious damage to apply where an abstraction is affecting or has the potential to affect sites designated under the Habitats Regulations. This means that conditions required to conclude 'no adverse effects' to protected sites are also required to protect against serious damage.

3. *The headline figures which are quoted to show the proportion of river flow that we abstract at low flows (Q95) are incorrect. These calculations have been made using the maximum instantaneous volumes applied for in our application. Our abstraction is not pumped, it is a gravity feed abstraction, the volume of which is determined by the opening of the abstraction sluices and the driving head which is also a function of the varying river level. As the river flow decreases so does the river level and thus so does our abstraction. As the river flow increases, our abstraction increases. The maximum instantaneous flow will have coincided with a period of HIGH river flow, and not LOW river flow. It will have also only occurred over a short period of the abstraction. It does not reflect our continuous abstraction rate.* ***Therefore, it appears that you have miscalculated our abstraction and consider it to be greater than it is, resulting in unnecessary regulatory constraints.*** *If you recalculate our abstraction using a mean abstraction rate, you will find that the River Severn operating guidelines provide sufficient protection to the downstream donor water courses, based on a reduced abstraction rate.*

- We acknowledge that the maximum abstraction quantities applied for may not necessarily reflect a consistent abstraction regime, or the abstraction regime during low flows. However, these figures were applied for and evidenced, and shall be included as the maximum abstraction rates on the licence. The maximum abstraction rate condition does not allow for consideration of reduced abstraction rates you detail above, or protection of low flows. Therefore, we have had to use them as 'static' value to assess the potential impact of imposing low flow restrictions (at both locations) on abstractable volumes for the canal. This also means that the reduction in potential abstractable volumes for the canal (during a typical year or drought and low flow conditions) really do demonstrate the worst 'potential' scenario, and as you have

indicated that the maximum abstraction rates would not be possible during a period of low flows, our proposed low flow restrictions should have a much lower impact on potential abstractable volumes than our modelling suggests.

- The low flow restrictions also prevent changes to the intake structures that could allow a greater abstraction rate at low flows.
- As above NRW understood the operating agreement / rules to mean the conditions set out in the Bill. The flows in the Severn at Penarth are higher during periods of river regulation than would typically be expected. However, the Tanat at Carreghofa is on a tributary of the Vyrnwy, which then flows into the Severn. The flows in the Tanat are not influenced by periods of river regulation and can be considered natural.
- The flow standards detail 'acceptable deviation from natural flows', and the proposed flow restrictions were considered in line with this. As the Severn abstraction is influenced by river regulation, these restrictions are less likely to apply, whereas they are on the Tanat which is not influenced by river regulation. Therefore, we consider the flow restrictions necessary to ensure the proposals will not adversely affect the integrity of any Natura 2000/Ramsar site, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects.

4. *The conversion of the hourly and daily maximum flows to an average instantaneous flow, which is then used to compare our abstraction to proposed abstraction rates, does not make hydrological sense.*

- As above. The maximum instantaneous, hourly, and daily rates of abstraction evidenced exceed relevant flow standards. Particularly the sub-daily rates. We have had to assess the abstraction this way in order to understand the worst-case impacts and what restrictions might be necessary to protect low flows and the environment.

5. *The numbers given in Table 1 for the Penarth abstraction, as well as Figure 1, are incorrect as these figures are based on the maximum applied for abstraction rate. It is noted in the text that the assessment is based on the Trust abstracting the maximum applied for volume however as previously stated this is not possible and furthermore, as can be seen in figures 8.51 in our Supporting Information for Penarth and Tanat our abstractions vary enormously over time. These figures and graphs are therefore misleading and incorrect. NRW's assessment of our maximum abstraction is not correctly calculated based on the hydrology and hydraulics at this site. It is crucial to express that these abstraction quantities are not physically possible at all times. For our max instantaneous rate to be achieved the upstream driving head would need to be much higher than it is for the majority of the time, this will only occur during periods of high flow. The structures at these locations limit our abstraction to a rate much lower than the max instantaneous rate for the majority of the time, based on the varying river level.*

- As above. We can acknowledge this in our determination documentation.

6. *The abstraction figures for the initial abstraction regime considered at Tanat with two flow restrictions includes a limit of the maximum hourly rate applied for, rather than the maximum instantaneous flow. This does not therefore replicate the abstraction during the qualifying period, for the reasons explained above. At flows above Q86 it is proposed to limit our abstraction to 0.158 m3/s, the maximum hourly abstraction rate. This limit is considerably less than the maximum instantaneous abstraction of 0.376 m3/s that was evidenced during the qualifying period and would kick in during periods of high flow. This would make more sense if the abstraction was by means of pump rather than a gravity feed of which it is.*

- As above.

7. *The abstraction figures for the initial abstraction regime considered at Tanat with two flow restrictions includes an abstraction limit of 5.9% of the river flow at the second trigger point. This is inconsistent with the statement on the first page of the document which stated: The Flow Standards broadly agree that abstraction of no more than 10% of the natural flow is appropriate for flows below Q95, and 15% for flows between approx. Q95 and Q50. This proposal is therefore inconsistent with NRW's own statement.*

- We initially considered 2 restrictions for the Tanat, however, following discussion with the Protected Sites Advisor, we felt that 3 restrictions reduced potential impacts on abstractable volumes for the canal. The restrictions are based on the maximum abstraction rates applied for meaning the restrictions apply at higher flows than Q95 to ensure the flow restrictions were met.
- The nature of the stepped restrictions we are proposing means there will be times when the abstraction is less than 10% or 15% of flow. A way to avoid this could be to introduce more stepped restrictions, however, we are unable to consider this currently due to the statutory deadline of 31/12/2022 – it is also worth noting that additional steps would also introduce more complexity in terms of operating the intake and ensuring compliance.

8. *Tables 2 and Tables 3 showing the impact that the different flow restrictions would have had on our abstraction at Penarth and Tanat, respectively, during 2021 and 2022 are not an accurate representation of our abstraction, as the data has been aggregated to give monthly totals. We would also question why data outside of the qualifying period has been used in your analysis. In the proposals set out in this document our abstraction limits are based on daily mean flows however the assessment has been done on monthly totals. This approach masks any variation in river flow over the month and is thus not representative, especially given the fact that the rivers in both these locations are very responsive to local weather conditions and river flows can vary dramatically over very small time periods. The canal has a daily requirement in order to maintain its equilibrium and important natural environment. A long period of low abstraction due to low river levels cannot be "offset" by a permitting a slightly higher abstraction rate when river levels increase. Furthermore, any HOF restriction will also be implemented, by you on a daily interval, to provide a higher resolution of protection to the downstream watercourse.*

- These tables were produced only to provide an indication of how abstraction volumes could be affected by the proposed restrictions and on the assumption that you abstract at the maximum permitted rates (in line with the qualifying period) regardless of intake limitations. These years were assessed as they were the only years where (given the extremely tight timescales) we had data to hand that identified which days the Severn was being regulated.

9. *The volumes of abstraction stated in tables 2 and 3 for Penarth and Tanat varies dramatically from our own abstraction records for this period. We would therefore like to reiterate Adam's request that the flow data used for this analysis is sent to us for our review.*

We understand the need for you to review the data to appreciate how we have modelled the restrictions. However, this will need to be provided and explained by technical specialists from our Hydrology team and we will be unable to arrange this prior to the issue of the licence given the fixed legislative time constraint of this programme.

We have determined that the restrictions are necessary to prevent serious damage to migratory features of the Severn Estuary designations and this is consistent with how we have licensed restrictions on other applications following the completion of our HRA (to conclude that the proposals will not adversely affect the integrity of any Natura 2000/Ramsar). When the licences are issued we will provide the HRA documents to allow you to further understand the justification for the flow restrictions and screening.

In relation to your licences the restrictions are unlikely to be applicable until the late spring / early summer months, allowing time to gather and review any further evidence to demonstrate whether any changes could be made. We can initiate an NRW led variation to a licence where appropriate. We are happy to continue further dialogue with you once the licences are issued to understand your further concerns particularly around the impact to SAC features.

At this time, we would ask that you complete your operator review of the licences so any admin changes can be made prior to the licence being issued.

## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 09 December 2022 07:15
**To:** Adam Comerford; Kathryn Maye; Nicholas Saiz
**Cc:** WA 2003 New Authorisations; Beckett, Mary; Lansdown, Ashley
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders Operator Review of Draft Licences
**Attachments:** PAN-007397 DRAFT NA Transfer Abstraction Licence Word Copy.doc; PAN-007395 DRAFT NA Transfer Abstraction Licence Word Copy.doc

**Follow Up Flag:** Filed to: \\My DMS View\PAN-007397 Tanat Feeder

**Categories:** Filed

Hi All,

Please find draft licences attached for the above NA applications. I must caveat that these licences are still subject to internal review, therefore, there could still be some changes. Please can you provide any comments by 15/12/2022.

Best wishes,

Charlotte
Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

cyfoethnaturiol.cymru / naturalresources.wales
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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Water Resources
## LICENCE TO
## ABSTRACT
## WATER

DRAFT

Environment Act 1995
Water Resources Act 1991 as amended by the Water Act 2003
Water Resources (Abstraction and Impounding) Regulations 2006
Natural Resources Body for Wales (Functions) Order 2012
Water Abstraction (Transitional Provisions) Regulations 2017

# IMPORTANT NOTES

## Need for safekeeping

This licence is an important document. The permission or right to abstract water may be valuable to your landholding. So -

- **Keep the licence safe, preferably with your deeds etc.**
- **Take careful note of the comments below about "transfer and apportionment" and "death and bankruptcy".**

**This is to ensure that the permission and any rights granted by the licence continue if you need to pass it on to someone else.**

**If you want to:**

- **revoke (cancel) the licence;**
- **vary (change/amend) the licence in any way or**
- **change your contact address (but you continue to hold the licence).**

**Please write to us at your local Natural Resources Wales office.**

Details of this licence are placed on a register, kept by Natural Resources Wales and open for inspection by the public. The public may also obtain further details about it by virtue of the Environmental Information Information Regulations 2004 (see also Disclosure of Information) except in special cases (for advice please contact us at the address shown on the front page of the licence).

## Transfer and apportionment

If you need to pass this licence or any part of it to someone else, you must contact Natural Resources Wales and obtain the appropriate application forms. Temporary licences cannot be transferred or apportioned. The licence holder remains responsible for compliance with the terms of the licence and any charges payable until the licence has been transferred or apportioned.

## Death or bankruptcy of the licence holder

If a licence has been **'vested'** in you, as a result of the death or bankruptcy of the licence holder, please contact Natural Resources Wales in writing, telling us the licence number(s) and the date that the licence vested in you as a personal representative or trustee of the licence holder. This is necessary in order to enable you to subsequently transfer the licence.

**'Vesting'** is the transfer of responsibility and ownership of a licence when an existing licence holder is no longer able to hold the licence either through death or bankruptcy.

You do not have to complete a form, but you must notify us in writing within 15 months of the date of vesting, giving the full names of all personal representatives or trustees and a contact address.

## Time limits

Your licence may be subject to a time limit (stated on the front of your licence). All new abstraction licences are legally required to include a time limit. For variations to licences, time limits are added in accordance with our policy.

The duration of a time limit is determined in accordance with our time limiting policy. The time limit is linked to the next or subsequent review of water resources within a Catchment Abstraction Management Strategy (CAMS).

There will be a presumption of renewal providing three tests are met: environmental sustainability is not in question; there is continued justification of need; and water is being used efficiently. Any application for renewal will still be subject to the normal statutory considerations.

If your licence is time limited and you wish to renew it when it expires, you will need to apply for a new licence to replace the existing one. You are advised to submit this application at least three months before it expires. To allow you to give early consideration to this, we will send you a reminder approximately 18 months before the expiry date.

If your licence cannot be renewed, we will endeavour to give at least six years notice. We will also endeavour to give at least six years notice where the licence is likely to be renewed on different terms and will significantly impact upon the use of the licence.

In exceptional circumstances, for example where there are other overriding statutory duties such as the Habitats Regulations, it may not be possible to provide six years notice.

## Charges

Unless specifically exempted, we may levy an annual CHARGE for water AUTHORISED to be abstracted by this licence, in accordance with our abstraction charges scheme in force at the time.

**The licence may be revoked if charges are not paid.**

## Quantity and quality of water

You must not abstract more than the quantity specified in the licence.

Natural Resources Wales does not, by issue of this licence or otherwise, in any way guarantee that the source of supply will produce the quantity of water authorised to be abstracted by this licence, nor that the water is fit for its intended use.

The quantity of water authorised for abstraction is given in cubic metres. One cubic metre is approximately 220 gallons.

(The precise conversion is 1 cubic metres = 219.969 gallons).

## Source of supply and authorised point of abstraction

You may abstract from the point(s) specified in the licence and from no other points. If you want to add or change the authorised point(s) of abstraction, you must apply to us to vary the licence.

## Land on which water is authorised to be used

Where this condition applies, you may only use the water you abstract on the area specified in the licence. You must apply to us to vary the licence if you wish to extend or alter this area or remove it.

## Purpose for which water is authorised to be used

You may only use the water for the purpose(s) specified in the licence. You must apply to us to vary the licence if you wish to add to or change the purpose(s).

## Offences

Under the Water Resources Act 1991 it is an offence:-

- to abstract water, or cause or permit any other person to abstract water, unless the abstraction is authorised by and in accordance with an abstraction licence, or is subject to an exemption;
- to do anything to enable abstraction, or to increase abstraction, except in accordance with an abstraction licence or exemption;
- to fail to comply with the conditions of an abstraction licence. **Note in particular that it may be a condition of the licence to maintain the meter or other measuring device etc. and failure to do so will be an offence;**
- to interfere with a meter or other device which measures quantities of water abstracted so as to prevent it from measuring correctly;
- to fail to provide information which we have reasonably required for the purpose of carrying out any of the Natural Resources Wales water resources functions;
- to knowingly make false statements for the purpose of obtaining a licence or consent or in giving required information.

The requirement for a licence is subject to some exemptions, set out in the Water Resources Act 1991 as amended. If in any doubt as to whether you need a licence, contact us at the address shown at the bottom of the front page of the licence.

## Right of appeal

If you are dissatisfied with our decision on your licence application, you may appeal.

If you are in England, you should write to the Secretary of State for the Environment, Food and Rural Affairs, care of The Planning Inspectorate at:
Room 4/19 Eagle Wing,
Temple Quay House,
2 The Square,
Temple Quay,
Bristol,
BS1 6PN.

If you are in Wales, you should write to Welsh Government care of
The Planning Inspectorate at:
Crown Buildings,
Cathays Park,
Cardiff,
CF10 3NQ.

You must serve notice of appeal within 28 days of the date of receipt of this licence (although the Secretary of State and The Welsh Government have power to allow a longer period for serving notice of appeal). See Water Resources Act 1991, section 43.

## Disclosure of information

Information about this licence is available in the public Register held by Natural Resources Wales. Members of the public are also entitled to ask us for other "environmental information" it holds, including any activities likely to affect "the state of any water" or any "activities or other measures designed to protect it". That would include the information additional to the licence document e.g. any related agreement or abstraction returns. In certain restricted circumstances it is possible to claim that information should be kept confidential. If you require more information about keeping this information off the public register because it is confidential, please contact us by writing to the address shown on the front page of the licence within 28 days of receiving this licence.

| Licence serial number | WA/054/0001/xxxx |
|---|---|

Please quote the serial number in all correspondence about this licence

Cyfoeth Naturiol Cymru
Natural Resources Wales

# TRANSFER LICENCE TO ABSTRACT WATER

The Natural Resources Body for Wales (hereafter referred to as "NRW") grants this licence to:-

Canal & River Trust ("the Licence Holder")

National Waterways Museum Ellesmere Port
South Pier Road
Ellesmere Port
Cheshire
England
CH65 4FW

Company Registration Number: 07807276

This licence authorises the Licence Holder to abstract water from the source of supply described in the Schedule of Conditions to this licence and subject to the provisions of that Schedule. The licence commences from the effective date shown below and shall remain in force until the date of expiry shown below.

Signed:

Ashley Lansdown
Permitting Team Leader
Permitting Service
Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

Date of issue……...xx December 2022

Date effective……xx December 2022

Date of expiry……31 March 2034

This licence should be kept safe, and its existence disclosed on any sale of the property to which it relates. Please read the 'important notes' on the cover to this licence.

Note: References to "the map" are to the map which forms part of this licence.
References to "NRW" are to the Natural Resources Body for Wales or any successor body.

Environment Act 1995
Water Resources Act 1991 as amended by the Water Act 2003
Water Resources (Abstraction and Impounding) Regulations 2006
Article 3 of the Natural Resources Body for Wales (Establishment) Order 2012
The Natural Resources Body for Wales (Functions) Order 2013
Water Abstraction (Transitional Provisions) Regulations 2017

DRAFT

| Licence serial number | WA/054/0001/xxxx |
|---|---|

# SCHEDULE OF CONDITIONS

**1. SOURCE OF SUPPLY**

1.1 Inland water (river) known as River Severn at Penarth Feeder, Penarth Pool Road, Newtown, Powys.

**2. POINT OF ABSTRACTION**

2.1 At National Grid Reference SO 13965 92624 marked 'Point A' on the map.

**3. MEANS OF ABSTRACTION**

3.1 Gravity flow to an open channel controlled by sluice gates.

**4. PURPOSE OF ABSTRACTION**

4.1 Transfer for the purpose of operations in the course of carrying out functions as a Navigation Authority.

**5. PERIOD OF ABSTRACTION**

5.1 All year.

**6. MAXIMUM QUANTITIES OF WATER TO BE ABSTRACTED**

6.1 **Subject to further conditions 9.1 and 9.2:**

821.3 cubic metres per hour
14,574 cubic metres per day
2,311,216 cubic metres per year

An hour is any period of 60 consecutive minutes, a day means any period of 24 consecutive hours and a year means the 12 month period beginning on 1 April and ending on 31 March.

**7. MEANS OF MEASUREMENT OF WATER ABSTRACTED**

7.1 (i) The Licence Holder shall use a thin plate weir structure to measure the quantity of abstracted water flowing through the lock bypass channel at Byles Lock. The head of water through this structure shall be measured using a measuring device.

(ii) No abstraction shall take place unless the Licence Holder has installed the structure and measuring device required in condition 7.1 (i) above unless otherwise agreed in writing by NRW.

(iii) The Licence Holder shall maintain, repair, or replace the structure and measuring device to ensure that accurate measurements of quantities of water are recorded at all times.

(iv) The Licence Holder shall retain evidence of current certification for inspection by NRW. The formula used to convert head to flow shall be approved in writing by NRW.

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7.2 (i) No abstraction shall take place unless the Licence Holder has installed a device to measure the frequency of filling and emptying of the lock chamber at Byles Lock, unless otherwise agreed in writing by NRW.

(ii) The Licence Holder shall position and install the device in accordance with any written directions given by NRW.

(iii) The Licence Holder shall maintain, repair, or replace the device to ensure that accurate measurements are recorded at all times.

(iv) The Licence Holder shall keep all records of device repair or replacement including evidence of current certification for a period of 6 years. The formula used to calculate lockage flow shall be approved in writing by NRW.

## 8. RECORDS

8.1 (i) Quantities of water calculated by the means specified in conditions 7.1 and 7.2 above shall be recorded by the Licence Holder at the same time each day during the whole of the period during which abstraction is authorised or as otherwise approved in writing by NRW.

(ii) The Licence Holder shall send to NRW a copy of the record required by condition 8.1 (i) or summary data to NRW within 28 days after 31 March in each year and also within 28 days of being so requested in writing by NRW.

(iii) Each record shall be kept and be made available during all reasonable hours for inspection by NRW for at least 6 years.

## 9. FURTHER CONDITIONS

9.1 **Subject to condition 9.2 below:**

When the flow in the River Severn as gauged by NRW at Dolwen Gauging Station is less than 0.86 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

**Commented [LC1]:** NRW Gauging station River Severn at Dolwen - River levels, rainfall and sea data (naturalresources.wales) – Website link and all level equivalents to be included in the issue letter.

**Table 1**

| When the flow (cubic metres per second) in the River Severn as gauged at Dolwen Gauging Station is: | The maximum quantity of water to be abstracted shall not exceed: | |
|---|---|---|
| | cubic metres per hour | cubic metres per day |
| less than 0.86 and greater than or equal to 0.7 | 360 | 8,640 |
| less than 0.7 | 180 | 4,320 |

9.2 **During any 'river regulation period':**

(i) No abstraction shall take place when the storage capacity of Llyn Clywedog is less than 25%.

(ii) When a drought order is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by NRW at its flow gauging station at Dolwen is greater than or equal to 0.7 cubic metres per second, abstraction shall not exceed 50 mega litres in any period of 7 days.

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(iii) When a drought order is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by NRW at its flow gauging station at Dolwen is less than 0.7 cubic metres per second, abstraction shall not exceed 180 cubic metres per hour and 4,320 cubic metres per day.

9.3 The Licence Holder shall discharge all of the water abstracted in pursuance of this licence to the Montgomery Canal at National Grid Reference SO 13906 93017 marked 'Point Q' on the map.

9.4 (i) No abstraction shall take place unless the Licence Holder has installed a screen with spacing no greater than 10 millimetres to the point of abstraction to prevent the entrapment, entrainment, or impingement of fish.

(ii) The Licence Holder shall maintain the fish screen in accordance with the manufacturer's specifications and keep records of such maintenance available for inspection.

9.5 (i) No abstraction shall take place unless the Licence Holder has installed a screen with spacing no greater than 40 millimetres to the point of discharge to the River Severn from the overflow weir to prevent the entrapment, entrainment, or impingement of fish.

(ii) The Licence Holder shall maintain the fish screen in accordance with the manufacturer's specifications and keep records of such maintenance available for inspection.

**Commented [LC2]:** Would like to include NGR if possible, are you able to provide this please?
It would slot into the following condition if you were able to provide:
*No abstraction shall take place unless the Licence Holder has installed a screen with spacing no greater than 40 millimetres to the point of discharge to the River Severn from the overflow weir at National Grid Reference xx to prevent the entrapment, entrainment, or impingement of fish.*

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| Licence serial number | WA/054/0001/xxxx |
|---|---|

## ADDITIONAL INFORMATION

Note: the following information is provided for information only. It does not form part of the licence.

**REASONS FOR CONDITIONS**

The licence is time-limited to a date to reflect the timing of a future review of the catchment resources availability.

Condition 6: The licence includes a maximum abstraction quantity condition in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. This is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.

Conditions 7 and 8: The abstraction is required to be measured to demonstrate compliance with the terms of the licence and to provide information on actual water usage for water planning purposes.

Condition 9.1 The licence includes a bespoke flow restrictions condition deemed necessary in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. This is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.

Condition 9.2: To reflect the Licence Holder's position in the qualifying period.

Condition 9.3: To ensure the abstraction can be classed as a transfer of water from one source of supply to another.

Condition 9.4: to prevent the entrapment, entrainment, and impingement of fish at the point of abstraction. This condition is deemed necessary in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. This is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.

Condition 9.5: to prevent the entrapment, entrainment, and impingement of fish at the point of discharge to the River Severn from the overflow weir. This condition is deemed necessary in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. This is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.

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**IMPORTANT NOTES**

This licence has been issued under the Water Abstraction (Transitional Provisions) Regulations 2017, which requires previously exempt abstractions to become regulated.

For the purposes of Conditions 7.1, 7.2 and 8.1, the Licence Holder shall contact:

Senior Officer People and Places Team
Natural Resources Wales
Maes y Ffynnon
Penrhosgarnedd
Bangor
Gwynedd
LL57 2DW
Tel: 0300 065 3000
Email: Mid.People.Places.Team@cyfoethnaturiolcymru.gov.uk

**Definitions**

- 'River regulation period' means any period of time that water is being or about to be released from Llyn Clywedog to support the flow in the River Severn.
- 'Drought order' as defined under the Water Resources Act 1991.

**Condition 7.1: Formulas to calculate flow through the lock bypass channel from the recorded head over the weir**

Flow is calculated from the recorded head over the weir using the following standard weir equation for thin plate weirs:

$$Q_B = Cd \times (2/3 \times \sqrt{2g}) \times b \times (h^{3/2})$$

- $Q_B$ is the bypass flow in $m^3/s$
- Cd is the coefficient of discharge
- g is acceleration due to gravity in $m/s^2$
- b is the breadth of the weir in m
- h is the recorded head of water over the weir in m

The applicant confirmed the thin plate weir dimensions as follows:

- b is the measured width of the notch in m, b = 0.600m
- B is the width of the approach channel in m, B = 1.650m
- p is the height of the crest relative to the floor in m, p = 0.200m
- H max is the maximum head above crest level in m, H max = 0.360m

The rating equation used to calculate flow from the recorded head over weir is as follows:

$Q_B = 3.794 \times h^{1.492}$

- $Q_B$ is the volumetric rate of flow in $m^3/s$
- h is the head above crest level in m

**Condition 7.2: Formula to calculate lockage flow**

The filling and emptying of a lock chamber referred to as 'lockage' is monitored using a lock counter. Lockage flow is derived from the following equation:

$Q_L = L \times V$

- $Q_L$ is the lockage flow in $m^3$
- L is the recorded lockage
- V is the lock volume in $m^3$

The applicant confirmed the lock volume to be $121m^3$.

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**Formula to calculate total volume of abstracted water flowing through the bypass channel and lock**

The total volume of abstracted water is calculated using the following equation:

$Q = Q_B + Q_L$

- Q is the total flow / abstracted water in $m^3$
- $Q_B$ is the bypass flow in $m^3/s$
- $Q_L$ is the lockage flow in $m^3$

**Water efficiency note**

The Licence Holder should use water abstracted under the terms of this licence in an efficient manner. NRW may refer to its guidance on water efficiency (or equivalent guidance) in determining whether water is being used efficiently and may offer advice on any measures considered necessary to meet particular recommendations.

**Metering**

NRW will have regard to its Abstraction Metering Good Practice Manual (or equivalent guidance) in directing any of the following: where the meter should be located or how it should be installed; whether the meter measures accurately, and/or is properly maintained; whether it is necessary to require repair or replacement of the meter.

**Screening**

NRW will have regard to its Screening for Intakes and Outfalls: A Best Practice Guide (or equivalent guidance) in agreeing where, how, and what type of fish screens should be installed and together with the results of any monitoring in determining whether the fish screens are properly effective and maintained, and in judging whether it is necessary to require repair or replacement of the fish screens.

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Point Q
Point A
Neuadd-fraith
Tynycoed
Canal Bridge
Fron-do
Freestone
Dolfor Farm
Pwll Penarth
Weir
Dolfor Lock
Sewage Works
Penarth
Glan-Hafren
Broniarth
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**Would you like to find out more about us, or about your environment?**

**Then call us on**
**0300 065 3000** (Mon-Fri 9-5)

**email**
**enquiries@naturalresourceswales.gov.uk**

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**www.naturalresourceswales.gov.uk**

**incident hotline 0300 065 3000** (24hrs)
**floodline 0345 988 1188**

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## Lillywhite, Charlotte

**From:** Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>
**Sent:** 15 December 2022 15:28
**To:** Lillywhite, Charlotte
**Cc:** WA 2003 New Authorisations; Beckett, Mary; Lansdown, Ashley; Kathryn Smith; Sarah Temple - Phillips; Kathryn Maye; Adam Comerford
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders Operator Review of Draft Licences

Charlotte,

The Trust would like to refer you back to the email of last week, sent by the Trust on 9/12/2022, in response to the proposals set out by email by NRW on 30 November 2022. Whilst the Trust received a response to these comments on 14/12/2022, we have not had opportunity to consider these, and the Trust are not able to provide any further response given time constraints as NRW have requested an operator review response by today 15/12/22.

Our specific responses regarding Tanat and Penarth draft licences are detailed below, however these are not comprehensive responses regarding the challenges we have previously made in writing to you, as stated above:

**Penarth**

Comments relating to 3.1

The Trust request that this should read "Gravity flow to an open channel controlled by a weir and sluice gates".

Comments relating to 6.1

The Trust would like to query why an hourly max quantity is needed, none of our other NA NRW transfer licences have one, apart from Llantysilio which we see as an exception. We would ask you to remove this for consistency as we consider this an additional regulatory burden with no environmental benefit.

The Trust also asks that the annual maximum is removed from the licence as it restricts the Trust from abstracting for more than 158 days at the maximum daily abstraction of 14.6 Ml/d. Again, this is an additional regulatory burden with no environmental benefit.

We also challenge some definitions. Please alter the definition of the day: "A day means any period of 24 consecutive hours". This effectively makes the daily mean an hourly flow condition and is inconsistent with condition 8.xx, because as drafted, the licence does not require any more than 1 measurement being recorded at the same time each day. Therefore the definition of a "day" in 6.xx should be changed to "24 hours starting midnight". This also applies to your definition of an hour that we wish for you to reconsider.

Comments relating to 7.1 and 7.2

Please remove all reference to the "bypass flow and frequency of filling and emptying of the lock chamber " and replace with one condition expecting the Trust to install and maintain a measuring device at Byles Lock. The Trust feel this is unnecessary detail.

Comments relating to 8.1 (ii):

It is an unnecessary regulatory burden to supply data every March on a transfer licence and so we request the following text: "The Licence Holder shall send to NRW a copy of the record required by condition 8.1 (i) or summary data to NRW ~~**within 28 days after 31 March in each year and also**~~ within 28 days of being so requested in writing by NRW." We note this has been accepted in relation to Llantysilio.

Comments relating to 9.1 & 9.2

Please refer to comments previously provided and our initial paragraph within this email. The Trust are unable to comment on impacts on Montgomery designated sites or on abstraction generally as we have not been given sight of the HRA and have not received the requested flow data.

Comments relating 9.4 & 9.5 (ii)
The Licence Holder shall maintain the fish screen **to ensure that it remains effective at all times** ~~**in accordance with the manufacturer's specifications**~~ and keep records of such maintenance available for inspection.

Comments relating to 9.5
The Trust cannot provide an NGR for a proposed fish screen as we do not have this at present.

Comments relating to Important Notes.
Please remove the section on condition 7.1. and 7.2 as this is unnecessary detail and was only provided as contextual information as part of the application to enhance NRW's understanding of this site.

**Tanat**

Comments relating to 6.1
The Trust would like to query why an hourly max quantity is needed, none of our other NA NRW transfer licences have one, apart from Llantysilio which we see as an exception. We would ask you to remove this for consistency as we consider this an additional regulatory burden with no environmental benefit.

The Trust also asks that the annual maximum is removed from the licence as it restricts the Trust from abstracting for more than 210 days at the maximum daily abstraction of 9.1 Ml/d. Again, this is an additional regulatory burden with no environmental benefit.

We also challenge some definitions. Please alter the definition of the day: "A day means any period of 24 consecutive hours". This effectively makes the daily mean an hourly flow condition and is inconsistent with condition 8.xx, because as drafted, the licence does not require any more than 1 measurement being recorded at the same time each day. Therefore the definition of a "day" in 6.xx should be changed to "24 hours starting midnight". This also applies to your definition of an hour that we wish for you to reconsider.

Comments relating to 7.1 and 7.2
Please remove all reference to the "broad crested weir and rectangular flume structure" and replace with one condition expecting the trust to install and maintain a measuring device. The Trust feel this is unnecessary detail.

Comments relating to 8.1 (ii):
It is an unnecessary regulatory burden to supply data every March on a transfer licence and so we request the following text: "The Licence Holder shall send to NRW a copy of the record required by condition 8.1 (i) or summary data to NRW ~~**within 28 days after 31 March in each year and also**~~ within 28 days of being so requested in writing by NRW." We note this has been accepted in relation to Llantysilio.

Comments relating to 9.1 & 9.2
Please refer to comments previously provided and our initial paragraph within this email. The Trust are unable to comment on impacts on Montgomery designated sites or on abstraction generally as we have not been given sight of the HRA and have not received the requested flow data.

Comments relating 9.4 & 9.5 (ii)
The Licence Holder shall maintain the fish screen **to ensure that it remains effective at all times** ~~in accordance with the manufacturer's specifications~~ and keep records of such maintenance available for inspection.

Comments relating to Important Notes.
Please remove the section on condition 7.1. as this is unnecessary detail and was only provided as contextual information as part of the application to enhance NRW's understanding of this site.

**General comments relating to both licences**
Given the numerous comments and concerns we have raised here in response to these operator reviews, in addition to the concerns we raised separately in our email of 9/12/2022, we would expect NRW to incorporate these into a revised draft licence and provide the Trust an opportunity for further review next week ahead of issue. This will also

provide you with the opportunity to incorporate any further changes made following completion of your internal review.

We would again request a copy of the full Habitat Regulations Assessment and supporting evidence, including the requested flow data, prior to issue, in order that we can properly consider this and take legal advice. Without this, we are likely to have no alternative but to appeal.

I note that you are due to issue this licence imminently; given that the Trust has 28 days in which to seek legal advice on the merits of an appeal, and then draft the appeal documentation if necessary and we haven't yet seen the HRA evidence- we would request NRW to hold off issuing this licence until the end of the determination period, so that the Trust will be able to use January to seek this advice. It is in both parties' interests to ensure that the Trust can have the time to seek this advice. I note a delay to issuing the Llantysilio licence in the week commencing 19 December has now been communicated and request the same for these licences.

All the best,

**Nicholas Saiz**
Project Manager
**M** 07584 543214
**E** nicholas.saiz@canalrivertrust.org.uk

---

**From:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Sent:** 09 December 2022 07:15
**To:** Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>; Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>
**Cc:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>; Beckett, Mary <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders Operator Review of Draft Licences

**CAUTION: This email originated from an external source. DO NOT CLICK/OPEN links or attachments unless you are certain of their origin.**

Hi All,

Please find draft licences attached for the above NA applications. I must caveat that these licences are still subject to internal review, therefore, there could still be some changes. Please can you provide any comments by 15/12/2022.

Best wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

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Follow us on https://twitter.com/canalrivertrust and https://www.instagram.com/canalrivertrust

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Canal & River Trust is a charitable company limited by guarantee registered in England & Wales with company number 7807276 and charity number 1146792. Registered office address National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

**Cadw mewn cysylltiad**
Cofrestrwch i dderbyn e-gylchlythyr Glandŵr Cymru https://canalrivertrust.org.uk/newsletter
Cefnogwch ni ar https://www.facebook.com/canalrivertrust
Dilynwch ni ar https://twitter.com/canalrivertrust ac https://www.instagram.com/canalrivertrust

Mae'r e-bost hwn a'i atodiadau ar gyfer defnydd y derbynnydd bwriedig yn unig. Os nad chi yw derbynnydd bwriedig yr e-bost hwn a'i atodiadau, ni ddylech gymryd unrhyw gamau ar sail y cynnwys, ond yn hytrach dylech eu dileu heb eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

Mae Glandŵr Cymru yn gwmni cyfyngedig drwy warant a gofrestrwyd yng Nghymru a Lloegr gyda rhif cwmni 7807276 a rhif elusen gofrestredig 1146792. Swyddfa gofrestredig: National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 21 December 2022 12:22
**To:** Adam Comerford; WA 2003 New Authorisations
**Cc:** Kathryn Maye; Nicholas Saiz; Lansdown, Ashley
**Subject:** PAN-007395 and 7 Penarth and Tanat Issue of NA Licences, Response to Operator Review, HRA and Modelling
**Attachments:** CRT Tanat Model_Nov2022.xlsx; CRT Penarth Model_Nov2022.xlsx; PAN-007395 and 7 NRW Response to Operator Review of Draft Licences.docx; PAN-007395 and 7 OGN 200 Form 1 Version 2 - Record of a HRA of a project.pdf; PAN-0073975 NA Issue Letter.docx; PAN-007397 NA Issue Letter.docx; PAN-007395 NA Transfer Abstraction Licence Signed PDF.pdf; PAN-007397 NA Transfer Abstraction Licence Signed PDF.pdf

**Follow Up Flag:** Filed to: \\My DMS View\PAN-007397 Tanat Feeder

**Categories:** Filed

Dear Adam,

I am pleased to tell you that the above applications for transfer abstraction licences to authorise two previously exempt abstractions have been successful.

Please find the following documents attached:

- PAN-007395 NA Transfer Abstraction Licence Signed PDF, and issue letter.
- PAN-007397 NA Transfer Abstraction Licence Signed PDF, and issue letter.
- Hydrology Modelling Excel Documents: CRT Tanat Model_Nov2022 and Penarth Model_Nov2022
- PAN-007395 and 7 NRW Response to Operator Review of Draft Licences
- PAN-007395 and 7 OGN 200 Form 1 Version 2 – Record of a HRA of a project

If you have any queries, please do not hesitate to contact me.

Best wishes,

Charlotte
Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Water Resources
## LICENCE TO
## ABSTRACT
## WATER

Environment Act 1995
Water Resources Act 1991 as amended by the Water Act 2003
Water Resources (Abstraction and Impounding) Regulations 2006
Natural Resources Body for Wales (Functions) Order 2012
Water Abstraction (Transitional Provisions) Regulations 2017

**502**

# IMPORTANT NOTES

## Need for safekeeping

This licence is an important document. The permission or right to abstract water may be valuable to your landholding. So -

- **Keep the licence safe, preferably with your deeds etc.**
- **Take careful note of the comments below about "transfer and apportionment" and "death and bankruptcy".**

**This is to ensure that the permission and any rights granted by the licence continue if you need to pass it on to someone else.**

**If you want to:**

- **revoke (cancel) the licence;**
- **vary (change/amend) the licence in any way or**
- **change your contact address (but you continue to hold the licence).**

**Please write to us at your local Natural Resources Wales office.**

Details of this licence are placed on a register, kept by Natural Resources Wales and open for inspection by the public. The public may also obtain further details about it by virtue of the Environmental Information Information Regulations 2004 (see also Disclosure of Information) except in special cases (for advice please contact us at the address shown on the front page of the licence).

## Transfer and apportionment

If you need to pass this licence or any part of it to someone else, you must contact Natural Resources Wales and obtain the appropriate application forms. Temporary licences cannot be transferred or apportioned. The licence holder remains responsible for compliance with the terms of the licence and any charges payable until the licence has been transferred or apportioned.

## Death or bankruptcy of the licence holder

If a licence has been **'vested'** in you, as a result of the death or bankruptcy of the licence holder, please contact Natural Resources Wales in writing, telling us the licence number(s) and the date that the licence vested in you as a personal representative or trustee of the licence holder. This is necessary in order to enable you to subsequently transfer the licence.

**'Vesting'** is the transfer of responsibility and ownership of a licence when an existing licence holder is no longer able to hold the licence either through death or bankruptcy.

You do not have to complete a form, but you must notify us in writing within 15 months of the date of vesting, giving the full names of all personal representatives or trustees and a contact address.

## Time limits

Your licence may be subject to a time limit (stated on the front of your licence). All new abstraction licences are legally required to include a time limit. For variations to licences, time limits are added in accordance with our policy.

The duration of a time limit is determined in accordance with our time limiting policy. The time limit is linked to the next or subsequent review of water resources within a Catchment Abstraction Management Strategy (CAMS).

There will be a presumption of renewal providing three tests are met: environmental sustainability is not in question; there is continued justification of need; and water is being used efficiently. Any application for renewal will still be subject to the normal statutory considerations.

If your licence is time limited and you wish to renew it when it expires, you will need to apply for a new licence to replace the existing one. You are advised to submit this application at least three months before it expires. To allow you to give early consideration to this, we will send you a reminder approximately 18 months before the expiry date.

If your licence cannot be renewed, we will endeavour to give at least six years notice. We will also endeavour to give at least six years notice where the licence is likely to be renewed on different terms and will significantly impact upon the use of the licence.

In exceptional circumstances, for example where there are other overriding statutory duties such as the Habitats Regulations, it may not be possible to provide six years notice.

## Charges

Unless specifically exempted, we may levy an annual CHARGE for water AUTHORISED to be abstracted by this licence, in accordance with our abstraction charges scheme in force at the time.

**The licence may be revoked if charges are not paid.**

## Quantity and quality of water

You must not abstract more than the quantity specified in the licence.

Natural Resources Wales does not, by issue of this licence or otherwise, in any way guarantee that the source of supply will produce the quantity of water authorised to be abstracted by this licence, nor that the water is fit for its intended use.

The quantity of water authorised for abstraction is given in cubic metres. One cubic metre is approximately 220 gallons.

(The precise conversion is 1 cubic metres = 219.969 gallons).

## Source of supply and authorised point of abstraction

You may abstract from the point(s) specified in the licence and from no other points. If you want to add or change the authorised point(s) of abstraction, you must apply to us to vary the licence.

## Land on which water is authorised to be used

Where this condition applies, you may only use the water you abstract on the area specified in the licence. You must apply to us to vary the licence if you wish to extend or alter this area or remove it.

## Purpose for which water is authorised to be used

You may only use the water for the purpose(s) specified in the licence. You must apply to us to vary the licence if you wish to add to or change the purpose(s).

## Offences

Under the Water Resources Act 1991 it is an offence:-

- to abstract water, or cause or permit any other person to abstract water, unless the abstraction is authorised by and in accordance with an abstraction licence, or is subject to an exemption;
- to do anything to enable abstraction, or to increase abstraction, except in accordance with an abstraction licence or exemption;
- to fail to comply with the conditions of an abstraction licence. **Note in particular that it may be a condition of the licence to maintain the meter or other measuring device etc. and failure to do so will be an offence;**
- to interfere with a meter or other device which measures quantities of water abstracted so as to prevent it from measuring correctly;
- to fail to provide information which we have reasonably required for the purpose of carrying out any of the Natural Resources Wales water resources functions;
- to knowingly make false statements for the purpose of obtaining a licence or consent or in giving required information.

The requirement for a licence is subject to some exemptions, set out in the Water Resources Act 1991 as amended. If in any doubt as to whether you need a licence, contact us at the address shown at the bottom of the front page of the licence.

## Right of appeal

If you are dissatisfied with our decision on your licence application, you may appeal.

If you are in England, you should write to the Secretary of State for the Environment, Food and Rural Affairs, care of The Planning Inspectorate at:
Room 4/19 Eagle Wing,
Temple Quay House,
2 The Square,
Temple Quay,
Bristol,
BS1 6PN.

If you are in Wales, you should write to Welsh Government care of
The Planning Inspectorate at:
Crown Buildings,
Cathays Park,
Cardiff,
CF10 3NQ.

You must serve notice of appeal within 28 days of the date of receipt of this licence (although the Secretary of State and The Welsh Government have power to allow a longer period for serving notice of appeal). See Water Resources Act 1991, section 43.

## Disclosure of information

Information about this licence is available in the public Register held by Natural Resources Wales. Members of the public are also entitled to ask us for other "environmental information" it holds, including any activities likely to affect "the state of any water" or any "activities or other measures designed to protect it". That would include the information additional to the licence document e.g. any related agreement or abstraction returns. In certain restricted circumstances it is possible to claim that information should be kept confidential. If you require more information about keeping this information off the public register because it is confidential, please contact us by writing to the address shown on the front page of the licence within 28 days of receiving this licence.

| Licence serial number | WA/054/0001/0123 |
|---|---|

Please quote the serial number in all correspondence about this licence

Cyfoeth Naturiol Cymru
Natural Resources Wales

# TRANSFER LICENCE TO ABSTRACT WATER

The Natural Resources Body for Wales (hereafter referred to as "NRW") grants this licence to:-

Canal & River Trust ("the Licence Holder")
National Waterways Museum Ellesmere Port
South Pier Road
Ellesmere Port
Cheshire
England
CH65 4FW

Company Registration Number: 07807276

This licence authorises the Licence Holder to abstract water from the source of supply described in the Schedule of Conditions to this licence and subject to the provisions of that Schedule. The licence commences from the effective date shown below and shall remain in force until the date of expiry shown below.

Signed:

A. Lodh

Ashley Lansdown
Permitting Team Leader
Permitting Service
Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

Date of issue……...21 December 2022

Date effective……..21 December 2022

Date of expiry……31 March 2034

This licence should be kept safe, and its existence disclosed on any sale of the property to which it relates. Please read the 'important notes' on the cover to this licence.

Note: References to "the map" are to the map which forms part of this licence.
References to "NRW" are to the Natural Resources Body for Wales or any successor body.

Environment Act 1995
Water Resources Act 1991 as amended by the Water Act 2003
Water Resources (Abstraction and Impounding) Regulations 2006
Article 3 of the Natural Resources Body for Wales (Establishment) Order 2012
The Natural Resources Body for Wales (Functions) Order 2013
Water Abstraction (Transitional Provisions) Regulations 2017

# SCHEDULE OF CONDITIONS

## 1. SOURCE OF SUPPLY

1.1 Inland water (river) known as River Severn at Penarth Feeder, Newtown.

## 2. POINT OF ABSTRACTION

2.1 At National Grid Reference SO 13965 92624 marked 'Point A' on the map.

## 3. MEANS OF ABSTRACTION

3.1 Gravity flow to an open channel controlled by a weir and sluice gates.

## 4. PURPOSE OF ABSTRACTION

4.1 Transfer for the purpose of operations in the course of carrying out functions as a Navigation Authority.

## 5. PERIOD OF ABSTRACTION

5.1 All year.

## 6. MAXIMUM QUANTITIES OF WATER TO BE ABSTRACTED

6.1 **Subject to further conditions 9.1 and 9.2:**

821.3 cubic metres per hour
14,574 cubic metres per day
2,311,216 cubic metres per year

An hour is any period of 60 consecutive minutes, a day means any period of 24 consecutive hours and a year means the 12 month period beginning on 1 April and ending on 31 March.

## 7. MEANS OF MEASUREMENT OF WATER ABSTRACTED

7.1 (i) No abstraction shall take place unless the Licence Holder has installed a measuring device at Byles Lock to measure quantities of water abstracted.

(ii) The Licence Holder shall position and install the measuring device in accordance with any written directions given by NRW.

(iii) The Licence Holder shall maintain, repair, or replace the measuring device to ensure that accurate measurements are recorded at all times.

(iv) The Licence Holder shall keep all records of measuring device repair or replacement including evidence of current certification for a period of 6 years.

## 8. RECORDS

8.1 (i) Quantities of water calculated by the means specified in condition 7.1 above shall be recorded by the Licence Holder at the same time each day during the whole of the period during which abstraction is authorised or as otherwise approved in writing by NRW.

(ii) The Licence Holder shall send to NRW a copy of the record required by condition 8.1 (i) or summary data to NRW within 28 days after 31 March in each year and also within 28 days of being so requested in writing by NRW.

(iii) Each record shall be kept and be made available during all reasonable hours for inspection by NRW for at least 6 years.

## 9. FURTHER CONDITIONS

9.1 **Subject to condition 9.2 below:**

When the flow in the River Severn as gauged by NRW at Dolwen Gauging Station is less than 0.86 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

**Table 1**

| When the flow (cubic metres per second) in the River Severn as gauged at Dolwen Gauging Station is: | The maximum quantity of water to be abstracted shall not exceed: | |
|---|---|---|
| | cubic metres per hour | cubic metres per day |
| less than 0.86 and greater than or equal to 0.7 | 360 | 8,640 |
| less than 0.7 | 180 | 4,320 |

9.2 **During any 'river regulation period':**

(i) No abstraction shall take place when the storage capacity of Llyn Clywedog is less than 25%.

(ii) When a drought order is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by NRW at its flow gauging station at Dolwen is greater than or equal to 0.7 cubic metres per second, abstraction shall not exceed 50 mega litres in any period of 7 days.

(iii) When a drought order is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by NRW at its flow gauging station at Dolwen is less than 0.7 cubic metres per second, abstraction shall not exceed 180 cubic metres per hour and 4,320 cubic metres per day.

9.3 The Licence Holder shall discharge the water abstracted in pursuance of this licence to the Montgomery Canal at National Grid Reference SO 13906 93017 marked 'Point Q' on the map.

9.4 (i) No abstraction shall take place unless the Licence Holder has installed a screen with spacing no greater than 10 millimetres to the point of abstraction to prevent the entrapment, entrainment, or impingement of fish.

(ii) The Licence Holder shall maintain the fish screen in accordance with the manufacturer's specifications and keep records of such maintenance available for inspection.

9.5 (i) No abstraction shall take place unless the Licence Holder has installed a screen with spacing no greater than 40 millimetres to the point of discharge to the River Severn from the overflow weir at National Grid Reference SO 13957 92773, in accordance with 'CRT286_Supporting Information' document dated 19/09/2019, to prevent the entrapment, entrainment, or impingement of fish.

(ii) The Licence Holder shall maintain the fish screen in accordance with the manufacturer's specifications and keep records of such maintenance available for inspection.

# ADDITIONAL INFORMATION

Note: the following information is provided for information only. It does not form part of the licence.

**REASONS FOR CONDITIONS**

The licence is time-limited to a date to reflect the timing of a future review of the catchment resources availability.

Condition 6: The licence includes a maximum abstraction quantity condition in order to establish that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site and to ensure the licence reflects the quantities abstracted during the qualifying period in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.

Conditions 7 and 8: The abstraction is required to be measured to demonstrate compliance with the terms of the licence and to provide information on actual water usage for water planning purposes.

Condition 9.1 The licence includes a bespoke flow restrictions condition deemed necessary in order to establish that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site.

Condition 9.2: To reflect the Licence Holder's operation during the qualifying period.

Condition 9.3: To ensure the abstraction can be classed as a transfer of water from one source of supply to another.

Condition 9.4: to prevent the entrapment, entrainment, and impingement of fish at the point of abstraction. This condition is deemed necessary in order to establish that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site.

Condition 9.5: to prevent the entrapment, entrainment, and impingement of fish at the point of discharge to the River Severn from the overflow weir. This condition is deemed necessary in order to establish that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site.

**IMPORTANT NOTES**

This licence has been issued under the Water Abstraction (Transitional Provisions) Regulations 2017, which requires previously exempt abstractions to become regulated.

For the purposes of Condition 8.1, the Licence Holder shall contact:

Senior Officer People and Places Team
Natural Resources Wales
Maes y Ffynnon
Penrhosgarnedd
Bangor
Gwynedd
LL57 2DW
Tel: 0300 065 3000
Email: Mid.People.Places.Team@cyfoethnaturiolcymru.gov.uk

**Definitions**

- 'River regulation period' means any period of time that water is being or about to be released from Llyn Clywedog to support the flow in the River Severn.
- 'Drought order' as defined under the Water Resources Act 1991.

**Condition 9.5:** Further detail on the point of discharge to the River Severn from the overflow weir can be found in **'**CRT286_Supporting Information' document dated 19/09/2019 and saved to DMS. The document includes a 'Schematic of Abstraction Arrangement - Plan view' and 'Photo 6: Overflow from open channel back to main River Severn'.

**Water efficiency note**

The Licence Holder should use water abstracted under the terms of this licence in an efficient manner. NRW may refer to its guidance on water efficiency (or equivalent guidance) in determining whether water is being used efficiently and may offer advice on any measures considered necessary to meet particular recommendations.

**Screening**

NRW will have regard to its Screening for Intakes and Outfalls: A Best Practice Guide (or equivalent guidance) in agreeing where, how, and what type of fish screens should be installed and together with the results of any monitoring in determining whether the fish screens are properly effective and maintained, and in judging whether it is necessary to require repair or replacement of the fish screens.

Cyfoeth Naturiol Cymru Natural Resources Wales

**MAP ACCOMPANYING LICENCE NUMBER / MAP I GYFEILIO TRWYDDED RHIF**

WA/054/0001/0123

Scale I Graddfa 1:10,000

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**Would you like to find out more about us, or about your environment?**

**Then call us on**
**0300 065 3000** (Mon-Fri 9-5)

**email**
**enquiries@naturalresourceswales.gov.uk**

**or visit our website**
**www.naturalresourceswales.gov.uk**

**incident hotline 0300 065 3000** (24hrs)
**floodline 0345 988 1188**

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Cyfoeth Naturiol Cymru
Natural Resources Wales

Our ref: PAN-007395

Your ref: CRT286

Dr Adam Comerford
National Waterways Museum Ellesmere Port
South Pier Road
Ellesmere Port
Cheshire
England
CH65 4FW

By email:
New.Authorisations@canalrivertrust.org.uk
Adam.Comerford@canalrivertrust.org.uk
Cc:
Kathryn.Maye@canalrivertrust.org.uk
Nicholas.Saiz@canalrivertrust.org.uk

21 December 2022

**Decision on your Transitional Licence application**

**Application Reference: PAN-007395**
**Licence number: WA/054/0001/0123**
**Site Name: River Severn at Penarth**

Dear Dr Comerford,

We are pleased to tell you that your application for a transfer abstraction licence to authorise a previously exempt abstraction has been successful.

Please read your licence carefully as it is a legal document**.** You will have to keep to the conditions shown on it and do any monitoring in line with the licence conditions.

**Your transfer licence will remain in force until 31/03/2034,** in line with our policy on setting time limits. The time limit is linked to future reviews of water resources within a Catchment Abstraction Management Strategy (CAMS) area. At the end of the time limit, we should be able to renew the licence if:

- there is no damage to the environment,
- the need for the abstraction can still be justified,
- water is being used efficiently; and
- you still meet the usual legal requirements for getting a licence.

We do not guarantee that we will renew the licence. We will contact you before your licence ends to tell you about the renewal process.

**Licence Quantities**

The licence includes restrictions on abstraction quantities to ensure no adverse impact on the Severn Estuary SAC and Ramsar in accordance with the Habitats Regulations 2017 and to ensure the licence reflects the quantities abstracted during the qualifying period in line with the Water Abstraction (Transitional Provisions) Regulations 2017.

**Flow restrictions / Hands off Flow**

Please note that your licence includes bespoke flow restrictions under condition 9.1 deemed necessary in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. The above flow restrictions were also considered when reflecting your position during the qualifying period under condition 9.2, in observing section 9 of the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987, which details restrictions on the abstraction during a period of River Severn Regulation.

The following table includes flows at NRW Dolwen Gauging Station, detailed under conditions 9.1 and 9.2 of the licence. As levels are measured rather than flows the following table details the flow level equivalents to be observed:

| Flow at Dolwen Gauging Station ($m^3/s$) | Level at Dolwen Gauging Station (m) |
|---|---|
| 0.86 | 0.166 |
| 0.7 | 0.145 |

You can view the river level of the River Severn at the NRW Dolwen Gauging Station via the following link:
https://rivers-and-seas.naturalresources.wales/Station/4260?parameterType=1.

We acknowledge that you have requested further information regarding the determination of these conditions. To allow you to further consider this, please find attached a copy of Habitats Regulations Assessment (HRA) completed in respect of these applications, together with the supporting modelling information .

**Screening / Historic Environment**

An intake screen has been conditioned on your licence, in order to prevent the entrapment, entrainment, and impingement of fish at the point of abstraction; as well as a screen at the point of discharge into the River Severn from the overflow weir at National Grid Reference SO 13957 92773 to prevent the entrapment, entrainment, and impingement of fish at this point. These conditions are deemed necessary in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. This is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.

During our screening assessment, it was identified that the Penarth Feeder is a Historic Monument and Listed Building. As the licence requires you to install screens, you should engage with Cadw and the Local Authority (Powys County Council) to discuss the screening requirements, using the following details:

- Cadw: by email: Cadw@gov.wales or telephone 0300 0256000

- Powys County Council: by email planning.services@powys.gov.uk or telephone 01597 827161 / 01597 827169

**Serious Damage**

As NRW considers serious damage to apply where an abstraction is affecting or has the potential to affect sites designated under the Habitats Regulations, the flow restriction and screening conditions referred to above are also considered necessary to protect against serious damage.

**Compliance**

We regularly make routine visits to make sure that the terms of licences are up to date and that any work to abstract or impound water keeps to the licence conditions. One of our representatives will contact you, before they visit, to discuss the terms of the licence. They may visit you again later without giving you notice. If you have any queries regarding the future regulation of your licence then please contact the North Powys Environment Team by email environmentteam.northpowys@cyfoethnaturiolcymru.gov.uk or via telephone 0300 065 3000.

It is your responsibility to make sure that the water you abstract is suitable for the purpose it will be used for. You must continue to monitor the water to make sure you are using it efficiently. It is also your responsibility to make sure that you have any other permission (for example, planning permission) you need in connection with your proposed work.

If you wish to apply to increase your application abstraction quantities you should do this through our normal application procedure, details of which are available on the 'Apply to change an existing abstraction or impoundment licence' page of our website, which can also be found via the following pathway: Home > Permits and Permissions > Water abstraction and impoundment licences > Apply to change an existing abstraction or impoundment licence.

**Biosecurity**

Any work undertaken should take account of biosecurity risks, and mitigation measures should be put in place. The most important measure is to ensure that all equipment (plant, tools, footwear etc) that come to site, arrive clean, and are cleaned again before leaving site. This applies to all sites, not just those where an invasive non-native species (INNS), pest or disease has been previously identified. Information on how to assess biosecurity risks; simple steps to reduce risks; and specific measures for higher risk activities can be found on the GBNNSS website for INNS, or for tree health on our website. If you need any further help, please feel free to contact our INNS and Biosecurity team or our Tree Health team.

**EU Exit**

Following the UKs departure from the EU on 31 January 2020 and the end of the transition period on 31 December 2020, the legal obligations relating to compliance with environmental permits and legislation will continue to apply. NRW will continue to issue and regulate all permits and licences in line with our current practice. If you have any questions about your permits or licences and/or site management, please contact our Customer Care Centre on 03000 653 000.

**Right of Appeal**
If you are not satisfied with the conditions set on your licence, you can appeal to Planning and Environment Decisions Wales at the following address:

Planning and Environment Decisions Wales
Crown Buildings
Cathays Park
Cardiff
CF10 3NQ
Telephone: 0300 0604400
Email: PEDW.Casework@gov.wales

You can get a standard notice of appeal from the address above. You must return the notice of appeal **within 28 days** of the date of this notice, and send a copy to us. The notice must give the reasons for the appeal and you must also send:

- the application it relates to,
- any information or reports you sent us with the application,
- this decision notice; and
- any other relevant correspondence.

You must send written notice of the appeal and the documents listed above to Planning and Environment Decisions Wales at the address above. At the same time, you must send us a copy of the notice and documents to:

Permitting Service Manager
Permitting Service
Natural Resources Wales
Tŷ Cambria
29 Newport Road
Cardiff CF24 0TP
Phone: 0300 065 3000

You can withdraw an appeal at any time before a decision has been made. In exceptional circumstances, Planning and Environment Decisions Wales have the power to allow a longer period for serving a notice of appeal.

If you have any questions about your licence, please contact me using the details below.

Yours sincerely

Charlotte Lillywhite

Water Resources Permitting Team
Natural Resources Wales

Direct phone line: 0300 065 3921
Direct email: Charlotte.Lillywhite@naturalresourceswales.gov.uk

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Form

## Record of a Habitats Regulations Assessment of a project

## OGN 200 Form 1

**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | References to the 2010 Habitats Regulations updated to reflect new consolidated version of the regulations which entered into force on 30th November 2017;<br>References to KSP and National Services Directorates updated to EPP |
| 1.2 | 28 June 2018 | With marked up changes in light of ruling in CJEU case c-323/17 'People over Wind'. |
| 1.3 | 27 June 2019 | With marked up changes in light of ruling in CJEU case c-323/17 'People over Wind'. See Guidance here |

**Next review date: April 2019**

# Record of a Habitats Regulations Assessment of a project

## 1. Project Details

| 1(a): Project details where an external party has applied to NRW for any form of authorisation | |
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| **Application reference numbers** | PAN-007395 (Penarth Feeder at Penarth on the River Severn), and PAN-007397 (Tanat Feeder at Carreghofa on the River Tanat) |
| **Date applications received** | 08/10/2019 |
| **Applicant details** | Canal & River Trust |
| **Activity proposed** | Under the Water Resources Act 1991 / Environment Act 1995 many abstractions were exempt from licensing control. These exempt abstractions could potentially take unlimited amounts of water, irrespective of availability and without regard to impacts on the environment or other abstractors. Transitional regulations came into force in January 2018 removing the exemptions for many of these activities. This will result in new licences, and variations to existing licences for these previously exempt abstractions (known as New Authorisations or transitional licences). These are existing activities and thus pose no new risks and can be considered as part of the baseline. Bringing them into regulation allows them to be regulated where currently there is no control.<br><br>The Canal & River Trust (Navigation Authority) have applied for two new transfer abstraction licences under the Water Abstraction (Transitional Provisions) Regulations 2017. The abstractions have been occurring for many years without a licensing requirement as abstraction for the purpose of navigation was a previously exempt activity under section 26 of the Water Resources Act 1991.<br><br><u>PAN-007395 (River Severn at Penarth)</u><br>The abstraction is from the River Severn at Penarth via a main river weir. The water flows under gravity via trash grilles into an open feeder channel via two sluice gates with dimensions not exceeding 570 millimetres (mm) by 550mm (which are generally operated alternately), any excess flow passing through the primary sluice gate(s) is discharged back into the River Severn via an overflow weir. The necessary abstracted water then follows through a secondary sluice as a final control before entering a culverted section of the feeder, which then discharges into the Montgomery Canal. |

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| | The applicant evidenced the following maximum abstraction quantities:<br>· 821.3 cubic metres per hour ($m^3$/hour)<br>· 14,574 cubic metres per day ($m^3$/day)<br>· 2,311,216 cubic metres per year ($m^3$/year)<br>· 228.1 litres per second (l/s)<br><br><u>PAN-007397 (River Tanat)</u><br>The abstraction is from the River Tanat at Carreghofa via a main river weir. The water flows under gravity to an open channel controlled by a weir and two sluice gates with dimensions not exceeding 850mm by 558mm (which are generally operated alternately). The water then flows into an open channel, then through a compound gauging structure consisting of a broad crest weir with critical depth rectangular flume (used to measure abstraction volumes), before finally discharging into the Montgomery Canal upstream of Carreghofa Locks.<br><br>The applicant evidenced the following maximum abstraction quantities:<br>· 567.5$m^3$/hour<br>· 9,100$m^3$/day<br>· 1,911,066$m^3$/year<br>· 376l/s<br><br>Both abstractions are for the purpose of 'operations in the course of carrying out functions as a Navigation Authority'. The abstractions are necessary to maintain the water level within the canal within a 'Normal Operating Zone', to avoid business risk including damage to infrastructure (caused by overtopping, damage to canal lining and canal bank collapse), and maintaining a navigable depth. The Montgomery Canal is designated as a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI) and the abstracted water is necessary to maintain the designations, see section 2.1 below for further detail on the Canal SAC.<br><br>The applicant states that both abstractions are subject to section 9 of the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987, which details the following restrictions during a 'river regulation period' (which means any period of time that water is being or about to be released from Llyn Clywedog to support the flow in the River Severn):<br><u>Penarth and Tanat Feeders</u><br>· No abstraction is permitted when the capacity of Llyn Clywedog is less than 25% of its capacity; and |

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| | · Other general requirements necessary for the operation of the canal.<br><br><u>Penarth Feeder</u><br>· Abstraction limited to 150 mega litres (Ml) over 7 days when discharges from Clywedog >300Ml/day and <500Ml/day,<br>· Abstraction limited to 115Ml over 7 days when discharges are equal to 500Ml/day; and<br>· Abstraction limited to 50Ml over 7 days when a drought order in force.<br><br><u>Tanat Feeder</u><br>· Abstraction limited to 49Ml over 7 days; OR a lesser amount in order to maintain a residual flow of 15Ml per day downstream of Carreghofa weir.<br><br>The Bill was provided as part of the supporting information document for both applications. |
| **Relevant legislation** | · Environment Act 1995<br>· Water Resources Act 1991 as amended by the Water Act 2003<br>· Water Resources (Abstraction and Impounding) Regulations 2006<br>· Natural Resources Body for Wales (Functions) Order 2012<br>· Water Abstraction (Transitional Provisions) Regulations 2017 |
| **Locations** | <u>Penarth Feeder</u><br>Point of Abstraction from River Severn: NGR SO 13965 92624<br>Point of Discharge into Montgomery Canal: NGR SO 13906 93017<br><br>From the point of abstraction, the River Severn flows for approximately 50 kilometres (km), before a main confluence with the River Vyrnwy.<br><br><u>Tanat Feeder</u><br>Point of Abstraction from River Tanat: NGR SJ 25360 21817<br>Point of Discharge into Montgomery Canal: NGR SJ 25474 20285<br><br>From the point of abstraction, the River Tanat flows for approximately 2km, before joining the River Vyrnwy, which then flows for 22km before a main confluence with the River Severn.<br><br>Both points of abstraction are well over 150km upstream of the Severn Estuary. |
| **Application documents** | · Application Form WRH<br>· Supporting information document<br>· Excel spreadsheet with total daily abstraction quantities |

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| **Environmental Statement** | N/A |
| **Pre-application correspondence** | N/A |
| **NRW team responsible for drafting this HRA report, and name of lead officer** | Water Resources Permitting, Charlotte Lillywhite |

## 2. Determining the need for a Habitats Regulations Assessment

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| **2.1 Is the whole of the project directly connected with or necessary to the management of one or more Natura 2000 sites, for the purposes of conserving the habitats or species for which the Natura 2000 site(s) is/are designated?** | **YES**<br>Both abstractions are necessary to ensure the Key Habitat of Open Water (Canal) Habitat, within Montgomery Canal SAC, UK0030213; which is designated for the Key Species of Floating water-plantain, *Luronium natans*. The location of the abstractions / discharges in relation to the SAC are detailed in the following map:<br> <br> |
| **2.2 Is there a possibility that the project could affect a different Natura 2000 site to the one the project is intended to conserve?** | **YES** |
| **2.3 Is it necessary to carry out an HRA?** | **YES** |

## 3. Considering the likelihood of a significant effect (LSE)

### 3.1 Renewal of a permission on the same or more restrictive terms as the extant permission

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| **Is this project a renewal of a current permission which complies with NRW approved criteria for ruling out significant effects of renewals (see section 6.2A of OGN 200) without conducting a project-specific LSE test?** | **NO** |

## 3.2 Likelihood of significant effects (LSE) test

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| **3.2.1 Which Natura 2000 sites might be affected by the proposal?** | Based on the project specification or information provided in the applications, it is considered that the following Natura 2000 sites have features which could be affected by the project:<br><br>· **UK0013030 Severn Estuary Special Area of Conservation (SAC)**<br>· **UK11081 Severn Estuary Ramsar**<br><br>The above designations are located over 150km downstream of both points of abstraction; however, it has been identified they are functionally linked.<br><br>The potential for the project to affect the following Natura 2000 site was also initially considered, but can be ruled out without further consideration:<br><br>· **UK9015022 Severn Estuary Special Protection Area (SPA)**<br><br>The Severn Estuary SPA was identified during MyMap Impact Assessment Screening well over 150km downstream of the points of abstraction. The above site was initially considered; however, it is designated for its assemblage of nationally important populations of waterfowl, internationally important populations of wintering bird species and migratory bird species. Therefore, given the nature of the designated features and their distance downstream from the proposals, it can be immediately ruled out. |

### 3.2.2 Screening assessment

**NB:** In light of the ruling of the CJEU in case C-323/17 'People over Wind', avoidance measures should not be considered at this stage of HRA. Therefore, the column previously included to allow for consideration in this section of the form has been removed.

| | Assessment of likelihood of significant effect | |
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| | **I**<br>**Relevant conservation objectives** | **II**<br>**Potential impact pathway** |
| **UK0013030 Severn Estuary Special Area of Conservation**<br>This designation is located over 150km downstream of the points of abstractions; however, it has been identified they are functionally linked as some of the migratory fish species access the River Severn and the River Tanat at the points of abstraction, and upstream. | | |
| ***Estuaries**<br><br>**The designation includes an overarching "estuaries" feature within which subtidal sandbanks, intertidal mudflats and sandflats, Atlantic salt meadows and reefs (of Sabellaria alveolata) and **three species of migratory fish are defined as both features in their own right and as sub-features of the estuary feature.***<br><br>*In addition hard substrate habitats including eel grass beds, **the estuary-wide assemblage of fish species** and the assemblage of waterfowl species (for which the Ramsar Site and SPA are specifically designated) are identified as notable estuarine assemblages which are **an intrinsic part*** | vi.<br>The abundance of the notable estuarine species assemblages[7] is maintained or increased.<br><br>[7]Assemblage of migratory fish species:<br>• River and Sea Lamprey, Twaite shad (Annex 1 species) and Allis shad<br>• Sea trout, salmon, eel. | **<u>European Eel, Atlantic Salmon, Sea lamprey, River lamprey and Sea trout</u>**<br>Initial MyMap Impact Assessment Screening identified the following migratory fish species features, as follows:<br><u>Penarth Feeder</u><br>**At the point of abstraction** - European Eel and Atlantic Salmon migratory routes.<br>**Close proximity downstream** – River lamprey 1km and Brown / Sea Trout 3km.<br><br><u>Tanat Feeder</u><br>**At the point of abstraction** - European Eel, Atlantic Salmon, and River lamprey migratory routes.<br>**Close proximity downstream** – Brown / Sea Trout 0.5km.<br><br>**Technical fisheries confirmed the following:**<br>· The large historic weirs associated with both intake feeders, are significant barriers to migration for most fish species. Both weirs include historic fish passes to assist with the upstream migration of Salmon.<br>· NRW survey Salmon and Trout at three locations (1054, 1035 & 1024) upstream of the Penarth abstraction, and two locations on the Tanat (8583 & 1111) upstream of the abstraction point. For further detail, please see the summary of salmon and trout survey data located here and Appendix 1 of this form. **The summary data from between 2002 until 2021 demonstrates the presence of**:<br>➢ **Salmon upstream of both points of abstraction**. NRW are satisfied that the habitat at both intakes would be unsuitable for the early lifecycle stages of Salmon (from egg to parr), however, there is suitable habitat further upstream from both intake locations. Therefore, only smolt or adult Salmon would be able to access both intake locations. |

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| ***of the estuary ecosystem – these are therefore covered by the "estuaries" feature.*** | | ➢ **'Trout' upstream of both points of abstraction**. NRW are satisfied that the monitoring records should relate to native brown trout (which are not protected under this designation) rather than Sea trout which are. Sea trout are not anticipated to be present at either intake due to their lifecycles within the catchment and distance upstream from the estuary.<br><br>As native Brown trout are the same species as Sea trout, it is acknowledged that it would be possible for a small number of native Trout to choose to migrate to the sea to become Sea trout. It should also be noted that the habitat required for the early lifecycle stages of Sea trout (from egg to parr), would be the same as for Salmon (i.e., not at either intake location, but upstream) and that only smolts and adult Sea trout would be able to access both intake locations.<br><br>Therefore, based on the above, **we do not anticipate there would be many, or any Sea trout present at both intake locations.**<br>· **Eel:** have been identified upstream of the abstraction points, however, due the distance upstream in the catchment, as well as multiple downstream barriers, only **large adult Eel are considered able to reach both points of abstraction**.<br>· **Lamprey:** Sea lamprey eDNA has been identified in the Lower Vyrnwy indicating their presence at the Severn / Vyrnwy confluence. NRW do not routinely survey for the presence of Lamprey currently, however, due to barriers to migration **we do not anticipate there to be many or any Sea or River lamprey present at both intake locations**.<br><br>Therefore, based on the above information, there is potential for:<br>· **direct capture, damage, or harm to the following designated species features:**<br>➢ Salmon – smolt or adults<br>➢ Sea trout – smolts or adults<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>due to the presence of these migratory species, there is potential for entrapment, entrainment, or impingement i.e., removal from the supporting habitat, into feeder channels and Montgomery Canal.<br><br>For **Salmon** and **Eel**, this has potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact** |

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| | | **pathway and significant effects cannot be ruled out.**<br><br>For **Sea trout** and **Lamprey**, due to the small potential numbers anticipated, if present at all, this does not have potential impact on the population size / assemblage of migratory fish species within the Severn Estuary. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.**<br><br>· **damage to the supporting habitat of the following designated species features through changes in flow:**<br>➢ Salmon<br>➢ Sea trout<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>**Penarth**: The instantaneous abstraction rate applied for (228l/s) equates to 18% of low flows, where Q95 equals 1,300l/s.<br>**Tanat:** The instantaneous abstraction rate applied for (376l/s) equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5$m^3$/hour, which equates to 25% of low flows.<br><br>Therefore, there is potential for both abstractions to impact on local hydrodynamics, through excessive fluctuations in flow and abstraction of a large percentage of the river flows during low flow conditions.<br><br>**Salmon** and **Eel** are known to be present at and downstream of these abstractions, therefore, this could impact on the movement of migratory fish species and subsequently population size / assemblage of these migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>The migratory limit and presence is not clear for **Sea trout** and **Lamprey**, therefore, there is potential that these abstractions could impact on the movement of migratory fish species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>**Twaite shad and Allis shad** |

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| | | MyMap Impact Assessment Screening initially identified the migratory limits of Twaite shad and Allis shad to be to around Worcester, which is greater than 100km downstream, and in hydraulic connectivity with both points of abstraction. Technical Fisheries have confirmed that Shad have been recorded within the River Severn at Stourport (10km further upstream than Worcester), likely due to the recent completion of the 'Unlocking the Severn Project'. Therefore, flow assessments of potential impacts on Twaite shad and Allis shad are considered at Stourport.<br><br>The combined instantaneous abstraction rates applied for the Penarth and Tanat abstraction equals 604l/s, which equates to 6% of low flows at Stourport, where Q95 flows equals 10,000l/s. However, based on the fact that the instantaneous abstraction rate applied for on the Tanat could not be maintained for any length of time, it is more reasonable to consider the combined hourly abstraction rate, which equals 1,389$m^3$/hour, which equates to 3.9% of low flows at Worcester, where Q95 flows equal 36,000$m^3$/hour.<br><br>The Severn Regulation operating rules specify a minimum flow to be maintained at Bewdley Gauging Station (downstream of Stourport), therefore these abstractions will not cause the flow at Bewdley to drop below the minimum that should be maintained.<br><br>It is therefore considered unlikely that the existing abstractions would change the flows significantly at the point at which **Twaite shad** and **Allis shad** would be likely to migrate / spawn within the River Severn. Therefore, no impact on the population size / assemblage of migratory fish species within the Severn Estuary are anticipated. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.** |
| **Subtidal sandbanks** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Intertidal mudflats and sandflats** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Atlantic salt meadow / salt marshes** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Reefs** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **River lamprey** | i.<br>The migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and **any of their spawning rivers** is | **River and Sea Lamprey**<br>MyMap Impact Assessment Screening identified River lamprey at or close to the points of abstraction.<br><br>**Technical fisheries confirmed the following:** |

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| | not obstructed or impeded by physical barriers, **changes in flows**, or poor water quality.<br><br>ii.<br>The size of the river lamprey population* in the Severn Estuary and **the rivers which drain into it**, is at least maintained and is at a level that is sustainable in the long term.<br><br>***River lamprey population:**<br>The size of the population is subject to non-anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and **breeding success in the River Severn and other rivers draining into the Severn Estuary.** | · The large historic weirs associated with both intake feeders, are significant barriers to migration for most fish species.<br>· **Lamprey:** Sea lamprey eDNA has been identified in the Lower Vyrnwy indicating their presence at the Severn / Vyrnwy confluence. NRW do not routinely survey for the presence of Lamprey currently, however, due to barriers to migration **we do not anticipate there to be many or any Sea or River lamprey present at both intake locations**.<br><br>Therefore, based on the above information, there is potential for:<br>· **direct capture, damage, or harm to River and Sea lamprey** due to the potential presence of these migratory species, there is potential for entrapment, entrainment, or impingement i.e., removal from the supporting habitat, into feeder channels and Montgomery Canal.<br>However, due to the small potential numbers anticipated, if present at all, this does not have potential impact on the population size / assemblage of migratory fish species within the Severn Estuary. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.**<br><br>· **damage to the supporting habitat of River and Sea through changes in flow:**<br>**Penarth**: The instantaneous abstraction rate applied for (228l/s) equates to 18% of low flows, where Q95 equals 1,300l/s.<br>**Tanat:** The instantaneous abstraction rate applied for (376l/s) equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5m$^3$/hour, which equates to 25% of low flows.<br><br>Therefore, there is potential for both abstractions to impact on local hydrodynamics, through excessive fluctuations in flow and abstraction of a large percentage of the river flows during low flow conditions.<br><br>The migratory limit and presence is not clear for **River and Sea lamprey**, therefore, there is potential that these abstractions could impact on the movement of migratory fish species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.** |
| **Sea lamprey** | i.<br>The migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and **any of their spawning rivers** is not obstructed or impeded by physical barriers, **changes in flows**, or poor water quality.<br><br>ii.<br>The size of the sea lamprey population* in the Severn Estuary | |

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| | and **the rivers which drain into it**, is at least maintained as is at a level that is sustainable in the long term.<br><br>**Sea lamprey population:**<br>The size of the population is subject to non-anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and **breeding success in the River Severn and other rivers draining into the Severn Estuary**. | |
| **Twaite shad** | i.<br>The migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and **their spawning rivers** is not obstructed or impeded by physical barriers, **changes in flows** or poor water quality.<br><br>ii.<br>The size of the twaite shad population within the Severn Estuary and **the rivers draining into it** is at least maintained and is at a level that is sustainable in the long term.<br><br>**Twaite shad population:**<br>The size of the population is subject to non-anthropogenic factors relating to natural fluctuations of external | **Twaite shad**<br>MyMap Impact Assessment Screening initially identified the migratory limits of Twaite shad to be to around Worcester, which is greater than 100km downstream, and in hydraulic connectivity with both points of abstraction. Technical Fisheries have confirmed that Shad have been recorded within the River Severn at Stourport (10km further upstream than Worcester), likely due to the recent completion of the 'Unlocking the Severn Project'. Therefore, flow assessments of potential impacts on Twaite shad are considered at Stourport.<br><br>The combined instantaneous abstraction rates applied for the Penarth and Tanat abstraction equals 604l/s, which equates to 6% of low flows at Stourport, where Q95 flows equals 10,000l/s. However, based on the fact that the instantaneous abstraction rate applied for on the Tanat could not be maintained for any length of time, it is more reasonable to consider the combined hourly abstraction rate, which equals 1,389$m^3$/hour, which equates to 3.9% of low flows at Worcester, where Q95 flows equal 36,000$m^3$/hour.<br><br>The Severn Regulation operating rules specify a minimum flow to be maintained at Bewdley Gauging Station (downstream of Stourport), therefore these abstractions will not cause the flow at Bewdley to drop below the minimum that should be maintained.<br><br>It is therefore considered unlikely that the existing abstractions would change the flows significantly at the point at which **Twaite shad** would be likely to migrate / spawn within the River Severn. Therefore, no impact on the population size / assemblage of migratory fish |

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| | factors such as food availability in the Bristol Channel and more widely and **breeding success in the River Severn and other rivers draining into the Severn Estuary.** | species within the Severn Estuary are anticipated. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.** |
| **UK11081 Severn Estuary Ramsar**<br>This designation is located over 150km downstream of the points of abstraction; however, it has been identified they are functionally linked as some of the migratory fish species access the River Severn and the River Tanat at the points of abstraction and upstream. | | |
| **Estuaries**<br>· *Estuarine habitat communities*<br>· *Hard substrate communities*<br>· *Notable estuarine species assemblages**<br><br>**The wider estuarine fish assemblage is covered as a "notable species assemblage" sub feature of the SAC "Estuaries" feature.* ***The fish assemblage of the whole estuarine and river system*** *is one of the most diverse in Britain, with over 110 species recorded.* | Assemblage of fish species:<br><u>Migratory species</u><br>· River and Sea Lamprey, Twaite shad and Allis shad.<br>· Sea trout, salmon, eel. | **<u>European Eel, Atlantic Salmon, Sea lamprey, River lamprey and Sea trout</u>**<br>Initial MyMap Impact Assessment Screening identified the following migratory fish species features, as follows:<br><u>Penarth Feeder</u><br>**At the point of abstraction** - European Eel and Atlantic Salmon migratory routes.<br>**Close proximity downstream** – River lamprey 1km and Brown / Sea Trout 3km.<br><br><u>Tanat Feeder</u><br>**At the point of abstraction** - European Eel, Atlantic Salmon, and River lamprey migratory routes.<br>**Close proximity downstream** – Brown / Sea Trout 0.5km.<br><br>**Technical fisheries confirmed the following:**<br>· The large historic weirs associated with both intake feeders, are significant barriers to migration for most fish species. Both weirs include historic fish passes to assist with the upstream migration of Salmon.<br>· NRW survey Salmon and Trout at three locations (1054, 1035 & 1024) upstream of the Penarth abstraction, and two locations on the Tanat (8583 & 1111) upstream of the abstraction point. For further detail, please see the summary of salmon and trout survey data located here and Appendix 1 of this form. **The summary data from between 2002 until 2021 demonstrates the presence of**:<br>➢ **Salmon upstream of both points of abstraction**. NRW are satisfied that the habitat at both intakes would be unsuitable for the early lifecycle stages of Salmon (from egg to parr), however, there is suitable habitat further upstream from both intake locations. Therefore, only smolt or adult Salmon would be able to access both intake locations.<br>➢ **'Trout' upstream of both points of abstraction**. NRW are satisfied that the monitoring records should relate to native brown trout (which are not protected under this designation) rather than Sea trout which are. Sea trout are not anticipated to be |
| **Assemblage of migratory fish species:**<br>· Sea Lamprey<br>· River Lamprey<br>· Twaite Shad<br>· Allis Shad<br>· Salmon<br>· Sea Trout<br>· Eel | i.<br>the migratory passage of both adults and juveniles of the assemblage of migratory fish species through the Severn Estuary between the Bristol Channel and **any of their spawning rivers** is not obstructed or<br>impeded by physical barriers, **changes in flows**, or poor water | |

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| | quality.<br><br>ii.<br>the size of the populations of the assemblage species in the Severn Estuary and **the rivers which drain**<br>**into it**, is at least maintained and is at a level that is sustainable in the long term. | present at either intake due to their lifecycles within the catchment and distance upstream from the estuary.<br><br>As native Brown trout are the same species as Sea trout, it is acknowledged that it would be possible for a small number of native Trout to choose to migrate to the sea to become Sea trout. It should also be noted that the habitat required for the early lifecycle stages of Sea trout (from egg to parr), would be the same as for Salmon (i.e., not at either intake location, but upstream) and that only smolts and adult Sea trout would be able to access both intake locations.<br><br>Therefore, based on the above, **we do not anticipate there would be many, or any Sea trout present at both intake locations.**<br>· **Eel:** have been identified upstream of the abstraction points, however, due the distance upstream in the catchment, as well as multiple downstream barriers, only **large adult Eel are considered able to reach both points of abstraction**.<br>· **Lamprey:** Sea lamprey eDNA has been identified in the Lower Vyrnwy indicating their presence at the Severn / Vyrnwy confluence. NRW do not routinely survey for the presence of Lamprey currently, however, due to barriers to migration **we do not anticipate there to be many or any Sea or River lamprey present at both intake locations**.<br><br>Therefore, based on the above information, there is potential for:<br>· **direct capture, damage, or harm to the following designated species features:**<br>➢ Salmon – smolt or adults<br>➢ Sea trout – smolts or adults<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>due to the presence of these migratory species, there is potential for entrapment, entrainment, or impingement i.e., removal from the supporting habitat, into feeder channels and Montgomery Canal.<br><br>For **Salmon** and **Eel**, this has potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>For **Sea trout** and **Lamprey**, due to the small potential numbers anticipated, if present at |

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| | | all, this does not have potential impact on the population size / assemblage of migratory fish species within the Severn Estuary. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.**<br><br>· **<u>damage to the supporting habitat of the following designated species features through changes in flow:</u>**<br>➢ Salmon<br>➢ Sea trout<br>➢ Large adult Eel<br>➢ Lamprey – Sea or River<br>**Penarth**: The instantaneous abstraction rate applied for (228l/s) equates to 18% of low flows, where Q95 equals 1,300l/s.<br>**Tanat:** The instantaneous abstraction rate applied for (376l/s) equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5m$^3$/hour, which equates to 25% of low flows.<br><br>Therefore, there is potential for both abstractions to impact on local hydrodynamics, through excessive fluctuations in flow and abstraction of a large percentage of the river flows during low flow conditions.<br><br>**Salmon** and **Eel** are known to be present at and downstream of these abstractions, therefore, this could impact on the movement of migratory fish species and subsequently population size / assemblage of these migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>The migratory limit and presence is not clear for **Sea trout** and **Lamprey**, therefore, there is potential that these abstractions could impact on the movement of migratory fish species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. **Therefore, there is an impact pathway and significant effects cannot be ruled out.**<br><br>**<u>Twaite shad and Allis shad</u>**<br>MyMap Impact Assessment Screening initially identified the migratory limits of Twaite shad and Allis shad to be to around Worcester, which is greater than 100km downstream, and in hydraulic connectivity with both points of abstraction. Technical Fisheries have confirmed |

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| | | that Shad have been recorded within the River Severn at Stourport (10km further upstream than Worcester), likely due to the recent completion of the 'Unlocking the Severn Project'. Therefore, flow assessments of potential impacts on Twaite shad and Allis shad are considered at Stourport.<br><br>The combined instantaneous abstraction rates applied for the Penarth and Tanat abstraction equals 604l/s, which equates to 6% of low flows at Stourport, where Q95 flows equals 10,000l/s. However, based on the fact that the instantaneous abstraction rate applied for on the Tanat could not be maintained for any length of time, it is more reasonable to consider the combined hourly abstraction rate, which equals 1,389$m^3$/hour, which equates to 3.9% of low flows at Worcester, where Q95 flows equal 36,000$m^3$/hour.<br><br>The Severn Regulation operating rules specify a minimum flow to be maintained at Bewdley Gauging Station (downstream of Stourport), therefore these abstractions will not cause the flow at Bewdley to drop below the minimum that should be maintained.<br><br>It is therefore considered unlikely that the existing abstractions would change the flows significantly at the point at which **Twaite shad** and **Allis shad** would be likely to migrate / spawn within the River Severn. Therefore, no impact on the population size / assemblage of migratory fish species within the Severn Estuary are anticipated. **There is an impact pathway in principle, but significant effects from the proposal when considered alone can be ruled out.** |
| **Internationally important <u>populations</u> of waterfowl:**<br>·Bewick's Swan<br>·European white-fronted goose<br>·Dunlin<br>·Redshank<br>·Shelduck<br>·Gadwall | None applicable | **There is no impact pathway from the proposal to the designated feature.** |
| **Internationally important <u>assemblage</u> of waterfowl:** | None applicable | **There is no impact pathway from the proposal to the designated feature.** |

| | | |
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| · waterfowl which contribute to the total peak **winter** count<br>· the above internationally important **wintering** populations<br>· the migratory **passage** species<br>· the nationally important populations<br><br>The species are as follows :<br>(w = wintering and p = passage):<br>▪ Bewick's swan (w)<br>▪ European white-fronted goose (w)<br>▪ Shelduck (w)<br>▪ Dunlin (w, p)<br>▪ Redshank (w, p)<br>▪ Gadwall (w)<br>▪ Ringed plover (w, p)<br>▪ Whimbrel (p)<br>▪ Teal (w)<br>▪ Pintail (w)<br>▪ Wigeon (w)<br>▪ Pochard (w)<br>▪ Tufted duck (w)<br>▪ Grey plover (w)<br>▪ Curlew (w)<br>▪ Spotted redshank (w)<br><br>***Other notable features:*** *Nationally important wintering populations of: Wigeon, teal, pintail,* | | |

| | | |
|---|---|---|
| *pochard, tufted duck, ringed plover, grey plover, curlew, and spotted redshank. Also, nationally important breeding population of Lesser Black backed gull* | | |

| **3.2.3 Screening decision of the project 'alone'** | |
|---|---|
| **~~(a) If ALL rows in column II of Table 3.2.2 are GREEN~~** | ~~The project is not likely to have a significant effect on any Natura 2000 site, because there is no impact pathway from the project to any Natura 2000 features, and no further consideration under the Habitats Directive/Regulations is required in order to determine the application.~~ |
| **~~(b) If there are NO rows coloured RED in column II of Table 3.2.2, and there are ANY rows which are BLUE~~** | ~~The project is not likely to have a significant effect on any Natura 2000 sites when considered alone, but the possibility of significant effects in combination with other plans and projects needs to be considered.~~ |
| **(c) If ANY rows in Column II of Table 3.2.2 are RED** | The project is likely have a significant effect on one or more Natura 2000 sites and therefore an appropriate assessment is required. |

# 4. Appropriate assessment of the project when considered alone

## 4.1 Assessment of project as currently defined

| Natura 2000 site feature (from Table 3.2.2 – RED rows only) | Impact pathway(s) (from Table 3.2.2) | Description of impacts | Assessment in view of conservation objectives | Can adverse effect on site integrity be ruled out? |
|---|---|---|---|---|
| **UK0013030 Severn Estuary Special Area of Conservation** | | | | |
| **Estuaries**<br>Assemblage of migratory fish species:<br>Salmon and Eel*. | Direct capture, damage, or harm to the designated species features. | Based on the known presence of Salmon (smolt and adults), and large adult Eel at or close to the points of abstraction, there is potential for entrapment or entrainment i.e., removal from the supporting habitats, into the feeder channels and Montgomery Canal. This has potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. | The proposal is likely to have a significant effect. | NO |
| · **Estuaries**<br>Assemblage of migratory fish species:<br>- River and Sea lamprey**<br>- Sea trout, Salmon, and Eel<br>· **River lamprey**<br>· **Sea lamprey** | Damage to the supporting habitat of designated species features through changes in flow. | · The instantaneous abstraction rates applied for:<br>- **Penarth**: 228l/s equates to 18% of low flows, where Q95 equals 1,300l/s; and<br>- **Tanat:** 376l/s equates to 60% of low flows, where Q95 equals 630l/s. It should be noted that this rate of abstraction could not be maintained for any length of time, based on the maximum hourly rate applied for of 567.5m3/hour, which equates to 25% of low flows.<br>Could result in local hydrodynamic impacts from the proposals as follows:<br>- Excessive fluctuations in flows; and<br>- A large proportion of the flows could be abstracted during a period of low flows.<br>This could impact locally on the movement of migratory fish | The proposal is likely to have a significant effect. | NO |

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| | | species and subsequently population size / assemblage of migratory fish species within the Severn Estuary. | | |
| **UK11081 Severn Estuary Ramsar** | | | | |
| · **Estuaries**<br>Assemblage of migratory fish species:<br>- Salmon and Eel*<br>· **Assemblage of migratory fish species:**<br>- Salmon and Eel* | Direct capture, damage, or harm to the designated species features. | As above for this impact pathway. | The proposal is likely to have a significant effect. | NO |
| · **Estuaries**<br>Assemblage of migratory fish species:<br>- River and Sea lamprey**<br>- Sea trout, Salmon, and Eel<br><br>· **Assemblage of migratory fish species**:**<br>- River lamprey<br>- Sea lamprey<br>- Salmon<br>- Sea trout<br>Eel | Damage to the supporting habitat of designated species features through changes in flow. | As above for this impact pathway. | The proposal is likely to have a significant effect. | NO |

***See section 5 below which considers Sea trout, River lamprey, Sea lamprey, Twaite shad and Allis shad.**
****See section 5 below which considers Twaite shad and Allis shad.**

## 4.2 Assessment of the project taking into account mitigating measures, conditions, or restrictions

| Natura 2000 Feature (from Table 4.1 – 'NO' rows only) | Description of adverse effects | Can adverse effects be mitigated? | Description of mitigation measures, and how they would be applied (e.g., contractual obligations, consent conditions) | Can adverse effect on site integrity be ruled out? |
|---|---|---|---|---|
| **UK0013030 Severn Estuary Special Area of Conservation** | | | | |
| **Severn Estuary SAC**<br>**Estuaries**<br>Assemblage of migratory fish species:<br>· Salmon and Eel*.<br><br>**Severn Estuary Ramsar**<br>· **Estuaries**<br>Assemblage of migratory fish species:<br>- Salmon and Eel*<br>· **Assemblage of migratory fish species:**<br>Salmon and Eel* | · Removal of migratory fish species from the riverine ecosystem, into the Penarth / Tanat Feeders and Montgomery Canal.<br>· Potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary. | YES | Fish screens with an appropriate aperture size will prevent the adverse effects identified.<br><br>Intake screening must be adequate to prevent the entrapment, entrainment, or impingement of the following species, which could be present at both intake locations:<br>· **Salmon smolt** that would be migrating downstream*** towards the sea as part of their lifecycle, as well as **adult salmon**.<br>***As detailed under the LSE stage of the form NRW are satisfied that the habitat at both intakes would be unsuitable for the early lifecycle stages of Salmon (from egg to parr), however, there is suitable habitat further upstream of both intake locations. Therefore, the screening is not necessary to protect Salmon in their early lifecycle stage (egg to parr) as they would not be present at either intake locations.<br><br>Intake screens with spacing no greater than 10mm are appropriate for salmon smolt and adults.<br>· **Large adult Eel** which may become attracted to the discharge. Intake screens with spacing no greater than 15mm are appropriate for large adult Eel.<br><br>**Therefore, Technical fisheries have advised that intake screens with spacing no greater than 10mm are necessary and adequate at both points of abstraction to prevent the entrapment, entrainment or impingement of Salmon (smolt and adults) and large adult Eel, see email dated 12/10/2022.** | YES |

<table>
<tr>
<td></td>
<td></td>
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<td>As detailed under section 1 of this form, the abstraction from the River Severn at Penarth has an overflow weir incorporated into the intake design, so that any excess water passing through the primary sluice gate(s) is discharged back into the River Severn. The applicant confirmed that the overflow weir is approximately 2 to 3 metres above the water level downstream of the weir.<br><br>Discharge screening must be adequate to prevent the entrapment, entrainment, or impingement of the following species, which could be present at both intake locations:<br>· Adult Salmon could become attracted to the discharge as part of their upstream migration.<br>Salmon smolt would be migrating downstream towards the sea, rather than upstream, therefore, they would not be attracted to the discharge. Salmon in their early lifecycle stage (egg to parr) would not be present***, therefore, no concerns.<br>· Large adult Eel could be present and become attracted to the discharge.<br><br>Therefore, Technical Fisheries have advised that a screen with spacing no greater than 40mm screening is necessary on the discharge from the overflow weir at Penarth back into the River Severn; to prevent the entrapment, entrainment or impingement of adult Salmon and large Eel.</td>
<td></td>
</tr>
<tr>
<td><u>Severn Estuary SAC</u><br>· Estuaries<br>Assemblage of migratory fish species:<br>- River and Sea lamprey**<br>- Sea trout, Salmon, and Eel<br>· River lamprey<br>· Sea lamprey<br><br><u>Severn Estuary</u></td>
<td>· Potential to impact locally on hydrodynamics of the Severn and Tanat at the points of abstraction, through excessive fluctuations in flow; and as a large proportion of the flows could be abstracted during a period of low flows. This could impact on the movement of migratory fish species present / close to the abstraction locations.</td>
<td></td>
<td>The following flow restrictions will be conditioned to ensure no more than 10% of the naturalised low flows can be abstracted down to Q99 low flows, at each location as confirmed in revised hydrology report dated 29/11/2022 and email dated 30/11/2022:<br><br><u>River Severn at Penarth</u><br>When the flow in the River Severn as gauged at Dolwen Gauging Station is less than 0.86 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:
<table>
<tr><th rowspan="2">Flow Range at Dolwen Gauging Station</th><th colspan="2">Maximum abstraction rates</th></tr>
<tr><th>Hourly</th><th>Daily</th></tr>
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</td>
<td>YES</td>
</tr>
</table>

**Ramsar**

· **Estuaries**
Assemblage of migratory fish species:
- River and Sea lamprey**
- Sea trout, Salmon, and Eel

· **Assemblage of migratory fish species**:**
- River lamprey
- Sea lamprey
- Salmon
- Sea trout

· Potential to impact on the population size / assemblage of migratory fish species within the Severn Estuary.

| $m^3/s$ | $m^3$/hour | $m^3$/day |
|---|---|---|
| Flows less than 0.86 and greater than or equal to 0.7 | 360 | 8,640 |
| Flows less than 0.7 | 180 | 4,320 |

**River Tanat at Carreghofa**

When the flow in the River Tanat as gauged at Llanyblodwel Gauging Station is less than 1.03 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

| Flow Range at Llanyblodwel Gauging Station $m^3/s$ | Maximum abstraction rates | |
|---|---|---|
| | Hourly $m^3$/hour | Daily $m^3$/day |
| Flows less than 1.03 and greater than or equal to 0.84 | 432 | 9,100 |
| Flows less than 0.84 and greater than or equal to 0.61 | 227 | 5,448 |
| Flows less than 0.61 | 133 | 3,192 |

It is considered necessary to include hourly and daily low flow restriction rates for both abstractions to prevent excessive fluctuations in flow during periods of low flows.

When the rivers are not in a period of low flows as defined below:
**River Severn at Penarth:** Flows equal to or greater than 0.86$m^3$/s at Dolwen Gauging Station.
**River Tanat at Carreghofa:** Flows equal to or greater than 1.03$m^3$/s at Llanyblodwel Gauging Station.
In order to prevent risk of excessive fluctuations in flow when the rivers are not in a period of low flows, maximum hourly, daily and annual abstraction quantities shall be included on the licence, which are be based on abstraction quantities evidenced during the qualifying period, as follows:
**River Severn at Penarth:** 821.3$m^3$/hour, 14,574$m^3$/day and 2,311,216$m^3$/year

| | | | | |
|---|---|---|---|---|
| | | | **River Tanat at Carreghofa:** 567.5$m^3$/hour, 9,100$m^3$/day and 1,911,066$m^3$/year<br><br>The above low flow restrictions and maximum abstraction quantities (when the rivers are not in a period of low flows) are in line with relevant flow standards (down to Q99 low flows) as detailed in Appendix 2; further detail on this modelling can be seen in Appendices 3 (Penarth) and 4 (Tanat) or in revised hydrology report dated 29/11/2022 and email dated 30/11/2022.<br><br>Appendix 5 demonstrates that the low flow restrictions considered necessary to mitigate against impacts to the Severn Estuary SAC and Ramsar will reduce the water that can be abstracted for the Montgomery Canal SAC during periods of low flows, which will likely lower the water levels within the canal during these periods. The Conservation Office for the Canal SAC confirmed that based on the potential durations of reduced abstraction periods (using 2021/2022 data which showed the impacts of more sustained low flow conditions) / potential reductions in the water level of the canal: the designated feature of Floating water-plantain will be robust enough to sustain these periods, and there should not be sufficient opportunity or duration for competing vegetation to grow. The Conservation Officer notes that longer durations than those demonstrated would result in the growth of competing vegetation, however, the modelling has not indicated this to be the case.<br><br>Therefore, based on the requirement to protect low flows in the River Severn and Tanat which are supporting habitat for the Severn Estuary designations; and the recent flow modelling data showing the impacts of more sustained low flow conditions:<br>**NRW are satisfied that the flow restriction mitigation measures detailed above will not adversely affect the integrity of the Montgomery Canal SAC.** | |

## 4.3 Concluding the appropriate assessment of the project alone

| | |
|---|---|
| ~~**(a) If the right hand column of Table 4.1 and Table 4.2 (if applicable) is 'YES' for all features**~~ | ~~It has been ascertained that the proposal, when considered alone, will not adversely affect the integrity of any Natura 2000 sites.~~ |
| ~~**(b) If there are any 'NO's in the right hand column of Table 4.1 that have not been resolved to 'YES' through mitigation measures identified in Table 4.2**~~ | ~~It has not been ascertained that the proposal, when considered alone, will not adversely affect the integrity of one or more Natura 2000 sites.~~ |
| **(c) Are there any residual effects of the project (net of any mitigation measures identified) which, though insignificant on their own, could be significant if considered in combination with the effects of other plans or projects?** | **YES** |

# 5 In combination assessment

## 5.1 Identifying possible in combination effects

| **BLUE impact pathway from Table 3.2**<br><br>**and/or**<br><br>**Residual effect (from appropriate assessment in section 4)** | **Natura 2000 site features concerned** | **Other plans/projects with effects that might interact with the effects of the project to render its effects significant (if any)** | **Nature of the in-combination effect (if any)** | **Is there likely to be any significant in-combination effect, in view of the site's conservation objectives?** |
|---|---|---|---|---|
| Direct capture, damage, or harm to the designated species features. | **Severn Estuary SAC**<br>- **Estuaries**<br>Assemblage of migratory fish species: Sea lamprey, River lamprey and Sea trout<br>- **River Lamprey**<br>- **Sea Lamprey**<br><br>**Severn Estuary Ramsar**<br>- **Estuaries**<br>*Notable estuarine migratory fish assemblage:*<br>Sea trout, River lamprey and Sea lamprey<br>- **Assemblage of migratory fish species:**<br>· Sea Lamprey<br>· River Lamprey<br>· Sea trout | Canal & Rivers Trust New Authorisation applications being determined by the Environment Agency within the Severn Corridor (all surface water):<br>- **NPS/NA/000428 Transfer between sources Diglis Lock 1, backpump (surface water). Feeds the Worcester and Birmingham Canal at NGR SO 84835 53819.**<br>Determination / HRA not complete, however EA currently intend to licence as per existing operation; no loss to the to the catchment as pumps recirculate water that is lost from the canal at Diglis Lock, back to the canal.<br>- **NPS/NA/000928 Transfer between sources Gloucester Pumps. Feeds the Gloucester and Sharpness Canal at NGR SO 82596 18323.**<br>Determination / HRA not complete, | No in combination effect is anticipated for the following reasons:<br>· The New Authorisation abstractions have been occurring legally without a licensing requirement for many years.<br>· The New Authorisation abstractions are already considered as part of the baseline flow conditions within the Severn Corridor catchment.<br>· New Authorisation applications must be determined in line with the Transitional Regulations 2017 and the 2017 Government response, which states that applications will only be significantly curtailed or refused to protect the environment from 'serious damage'. Which also allows for the implementation of fish screening, where historically screens may not have been present.<br>· Where required maximum abstraction volumes shall be conditioned in line with evidenced abstraction rates. | **NO** |

| | | | | |
|---|---|---|---|---|
| Potential for damage to the supporting habitat of designated species through changes in flow. | **<u>Severn Estuary SAC</u>**<br>- **Estuaries**<br>Assemblage of migratory fish species: Twaite shad (Annex 1 species) and Allis shad<br>- **Twaite shad**<br><br>**<u>Severn Estuary Ramsar</u>**<br>- **Estuaries**<br>*Notable estuarine migratory fish assemblage:*<br>Twaite shad and Allis shad<br>- **Assemblage of migratory fish species:**<br>· Twaite Shad<br>· Allis Shad | however EA currently intend to licence as per existing operation and in line with flow and tide related conditions as set out in the canal operating agreement.<br>- **NPS/NA/000933 Transfer between sources River Frome at Whitminster. Feeds the Gloucester and Sharpness Canal at NGR SO 76039 08783.**<br>Determination / HRA not complete, however EA currently intend to licence as per existing operation, which includes compensation flow of 0.14 cumecs to the River Frome at the point of abstraction. | | |
| **(a) If the right hand column is 'NO' for all rows** | | The project, when considered in combination with other plans and projects, is either not likely to have a significant effect on, or will not adversely affect the integrity of any Natura 2000 site. | | |
| ~~**(b) If any rows in the right hand column are 'YES' or 'DON'T KNOW'**~~ | | ~~The project is likely to have a significant effect in combination with other plans or projects.~~ | | |

## 6. Conclusion

| | |
|---|---|
| **HRA is not required because the whole of the project is directly connected with or necessary to the management of one or more Natura 2000/Ramsar sites, for the purposes of conserving the habitats or species for which the site(s) is/are designated, and the project is not likely to have a significant effect on any other Natura 2000/Ramsar sites.<br>(As documented in section 2.1 and 2.2 of this form)** | |
| **HRA is not required because there is no conceivable impact pathway to any Natura 2000/Ramsar site<br>(As documented in section 2.3 of this form)** | |
| **This project is a renewal of a current permission which complies with NRW agreed criteria for ruling out significant effects of a renewal without conducting a project-specific LSE test. Therefore, it is considered not likely to have a significant effect on any Natura 2000/Ramsar sites, either alone or in-combination with other plans and projects.<br>(As documented in section 3.1 of this form)** | |
| **The project has been screened for likelihood of significant effects and, taking account of the advice received from protected sites advisors, is considered not likely to have a significant effect on any Natura 2000/Ramsar site<br>(As documented in section 3.2 of this form, or section 5 if applicable)** | |
| **In light of the conclusions of an appropriate assessment, and taking account of the advice received from protected sites advisors, it has been established that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects.<br>(As documented in section 4 of this form, and section 5 if applicable)** | **X** |
| **In light of the conclusions of the appropriate assessment, it has not been ascertained that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, as documented in section 4 of this form, and section 5 is applicable.**<br><br>**Approval for the project cannot be given unless either:**<br>• **the project specification, and/or the terms under which it might be approved, are modified so as to remove the risk of adverse effects, and a revised HRA report is prepared, or**<br>• **the project satisfies the requirements of Article 6(4) of the Habitats Directive, an Article 6(4) Statement of Case is prepared** | |

| (OGN 200 Form 3) and submitted for consideration by the appropriate authority, normally Welsh Ministers | |
|---|---|

**Signed:** Charlotte Lillywhite

**Name:** Charlotte Lillywhite

**Position:** Water Resources Permitting Officer 2

**Date:** 30/11/2022

HRA Escalation in accordance with OGN200;

Signed:

Name: John Wheadon

Position: Acting Head of Regulation and Permitting

Date: 7 December 2022

## 7. Consultation with protected sites advisor(s) and how sections 2, 3, 4 and 5 of this HRA report (as applicable) take into account that advice.

| Relevant section of the HRA report | Date(s) of correspondence* and any meeting(s) with protected sites advisor(s) | Description of how the comments from protected sites advisors have been taken into account |
|---|---|---|
| **NRW - Statutory Nature Conservation Body for the Montgomery Canal SAC** | | |
| 4.2 | **30/11/2022** Advice from North Powys Environment Team on Form 2, regarding the effect of the abstraction with mitigation measures on the Montgomery Canal SAC. The Montgomery Canal SAC is designated for the key species *Luronium natans*.<br>The advice received states:<br>- Abstractions are required and necessary to the management of the Montgomery Canal SAC<br>- There is a fundamental need for a sufficient level of water to be maintained within the canal<br>- Proposed restrictions on abstraction as mitigation for the Severn Estuary SAC may have the potential to impact on the integrity of the Montgomery Canal SAC<br>- Longer durations or regular/repeat episodes of lower water levels, could result in growth of swamp/marginal vegetation, and *Luronium* may become outcompeted<br>- There is concern that not enough information is provided to demonstrate that restrictions, as mitigation for the Severn Estuary SAC, will not adversely affect the integrity of the Montgomery Canal SAC. As such, the North Powys Environment Team is unable to agree with the conclusion reached by permitting which is that "NRW is satisfied that the | **Permitting made the following amendments to Form 1:**<br>Updated wording relating to the Montgomery Canal SAC as follows:<br>**FROM** 'NRW are satisfied that the flow restriction mitigation measures detailed above are considered not likely to have a significant effect on the Montgomery Canal SAC.' - yellow highlighted text in column to the left.<br>**TO** 'NRW are satisfied that the flow restriction mitigation measures detailed above will not adversely affect the integrity of the Montgomery Canal SAC.'.<br><br>Change necessary, as the legal test at this stage of the form is whether the abstractions (with mitigation measures) are likely to have an adverse effect on the integrity of the site, not likely significant effect.<br><br>Permitting sent Protected Sites Advisor (PSA) for the Montgomery Canal SAC (cc in Severn Estuary designations PSA) an email highlighting this 08/02/2022.<br><br>**Further detail on Permitting (Competent Authority) decision making:**<br>**River Regulation**<br>The River Severn is subject to river regulation, which means water is released from Llyn Clywedog (and other sources) to offset / support large abstractions from the Severn further downstream. Regulation results in increased flows in the Severn than would naturally be observed. The flows in the Severn at Penarth are higher during periods of river regulation than would typically be expected, as the abstraction is downstream of the releases and upstream of the large abstractions. It is important to note that the River Severn could be in a period of low flows, without regulation taking place. The Tanat is a tributary of the Vyrnwy, which then flows into the Severn. The flows in the Tanat are not influenced by periods of river regulation and can be considered natural.<br><br>**Modelling (Appendix 5 of this form)**<br>Flow data was utilised from 2021 (months Jan - Dec) and 2022 (months Jan – October) to provide an indication of how abstraction volumes from the Severn and Tanat abstractions could |

| | | |
|---|---|---|
| | flow restriction mitigation measures are considered not likely to have a significant effect on the Montgomery Canal". The officer also states that he does not believe the HRA conclusion in section 6 of Form 1 can be reached. | be affected by the proposed restrictions, on the assumption that the applicant abstracts at the maximum permitted rates (in line with the qualifying period), regardless of intake limitations (i.e., the maximum permitted rates may not be possible). These years were assessed as NRW were confident which days the Severn was being regulated. See hydrology report dated 29/11/2022 for further detail. The 2021 data used demonstrates potential impacts during a more typical year; whilst the 2022 data demonstrates potential impacts during a period of sustained low flows / drought conditions.<br><br>**Tanat:**<br>Potential impacts on abstractable volumes for the Montgomery Canal, shown as a percentage reduction in abstractable volumes over a month:<br>- **2021:** between 2-17% reduction (potentially affecting 3 months, and 0% on 9 months), and<br>- **2022:** between15-52% reduction (potentially affecting 5 months, and 0% on 5 months).<br>The 2022 data demonstrated that the proposed low flow restrictions could have a larger impact on the abstractable volumes during a period of drought, when compared with a more typical year such as 2021 - % reduction and number of months.<br><br>**Severn:**<br>Potential impacts on abstractable volumes for the Montgomery Canal, shown as a percentage reduction in abstractable volumes over a month:<br>- **2021:** between 2-14% reduction (potentially affecting 5 months, and 0% on 7 months), and<br>- **2022:** between 2-7% reduction (potentially affecting 3 months, and 0% on 7 months).<br>The 2022 data demonstrated that the proposed low flow restrictions could have less of an impact on the abstractable volumes during a period of drought, when compared with a more typical year as demonstrated by the 2021 data - % reduction and number of months affected. The reason the proposed restrictions could have has less of an impact on abstractable volumes for the canal is due to additional flows in the Severn during a period of river regulation. River regulations means that the flows within the Severn at Penarth would be less likely to be sufficiently low for the proposed low flow restrictions to apply, even during a period of drought.<br><br>**Summary**<br>- **2021 assessment of potential reductions in abstractable volumes, a more typical year:** The modelling showed a potential reduction of between 2-17% for the Tanat abstraction (3 months), which are comparable with a potential reduction of between 2 – 14% for the abstraction from the Severn (5 months) when the impact of river regulation is less pronounced.<br>- **2022 assessment of potential reductions in abstractable volumes, a period of sustained low flows / drought conditions:** The modelling showed a potential reduction of between 15-52% for the Tanat abstraction (5 months), compared with a potential reduction of between 2 – 7% for the abstraction from the Severn (3 months) when the impact of river regulation was more pronounced. |

| | | |
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| | | - Therefore, during a typical year the above modelling indicates a small potential reduction in abstractable volumes for the canal as a result of the low flow restrictions and Permitting do not anticipate that this would translate into significant reductions in water levels within the canal.<br>- Similar reductions in abstraction volumes were detailed in appendix 5 of Version 1 of Form 1 dated 21/10/2022 were previously agreed in Version 1 of Form 2 dated 08/11/2022 with Protected Sites advisor for the Montgomery Canal SAC, which informed this current Version 2 of Form 1.<br><br>Permitting acknowledged the concerns from the Protected Sites Advisor that not enough information / sufficient data is provided to demonstrate that restrictions, as mitigation for the Severn Estuary SAC, will not adversely affect the integrity of the Montgomery Canal SAC and took the following steps:<br>· Permitting sent an updated modelling report to the applicant and enquired whether any further information or supplementary data to allow us to better understand how the proposed restrictions could impact on water levels within the canal (SAC) was available (see email dated 30/11/2022).<br>· The applicant requested additional data to allow them to assess the potential impacts of HRA version 2 flow restrictions (see email dated 01/12/2022).<br>· Permitting confirmed that there will be a delay in sending the requested data and updated them on our current determination progress, following discussion with Team Leader and Permitting Service Manager (see email dated 02/12/2022).<br><br>Following the email sent 30/11/2022, the applicant also confirmed the following in an email dated 09/12/2022:<br>*'Our abstraction is not pumped, it is a gravity feed abstraction, the volume of which is determined by the opening of the abstraction sluices and the driving head which is also a function of the varying river level. As the river flow decreases so does the river level and thus so does our abstraction. As the river flow increases, our abstraction increases.* ***The maximum instantaneous flow will have coincided with a period of HIGH river flow, and not LOW river flow. It will have also only occurred over a short period of the abstraction. It does not reflect our continuous abstraction rate. Therefore, it appears that you have miscalculated our abstraction and consider it to be greater than it is****, resulting in unnecessary regulatory constraints.'.*<br>The above response from the applicant further indicates that the 2021 / 2022 modelling to provide an indication of how abstraction volumes from the Severn and Tanat abstractions could be affected by the proposed restrictions, demonstrate the worst 'potential' scenario. The applicant confirms that the maximum abstraction rates used in the modelling would not be possible during a period of low flows. Therefore, our proposed low flow restrictions should have a much lower potential impact on abstractable volumes than our modelling suggests and thus, a lower potential impact on water levels within the canal. |

| | | |
|---|---|---|
| | | As the Competent Authority, Permitting is required to make a decision on the basis of the best scientific knowledge available. Having considered the best scientific knowledge available, there is no reasonable scientific doubt that the project will not adversely affect the integrity of the Montgomery Canal SAC. Permitting have exercised evaluative judgement, considering the potential effects of the project on the protected species, and whether those effects presented a real risk to the maintenance of their favourable conservation status. Permitting are satisfied that that the project poses no real risk to the integrity of the Montgomery Canal SAC.<br><br>Permitting can therefore conclude the following:<br>*In light of the conclusions of an appropriate assessment and taking account of the advice received from protected sites advisors, it has been established that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, taking into account any conditions or restrictions as applicable, either alone or in-combination with other plans and projects. (As documented in section 4 of this form, and section 5 if applicable)*<br><br>In accordance with OGN200, this matter was escalated for a decision on 07/12/2022 (in attendance: Gavin Bown (Head of Mid Wales Operations), Dave Lee (North Powys Environment Team Leader), Ann Weedy (Operations Manager Mid), John Wheadon (Permitting Centre Manager) acting on behalf of Nadia De Longhi (Head of Regulation and Permitting) in line with the scheme of delegation and Ashley Lansdown (Water Resources Team Leader).<br><br>Gavin Bown, confirmed the following by email:<br>*'Thanks for our meeting on the 7th December where the options were summarised, and escalation approach (as per OGN200) explained by Ashley. It's clear there has been constructive engagement with the local Environment Team on this application. Given the evidence available, and that refusal of the application (the 'do nothing' option) presents a higher likelihood of adverse impact to the integrity of the canal SAC than the other options and that our evidence indicates options 1 and 2 present a higher likelihood of adverse impact on the relevant SACs than option 3, as Head of Mid Ops I support Option 3 within the options appraisal summary. This would involve the licences for Tanat and Penarth being issued with flow restriction conditions and screening at the intakes. We would want CRT to monitor levels in the canal so that we can use the data to help establish protective levels required.'.* |
| **NRW - Statutory Nature Conservation Body for the Severn Estuary designations and Montgomery Canal SAC** | | |
| Form 2 | The Form 2 response, completed by Severn Estuary designations and Montgomery Canal SAC PSAs was confirmed via emails on 30/11/2022, however, the form was undated. So that there is a clear date for the purposes of audit trail in decision making, permitting added the correct date | N/A |

| | | |
|---|---|---|
| | (30/11/2022) to the forms and sent an email highlighting this to the PSAs on 08/02/2022. | |
| **See HRA Form 1 Version 1 dated 21/10/2022 and HRA Form 2 Version 1 for further details of discussions which informed this current version (2).** | | |
| **Natural England - Statutory Nature Conservation Body for the Seven Estuary SAC, SPA and Ramsar English Sites** | | |
| HRA Form 1 Version 1 dated 21/10/2022: Questions initially received via emails regarding version 1 of the assessment, for further detail, please see section 7 of that form, or 'Record of correspondence between NRA and Natural England' dated 14/12/2022.<br><br>This current version of Form 1 – Version 2 along with the record of questions asked on Form 1 Version 1 sent to Natural England 16/12/2022. | | |

**The following responses were received from Statutory Nature Conservation Body for the Montgomery Canal SAC and Severn Estuary SAC, SPA, Ramsar on HRA Form 2 Version 2:**

Cyfoeth Naturiol Cymru
Natural Resources Wales

# Form

## Protected sites advisor response to an internal consultation on the Habitats Regulations Assessment of a project

## OGN 200 Form 2

**Document owner: Protected Sites Team, EPP**

**Version History:**

| Document Version | Date Published | Summary of Changes |
|---|---|---|
| 1.0 | March 2016 | Document created |
| 1.1 | 30 November 2017 | Minor changes only |

**Next review date: April 2018**

Cyfoeth Naturiol Cymru
Natural Resources Wales

## Protected sites advisor response to an internal consultation on the Habitats Regulations Assessment of a project

**TO:** Charlotte Lillywhite, Water Resources Permitting

**FROM:** Sarah Revill, Marine Area Advice and Management Team
Alastair Hotchkiss, North Powys Environment Team

**SUBJECT:** Habitats Regulation Assessment of transfer water abstraction licence applications PAN-007395 (Penarth Feeder at Penarth on the River Severn), and PAN-007397 (Tanat Feeder at Carreghofa on the River Tanat):

Montgomery Canal SAC
Severn Estuary SAC and Ramsar

Thank you for consulting the Marine Area Advice and Management Team and North Powys Environment Team on the above project and sending us a copy of the draft Form 1 HRA report dated 30 November 2022. Our comments are as follows:

*Marine Area Advice and Management Team comments:*
We welcome the further information provided to address our previous concerns relating to abstraction limits and screen sizes. We note the latest modelling undertaken by Robert Bissell referred to within the HRA, with mitigation of 2 cutback restrictions to abstraction volumes at Penarth Weir and 3 cutback restrictions at Tanat. Given the mitigation stated, we can concur with the conclusion of the HRA that the proposal will not adversely affect the integrity of the Severn Estuary SAC, SPA and Ramsar Site.

*North Powys Environment Team comments:*
We have reconsidered the HRA based on the changes and further information. The abstractions, as a project (i.e., without considering any restrictions as mitigation for Severn Estuary SAC) are required and necessary to the management of the Montgomery Canal SAC. There is a fundamental need for a sufficient level of water to be maintained within the canal.

However, the proposed restrictions on abstractions as mitigation for the Severn Estuary SAC may have the potential to impact the integrity of the Montgomery Canal SAC, and therefore the likely significant effect of restrictions on the Montgomery Canal SAC should be considered.

We note the comment on page 26 of the HRA (based on advice we provided) about floating water-plantain *Luronium natans* tolerating some periods of lower water levels, so long as these are followed by periods of deeper water later in the year, which would be the expectation every winter. But longer durations or regular/repeat episodes of lower water levels, could result in growth of swamp/marginal vegetation, and *Luronium* may become outcompeted. Whilst we recognise the comments on this form relate to the SAC feature (*Luronium*), it is important to note that SSSI features (including some of the *Potamogeton* spp.) may be at even greater risk by periods of low levels.

We are of therefore of the opinion that it would be difficult for NRW to conclude no likely significant effect without information as to how actual water levels in the canal would be affected by different abstraction restriction scenarios (and potentially future climate scenarios). Although the modelling provided in Appendix 5 is informative of changes in volumes entering the canal, this would also require information on how the canal retains water levels during prolonged periods of restricted abstraction for example.

We acknowledge that this is going to be influenced by significant canal dredging works happening over next 3 years (particularly around Tanat feeder end), and planned repairs to the leaking Vyrnwy aqueduct, etc. These projects (which will be subject to CRTs own HRAs, as competent authority), in combination, would be expected to make canal features more resilient in drought periods and any periods of lower abstraction rates.

Despite that, we are concerned that not enough information is provided to demonstrate that the restrictions, as mitigation for the Severn Estuary SAC, will not adversely affect the integrity of the Montgomery Canal SAC. We are therefore unable to agree with the comment at the top of page 27 that “NRW are satisfied that the flow restriction mitigation measures detailed above are considered not likely to have a significant effect on the Montgomery Canal SAC.” Consequently, we do not believe the HRA conclusion (section 6) can be reached.

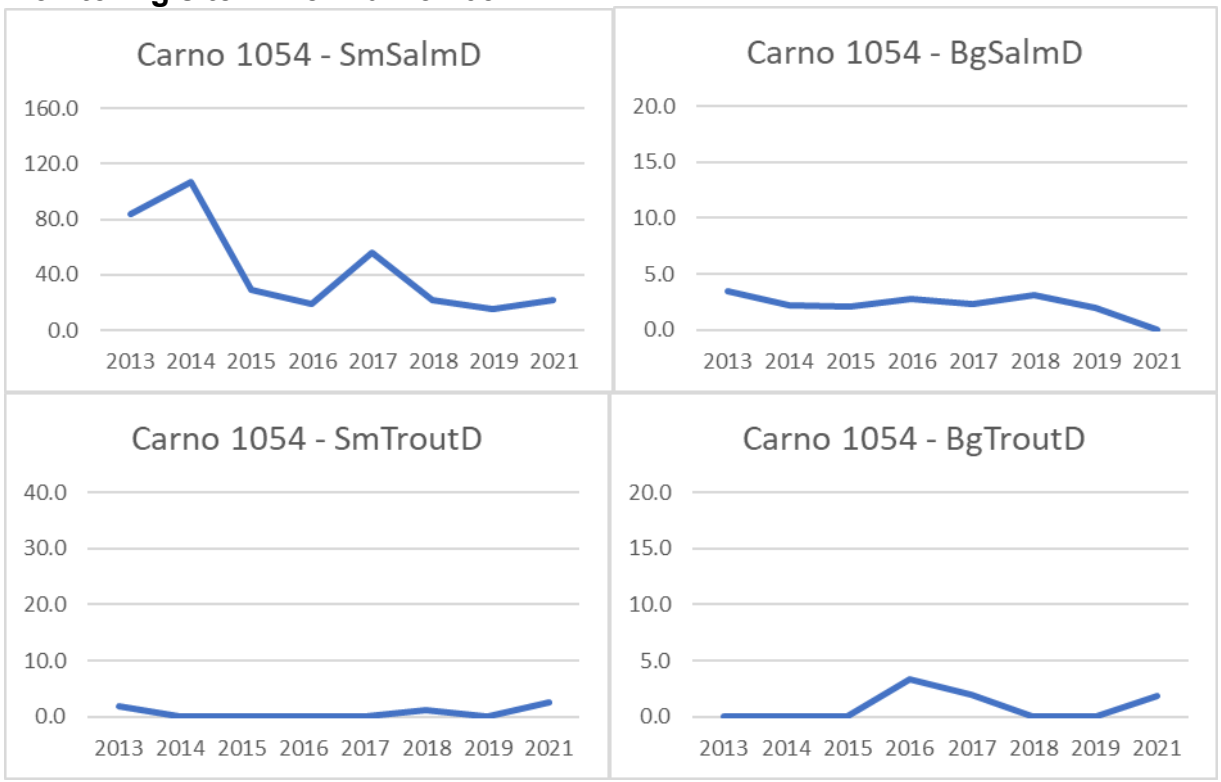
Signed: Alastair Hotchkiss (North Powys Environment Team)
Sarah Revill (Marine Area Advice and Management Team)

Date: 30/11/2022

**Appendix 1:** Graphs showing numbers and tables showing overall grade of salmon and trout survey data from between 2002 and 2021, for monitoring sites upstream of the point of abstractions on the River Severn and River Tanat. For further detail, please see the summary of salmon and trout survey data located here.

- No summary graphs or overall grade data included for monitoring site 1035 at Clywedog.

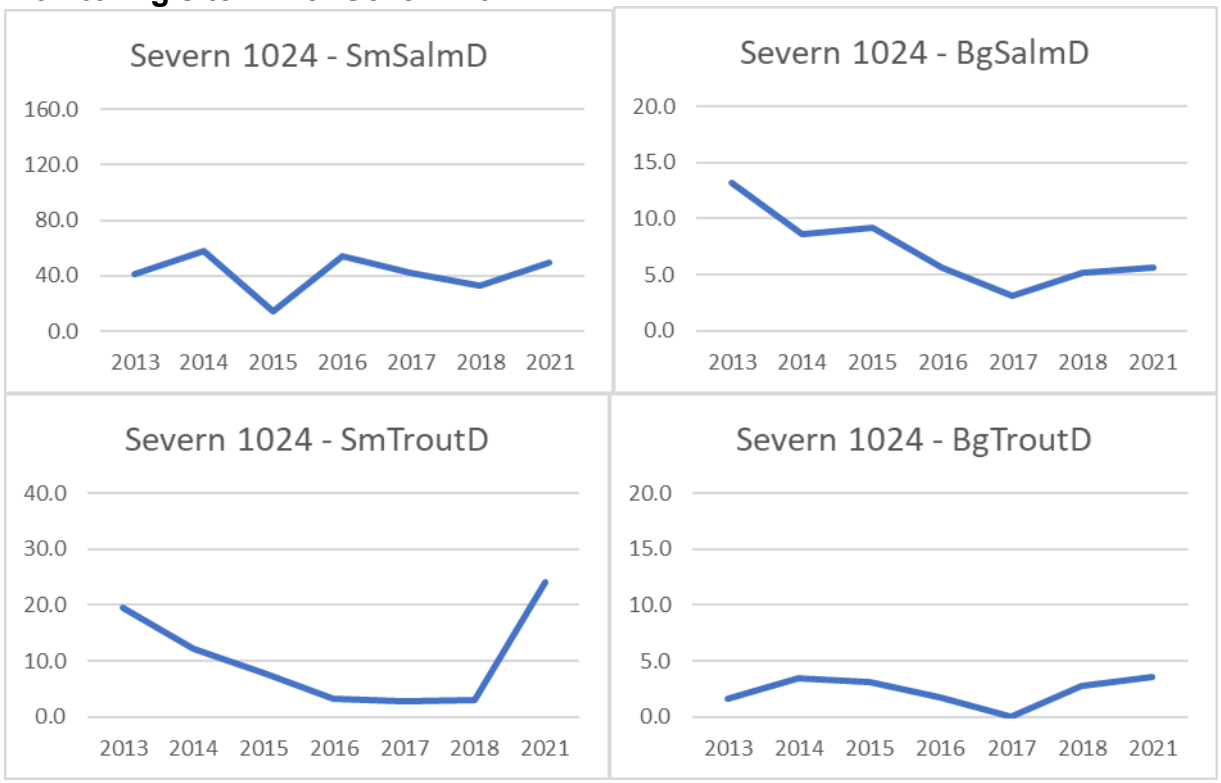
**Monitoring site: River Carno 1054**




**Overall Grade**

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 |
|---|---|---|---|---|---|---|---|---|
| Salmon | B | B | D | D | C | D | D | D |
| Trout | E | F | F | E | E | E | E | E |

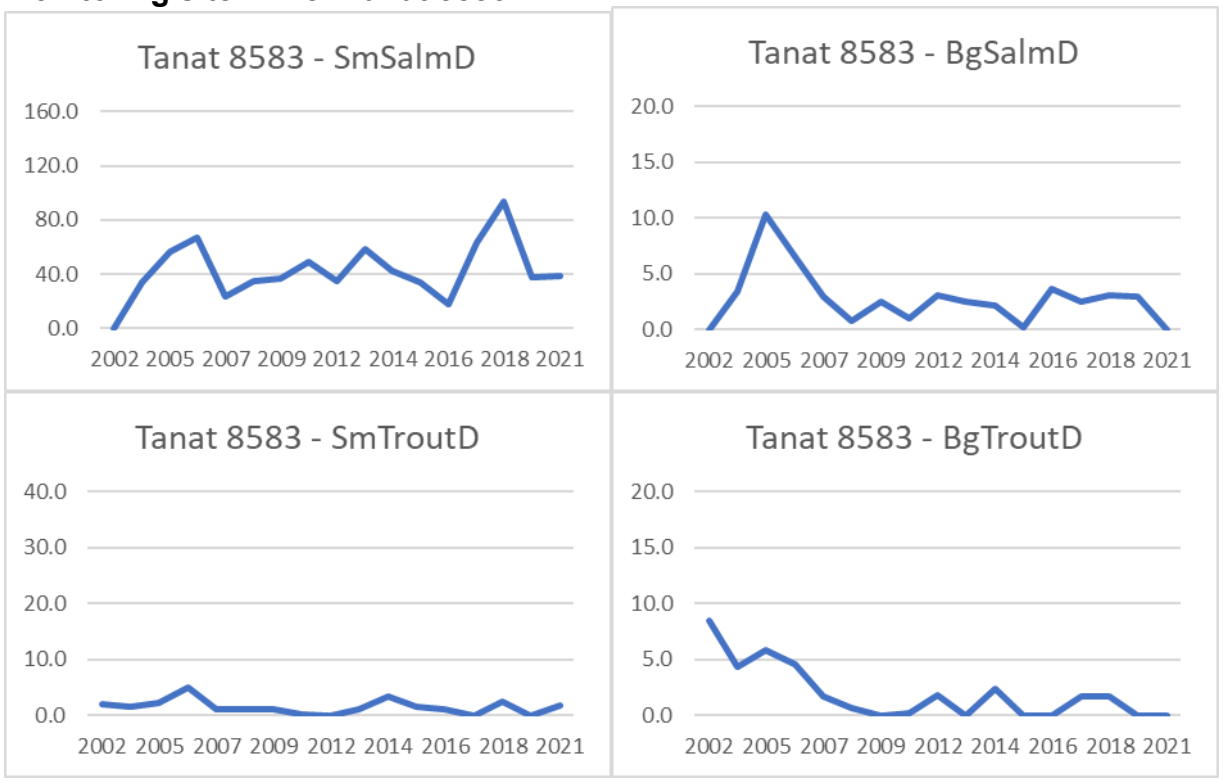
**Monitoring site: River Severn 1024**




**Overall Grade**

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2021 |
|---|---|---|---|---|---|---|---|
| Salmon | B | B | D | C | C | C | C |
| Trout | D | D | D | E | E | E | C |

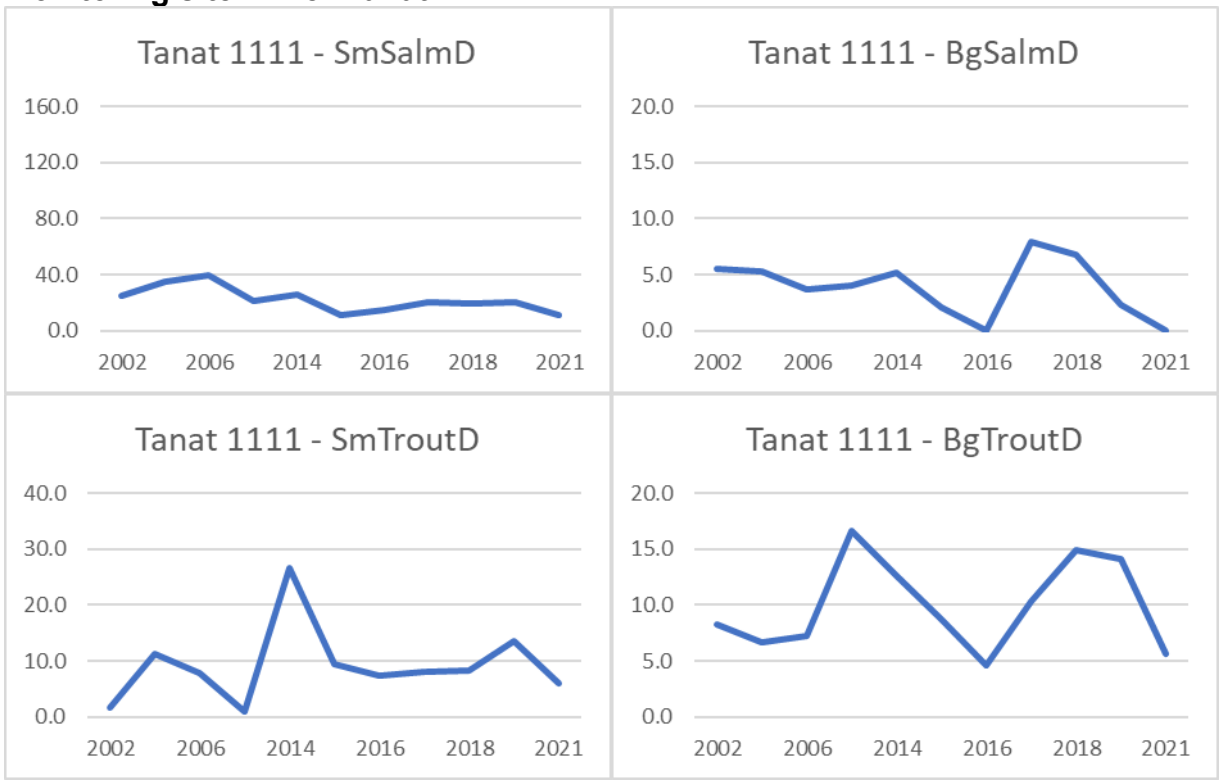
**Monitoring site: River Tanat 8583**




**Overall Grade**

| | 2002 | 2003 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Salmon | F | D | B | B | D | D | D | C | D | C | C | D | D | C | B | D | D |
| Trout | D | E | D | D | E | E | E | E | E | E | E | E | E | E | E | F | E |

**Monitoring site: River Tanat 1111**




**Overall Grade**

| | 2002 | 2003 | 2006 | 2011 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Salmon | D | C | C | D | D | E | E | C | D | D | E |
| Trout | D | D | D | C | B | C | D | C | C | C | D |

## Appendix 2: Flow standards

**Table 1:** based on Water Framework Directive (WFD) Ecological Flow Indicators (EFI)

| River type | Flow > Q95 | | Flow < Q95 | |
|---|---|---|---|---|
| | *Mar - Jun* | *Jul - Feb* | *Mar - Jun* | *Jul - Feb* |
| *Predominantly clay. South East England, East Anglia and Cheshire plain* | 25% | 30% | 15% | 20% |
| *Chalk catchments; predominantly gravel beds; base-rich* | 15% | 20% | 10% | 15% |
| *Hard limestone and sandstone; low-medium altitude; some oligotrophic hard rock* | 20% | 25% | 15% | 20% |
| *Non-calcareous shales; pebble bedrock; Oligomeso-trophic; Stream order 1 and 2 bed rock and boulder; ultra-oligo trophic torrential* | 15% | 20% | 10% | 15% |
| | *Oct – Apr* | *May – Sep* | *Oct - Apr* | *May - Sep* |
| *Salmon spawning & nursery (not chalk rivers)* | 15% | 20% | 10% | 15% |

**Table 1: Flow standards for UK river types for supporting good ecological status given as the percentage allowable abstraction of natural flow (UKTAG, 2008).**

| | high flow → | | | low flow |
|---|---|---|---|---|
| **Abstraction Sensitivity Band** | **Q30** | **Q50** | **Q70** | **Q95** |
| ASB3. high sensitivity | 24% | 20% | 15% | 10% |
| ASB2. moderate sensitivity | 26% | 24% | 20% | 15% |
| ASB1. low sensitivity | 30% | 26% | 24% | 20% |

**Table 2: Percentage allowable abstraction from natural flows at different abstraction sensitivity bands.**

**Table 2:** based on CAMS EFI, developed from WFD EFI

**Table 3:** based on Common Standards Monitoring Guidance (CSMG)

**rCSMG Table 3 Flow targets in relation to river size and discharge**

| River size | < Qn95 (low flows) | Qn50-95 (low to moderate flows) | QN10-50 (moderate to high flows) | >Qn10 (high flows) |
|---|---|---|---|---|
| Headwater | 5 | 10 | 15 | 15 |
| River | 10 | 15 | 20 | 10 |
| Large river | 15 | 20 | 20 | 20 |

Qn: daily naturalised flows. Figures are percentage deviation for daily naturalised flow

| EW band (sensitivity) | Maximum % reduction from daily naturalised (benchmark) flow | | |
|---|---|---|---|
| | **<Qn50** | **Qn50-95** | **>Qn95** |
| Very High | 10 | 10 | 1-5 |
| High | 15 | 10 | 5-10 |
| Moderate | 20 | 15 | 10-15 |
| Low | 20 | 15 | 15 |
| Very Low | 20 | 20 | 15 |

*Table 8.4: Derivation of HD ERF based on acceptable deviation from natural flows*

**Table 4:** based on Habitats Directive Ecological River Flow Objectives (HD ERFO)

The existing abstractions fall under the following classes: Table 1: '*Salmon spawning & nursery (not chalk rivers)*' or '*Non-calcareous shales; pebble bedrock; Oligomeso-tophic; Stream order 1 and 2 bed rock and boulder; Ultra-oligo trophic torrential*', Table 2: '*ASB3 High sensitivity*', Table 3: '*River*'; and Table 4: not considered relevant as the River Penarth and River Tanat are not designated SAC rivers. The maximum abstraction rates applied for, and the low flow restrictions proposed are considered necessary and in line with all of the above flow standards until Q99 flows (see appendix 3 and 4). It is important to note that the flow restrictions to be applied to the licences have potential to reduce abstractable volumes for the Montgomery Canal SAC - see Appendix 5 below for more information. We are satisfied that the proposed flow restrictions are appropriate to protect all designations and features identified.

**Appendix 3: Modelling of flow restrictions for the River Severn at Penarth**

The flows in the River Severn are influenced by the Severn Regulation Scheme, which augments naturally low flows with reservoir releases to support large abstractions further downstream. As such, flows in the Severn at Penarth rarely fall as low as they would naturally. For example, the natural Q95 of 1.0$m^3$/s equates to less than Q99 of actual river flows. However, there are occasions when the Severn is not being regulated and river flows can fall lower than this, so it's important to protect those very low flows.

CRT are applying for the following abstraction rates:

- Instantaneous: 0.228$m^3$/s
- Hourly: 821$m^3$/hr, which equates to average 0.228$m^3$/s
- Daily: 14574 $m^3$/d, which equates to average 0.169$m^3$/s

How the above rates compare with Q95 low flows:

- Q95 (natural) at the point of abstraction = 1.0$m^3$/s
- Q95 (actual) at the point of abstraction = 1.74$m^3$/s

The instantaneous and hourly abstraction rates equate to 18% of Q95 (nat) and 13% of Q95 (actual).

The abstraction restrictions in set out in the British Waterways Bill have not been modelled because the restrictions (when averaged) are generally higher than the evidenced maximum abstraction rates applied for, which will supersede these Bill restrictions. The conditions regarding Clywedog storage and Drought Orders occur so rarely that they have not been modelled, although they will be replicated as condition on the licence.

Therefore, the following restrictions are proposed:
When the flow in the River Severn as gauged at Dolwen Gauging Station is less than 0.86 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

| **Flow Range at Dolwen Gauging Station $m^3$/s** | **Maximum abstraction rates** | |
|---|---|---|
| | **Hourly $m^3$/hour** | **Daily $m^3$/day** |
| Flows less than 0.86 and greater than or equal to 0.7 | 360 | 8,640 |
| Flows less than 0.7 | 180 | 4,320 |

When the river is not in a period of low flows, i.e., flows equal to or greater than 0.86$m^3$/s at Dolwen Gauging Station.
In order to prevent risk of excessive fluctuations in flow when the rivers are not in a period of low flows, maximum hourly, daily and annual abstraction quantities shall be included on the licence, which are be based on abstraction quantities evidenced during the qualifying period, as follows: 821.3$m^3$/hour, 14,574$m^3$/day and 2,311,216$m^3$/year

Table 1 (below) shows low flow percentiles of naturalised flows, and compares the impacts of the existing abstraction regime, with the proposed abstraction regime. The table demonstrates how low flows are augmented by the regulation scheme. With the current abstraction regime, it's clear

that abstraction exceeds 10% of the river flow at the lowest flows, equating to 44% of the flow at Q99. The abstraction regime proposed during a period of low flows, with two restrictions better protect low flows at flows below Q95 than with one restriction. It should be noted that this assessment is based on CRT abstracting the maximum rates permitted/evidenced.

River flows at Penarth can fall as low as 0.6-0.7$m^3$/s when the Severn is being regulated. The proposed 2 abstraction restrictions would limit abstraction to 50l/s at the lowest flows, which equates to 8% of 0.6$m^3$/s. It should be noted that flows have only fallen to 0.6$m^3$/s for 17 days in a 52 year record.

| Flow Percentile | Natural Flow (m3/s) | Current Situation | | With 1 Abstraction Restriction | | With 2 Abstraction Restrictions | |
|---|---|---|---|---|---|---|---|
| | | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow | Residual Flow (m3/s) | Abstr as % of flow |
| 85 | 1.94 | 1.71 | 12% | 1.71 | 12% | 1.71 | 12% |
| 86 | 1.85 | 1.62 | 12% | 1.62 | 12% | 1.62 | 12% |
| 87 | 1.76 | 1.53 | 13% | 1.53 | 13% | 1.53 | 13% |
| 88 | 1.66 | 1.43 | 14% | 1.43 | 14% | 1.43 | 14% |
| 89 | 1.57 | 1.34 | 15% | 1.34 | 15% | 1.34 | 15% |
| 90 | 1.47 | 1.24 | 16% | 1.37 | 7% | 1.37 | 7% |
| 91 | 1.37 | 1.15 | 17% | 1.27 | 7% | 1.27 | 7% |
| 92 | 1.29 | 1.06 | 18% | 1.19 | 8% | 1.19 | 8% |
| 93 | 1.19 | 0.96 | 19% | 1.09 | 8% | 1.09 | 8% |
| 94 | 1.10 | 0.87 | 21% | 1.00 | 9% | 1.00 | 9% |
| 95 | 1.01 | 0.78 | 23% | 0.91 | 10% | 0.91 | 10% |
| 96 | 0.91 | 0.68 | 25% | 0.81 | 11% | 0.86 | 5% |
| 97 | 0.81 | 0.58 | 28% | 0.71 | 12% | 0.76 | 6% |
| 98 | 0.67 | 0.45 | 34% | 0.57 | 15% | 0.62 | 7% |
| 99 | 0.52 | 0.29 | 44% | 0.42 | 19% | 0.47 | 10% |

***Table 1.*** *Comparing impacts of existing abstraction regime vs proposed abstraction regime on NATURAL flow flows at Penarth*

The impacts are also shown in Figure 1, below.

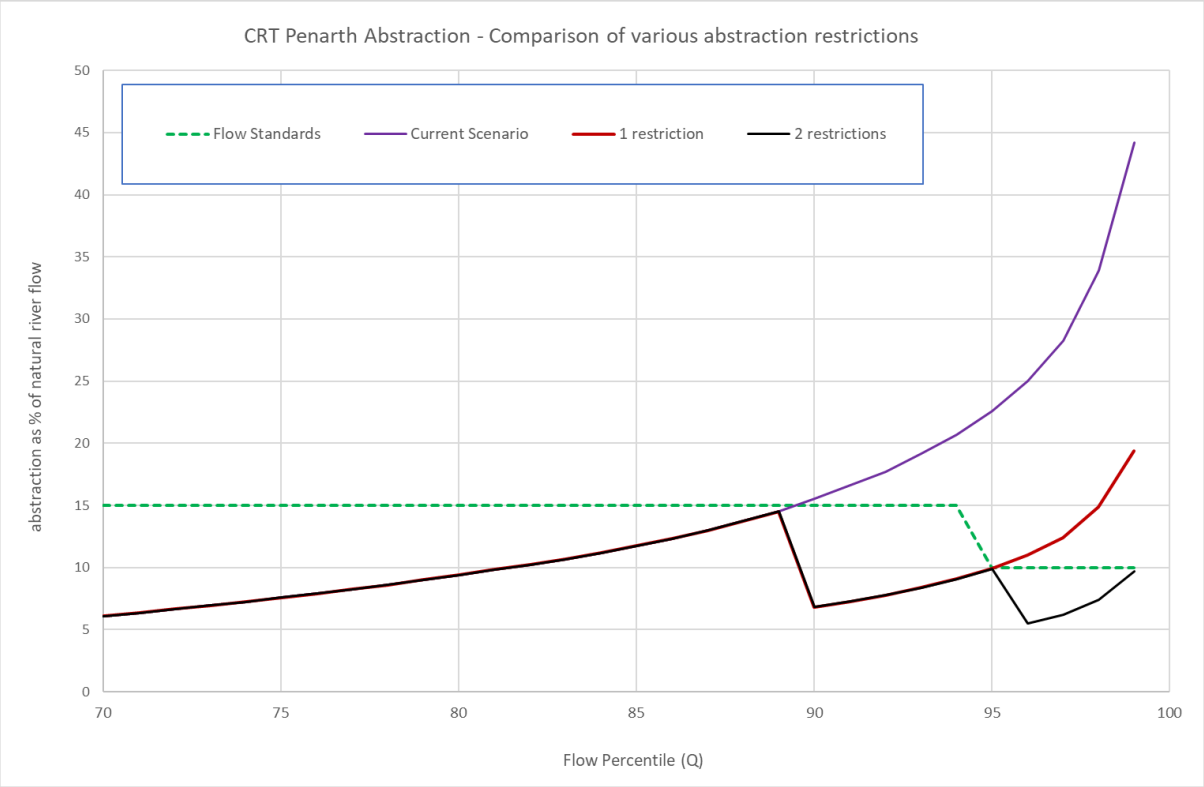



*Figure 1. Abstraction impacts as % of NATURAL river flow, vs flow standards.*

**Appendix 4: Modelling of flow restrictions for the River Tanat at Carreghofa**
Flows in the Tanat are considered natural upstream of the CRT abstraction at Carreghofa.

CRT are applying for the following abstraction rates:

- Instantaneous: 0.376$m^3$/s
- Hourly: 567.5$m^3$/hr, which equates to average 0.158$m^3$/s
- Daily: 9100 $m^3$/d, which equates to average 0.105$m^3$/s

How the above rates compare with Q95 low flows, where Q95 at the point of abstraction = 0.63$m^3$/s

- The instantaneous rate of abstraction equates to 60% of Q95.
- The hourly rate of abstraction equates to 25% of Q95.

The abstraction restrictions in set out in the British Waterways Bill include limiting abstraction to 49Ml over 7 days whenever the Severn is being regulated, or a lesser amount to maintain a residual flow of 15Ml/d downstream of Carreghofa weir. The 49Ml over 7 days has been modelled as constant average abstraction of 0.081$m^3$/s.

In order to protect low flows, NRW have modelled two and three flow restrictions to the CRT abstraction, as detailed in figure 2 and 3 below. These will be linked to flows at Llanyblodwel Gauging Station, which is situated just upstream of the CRT intake.

Figure 2 (below) shows low flow percentiles and compares the impacts of the existing abstraction regime, with the proposed abstraction regime. Also shown is an abstraction regime with just 1 restriction. Figure 2 shows that the current/existing scenario is not compliant with relevant flow standards at low flows, with abstraction exceeding 20% of the lowest flows. Applying only 1 abstraction restriction is also not sufficient to protect the lowest flows, with abstraction of up to 17% at Q99. Applying a second abstraction restriction at Q95 helps protect the lowest flows.

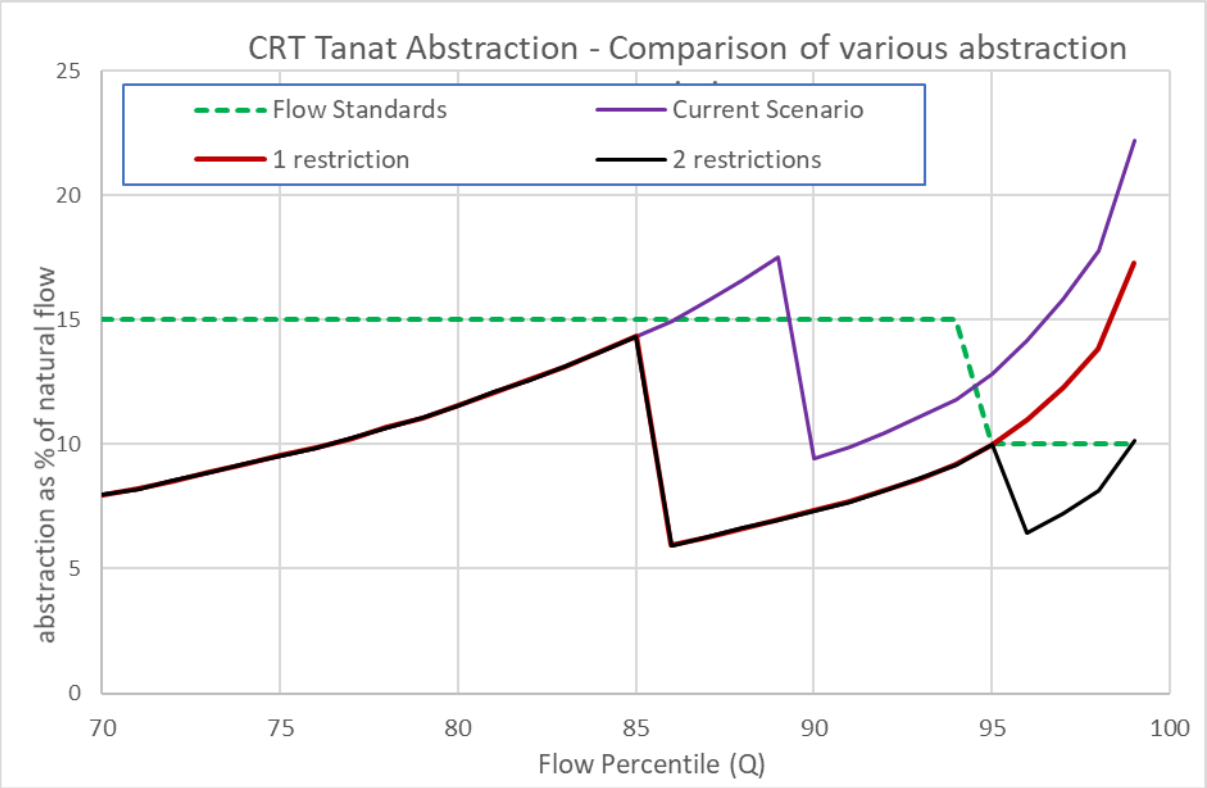



*Figure 2. Abstraction impacts as % of river flow, vs flow standards.*

**Considering the impact of applying a third low flow restriction, as outlined below:**

When the flow in the River Tanat as gauged at Llanyblodwel Gauging Station is less than 1.03 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:

| Flow Range at Llanyblodwel Gauging Station $m^3/s$ | Maximum abstraction rates | |
|---|---|---|
| | Hourly $m^3$/hour | Daily $m^3$/day |
| Flows less than 1.03 and greater than or equal to 0.84 | 432 | 9,100 |
| Flows less than 0.84 and greater than or equal to 0.61 | 227 | 5,448 |
| Flows less than 0.61 | 133 | 3,192 |

Three flow restrictions would allow additional abstraction in the flow range Q86 to Q90, when compared to the two flow restrictions modelled above.

When the river is not in a period of low flows, i.e., flows equal to or greater than 1.03m$^3$/s at Llanyblodwel Gauging Station.
In order to prevent risk of excessive fluctuations in flow when the rivers are not in a period of low flows, maximum hourly, daily and annual abstraction quantities shall be included on the licence, which are be based on abstraction quantities evidenced during the qualifying period, as follows: 567.5m$^3$/hour, 9,100m$^3$/day and 1,911,066m$^3$/year

Figure 3 below shows the impact of applying a third low flow restriction:

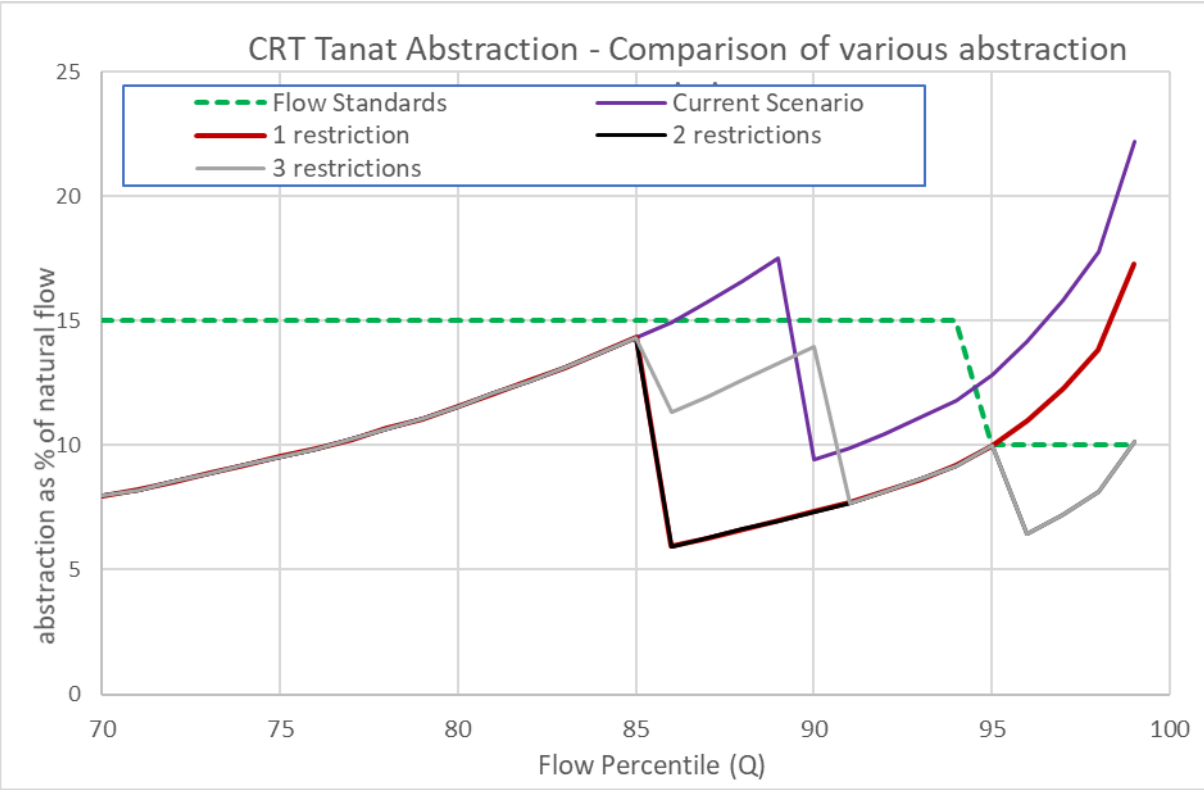



*Figure 3. Abstraction impacts as % of river flow, vs flow standards.*

**Appendix 5:** Monthly abstraction volumes possible from the points of abstraction (Penarth and Tanat), comparison of current situation (no low flow restrictions), versus proposed licence restrictions, using recent flow data (years 2021 and 2022)

**Penarth**

The impact of the proposed flow restriction has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 2 below demonstrates how the proposed restriction would reduce abstraction by an average of 3% in summer months, and up to 14% in July 2021.

| Year/Month | Existing scenario Vol Abstr (Ml) | With abstr restriction Vol Abstr (Ml) | % reduction |
|---|---|---|---|
| Jan-21 | 611 | 611 | 0% |
| Feb-21 | 552 | 552 | 0% |
| Mar-21 | 611 | 611 | 0% |
| Apr-21 | 591 | 558 | -6% |
| May-21 | 611 | 611 | 0% |
| Jun-21 | 591 | 580 | -2% |
| Jul-21 | 611 | 522 | -14% |
| Aug-21 | 611 | 589 | -4% |
| Sep-21 | 591 | 580 | -2% |
| Oct-21 | 611 | 611 | 0% |
| Nov-21 | 591 | 591 | 0% |
| Dec-21 | 611 | 611 | 0% |
| Jan-22 | 611 | 611 | 0% |
| Feb-22 | 552 | 552 | 0% |
| Mar-22 | 611 | 611 | 0% |
| Apr-22 | 591 | 547 | -7% |
| May-22 | 611 | 600 | -2% |
| Jun-22 | 591 | 591 | 0% |
| Jul-22 | 611 | 600 | -2% |
| Aug-22 | 611 | 611 | 0% |
| Sep-22 | 591 | 591 | 0% |
| Oct-22 | 217 | 217 | 0% |

*Table 2. Impact on abstraction volumes associated with proposed restriction.*

**Tanat**

The impact of the proposed flow restrictions has been assessed in terms of reduced abstraction rates and therefore water available to the canal. This has been assessed for 2021 and 2022 only. Table 3 below shows that applying 1, 2 or 3 abstraction restrictions causes a relatively large reduction in water abstracted – particularly during the 2022 drought. Limiting abstraction rates to 0.037m3/s at flows below Q95 means in July 2022 (for example) CRT would be able to abstract approximately 44% less water than they currently theoretically could. Having a 3rd abstraction restriction allows CRT to abstract slightly more water in the flow range Q86 to Q90, which in some months offsets the impact of limiting abstraction to 0.037m3/s when flows are below Q95 (May 2022 for example). However, it has little/no benefit during sustained periods of low flows, as were experienced in July-Sept 2022.

| Year/Month | Existing scenario | With 1 restriction | | With 2 restrictions | | With 3 restrictions | |
|---|---|---|---|---|---|---|---|
| | Vol Abstr (Ml) | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction | Vol Abstr (Ml) | % reduction |
| Jan-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-21 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Jun-21 | 403 | 403 | 0% | 403 | 0% | 403 | 0% |
| Jul-21 | 317 | 297 | -6% | 297 | -6% | 311 | -2% |
| Aug-21 | 303 | 283 | -7% | 283 | -7% | 293 | -4% |
| Sep-21 | 237 | 193 | -19% | 190 | -20% | 197 | -17% |
| Oct-21 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Nov-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Dec-21 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| Jan-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Feb-22 | 382 | 382 | 0% | 382 | 0% | 382 | 0% |
| Mar-22 | 423 | 423 | 0% | 423 | 0% | 423 | 0% |
| Apr-22 | 410 | 410 | 0% | 410 | 0% | 410 | 0% |
| May-22 | 363 | 251 | -31% | 251 | -31% | 309 | -15% |
| Jun-22 | 250 | 205 | -18% | 190 | -24% | 196 | -21% |
| Jul-22 | 230 | 173 | -25% | 128 | -44% | 135 | -41% |
| Aug-22 | 237 | 177 | -25% | 114 | -52% | 114 | -52% |
| Sep-22 | 243 | 191 | -21% | 148 | -39% | 150 | -38% |
| Oct-22 | 164 | 164 | 0% | 164 | 0% | 164 | 0% |

*Table 3. Impact on abstraction volumes associated with proposed restriction*

**PAN-007395 and 7 NRW Response to Operator Review of Draft Licences**

Email from CRT to NRW 15/12/2022:

RE_ PAN-007395 &
7 Penarth and Tanat

CRT text in black and **red**
NRW response in green

The Trust would like to refer you back to the email of last week, sent by the Trust on 9/12/2022, in response to the proposals set out by email by NRW on 30 November 2022. Whilst the Trust received a response to these comments on 14/12/2022, we have not had opportunity to consider these, and the Trust are not able to provide any further response given time constraints as NRW have requested an operator review response by today 15/12/22.

Our specific responses regarding Tanat and Penarth draft licences are detailed below, however these are not comprehensive responses regarding the challenges we have previously made in writing to you, as stated above:

**Penarth**

Comments relating to 3.1

The Trust request that this should read "Gravity flow to an open channel controlled by a weir and sluice gates".

Agreed – wording of condition to be amended in line with above.

Comments relating to 6.1

The Trust would like to query why an hourly max quantity is needed, none of our other NA NRW transfer licences have one, apart from Llantysilio which we see as an exception. We would ask you to remove this for consistency as we consider this an additional regulatory burden with no environmental benefit.

The Tanat and Severn evidenced sub-daily abstraction rates which represented a high proportion of the flows within the rivers, as flows reduced. In order to meet flow standards and to avoid excessive fluctuations in flows in the rivers, it is considered necessary to include maximum hourly in addition to daily abstraction rates. This was a condition required as part of the appropriate assessment of the proposals, which allowed us to conclude: that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. This is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.

Comments regarding Llantysilio: An hourly rate is required for the Llangollen abstraction in line with the conclusions of the Dee HDROC that specify a need for sub-daily rates and also the requirements of the Dee General Directions that requires the CRT and UU abstractions to be operated "to achieve a continuous and constant rate of abstraction… to avoid excessive fluctuations in flows" in the River Dee.

Comments regarding Brecon: 'For the Brecon abstraction, conditions will be included which will require the daily abstraction rate to progressively cutback as flows reduce to meet HDRoC flow requirements (HDERF on Usk). In effect these conditions result in significant reduction in daily abstraction quantities at low flows, meaning the proportion of the abstraction in

comparison to river flows is very low (e.g. 0.15% of the flow). This is considered sufficient to protect against the risk of excessive sub-daily fluctuations in flow. Therefore, only maximum daily and annual abstraction quantities are considered necessary.

The Trust also asks that the annual maximum is removed from the licence as it restricts the Trust from abstracting for more than 158 days at the maximum daily abstraction of 14.6 Ml/d. Again, this is an additional regulatory burden with no environmental benefit.
The purpose of New Authorisations (NA) is to bring previously exempt abstractions into the licensing system. As part of that process, we are required to ensure the licences issued reflect the historic abstraction that has taken place during the 2011 – 2017 qualifying period. Therefore, the maximum annual abstraction rate included on the licence is as evidenced and applied for, therefore, it will need to remain on the licence.

We also challenge some definitions. Please alter the definition of the day: "A day means any period of 24 consecutive hours". This effectively makes the daily mean an hourly flow condition and is inconsistent with condition 8.xx, because as drafted, the licence does not require any more than 1 measurement being recorded at the same time each day. Therefore the definition of a "day" in 6.xx should be changed to "24 hours starting midnight". This also applies to your definition of an hour that we wish for you to reconsider.
The definition of a day is standard definition used across all modern licences and therefore will remain the same. Condition 8.1 requires you to take a reading of the measuring device at the same time each day. This device would usually be a meter and show the amount abstracted in a running total, rather than an instantaneous rate at a particular time. As written, the licence allows you to pick what time of day you take this reading. Changing the definition to midnight to midnight would require condition 8.1 to be changed to require the measurement to be taken at midnight which would reduce your flexibility and likely be impractical.

Comments relating to 7.1 and 7.2
Please remove all reference to the "bypass flow and frequency of filling and emptying of the lock chamber " and replace with one condition expecting the Trust to install and maintain a measuring device at Byles Lock. The Trust feel this is unnecessary detail.
Agreed – conditions have been revised in line with comments, which is consistent with the wording used on the Llangollen and Mon + Brec licences.

Comments relating to 8.1 (ii):
It is an unnecessary regulatory burden to supply data every March on a transfer licence and so we request the following text: "The Licence Holder shall send to NRW a copy of the record required by condition 8.1 (i) or summary data to NRW ~~**within 28 days after 31 March in each year and also**~~ within 28 days of being so requested in writing by NRW." We note this has been accepted in relation to Llantysilio.
This condition is the standard returns conditions used across all modern licences that require returns for all year abstractions. NRW will send you a form by email to complete throughout the year. NRW will contact you when the information is due. Further information on the returns process can be found on our website here Natural Resources Wales / Submit your water abstraction return.

Comments regarding Llantysilio: This was agreed for the Llantysilio (Llangollen) abstraction due to the conjunctive abstraction with United Utilities and the fact that that there is an existing arrangement for CRT to submit data to NRW. We are not looking to change this requirement for any of the other abstractions.

Comments relating to 9.1 & 9.2

Please refer to comments previously provided and our initial paragraph within this email. The Trust are unable to comment on impacts on Montgomery designated sites or on abstraction generally as we have not been given sight of the HRA and have not received the requested flow data.

See NRW response to question 9 in our email dated 14/12/2022.

'*We understand the need for you to review the data to appreciate how we have modelled the restrictions. However, this will need to be provided and explained by technical specialists from our Hydrology team and we will be unable to arrange this prior to the issue of the licence given the fixed legislative time constraint of this programme.*

*We have determined that the restrictions are necessary to prevent serious damage to migratory features of the Severn Estuary designations and this is consistent with how we have licensed restrictions on other applications following the completion of our HRA (to conclude that the proposals will not adversely affect the integrity of any Natura 2000/Ramsar). When the licences are issued we will provide the HRA documents to allow you to further understand the justification for the flow restrictions and screening.*

*In relation to your licences the restrictions are unlikely to be applicable until the late spring / early summer months, allowing time to gather and review any further evidence to demonstrate whether any changes could be made. We can initiate an NRW led variation to a licence where appropriate. We are happy to continue further dialogue with you once the licences are issued to understand your further concerns particularly around the impact to SAC features.*'.

Comments relating 9.4 & 9.5 (ii)

The Licence Holder shall maintain the fish screen **to ensure that it remains effective at all times** ~~**in accordance with the manufacturer's specifications**~~ and keep records of such maintenance available for inspection.

This is a standard condition to ensure fish screen(s) operates as intended and is used across modern licences which require the fish screening condition(s). Therefore, the condition will remain as drafted in the previous version of the licence shared with you,

Comments relating to 9.5

The Trust cannot provide an NGR for a proposed fish screen as we do not have this at present.

For compliance purposes it is considered necessary to include an NGR in this condition. Using the best available information (CRT286_Supporting Information' document dated 19/09/2019), NRW have estimated the NGR for the overflow channel to be at SO 13957 92773, see screenshots below:

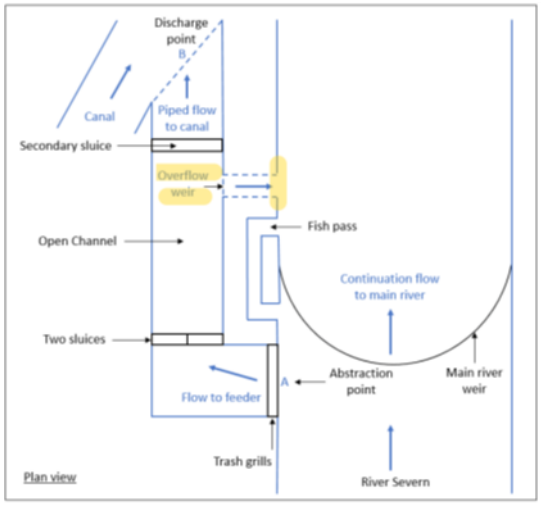
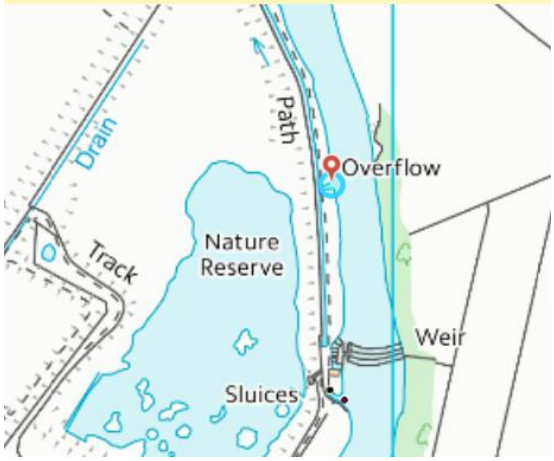



Photo 6: Overflow from open channel back to main River Severn

SO 13957 92773




The condition is now as follows:

*'No abstraction shall take place unless the Licence Holder has installed a screen with spacing no greater than 40 millimetres to the point of discharge to the River Severn from the overflow weir at National Grid Reference SO 13957 92773, in accordance with 'CRT286_Supporting Information' document dated 19/09/2019, to prevent the entrapment, entrainment, or impingement of fish.'.*

Further detail is now included in the important notes section referring to the 'Schematic of Abstraction Arrangement - Plan view' and 'Photo 6: Overflow from open channel back to main River Severn', as detailed in the 'CRT286_Supporting Information' document.

<u>Comments relating to Important Notes.</u>

Please remove the section on condition 7.1. and 7.2 as this is unnecessary detail and was only provided as contextual information as part of the application to enhance NRW's understanding of this site.

Removed following the update to condition 7.1.

**Tanat**

Comments relating to 6.1

The Trust would like to query why an hourly max quantity is needed, none of our other NA NRW transfer licences have one, apart from Llantysilio which we see as an exception. We would ask you to remove this for consistency as we consider this an additional regulatory burden with no environmental benefit.

The Trust also asks that the annual maximum is removed from the licence as it restricts the Trust from abstracting for more than 210 days at the maximum daily abstraction of 9.1 Ml/d. Again, this is an additional regulatory burden with no environmental benefit.

We also challenge some definitions. Please alter the definition of the day: "A day means any period of 24 consecutive hours". This effectively makes the daily mean an hourly flow condition and is inconsistent with condition 8.xx, because as drafted, the licence does not require any more than 1 measurement being recorded at the same time each day. Therefore the definition of a "day" in 6.xx should be changed to "24 hours starting midnight". This also applies to your definition of an hour that we wish for you to reconsider.

See comments above for these three points.

Comments relating to 7.1 ~~and 7.2~~

Please remove all reference to the "broad crested weir and rectangular flume structure" and replace with one condition expecting the trust to install and maintain a measuring device. The Trust feel this is unnecessary detail.

Agreed – see comments above.

Comments relating to 8.1 (ii):

It is an unnecessary regulatory burden to supply data every March on a transfer licence and so we request the following text: "The Licence Holder shall send to NRW a copy of the record required by condition 8.1 (i) or summary data to NRW ~~**within 28 days after 31 March in each year and also**~~ within 28 days of being so requested in writing by NRW." We note this has been accepted in relation to Llantysilio.

See comments above.

Comments relating to 9.1 & 9.2

Please refer to comments previously provided and our initial paragraph within this email. The Trust are unable to comment on impacts on Montgomery designated sites or on abstraction generally as we have not been given sight of the HRA and have not received the requested flow data.

See comments above.

Comments relating 9.4 & 9.5 (ii)

The Licence Holder shall maintain the fish screen **to ensure that it remains effective at all times** ~~in accordance with the manufacturer's specifications~~ and keep records of such maintenance available for inspection.

See comments above.

Comments relating to Important Notes.

Please remove the section on condition 7.1. as this is unnecessary detail and was only provided as contextual information as part of the application to enhance NRW's understanding of this site.

As above - removed following the update to condition 7.1.

**General comments relating to both licences**

Given the numerous comments and concerns we have raised here in response to these operator reviews, in addition to the concerns we raised separately in our email of 9/12/2022, we would expect NRW to incorporate these into a revised draft licence and provide the Trust an opportunity for further review next week ahead of issue. This will also provide you with the opportunity to incorporate any further changes made following completion of your internal review.

Please see our email dated 19/12/2022

RE_ PAN-007395 &
7 Penarth and Tanat

*'We are minded to issue the licences this week, and there will be no further drafts ahead of this. I shall provide our responses to your email when the licences are issued.'.*

We would again request a copy of the full Habitat Regulations Assessment and supporting evidence, including the requested flow data, prior to issue, in order that we can properly consider this and take legal advice. Without this, we are likely to have no alternative but to appeal.

I note that you are due to issue this licence imminently; given that the Trust has 28 days in which to seek legal advice on the merits of an appeal, and then draft the appeal documentation if necessary and we haven't yet seen the HRA evidence- we would request NRW to hold off issuing this licence until the end of the determination period, so that the Trust will be able to use January to seek this advice. It is in both parties' interests to ensure that the Trust can have the time to seek this advice. I note a delay to issuing the Llantysilio licence in the week commencing 19 December has now been communicated and request the same for these licences.

As detailed above, see NRW response to question 9 in our email dated 14/12/2022.

## Lillywhite, Charlotte

**From:** Wheadon, John
**Sent:** 22 December 2022 17:04
**To:** Richard Parry
**Cc:** Pearce, Hannah; Cowell, Alex; Adam.Comerford@canalrivertrust.org.uk
**Subject:** FW: PAN-007395 and 7 Penarth and Tanat Issue of NA Licences, Response to Operator Review, HRA and Modelling
**Attachments:** CRT Tanat Model_Nov2022.xlsx; CRT Penarth Model_Nov2022.xlsx; PAN-007395 and 7 NRW Response to Operator Review of Draft Licences.docx; PAN-0073975 NA Issue Letter.docx; PAN-007397 NA Issue Letter.docx

Hello Richard.

E-mail (below) and attachments confirming the issue of the Penarth and Tanat NA licences as requested.

Due to the size of the attachments I will need send you three more separately.

Regards,

John

John Wheadon
*Rheolwr Gwasanaeth Trwyddedu / Permitting Service Manager*
Cyfoeth Naturiol Cymru / Natural Resources Wales
*Cyfarwyddiaeth Tystiolaeth, Polisi a Thrwyddedu /Evidence, Policy and Permitting Directorate*
03000 654502

www.cyfoethnaturiol.cymru / www.naturalresources.wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**

**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi**
**Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay**

---

**From:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Sent:** 21 December 2022 12:22
**To:** Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>; WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>
**Cc:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Subject:** PAN-007395 and 7 Penarth and Tanat Issue of NA Licences, Response to Operator Review, HRA and Modelling

Dear Adam,

I am pleased to tell you that the above applications for transfer abstraction licences to authorise two previously exempt abstractions have been successful.

Please find the following documents attached:

- PAN-007395 NA Transfer Abstraction Licence Signed PDF, and issue letter.
- PAN-007397 NA Transfer Abstraction Licence Signed PDF, and issue letter.
- Hydrology Modelling Excel Documents: CRT Tanat Model_Nov2022 and Penarth Model_Nov2022
- PAN-007395 and 7 NRW Response to Operator Review of Draft Licences
- PAN-007395 and 7 OGN 200 Form 1 Version 2 – Record of a HRA of a project

If you have any queries, please do not hesitate to contact me.

Best wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
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Twitter | Facebook | LinkedIn | Instagram

**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

## Lillywhite, Charlotte

**From:** Wheadon, John
**Sent:** 22 December 2022 17:08
**To:** Richard Parry
**Cc:** Pearce, Hannah; Cowell, Alex; Adam.Comerford@canalrivertrust.org.uk
**Subject:** RE: PAN-007395 and 7 Penarth and Tanat Issue of NA Licences, Response to Operator Review, HRA and Modelling
**Attachments:** PAN-007395 NA Transfer Abstraction Licence Signed PDF.pdf; PAN-007397 NA Transfer Abstraction Licence Signed PDF.pdf; PAN-007395 and 7 OGN 200 Form 1 Version 2 - Record of a HRA of a project.pdf

Richard

Final three attachments relating to these licences.

Regards,

John

John Wheadon
*Rheolwr Gwasanaeth Trwyddedu / Permitting Service Manager*
Cyfoeth Naturiol Cymru / Natural Resources Wales
*Cyfarwyddiaeth Tystiolaeth, Polisi a Thrwyddedu /Evidence, Policy and Permitting Directorate*
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**Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay**

---

**From:** Wheadon, John
**Sent:** 22 December 2022 17:03
**To:** 'Richard Parry' <Richard.Parry@canalrivertrust.org.uk>
**Cc:** Pearce, Hannah <Hannah.Pearce@cyfoethnaturiolcymru.gov.uk>; Cowell, Alex <alex.cowell@cyfoethnaturiolcymru.gov.uk>; Adam.Comerford@canalrivertrust.org.uk
**Subject:** FW: PAN-007395 and 7 Penarth and Tanat Issue of NA Licences, Response to Operator Review, HRA and Modelling

Hello Richard.

E-mail (below) and attachments confirming the issue of the Penarth and Tanat NA licences as requested.

Due to the size of the attachments I will need send you three more separately.

Regards,

John

John Wheadon
*Rheolwr Gwasanaeth Trwyddedu / Permitting Service Manager*
Cyfoeth Naturiol Cymru / Natural Resources Wales
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**Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay**

---

**From:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Sent:** 21 December 2022 12:22
**To:** Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>; WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>
**Cc:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Subject:** PAN-007395 and 7 Penarth and Tanat Issue of NA Licences, Response to Operator Review, HRA and Modelling

Dear Adam,

I am pleased to tell you that the above applications for transfer abstraction licences to authorise two previously exempt abstractions have been successful.

Please find the following documents attached:

- PAN-007395 NA Transfer Abstraction Licence Signed PDF, and issue letter.
- PAN-007397 NA Transfer Abstraction Licence Signed PDF, and issue letter.
- Hydrology Modelling Excel Documents: CRT Tanat Model_Nov2022 and Penarth Model_Nov2022
- PAN-007395 and 7 NRW Response to Operator Review of Draft Licences
- PAN-007395 and 7 OGN 200 Form 1 Version 2 – Record of a HRA of a project

If you have any queries, please do not hesitate to contact me.

Best wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

## Lillywhite, Charlotte

**From:** Simon Cox <Simon.Cox@burges-salmon.com>
**Sent:** 18 January 2023 21:43
**To:** Enquiries; Lillywhite, Charlotte
**Cc:** Michael Barlow
**Subject:** Our client: Canal & River Trust - Appeal of Abstraction Licence WA/054/0001/0123, Penarth Feeder [BURGES-WORK.FID10621152]
**Attachments:** AB01 - Notice of Grounds of Appeal (Penarth).pdf; AB03 - Index for Appeal (Penarth).pdf; WORK_47412891_1_L (Burges Salmon_CRT) Letter to PEDW lodging Abstraction Licence Appeal WA_054_0001_0123 (Penarth) 18 January 2023.PDF; AB02 - Appellant's Grounds of Appeal of Licence WA.054.0001.0123 (Penarth) - 18 January 2023.pdf

**Follow Up Flag:** Filed to: \\My DMS View\Penarth Issued
**Flag Status:** Completed

**Categories:** Filed

Dear NRW

**Appeal under The Water Abstraction (Transitional Provisions) Regulations 2017**
**Appellant: Canal & River Trust**
**Respondent: Natural Resources Wales**
**Licence Reference and Site: WA/054/0001/0123, Penarth Feeder, Newtown**
**Date of issued Licence: 21 December 2022**

We act for the Appellant in this matter.

Further to the issue of the abovementioned Licence on 21 December 2022, the Appellant wishes to appeal the conditions of the Licence.

In accordance with the appeal guidance set out in Respondent's decision letter of 21 December 2022, we attach the following:

- Appeal Notice in respect of Licence WA/054/0001/0123;
- Grounds of Appeal;
- Index of the Appendices to the Grounds of Appeal; and
- A copy of our covering letter to Planning and Environment Decisions Wales.

The appendices to both Grounds of Appeal exceed our firm's email maximum file size limit. We will therefore circulate a separate link to our file share site where the Appendices to the Grounds of Appeal will be uploaded and available for access and download. Please note, we recommend downloading emails to view properly/access attachments.

We should be grateful if you would confirm receipt of this email and of the corresponding documents attached and referred to.

Yours faithfully

**Burges Salmon LLP**

---

**Simon Cox**
Solicitor
Burges Salmon LLP

**T**: +44 (0) 117 307 6124
**M**: +44 (0) 7814 864 721

**Legal Team Assistant**: Genieka Stewart
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## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 19 January 2023 16:58
**To:** Simon Cox
**Subject:** RE: Our client: Canal & River Trust - Appeal of Abstraction Licences WA/054/0001/0123 and WA/054/0001/0124 [BURGES-WORK.FID10621152]

**Follow Up Flag:** Follow up
**Flag Status:** Completed

**Categories:** Filed

Hi Simon,

Please accept this email as confirmation that I have received the two appeals (WA/054/0001/0123 and WA/054/0001/0124). I have also been able to access the two iManage Share folders containing the Appendices to the Grounds of Appeal.

Best wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

---

**From:** Simon Cox <Simon.Cox@burges-salmon.com>
**Sent:** 19 January 2023 09:50
**To:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Subject:** RE: Our client: Canal & River Trust - Appeal of Abstraction Licences WA/054/0001/0123 and WA/054/0001/0124 [BURGES-WORK.FID10621152]

Charlotte

I just wanted confirmation that you were in safe receipt of the two appeals (WA/054/0001/0123 and WA/054/0001/0124) lodged with PEDW and shared with yourself on 18 January?

You should have also received respective email invitations which grants you access to our iManage Share folder containing the Appendices to the Grounds of Appeal. iManage Share is a secure platform which we routinely use when sending bundles. Once the invite is received, you must then create your own password upon signing in for the first time.

Kind regards

Simon

---

**Simon Cox**
Solicitor
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**T**: +44 (0) 117 307 6124
**M**: +44 (0) 7814 864 721

**Legal Team Assistant**: Genieka Stewart
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**From:** Simon Cox
**Sent:** 18 January 2023 22:09
**To:** enquiries@naturalresourceswales.gov.uk; Charlotte.Lillywhite@naturalresourceswales.gov.uk
**Cc:** Michael Barlow <Michael.Barlow@burges-salmon.com>
**Subject:** Our client: Canal & River Trust - Appeal of Abstraction Licence WA/054/0001/0124, Tanat Feeder [BURGES-WORK.FID10621152]

Dear NRW

**Appeal under The Water Abstraction (Transitional Provisions) Regulations 2017**
**Appellant: Canal & River Trust**
**Respondent: Natural Resources Wales**
**Licence Reference and Site: WA/054/0001/0124, Tanat Feeder, Carreghofa**
**Date of issued Licence: 21 December 2022**

We act for the Appellant in this matter.

Further to the issue of the abovementioned Licence on 21 December 2022, the Appellant wishes to appeal the conditions of the Licence.

In accordance with the appeal guidance set out in Respondent's decision letter of 21 December 2022, we attach the following:

- Appeal Notice in respect of Licence WA/054/0001/0124;
- Grounds of Appeal;
- Index of the Appendices to the Grounds of Appeal; and
- A copy of our covering letter to Planning and Environment Decisions Wales.

The appendices to both Grounds of Appeal exceed our firm's email maximum file size limit. We will therefore circulate a separate link to our file share site where the Appendices to the Grounds of Appeal will be uploaded and available for access and download. Please note, we recommend downloading emails to view properly/access attachments.

We should be grateful if you would confirm receipt of this email and of the corresponding documents attached and referred to.

Yours faithfully

**Burges Salmon LLP**

---

**Simon Cox**
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A list of the members and directors of the above entities may be inspected at the relevant registered office and also at Burges Salmon LLP, One Glass Wharf, Bristol, BS2 0ZX Tel: +44 (0)117 939 2000 Fax:+44 (0)117 902 4400 https://www.burges-salmon.com. Further information about Burges Salmon entities, including details of their regulators, is set out in the "Who we are" section of the Burges Salmon website at https://www.burges-salmon.com.

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# The Severn Estuary / Môr Hafren European Marine Site

**comprising :**

**The Severn Estuary / Môr Hafren Special Area of Conservation (SAC)**

**The Severn Estuary Special Protection Area (SPA)**

**The Severn Estuary / Môr Hafren Ramsar Site**

# Natural England & the Countryside Council for Wales' advice given under Regulation 33(2)(a) of the Conservation (Natural Habitats, &c.) Regulations 1994, as amended.

**June 2009**

NATURAL ENGLAND

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

Llywodraeth Cynulliad Cymru
Welsh Assembly Government
CORFF NODDEDIG | SPONSORED BODY

A Welsh version of all or part of this document can be made available on request from the Countryside Council for Wales

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# *SUMMARY*

This document contains Natural England and the Countryside Council for Wales' (CCW's) advice issued under Regulation 33 of the Conservation (Natural Habitats, &c.) Regulations 1994, for the *Severn Estuary European Marine Site (EMS,) which comprises the Special Area of Conservation (SAC), Special Protection Area (SPA), and Ramsar site*, namely conservation objectives and advice on operations. It also includes an explanation of the purpose and format of Natural England and CCW's "Regulation 33 advice".

**Section 1** provides the legal basis and practical requirements for setting conservation objectives for Natura 2000 sites, as understood by Natural England and CCW. It also briefly explains the legal and practical basis of the operations advice.

**Section 2** details the qualifying features for the Severn Estuary SAC, SPA and Ramsar site under the EU Habitats and Birds directives and the Convention on Wetlands of International Importance.

**Section 3** provides a description of the features of the Severn Estuary EMS

**Section 4** contains Natural England and CCW's advice as to the conservation objectives (Regulation 33(2)(a)) for SAC, SPA and Ramsar site. This section also includes the favourable condition tables for the SAC, SPA and Ramsar site.

**Section 5** contains Natural England and CCW's advice on operations which may cause deterioration or disturbance of the habitats and species for which the SAC, SPA and Ramsar site has been selected (Regulation 33(2)(b)). This is provided to assist the relevant authorities and others in understanding the implications of the designation of these sites and the requirements of the Habitats Regulations and government policy.

**Section 6** contains the references.

**Section 7** contains a glossary of terms.

**Appendices 1-9** provide maps of the extent of the SAC, SPA and Ramsar designations; the indicative extent of the habitat features, and sub features where information is available; and the low-tide distribution of birds.

**Appendices 10-11** provide additional background information useful to the understanding of this advice.

**Notes :**

**CCW and Natural England's predecessor English Nature, issued advice under Regulation 33(2)(a) and 33(2)(b) in relation to the SPA in February 2005 which is now superseded by this document.**

**This advice does not cover the terrestrial areas of the Severn Estuary SPA (ie ground which lies behind flood defences and which are not subject to the tidal influence of the estuary and are not therefore within the European Marine Site.**

**CCW and Natural England also issued advice under Regulation 33(2)(a) in relation to the cSAC in June 2008 which is also superseded by this document.**

# 1. Introduction

This document provides advice under Regulation 33 (2) for the Severn Estuary European Marine Site (EMS), which comprises the following sites :

- Severn Estuary Special Area of Conservation (SAC)*
- Severn Estuary Special Protection Area (SPA)
- Severn Estuary Ramsar Site

(*At the time of issue of this document the Severn Estuary has been accepted by the European Commission as a Site of Community Importance (SCI) but formal notices have not yet been issued (expected to take place in 2009). Given the imminent notification of the SAC the Severn Estuary SCI is referred to as SAC throughout this document).

The indicative extent and relationship of these designated sites is shown in Appendix 1

This document:

- is designed to help relevant and competent authorities responsible for complying with the requirements of the Habitats Directive to understand the international importance of the site and the underlying physical and ecological processes supporting the habitats and species for which each of the above designated sites has been selected.
- is intended to assist the relevant authorities to develop, if considered appropriate, a management scheme under Regulation 34 of the Habitats Regulations, under which they shall exercise their functions in accordance with the requirements of the Directive;
- contains Natural England and CCW's advice to competent authorities as to the conservation objectives of each of the above designated sites, for the purpose of considering plans and projects in accordance with Article 6 of the Habitats Directive and Parts IV and IVa of the Habitats Regulations. Natural England and CCW will provide more detailed advice to competent authorities to assess the implications of particular plans or projects, where appropriate, at the time those plans or projects are being considered.

Anyone proposing to undertake plans or projects with a potential impact on site features are encouraged to consult Natural England or CCW early in the planning stages to identify possible issues of concern.

The advice in this document is subject to review by Natural England and CCW, for example to:

- add further advice on monitoring requirements in order to assess the degree to which the conservation objectives are being achieved in future;
- add further advice on operations likely to damage the features for which the SPA, SAC and Ramsar Site are selected (under Habitats Regulation 33(2)(b));
- take account of new information about the SPA, SAC and Ramsar site or its features, or any future changes to the designations.

Notes :

CCW and Natural England's predecessor English Nature, issued advice under Regulation 33(2)(a) and 33(2)(b) in relation to the SPA in February 2005 which is now superseded by this document.

This advice does not cover the terrestrial areas of the Severn Estuary SPA (ie ground which lies behind flood defences are which are not subject to the tidal influence of the estuary and are not therefore within the European Marine Site.

CCW and Natural England also issued advice under Regulation 33(2)(a) in relation to the cSAC in June 2008 which is also superseded by this document.

## 1.1 Natura 2000

The European Union Habitats[1] and Birds[2] Directives are international obligations which set out a number of actions to be taken for nature conservation. They represent one of the ways in which EU member states are fulfilling the commitments they made at the "Earth Summit" in Rio de Janeiro in 1992, for the conservation of the Earth's biological diversity[3].The Habitats Directive aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, and sets out measures to maintain or restore, natural habitats and species of European Union interest at favourable conservation status[4].

European sites include Special Areas of Conservation (SACs) designated under the 1992 Habitats Directive, which support natural habitats and species of European importance, and Special Protection Areas (SPAs) classified under the 1979 Birds Directive, which support internationally important wild bird populations. UK and Welsh Assembly Government policy also requires that Ramsar sites should receive the same level of protection as European sites[5].

The Habitats Directive is given effect in the UK largely through the Conservation (Natural Habitats, &c.) Regulations 1994 ("the Habitats Regulations")[6]. These Regulations set out the powers and duties of UK statutory bodies towards compliance with the requirements of the Habitats Directive. Under these Regulations, SACs together with Special Protection Areas (SPAs) classified under the 1979 EC Birds Directive for the conservation of birds, are called "European sites" and will form a network of conservation areas to be known as 'Natura 2000'. Where SAC or SPA consist of marine areas they are referred to as European Marine Sites.[7]

There are various sources of guidance on the legal framework for European sites and European Marine Sites.[8]

**A note on Ramsar :**
The Convention on Wetlands of International Importance especially as Waterfowl Habitats (Ramsar Convention) was signed in Ramsar, Iran in 1971. The broad objectives of the Convention are to stem the loss and progressive encroachment on wetlands now and in the future, including through the designation of Ramsar sites.

A habitat can qualify as a Ramsar site for its representation of a wetland, or for the plant or animal species, including waterbirds, that it supports.

In accordance with Office of the Deputy Prime Minister (2005) *Planning Policy Statement 9: Biological and Geological Conservation*, Welsh Office Planning Guidance *Technical Advice Note No. 5* (TAN5), the DETR and NAW statements *Ramsar Sites in England* (November 2000) and *Ramsar Sites in Wales* (February

[1] Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.
[2] Council Directive 79/409/EEC on the conservation of wild birds.
[3] Biological diversity is defined as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems." (1992 International Convention on Biological Diversity, Article 2. http://www.biodiv.org/convention/)
[4] A habitat or species is defined as being at favourable conservation status when its natural range and the areas it covers within that range are stable or increasing and the specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future.
[5] Office of the Deputy Prime Minister (2005) *Planning Policy Statement 9: Biological and Geological Conservation,* Welsh Assembly Government (2006) *Draft Revised Technical Advice Note 5 Nature Conservation and Planning,* DETR (2000) *Ramsar sites in England*, National Assembly for Wales (20010, *Ramsar sites in Wales*.
[6] SI 1994/2716, HMSO, London. http://www.legislation.hmso.gov.uk/si/si1994/uksi_19942716_en_1.htm)
[7] "Marine areas" are defined in the Habitats Regulations as areas "continuously or intermittently covered by tidal waters or any part of the sea in or adjacent to Great Britain up to the limit of territorial waters."
[8] *European Marine Sites in England & Wales: A guide to the Conservation (Natural Habitats &c.) Regulations 1994 and to the Preparation and Application of Management Schemes* (DETR & The Welsh Office, 1998), Office of the Deputy Prime Minister (2005) *Planning Policy Statement 9: Biological and Geological Conservation,* Welsh Assembly Government (2006*) Draft Revised Technical Advice Note 5 Nature Conservation and planning,* CCW (undated) *Natura 2000: European wildlife sites.*

2001); Ramsar sites classified under the Convention on Wetlands of International Importance should be given the same consideration as European sites when considering plans and projects that may affect them.

## 1.2 The role of Natural England and the Countryside Council for Wales

Regulation 33 of the Habitats Regulations requires Natural England and the Countryside Council for Wales (CCW) to advise the relevant authorities[9] for each European Marine Site in, or partly in, England and Wales as to

(a) the conservation objectives for that site, and

(b) any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated.

This document contains Natural England and CCW's advice under Regulation 33 in relation to the designated sites which comprise the Severn Estuary EMS.

The Conservation (Natural Habitats &c.) Regulations 1994, as amended transpose the Habitats Directive into law in Great Britain. They give Natural England and CCW a statutory responsibility to advise relevant authorities as to the conservation objectives for European Marine Sites and Ramsar Sites in England and Wales and to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the sites have been designated. This information will be a key component of any management scheme that may be developed for this site. It will also aid competent authorities in defining the scope and nature of 'appropriate assessment' which the Habitats Directive requires to be undertaken for 'plans and projects' having a significant effect on the European site (Habitats Regulations 20, 48, 50, 60-62 and 85B). Note that Natural England and CCW will also advise competent authorities on individual plans and projects as they arise. Natural England and CCW are also competent and relevant authorities under the Habitats Regulations.

## 1.3 The precautionary principle

The advice on operations contained within this package has been made based on the precautionary principle and any actions which may need to be taken in response to concerns identified as a result of monitoring undertaken by Natural England and the Countryside Council for Wales will also be made on this basis. All forms of environmental risk should be tested against the precautionary principle which means that where there are real risks to the site, lack of full scientific certainty should not be used as a reason for postponing measures that are likely to be cost effective in preventing such damage. It does not however imply that the suggested cause of such damage must be eradicated unless proved to be harmless and it cannot be used as a licence to invent hypothetical consequences. Moreover, it is important, when considering whether the information available is sufficient, to take account of the associated balance of likely costs, including environmental costs, and benefits (DETR & the Welsh Office, 1998).

## 1.4 The role of other competent and relevant authorities

The Conservation (Natural Habitats &c.) Regulations 1994 require competent authorities to exercise their functions so as to secure compliance with the requirements of the Habitats and Birds Directives. The term "competent authority" includes all public bodies and statutory undertakers. The Regulations identify a number of competent authorities as "relevant authorities", with particular functions in relation to European Marine Sites. In addition to their duties as competent authorities, under Regulation 34 the relevant authorities may establish a management scheme for a European Marine Site under which they shall exercise their relevant functions. Such a management scheme should be guided by the information contained in this document. Relevant authorities must, within their areas of jurisdiction, have regard to both direct and indirect effects on an interest feature of the site. This may include consideration of issues outside the boundary of the European Marine Site.

[9] The types of bodies that are "relevant authorities" are identified in Regulation 5 of the Habitats Regulations.

Relevant authorities should ensure that all plans for the area integrate with the management scheme for the European Marine Site. Such plans may include Shoreline Management Plans, the Environment Agency's Flood Risk Management Strategy and Catchment Flood Management Plans, Local Development Plans/ Frameworks, Sites of Special Scientific Interest management plans, local Biodiversity Action Plans and sustainable development strategies for estuaries. This must occur to ensure that there is only a single management scheme through which all relevant authorities exercise their duties under the Conservation (Natural Habitats &c.) Regulations 1994.

Relevant authorities also need to have regard to changing circumstances of the European Marine Site and may therefore need to modify the management scheme and/or the way in which they exercise their functions so as to maintain the favourable condition of interest features concerned in the long term. There is no requirement for relevant authorities to take any actions outside their statutory functions. For the purposes of this document the term 'interest feature' refers to any of the habitat types or species for which the European Marine Sites have been designated.

Under certain circumstances, where another relevant authority is unable to act for legal reasons, or where there is no other relevant authority, Natural England and CCW are empowered to use their bylaw-making powers under Regulation 36 of the Habitats Regulations 1994.

None of the information contained in this document legally binds any organisation (including Natural England and CCW) to any particular course of action. However, in exercising their functions in accordance with the requirements of the Habitats Directive, as required by the Habitats Regulations, and in accordance with government policy on Ramsar sites, the relevant authorities should be guided by the advice contained in this document. This applies amongst other things to the establishment of a "management scheme"[10], if such a scheme is established.

## 1.5 Responsibilities under other conservation designations

In addition to its SAC, SPA and Ramsar Site status, parts of the Severn Estuary are also notified as Sites of Special Scientific Interest (SSSIs) under the 1981 Wildlife and Countryside Act and Bridgwater Bay is also a National Nature Reserve. The obligations of relevant authorities and other organisations under such designations are not directly affected by the advice contained in this document.

Relevant authorities and others may have obligations towards the conservation of habitats and species that are not features for which the Severn Estuary European Marine Site has been designated, and such obligations are not affected by this document.

## 1.6 Role of advice provided under Regulation 33

The information provided under Regulation 33 is in two parts: the conservation objectives, and the advice on operations. The legal context for each of these elements, the format of the advice and its underlying rationale are explained here. Sections 4 (conservation objectives and favourable condition tables) and 5 (operations advice) should be read in conjunction with these explanatory notes.

The information contained in this document is based on best available knowledge at time of writing and is subject to review at Natural England and CCW's discretion.

As referred to under section 1.1. above, there are various sources of guidance on the legal framework for European sites and European Marine Sites.[11]

[10] Regulation 34 of the Habitats Regulations.

[11] European Marine Sites in England & Wales: A guide to the Conservation (Natural Habitats &c.) Regulations 1994 and to the Preparation and Application of Management Schemes (DETR & The Welsh Office, 1998), Office of the Deputy Prime Minister (2005) Planning Policy Statement 9: Biological and Geological Conservation, Welsh Assembly Government (2006) Draft Revised Technical Advice Note 5 Nature Conservation and planning, CCW (undated) Natura 2000: European wildlife sites.

### 1.6.1 Outline of legal context and purpose of conservation objectives

The conservation objectives for a European Marine Site are intended to represent the aims of the Habitats and Birds Directives in relation to that site. The Habitats Directive requires that measures taken under it, including the designation and management of SACs, be designed to maintain or restore habitats and species of European Community importance at "favourable conservation status" (FCS), as defined in Article 1 of the Directive as follows;

**Favourable conservation status as defined in Article 1 of the Habitats Directive**

***Conservation status of a natural habitat*** means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.

The conservative [sic] status of a natural habitat will be taken as 'favourable' when:

- its natural range and the areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- conservation status of typical species is favourable as defined in [Article] 1(i).

***Conservation status of a species*** means the sum of the influences acting on the species concerned that may affect the long-term natural distribution and abundance of its populations within the territory referred to in Article 2;

The conservation status of a species will be taken as 'favourable' when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

In addition, the Birds Directive requires that, in relation to certain species of birds listed in Annex 1 of the Directive and regularly occurring migratory species, special measures are taken in order to ensure their survival and reproduction in their area of distribution. The species listed in Annex 1 of the Birds Directive are the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution. Species listed on Annex 1 are in danger of extinction, rare or vulnerable. Annex 1 species that regularly occur at levels over 1% of the national population meet the SPA qualifying criteria.

Therefore, the conservation objectives for the Severn Estuary SAC, SPA and Ramsar site represents Natural England and the Countryside Council for Wales' current judgement of the appropriate contribution of the site to the achievement of the favourable conservation status of the habitats and species of the European Marine Site. The conservation objectives in this document are intended to guide relevant and competent authorities in the exercise of their functions to comply with the requirements of the Directives outlined above.

## 1.7 Condition

Natural England and CCW use the term "favourable condition" for the condition represented by the achievement of the conservation objectives, in other words the desired condition for a designated habitat or a species on an individual site.

On many terrestrial European sites, we know sufficient about the required condition of qualifying habitats to be able to define favourable condition with confidence. In contrast understanding the functioning of large, varied, dynamic marine and estuarine sites, which experience a variety of pressures resulting from historic and current activities, is much more difficult. Consequently it is much harder to precisely define favourable condition in sites like the Severn Estuary. In general the conservation objectives provided are based on a working assumption that the current condition of the features is favourable for most attributes. Nevertheless there are certain instances where the assumption does not apply. In particular some of the intertidal habitats of the Severn are subject to coastal squeeze. Where existing problems *have* been identified, the relevant objectives reflect this.

If it becomes evident that the condition of other features is significantly degraded, and is therefore unfavourable, then restorative management actions will need to be undertaken to return the interest feature to favourable condition. In future revisions of our advice under Regulation 33, Natural England and CCW will keep our assumption under review in light of ongoing and future monitoring and our developing understanding of the features and the factors affecting them.

## 1.8 Favourable Condition Tables

The detailed information regarding the measures and targets that may be used during site monitoring to determine whether favourable condition is being achieved in practice is presented within the Favourable Condition Tables in section 4.

The favourable condition table specifies the following (in columns from left to right):

- **Features**: interest features for which the SAC, SPA or Ramsar site is selected.
- **Subfeatures**: ecologically important sub-divisions of an interest feature. In the case of a habitat interest feature, subfeatures would be component habitats or communities (eg. defined by type and/or by geographic location within the site). In the case of species interest features, subfeatures include the population itself, or any ecologically relevant subdivisions of the population, and any habitats or communities on which it/they depend.
- **Attributes**: particular characteristics of the features or sub-features which provide an indication of the condition of the feature (eg. total population size, extent of a habitat type).
- **Measures**: what exactly about the attributes will be measured, in terms of the units of measurement to be used, arithmetic nature and an indication of the frequency at which the measurement is taken. An indication of the method that is likely to be used to obtain the observed values of attributes. The method is closely linked to the way in which the measure is expressed. It is important to note that in many cases the precise monitoring method to be used may not be known at this stage.
- **Targets**: These define the attribute values that equate to favourable condition. If changes are observed that are 'significantly' different from the target, this will act as a trigger for further investigation as to the cause of the change, or remedial management action. In general the targets in the favourable condition table are subject to natural processes as set out in the conservation objectives; i.e. where natural processes alone dictate that targets are not met this will not result in the condition of the feature being classed as unfavourable. The term 'subject to natural processes' is explained further in Section 4.1.
- **Comments**: notes on the rationale for the use of each attribute and measure.

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and

nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects. Natural England and CCW will provide more detailed advice to competent and relevant authorities to assess the implications of any given plan or project under the Regulations, where appropriate, at the time a plan or project is being considered.

The favourable condition table specifies the main types of information that Natural England and CCW may use to assess the condition of interest features. On many terrestrial European sites, we know sufficient about the preferred or target condition of qualifying species and habitats to be able to define measures and associated targets for all attributes. In European Marine Sites favourable condition is generally harder to define precisely since our knowledge of features is still developing. Accordingly, in the absence of such information, condition of interest features in European Marine Sites will, in the first instance, be assessed against targets based on their condition at the time the sites were selected, which may need to be established through baseline surveys in many cases.

The information contained within the favourable condition table is not necessarily what will be monitored but provides a basis for discussions with management and advisory groups. The attributes and associated measures and targets may be modified over time. The selection of attributes is based on the current understanding of the habitats and species and the available measuring techniques.

The appropriateness of individual attributes as indicators of condition will be reviewed as more knowledge of the condition of interest features is obtained and/or survey and monitoring techniques develop. Monitoring of the attributes may be of fairly coarse methodology, underpinned by more rigorous methods on specific areas within the site.

The favourable condition table will be an important, but not the only, driver of the site monitoring programme. Other data, such as results from compliance monitoring and appropriate assessments, will also have an important role in assessing condition of interest features. The monitoring programme will be developed as part of the management scheme process through discussion with the relevant authorities and other interested parties. Natural England and the Countryside Council for Wales will be responsible for collating the information required to assess condition, some of which may be collected by other organisations, and for judging the condition of each feature within the site, taking into account all available information and using the favourable condition table as a guide.

The conservation objectives and associated Favourable Condition Tables in this document are intended to guide relevant and competent authorities in the exercise of their functions to comply with the requirements of the Directives outlined above.

## 1.9 Advice on operations

### 1.9.1 Legal context

Natural England and CCW's specific duty in Regulation 33 to give advice on operations that are potentially damaging needs to be seen in the context of the Habitats Directive, which requires that:

- the necessary conservation measures are established which correspond to the ecological requirements of the habitats and species on the site;
- appropriate steps are taken to avoid deterioration of habitats and significant disturbance of species.
- any plan or project which is likely to have a significant effect on a site is subject to an appropriate assessment in view of the site's conservation objectives.

The operations advice, in combination with the conservation objectives, is designed to assist relevant authorities and other decision-makers in complying with these provisions. The operations advice given in this document is without prejudice to other advice given, including the conservation objectives themselves

and other advice which may be given by Natural England and CCW from time to time in relation to particular operations.

The term "operations" is taken to cover all types of human activity, irrespective of whether they are under any form of regulation or management.[12] This is because the obligations in the Directive are

defined by the conservation requirements of the habitats and species, not by existing regulatory or management regimes. Thus the advice contains reference to operations which may not be the responsibility of any of the relevant authorities.

### 1.9.2 Practical requirements

Operations manifest themselves through one or more factors[13]. The conservation status of a given habitat or species could potentially be affected by many different types of factor, and hence many different types of operation.[14] The key practical purpose of the Regulation 33 operations advice is to assist in the identification of priorities for management, by identifying operations to which features are both 'sensitive' and 'vulnerable'. Sensitivity is defined as 'the intrinsic intolerance of a habitat, community or individual of a species to damage from an external factor.' Vulnerability is defined as 'the likelihood of exposure of a habitat, community or individual of a species to a factor to which it is sensitive'.[15] Thus the potential for an operation to deteriorate or disturb a feature depends both on the sensitivity of the feature to the operation – through its associated factors - and the location, intensity, duration and frequency of the operation and the factors that it affects or causes.

Formulating the operations advice has three main elements:

1. Identifying factors to which the features are sensitive.
2. Identifying the types of operation that can cause or affect those factors.
3. Assessing the likelihood of those factors (and hence the features) being affected by those operations, in other words the vulnerability of the feature to those effects.

The first and second of these elements relies on current understanding of the inherent sensitivity of features to particular factors, and the effect of operations on factors. Although there will be site-specific elements to this information, it may often rely on information from a variety of sources which are not specific to this site. The third stage is very site-specific, relying on information about the types, location, intensity, duration and so on, of operations occurring or likely to occur in or around the site.

Given that in many cases, information of the type indicated in the previous paragraph is rudimentary, or simply not available a precautionary approach is adopted for the identification of factors and operations. The operations advice clearly has to be based on the best available knowledge at the time and is subject to continual review. It necessarily involves an element of risk assessment, both in terms of assessing the likelihood of an operation or factor occurring, and the likelihood of it having an adverse effect on a feature.

Natural England and CCW's advice to the relevant authorities is that, as a minimum, the extent and management of the operations identified in Section 5 should be reviewed in the context of the conservation objectives. The advice should also help to identify the types of plans or projects that would be likely to have a significant effect and should be subject to appropriate assessment, noting that such judgements will need to be made on a case-specific basis.

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[12] The term also includes what the Habitats Directive and Regulations call "plans and projects" (see footnote 9).

[13] A factor is defined as "A component of the physical, chemical, ecological or human environment that may be influenced by a natural event or a human activity" (*Sensitivity and mapping of inshore marine biotopes in the southern Irish Sea (Sensmap): Final report.* CCW, Bangor, December 2000.)

[14] The complexity of formulating operations advice is compounded by the "many-to-many" relationship that exists between operations and factors, where an operation may manifest itself through several factors, and a factor may be affected by several operations, in different ways and to different magnitudes.

[15] Adapted from Hiscock, K. [ed] 1996. *Marine Nature Conservation Review: rationale and methods.* Peterborough: JNCC.

The advice in Section 5 of this document is not a list of prohibited operations, or operations necessarily requiring consultation with, or consent[16] from, Natural England or CCW. The input of the relevant authorities and others is a legal and practical necessity in determining the management needs of the site. Thus, the operations advice is provided specifically with the intention of initiating dialogue between Natural England, CCW and the relevant authorities.

Note : The advice on operations previously issued for the SPA in February 2005 is superseded by the advice given in Section 5.

[16] However, in relation to land included within the European Marine Site, which has been notified as a Site of Special Scientific Interest (SSSI), owners or occupiers require Natural England or CCW's consent for any operations included in the SSSI notification, and statutory bodies intending to carry out or permit potentially damaging operations must notify Natural England or CCW and comply with certain other provisions. (Wildlife and Countryside Act 1981, section 28, as amended by the Countryside and Rights of Way Act 2000, section 75). General guidance on the operation of SSSIs is given in the CCW leaflet *Sites of Special Scientific Interest: A guide for landowners and occupiers* (Countryside Council for Wales, Bangor, 2001).

# 2. Qualifying features under the EU Habitats and Birds Directives and the Convention on Wetlands of International Importance

Table 1 shows the wide range of nature conservation features for which the estuary is valued and the interrelationship of these features by designation. This table outlines features of European and International importance in their own right and others of national importance for which the Severn Estuary has been designated as a Site of Special Scientific Interest (SSSI) but which form an intrinsic part of the Severn ecosystem and therefore contribute to the overarching "estuary" feature of the SAC and Ramsar Site.

**Table 1 : Summary of Notified features of each designation** :

| Feature | SAC | SPA | Ramsar Site | SSSI (Nationally important feature) |
|---|---|---|---|---|
| Estuary | Yes | *Supporting habitat to designated bird interests* | Yes | (Yes) |
| Subtidal sandbanks | Yes | No – outside boundary of SPA | No – outside boundary of Ramsar Site | *No – outside boundary of SSSI* |
| Intertidal Mud and Sand | Yes | *Supporting habitat to designated bird interests* | *Component of Ramsar "estuaries" feature and supporting habitat to designated bird interests* | Yes |
| Atlantic salt meadow / salt marshes | Yes | *Supporting habitat to designated bird interests* | *Component of Ramsar "estuaries" feature and supporting habitat to designated bird interests* | Yes |
| Reefs | Yes | No | *Intertidal Sabellaria contiguous with subtidal reefs is a component of the hard substrates subfeature of the Ramsar "estuaries" feature* | No – outside boundary of SSSI |
| Migratory fish (river & sea lamprey & twaite shad) | Yes | No | Yes | (Yes) |
| Migratory fish (salmon, eel, sea trout and Allis Shad) | *Part of notable species sub-feature of estuary feature* | No | Yes | (Yes) |
| Assemblage of fish species (>100 species) | *Notable species sub-feature of estuary feature* | No | *Notable species sub-feature of estuary feature)* | (Yes) |
| Internationally important populations of migratory bird species | *Notable species sub-feature of estuary feature* | Yes | Yes Internationally important populations of waterfowl | Yes |
| Internationally important populations of wintering bird species | *Notable species sub-feature of estuary feature* | Yes | | Yes |
| Assemblage of nationally important populations of waterfowl | *Notable species sub-feature of estuary feature* | Yes | Yes | Yes |
| Hard substrate habitats (Rocky shores) | *Notable species sub-feature of estuary feature* | *Supporting habitat to designated bird interests* | *Component of Ramsar "estuaries" feature and supporting habitat to designated bird interests* | Yes |
| Freshwater grazing marsh / Neutral grassland | No | *Supporting habitat to designated bird interests within SPA but outside European Marine Site* ***and therefore not addressed in this Regulation 33 advice document*** | | Yes (currently England only ) |

## 2.1 Qualifying interest features of the Severn Estuary / Môr Hafren SAC

The Severn Estuary has been designated an SAC on the basis that it supports occurrences of habitat types and species listed in Annexes I and II respectively of the Habitats Directive that are considered important in a European context and meeting the criteria in Annex III of the Directive. These are the interest features of the SAC and are listed in the Table 2 and their relationships are shown in Figure 1.

The designation includes an overarching **"estuaries"** feature within which **subtidal sandbanks**, **intertidal mudflats and sandflats, Altlantic salt meadows** and **reefs** (of *Sabellaria alveolata*) and **three species of migratory fish** are defined as both features in their own right and as sub-features of the estuary feature.

In addition **hard substrate habitats** including **eel grass beds,** the estuary-wide **assemblage of fish species** and the **assemblage of waterfowl species** (for which the Ramsar Site and SPA are specifically designated) are identified as **notable estuarine assemblages** which are an intrinsic part of the estuary ecosystem – these are therefore covered by the "estuaries" feature.

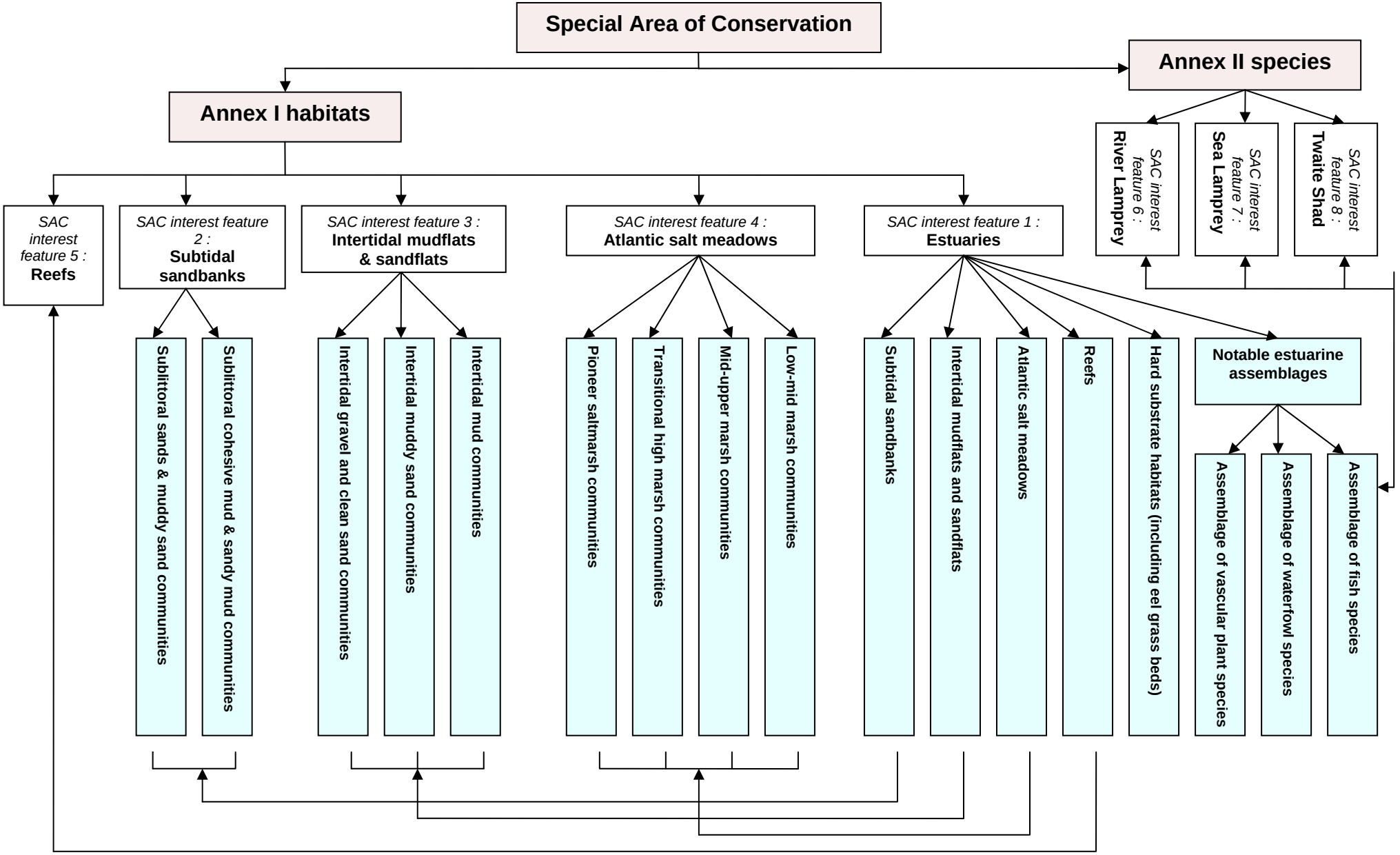
**Table 2 : Interest features of the SAC**

| **Feature name** | **Scientific term**[10] | **EU Code**[17] |
|---|---|---|
| Annex I habitat types | | |
| *SAC interest feature 1:* **Estuaries** | Estuaries | 1130 |
| *SAC interest feature 2:* **Subtidal sandbanks** | Sandbanks which are slightly covered by seawater all the time | 1110 |
| *SAC interest feature 3:* **Intertidal mudflats and sandflats** | Mudflats and sandflats not covered by seawater at low tide | 1140 |
| *SAC interest feature 4:* **Atlantic salt meadows** | Atlantic salt meadows (*Glauco puccinellietalia maritimae)* | 1330 |
| *SAC interest feature 5:* **Reefs** | Reefs | 1170 |
| Annex II species | | |
| *SAC interest feature 6:* **River lamprey** | *Lampetra fluviatilis* | 1099 |
| *SAC interest feature 7:* **Sea lamprey** | *Petromyzon marinus* | 1095 |
| *SAC interest feature 8:* **Twaite shad** | *Alosa fallax* | 1103 |

Each interest feature has a conservation objective in Section 4 of this document.

[17] European Commission (2007) Interpretation Manual of EU Habitats EUR27 July 2007, and Natura 200- Standard Data Form Explanatory Notes, Appendix C.

**Figure 1 : Flow chart showing the relationship between the interest features of the Severn Estuary SAC (shown in white boxes) and their component sub features (shown in blue boxes).** NB Some habitats that are sub features of the Annex II estuary feature are also features in their own right with their own sub features.



## 2.2 Qualifying interest features of the Severn Estuary / Môr Hafren SPA

The Severn Estuary was classified as an SPA on 13 July 1995 (subsuming a previously designated SPA called the Upper Severn Estuary) . The 1995 citation accompanying the classification is the baseline for the advice issued in this document. The qualifying interest features of the Severn Estuary SPA are shown in Table 3.

It should be noted that since designation changes in bird numbers have occurred in relation to the qualifying thresholds, which have themselves changed. These changes are highlighted by the SPA review published by the JNCC and details are also shown in Table 3. These changes are likely to be the subject of formal changes to the SPA designation in due course, however at present the legally protected species remain those in the original 1995 citation. (Note : Further information on the peak counts of the SPA species and waterfowl assemblage between 1988/9 and 2006/07 are given in Appendix 11.)

The SPA within the European Marine Site boundary includes saltmarshes and the adjacent extensive areas of intertidal mud, sand and rocky shores. All these habitats provide essential food and resting places for the wide range of wintering and migratory waterfowl and are therefore identified as key "supporting habitats" for the conservation of these species. The relationship between the features and supporting habitats supporting habitats is shown in Table 3. The supporting habitats are mapped in Appendix 8 to show their distribution and extent.

***Notes relating to Table 3***

**[1] Severn Estuary SPA original citation from July 1995 (though updated by Natural England in July 2002, version 2.3).*

**[2] JNCC Severn Estuary SPA Review, dated 2001 available from the JNCC www.jncc.gov.uk/pdf/SPA/UK9015022.pdf (Stroud, DA, et al., 2001)*

**[3] JNCC Natura 2000 Standard Data Form, May 2006, version 1.1.*

**[4] 5 year peak mean, 1988/89 – 1992/93.*

**[5] 5 year peak mean, 1991/92 – 1995/96.*

**[6] 5 year peak mean, 01/04/1998.*

## Table 3 : The qualifying interest features and supporting habitats of the Severn Estuary SPA.

| Species | Original SPA citation (1995) *[1] | SPA Review (2001) *[2] | Natura 2000 form (2006) *[3] | Notes | Supporting habitats |
|---|---|---|---|---|---|
| **Internationally important populations of regularly occurring Annex 1 species** [under Article 4.1 of the EU Birds Directive]. | | | | | |
| *SPA interest feature 1* :<br>**Bewick's swan** *Cygnus columbianus bewickii* | ✓ | ✓ | ✓ | Over-wintering | **Intertidal mudflats and sandflats**<br>**Saltmarsh** |
| **Internationally important populations of regularly occurring migratory bird species** [under Article 4.2 of the EU Birds Directive]. | | | | | |
| *SPA interest feature 2* :<br>**European white-fronted goose** *Anser albifrons albifrons* | ✓ | x | ✓ | Over-wintering | **Intertidal mudflats and sandflats**<br>**Saltmarsh**<br>**Hard substrate habitats**<br><br>(Freshwater coastal grazing marsh, improved grassland and open standing waters also occur within the SPA but these habitats lie outside EMS boundary) |
| *SPA interest feature 3* : **Dunlin** *Calidris alpina alpina* | ✓ | ✓ | ✓ | | |
| *SPA interest feature 4* : **Redshank** *Tringa totanus* | ✓ | ✓ | ✓ | | |
| *SPA interest feature 5* : **Shelduck** *Tadorna tadorna* | ✓ | ✓ | ✓ | | |
| *SPA interest feature 6* : **Gadwall** *Anas strepera* | ✓ | x | ✓ | | |
| **Curlew** *Numenius arquata* | x | ✓ | x | | |
| **Pintail** *Anas acuta* | x | ✓ | x | | |
| **Ringed plover** *Charadrius hiaticula* | x | ✓ | x | On passage | |
| *SPA interest feature 7* **: Internationally important assemblage of waterfowl** (wildfowl & waders) [under Article 4.2 of the EU Birds Directive]. | | | | | |
| **Bewick's swan** *Cygnus columbianus bewickii* | ✓ | ✓ | The Natura 2000 data form does not list separate waterfowl species within this assemblage. | The wintering waterfowl assemblage includes all regularly occurring waterfowl. Species that qualify as a listed component of the assemblage include all the internationally important regularly occurring migratory species as well as the Annex 1 wintering species. The list also includes species present in nationally important numbers or species whose populations exceed 2,000 individuals<br><br>In the original citation, in winter, it is stated that the area regularly supported 68,026 individual waterbirds *[4]. In the SPA Review it is stated that the area regularly supports 93,986 individual waterfowl in winter *[5]. In the Natura 2000 form, in winter, it is stated that the area regularly supports 84,317 waterfowl *[6]. | **Intertidal mudflats and sandflats**<br>**Saltmarsh**<br>**Hard substrate habitats**<br><br>(Freshwater coastal grazing marsh, improved grassland and open standing waters also occur within the SPA but these habitats lie outside EMS boundary) |
| **European white-fronted goose** *Anser albifrons albifrons* | ✓ | ✓ | | | |
| **Dunlin** *Calidris alpina alpina* | ✓ | ✓ | | | |
| **Redshank** *Tringa totanus* | ✓ | ✓ | | | |
| **Shelduck** *Tadorna tadorna* | ✓ | ✓ | | | |
| **Gadwall** *Anas strepera* | ✓ | ✓ | | | |
| **Wigeon** *Anas penelope* | ✓ | ✓ | | | |
| **Teal** *Anas crecca* | ✓ | ✓ | | | |
| **Pintail** *Anas acuta* | ✓ | ✓ | | | |
| **Pochard** *Aythya ferina* | ✓ | ✓ | | | |
| **Tufted duck** *Aythya fuligula* | ✓ | ✓ | | | |
| **Ringed plover** *Charadrius hiaticula* | ✓ | x | | | |
| **Grey plover** *Pluvialis squatarola* | ✓ | ✓ | | | |
| **Curlew** *Numenius arquata* | ✓ | ✓ | | | |
| **Whimbrel** *Numenius phaeopus* | ✓ | ✓ | | | |

| Species | Original SPA citation (1995) *[1] | SPA Review (2001) *[2] | Natura 2000 form (2006) *[3] | Notes | Supporting habitats |
|---|---|---|---|---|---|
| **Spotted redshank** *Tringa erythropus* | ✓ | x | | | |
| **Lapwing** *Vanellus vanellus* | x | ✓ | | | |
| **Mallard** *Anas platyrhynchos* | x | ✓ | | | |
| **Shoveler** *Anas clypeata* | x | ✓ | | | |

Information on populations of bird species using the Severn Estuary European Marine Site at the time the SPA was classified is contained in Table 4 and their relationships are shown in Figure 2.

**Table 4 : Information on populations of bird species using the Severn Estuary European Marine Site at the time the Severn Estuary SPA was classified (1995).**

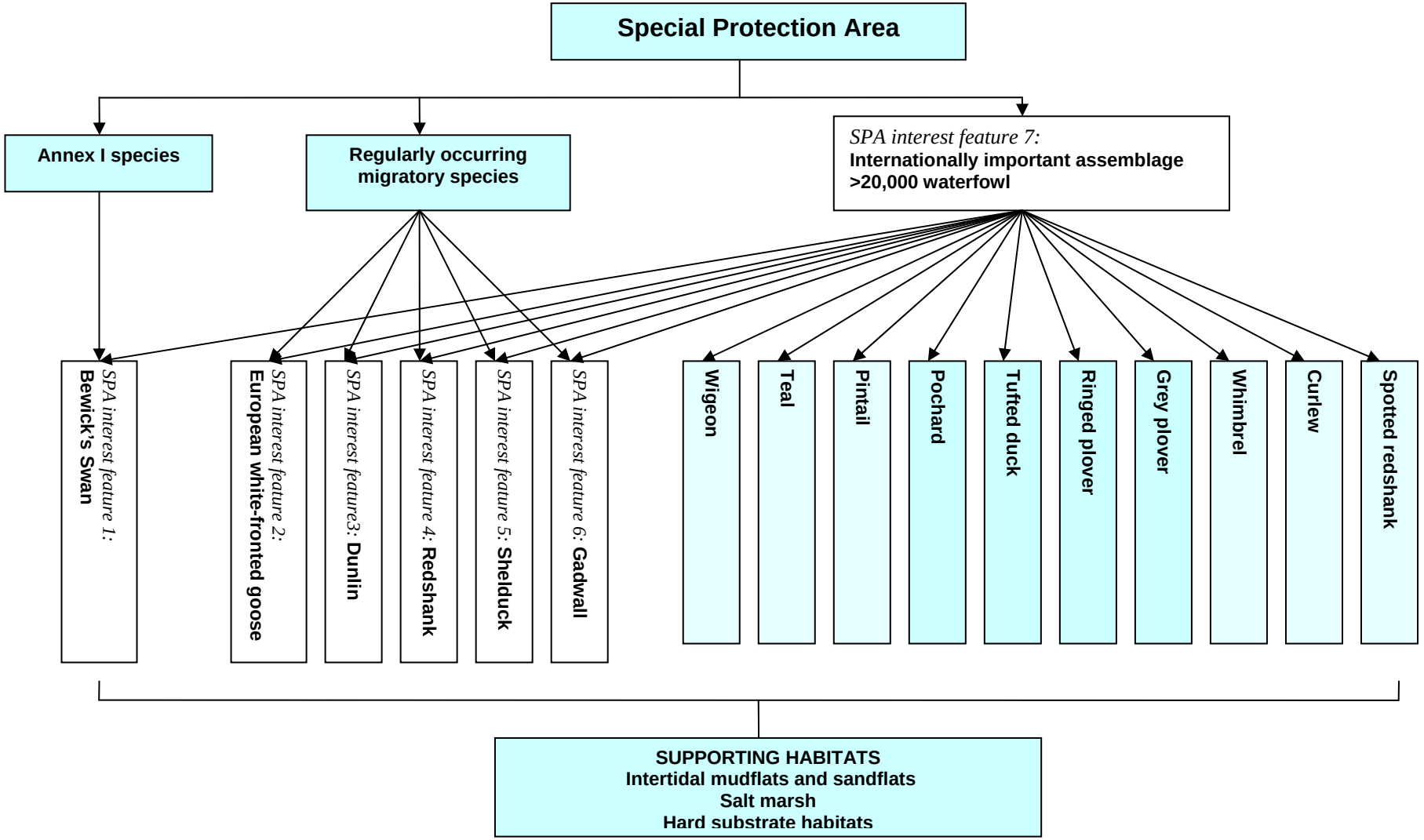
| **Internationally important populations of regularly occurring Annex 1 species** | | |
|---|---|---|
| **Species** | **Population ( 5 yr peak mean :1988/9 to 1992/3 )** | |
| *SPA interest feature 1:* **Bewick's swan** | 289 birds | 4.1% Great Britain 1.7% NW Europe |
| **Internationally important populations of regularly occurring migratory bird species** | | |
| **Species (wintering)** | **Population ( 5 yr peak mean: 1988/9 to 1992/3)** | |
| *SPA interest feature 2:* **European white-fronted goose** | 3,002 | 50% British, 1% North West Europe |
| *SPA interest feature 3:* **Dunlin** | 41,683 | 2.9% East Atlantic flyway |
| *SPA interest feature 4:* **Redshank** | 2,013 | 1.3% East Atlantic flyway |
| *SPA interest feature 5:* **Shelduck** | 2,892 | 1.2% North West Europe |
| *SPA interest feature 6:* **Gadwall** | 330 | 2.8 % NW Europe |
| *SPA interest feature 7:* **An internationally important assemblage of waterfowl** *(Assemblage includes above species plus the following listed nationally important populations)* | | |
| **Importance** | **Population ( 5 yr peak mean: 1988/9 to 1992/3)** | |
| The Severn Estuary supports over 20,000 wintering waterfowl. | 68,026 individual birds comprising 17,502 wildfowl and 50,524 waders | |
| **Nationally important bird populations within internationally important assemblage of waterfowl** | | |
| **Species** | **Population ( 5 yr peak mean: 1988/9 to 1992/3)** | |
| Wigeon | 3,977 birds | 1.6% Great Britain |
| Teal | 1,998 | 2.0% Great Britain |
| Pintail | 523 | 2.1% Great Britain |
| Pochard | 1,686 | 3.8% Great Britain |
| Tufted duck | 913 | 1.5% Great Britain |
| Ringed plover | 227 | 1.0% Great Britain |
| Grey plover | 781 | 3.7% Great Britain |
| Curlew | 3,096 | 3.4% Great Britain |
| Whimbrel | 246 | 4.9% Great Britain |
| Spotted redshank | 3 | 1.5% Great Britain |

Notes :
1. Previous advice issued in respect of the Severn Estuary SPA in February 2005 excluded Gadwall for the listed species of internationally important populations of regularly occurring migratory birds as they were considered not to use the European Marine Site area to any significant degree. Further recent evidence (2002/03 Low Tide Bird Counts) has demonstrated that this species does make use of areas within the European Marine Site and has consequently now been included.
2. The SPA review has identified that since the classification of the Severn Estuary SPA in 1995 the Severn Estuary now supports nationally important populations of Mallard, Lapwing and Shoveler.

(Note : Further information on the peak counts of the SPA species and waterfowl assemblage between 1988/9 and 2006/07 are given in Appendix 11.)

Each interest feature has a conservation objective in Section 4 of this document. Reference should also be made to sections of this document that relate to the Severn Estuary SAC interest features (particularly with respect to the conservation requirements of the supporting habitats) and the Severn Estuary Ramsar Site interest features.

**Figure 2 : Flow chart showing the relationship between the qualifying bird species features (in white boxes) of the Severn Estuary SPA and their supporting habitats**



## 2.3 Qualifying interest features of the Severn Estuary/ Môr Hafren Ramsar Site

The Severn Estuary was classified as a Ramsar Site on 13 July 1995 (subsuming a previously designated Upper Severn Estuary Ramsar Site). The 1995 citation is the basis for the advice issued in this document as this defines the legally protected species covered by the Ramsar designation at this time.

It should be noted that a number of changes have been made to the criteria since the listing of the Severn Estuary Ramsar Site and it is these new (2005) criteria which are now presented on the JNCC website used by many authorities as a reference source. For completeness qualification under both the criteria used at the time of 1995 Ramsar designation and the revised 2005 criteria have been outlined in Table 5 which provides a confirmation of the defined Ramsar features for which Conservation Objectives have been written.

The qualifying interest features of the Severn Estuary Ramsar Site overlap with those of the Severn Estuary SPA and SAC. To facilitate the development of integrated objectives across the designations the Ramsar criteria have been interpreted and the Ramsar features defined so that they are consistent with those already identified in the SAC and SPA sections of this document.

**Table 5 : confirmation of Ramsar features in context of 1995 and 2005 Ramsar criteria**

| **Ramsar Features (for which conservation objectives have been written)** | **Criteria at designation (1995)** (original criteria) | **Revised Criteria (2005)** (criteria currently used on JNCC website) |
|---|---|---|
| ***Ramsar interest feature 1:***<br><br>***Estuaries**<br>*- characteristic physical form and flow, estuarine habitat communities and species assemblages* | **Criterion 1** : qualifies due to its immense tidal range affecting both the physical environment and biological communities present | **Criterion 1** : qualifies due to immense tidal range (second-largest in world), this affects both the physical environment and biological communities. |
| *- estuarine habitat communities and species assemblages* | **Criterion 2b** : qualifies due to its unusual estuarine communities, reduced species diversity and high productivity. The high tidal range leads to strong tidal streams and high turbidity, producing communities characteristic of the extreme physical conditions of liquid mud and tide swept sand and rock | **Criterion 3** : qualifies due to its unusual estuarine communities, reduced diversity and high productivity |
| ***Ramsar interest feature 2:***<br><br>**Assemblage of migratory fish species :**<br>Sea Lamprey<br>River Lamprey<br>Twaite Shad<br>Allis Shad<br>Salmon<br>Sea Trout<br>Eel | **Criterion 2c** : qualifies as it is important for the run of migratory fish between sea and river via estuary. Species include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*. | **Criterion 4** : qualifies as it is important for the run of migratory fish between sea and river via estuary. Species include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*. |
| ** The wider estuarine fish assemblage is covered as a "notable species assemblage" sub feature of the SAC "Estuaries" feature* | | **Criterion 8** : qualifies as the fish assemblage of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. |

Table continued …

<table>
<tr><th>Ramsar Features<br>(for which conservation objectives have been written)</th><th>Criteria at designation (1995)<br>(original criteria)</th><th>Revised Criteria (2005)<br>(criteria currently used on JNCC website)</th></tr>
<tr><td>Ramsar interest feature 3:<br>Bewick's Swan<br><br>Ramsar interest feature 4:<br>European white-fronted goose<br><br>Ramsar interest feature 5: Dunlin<br>Ramsar interest feature 6: Redshank<br>Ramsar interest feature 7: Shelduck<br>Ramsar interest feature 8: Gadwall<br><br>ie Internationally important <u>populations</u> of waterfowl</td><td>Criterion 3c : qualifies by regularly in winter supporting internationally important populations (1% or more) of species of waterfowl<br><br>Bewick's swan<br>European white-fronted goose<br>Dunlin<br>Redshank<br>Shelduck<br>Gadwall</td><td rowspan="2">Criterion 6 : qualifies as it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.<br><br>Species with peak counts in winter - at designation:<br>Tundra/Bewick's swan<br>Greater /European white-fronted goose<br>Dunlin<br>Common redshank<br>Common shelduck<br>Gadwall<br><br>Populations identified subsequent to designation:<br>Ringed plover (spring/autumn)<br>Eurasian teal (winter)<br>Northern pintail (winter)<br>Lesser black-backed gull (breeding)</td></tr>
<tr><td rowspan="3">Ramsar interest feature 9:<br>Internationally important <u>assemblage</u> of waterfowl<br><br>This feature incorporates :<br><br>• waterfowl which contribute to the total peak winter count (criterion 3a)<br>• the above internationally important wintering populations (qualifying under criterion 3c)<br>• the migratory passage species (qualifying under criterion 2c)<br>• the nationally important populations (identified under other notable features of the Ramsar Site citation)<br><br>The species are as follows :<br>(w = wintering and p = passage):<br><br>Bewick's swan (w)<br>European white-fronted goose (w)<br>Shelduck (w)<br>Dunlin (w, p)<br>Redshank (w, p)<br>Gadwall (w)<br>Ringed plover (w, p)<br>Whimbrel (p)<br>Teal (w)<br>Pintail (w)<br>Wigeon (w)<br>Pochard (w)<br>Tufted duck (w)<br>Grey plover (w)<br>Curlew (w)<br>Spotted redshank (w)</td><td>Qualifies under Criterion 2c as it is particularly important for migratory birds during passage periods in spring and autumn. Nationally important populations of :<br><br>Ringed plover<br>Dunlin<br>Whimbrel<br>Redshank</td></tr>
<tr><td>Criterion 3a : qualifies by regularly supporting in winter over 20,000 waterfowl - (1988/89 to 1992/93 average peak count was 68,026 waterfowl: 17,502 wildfowl and 50,524 waders)</td><td>Criterion 5 : qualifies as it supports an assemblage of international importance - (1998/99-2002/2003 5 year peak mean was 70,919 waterfowl</td></tr>
<tr><td>Other notable features :<br>Nationally important wintering populations of:<br><br>Wigeon, teal, pintail, pochard, tufted duck, ringed plover, grey plover, curlew and spotted redshank. Also nationally important breeding population of Lesser Black backed gull</td><td></td></tr>
</table>

Each interest feature has a conservation objective in Section 4 of this document.

Reference should also be made to sections of this document that relate to the Severn Estuary SAC interest features (particularly with respect to the conservation requirements of the supporting habitats) and the Severn Estuary SPA interest features.

Information on the populations of bird species using the Severn Estuary Ramsar Site at the time of designation is contained in Table 6 and their relationships are shown in Figure 3. Ramsar interest feature 9 incorporates both wintering and passage populations of some birds and hence some species are included more than once in the lists given in Table 6.

**Table 6 : Information on populations of bird species using the Severn Estuary Ramsar Site at the time of classification (1995)**

| *Ramsar interest features3 to 8:*<br>**Internationally important <u>populations</u> of wintering waterfowl** (1995 Ramsar Criterion 3c) | | |
|---|---|---|
| **Species** | **Population ( 5 yr peak mean: 1988/9 to 1992/3)** | |
| *Ramsar interest feature 3:* **Bewick's swan** | 289 | 4.1% Great Britain, 1.7% North West Europe |
| *Ramsar interest feature 4:* **European white-fronted goose** | 3,002 | 50% British, 1% North West Europe |
| *Ramsar interest feature 5:* **Dunlin** | 41,683 | 2.9% East Atlantic flyway, 9.6% British |
| *Ramsar interest feature 6:* **Redshank** | 2,013 | 1.3% East Atlantic flyway, 2.6% British |
| *Ramsar interest feature 7:* **Shelduck** | 2,892 | 1.2% NW European, 3.9 % British |
| *Ramsar interest feature 8:* **Gadwall** | 330 | 2.8 % NW European, 5.5 % British |

| *Ramsar interest feature 9:*<br>**Internationally important <u>assemblage</u> of waterfowl (**1995 Ramsar Criterion 2c, 3a and 3c)<br>*(Assemblage includes above wintering species populations plus the following listed nationally important populations (migratory passage and wintering species)* | |
|---|---|
| **International importance (1995 Ramsar Criterion 3a)** | **Population ( 5 yr peak mean: 1988/9 to 1992/3)** |
| Regularly supporting in winter over 20,000 waterfowl. | 68,026 individual birds comprising 17,502 wildfowl and 50,524 waders |

| **Nationally important bird populations within internationally important assemblage of waterfowl (1995 Ramsar Criterion 2c and other nationally important populations)** | | |
|---|---|---|
| **Species** | **Population ( 5 yr peak mean: 1987/8 to 1991/2)** | |
| Dunlin | 3,510 (spring migration)<br>5,500 (autumn migration) | 1.7 % British passage<br>2.7 % British passage |
| Redshank | 2,456 (autumn migration) | 2 % British passage |
| Ringed plover | 442 (spring migration)<br>1,573 (autumn migration) | 1.4 % British passage<br>5.2 % British passage |
| Whimbrel | 246 (spring migration)<br>66 (autumn migration) | 4.9 % British passage<br>1.3 % British passage |
| | **Population ( 5 yr peak mean: 1988/9 to 1992/3)** | |
| Wigeon | 3,977 birds | 1.6% Great Britain |
| Teal | 1,998 | 2.0% Great Britain |
| Pintail | 523 | 2.1% Great Britain |
| Pochard | 1,686 | 3.8% Great Britain |
| Tufted duck | 913 | 1.5% Great Britain |
| Grey plover | 781 | 3.7% Great Britain |
| Curlew | 3,096 | 3.4% Great Britain |
| Spotted redshank | 3 | 1.5% Great Britain |

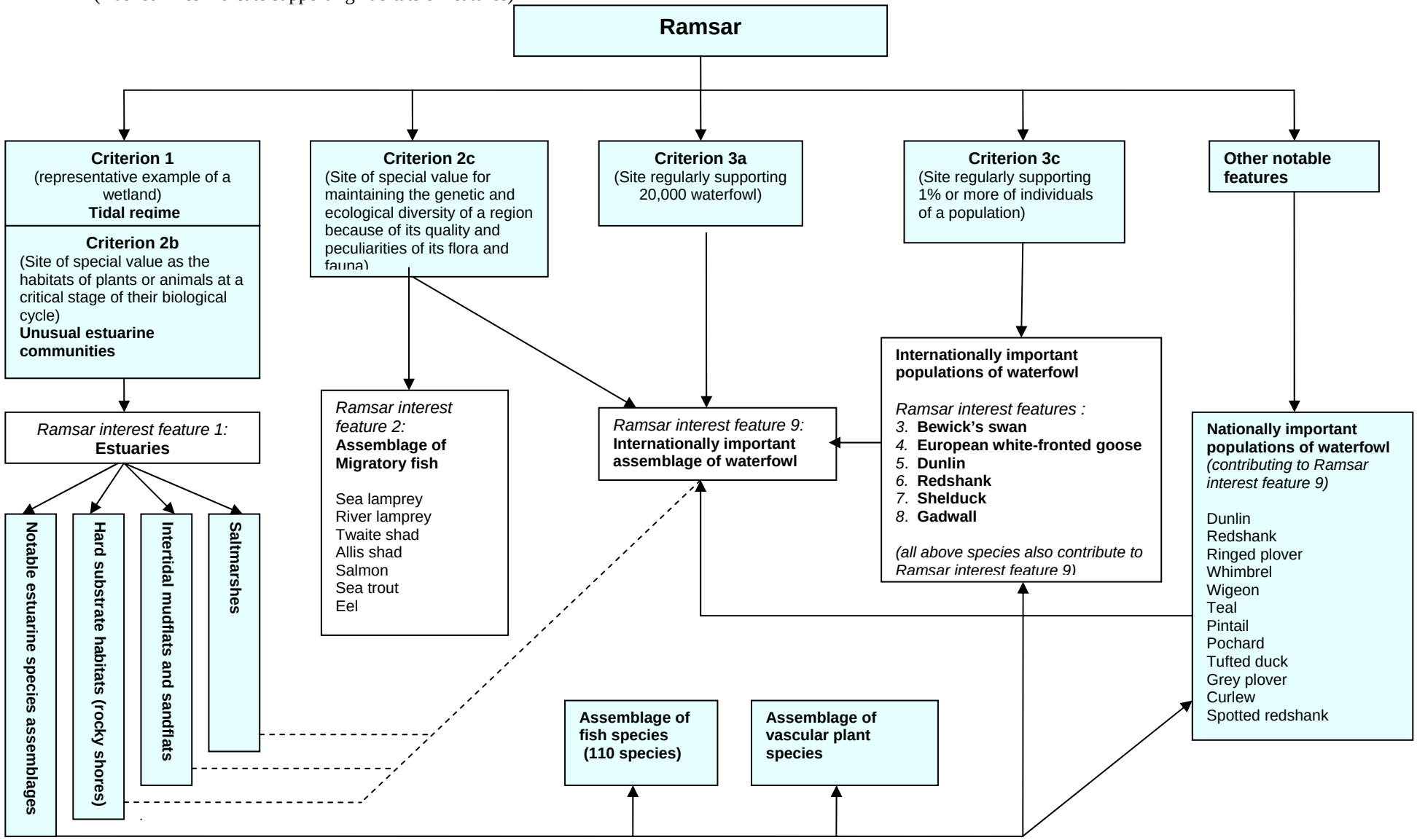
(Note : Further information on the peak counts of the SPA species and waterfowl assemblage between 1988/9 and 2006/07 are given in Appendix 11.)

The Ramsar Site within the European Marine Site boundary includes saltmarshes and the adjacent extensive areas of intertidal mud, sand and rocky shores. All these habitats provide essential food and resting places for the wide range of wintering and migratory waterfowl and are therefore identified as key "supporting habitats" for the conservation of these species. The relationship between the Ramsar Site bird features (Ramsar interest features 3 to 9) and their supporting habitats is shown in Table 7. The supporting habitats are mapped in Appendix 8 to show their distribution and extent.

**Table 7 : A summary of the qualifying bird features and associated supporting habitats within the Severn Estuary Ramsar Site**

| **Designation** | **Qualifying feature** | **Protected Supporting habitats** | | |
|---|---|---|---|---|
| | | **Estuary** | | |
| | | **Intertidal mudflats and sandflats** | **Hard substrate habitats (rocky shores)** | **Saltmarsh** |
| Ramsar Site (*classified 13 July 1995)* | *Ramsar interest features 3 to 8 :* Internationally important populations of individual species of waterfowl | ✓ | ✓ | ✓ |
| | *Ramsar interest feature 9:* Internationally important assemblage of waterfowl | ✓ | ✓ | ✓ |

**Figure 3 : Flow chart showing the relationship between the interest features (in white boxes) for which the Severn Estuary Ramsar Site qualifies.**
(Dashed lines indicate supporting habitats of features)



# 3. General description of the Severn Estuary and its designated features

## Introduction

The Severn Estuary is the largest example of a coastal plain estuary in the United Kingdom and one of the largest estuaries in Europe. The overall area of the European and International conservation designations is 73,715.4 ha (see Appendix 1) of which roughly two thirds is composed of subtidal habitats (stable sandbanks and shifting sediments of gravel, sand and mud) and one third is composed of intertidal habitats (tide washed mud and sand, saltmarshes and rocky shores).

The estuary lies in the broad Severn Vale, with most of the sediments on the margins of the estuary having accumulated since the last ice age. As with many other estuaries in England and Wales, it has been a focus for human activity, a location for settlement, a source of food, water and raw materials and a gateway for trading and exploration. The Estuary and its coastal hinterland support the cities of Cardiff, Bristol, Newport and Gloucester. Today, major industries are sited around the Estuary's shores. There are modern port installations, chemical processing companies and nuclear power stations among others. Exploitation of the natural resources includes commercial shrimp fishing and fishing for salmon using putchers, lave nets, draught nets and bag nets. The Severn supports an important eel and elver fishery. Aggregate extraction also occurs within the estuary.

Alongside all these competing activities, the Estuary also supports a wide array of habitats and species of international importance for nature conservation.

Human activity has increasingly influenced the character of the marginal wetland mudflats and marshes, with extensive land claim occurring during and since the Roman period. Sediment flows and fluxes affecting the estuary are of particular importance for estuarine processes and ecology and the morphology of the estuary is constantly changing due to the complex hydrodynamics. Sediment deposits provide essential material to maintain the mudflats, sandflats and saltmarsh. Estuary-wide fluctuations in the wind-wave climate over recent centuries have led to major movements of the high-tide shoreline, and some reclaimed lands have been lost (Allen, 1990, Atkins, W.S. 2004). In addition, the Severn Estuary CHaMP (ABPMer, 2006) predicts losses of intertidal mudflats and sandflats and saltmarsh habitats over the next 100 years in response to rising sea-level.

A number of habitats and species have also been recognised through the designation of several Sites of Special Scientific Interest (most notably, the Upper Severn Estuary, Severn Estuary and Bridgwater Bay SSSIs in the 1980's) which underpin the European and International designations.

The following sections briefly describe each of the main habitat and species features covered by the three designations and the inter-relationships between them. All feature descriptions are based on best available knowledge at the present time and in some cases this is limited. For example there is limited information on the extent of the subtidal reef habitat within the estuary. Maps showing the distribution of the habitats are indicative only and the advice in this document is provided on the basis of current knowledge and may be subject to change as knowledge improves.

## 3.1 Estuaries

### 3.1.1 Range

Estuaries are habitat complexes which comprise an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. Many of these habitats, such as mudflats and sandflats not covered by sea water at low tide, saltmarshes, sandbanks which are slightly covered by sea water all the time and reefs, are identified as Annex I habitat types in their own right.

Estuaries are defined as the downstream part of a river valley, subject to the tide and extending from the limit of brackish water. There is a gradient of salinity from freshwater in the river to increasingly marine conditions towards the open sea.

Estuaries are widespread throughout the Atlantic coasts of Europe. Approximately one-quarter of the area of estuaries in north-western Europe occurs in the UK. The UK has over 90 estuaries[18].

The selection of estuary sites has taken account of the UK's EU responsibility for this habitat type, and the SAC series contains a high proportion of the total UK resource. Sites have been selected to represent the geographical range of estuaries in the UK, and to encompass examples of the four geomorphological sub-types (coastal plain, bar-built, complex, and ria estuaries) and the associated range of communities. Selection has generally favoured larger estuaries, as they display a wider variety of habitats, but smaller estuaries have also been selected where they have specific features of interest, such as undisturbed transitions from marine to terrestrial habitats, or are representative of a particular geomorphological sub-type.

The Severn Estuary is the largest example of a coastal plain estuary in the UK, and one of the largest estuaries in Europe. It contributes approximately 30% of the UK Natura 2000 resource for estuaries, by area.[19]

### 3.1.2 Extent and Distribution

The extent of the Estuary feature is 73678 ha.

The Severn Estuary SAC covers the extent of the tidal influence from an upstream limit between Frampton and Awre in Gloucestershire out seawards to a line drawn between Penarth Head in Wales and Hinckley point in Somerset. It includes subtidal and intertidal areas landward to the line of high ground and flood defences (banks and walls) that provide the limit of tidal inundation.

**The Estuary is an over-arching feature which incorporates all aspects of the physical, chemical and biological attributes of the estuary as an ecosystem. The physical nature of the tidal regime determines not only the structure of the estuary and individual habitats but also the conditions affecting it and the biological communities it therefore supports.**

### 3.1.3 Structure and Function

The Severn Estuary is important for its immense tidal range, which affects both the physical environment and the diversity and productivity of the biological communities. The tidal range is the second largest in the world, reaching in excess of 13 m at Avonmouth[20]. This macrotidal environment is partly due to the estuary's funnel shape which concentrates the tidal wave as it moves up the Bristol Channel. Tidal currents

[18] JNCC website

[19] Based on Natura 2000 Standard data forms for all UK Natura 2000 sites which have estuaries as a feature- source: JNCC website http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H1130

[20] Data on tidal range can be found on the Proudman Oceanographic Laboratory website http://www.pol.ac.uk/ntslf/tides/?port=0060 .

are also amplified and exceed 7 metres per second close to Avonmouth (British Geological Survey, 1996). These factors make the estuary important in representing one of the most dynamic estuarine systems in the UK , Europe and the world.

There are several major rivers, including the Taff, Usk, Wye, Severn, Avon and Parrett which feed into the estuary, and influence the salinity regime. Together these rivers tend to produce a marked east-west salinity gradient and a range of conditions varying from brackish to fully saline, depending on the season and rainfall, which in turn influences the occurrence and distribution of habitats and species throughout the estuary and its fringes.

Fine sediments which are mainly derived from erosion of the intertidal zone and suspended sediments in river water entering the estuary create high turbidity, which has its highest average level between Avonmouth and the outer part of Bridgwater Bay (British Geological Survey, 1996, ABPMer, 2006). The strong tidal currents create a highly dynamic environment and the resultant scouring of the seabed and high turbidity give rise to low diversity communities. The Severn has an extreme type of hydrodynamic and sedimentary regime which distinguishes it from other estuaries and which dominates the whole system. It is estimated that the estuary carries 10 million tons of suspended sediments on spring tides (Kirby & Parker,1983; Kirby, 1986). Such conditions were initiated by the start of sea-level rise in late glacial times, with some evidence for steady sedimentation persisting for at least 5000 years, during which there has been a steady rise in sea level of 5 m, a trend which is continuing at present (British Geological Survey, 1996). Defra guidance[21] indicates sea –level rise for Wales and the South West to be 3.5 mm per annum to 2025, rising to 8 mm per annum (2025-2055), 11.5 mm (2055-2085) and 14.5 mm (2085-2115).

### 3.1.4 Typical Habitats and Species

The extreme hydrodynamic and sedimentary conditions essentially determine the type of habitats and species present and result in characteristic animal and plant communities. Typical species for each habitat are given in the individual habitat sections.

The predominant unconsolidated sediments are muds and sands which form the basis of the structure of the estuarine habitats which include saltmarshes (section 3.5), intertidal mud and sand flats (section 3.4) and subtidal sand banks (section 3.3), mixed mud and sand, rock outcrops, boulder and shingle shores (section 3.7) as well as biogenic (worm built) reefs (section 3.6). There are also sandy beaches on the southern shores in the outer part of the estuary, backed by sand dunes.

The intertidal zone of mudflats, sandbanks, rocky platforms and saltmarsh is one of the largest and most important in Britain and this range of habitats provide an ecosystem of great importance for a wide range of fish (section 3.8) and bird (section 3.9) species – for feeding, breeding, resting and migration.

### 3.1.5 Natural Processes

The structure of estuaries is largely determined by geomorphological and hydrographic factors, with the original shaping forces having their beginnings in the geological origins of the adjacent land areas and the influence of major geological events such as ice ages and periods of higher and lower sea levels.

The shape of the estuaries, their macro- and micro-topography, and bathymetry, are important components of the character of the habitats and influences the distribution and abundance of marine life, *i.e.* the features' typical species. It is both determined by, and influences, natural environmental processes and consequently, can be impacted either directly or indirectly (through changes to natural processes) by man.

Estuaries are complex dynamic systems that have a natural tendency to accumulate sediment, thereby changing their form from their original Holocene morphology to a state where tidal energy is dissipated by

[21] Defra, 2006. Flood and Coastal Defence Appraisal Guidance FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts October 2006

sub- and intertidal sediment banks. The width and depth of the estuary will therefore change over time towards a state of dynamic equilibrium or "most probable state".

The velocities of currents passing through the mouth are determined partly by the tidal range and partly by the cross sectional area of the mouth itself. If these velocities are higher than the sediment erosion threshold, erosion will widen the channel and lower velocities will ensue. If velocities are lower than the sediment depositional threshold, deposition will narrow the mouth and higher velocities will ensue. In this way, an equilibrium cross section will evolve which balances tidal prism, velocities and erosion/depositional thresholds. Sea level rise means that estuaries will show a natural tendency to migrate inland (roll-over) and may erode at the mouth. Where changes in extent are attributable to the estuary adjusting to equilibrium, then the feature should be determined favourable. Where this process is constrained by hard sea defence, then this would be considered as coastal squeeze. (JNCC Common Standards Monitoring Guidance for Estuaries (version 4)).

A complex pattern and combination of physical, chemical and biological conditions and processes operates within estuaries, with many parameters varying temporally and spatially. These parameters establish the baseline conditions in the estuary and continually shape the estuaries and the habitats and wildlife they support. The key parameters are: the flood hydrograph[22]; the nature of the catchment and its influence on freshwater flow and nutrient and sediment input; the nature of the estuary sediment; and the relatively high sediment levels in the estuaries resulting in low water retention within the estuary system and exposure of significant proportions of sediment at low tide. The biological communities of the estuaries have developed in response to these prevailing conditions and the daily patterns of water flow, exposure, sediment movement and water chemistry.

## 3.2 Subtidal sandbanks

### 3.2.1 Range

Sandbanks which are slightly covered by sea water all the time (subtidal sandbanks) consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20 m below chart datum (but sometimes including channels or other areas greater than 20 m deep). The habitat comprises distinct banks (i.e. elongated, rounded or irregular 'mound' shapes) which may arise from horizontal or sloping plains of sandy sediment. Where the areas of horizontal or sloping sandy habitat are closely associated with the banks, they are included within the Annex I type.

Sandbanks which are slightly covered by sea water all the time occur widely on the Atlantic coasts of north-west Europe, and occur widely around the UK coast. They are widespread in inshore waters (within 12 nautical miles of the coast) and also occur offshore in the southern North Sea and in the Irish Sea (between 12 and 200 nautical miles).

The UK SAC series includes large sublittoral sandbanks showing good habitat structure and function. The selected sites represent the range of variation within the four main sub-types (gravelly and clean sands, muddy sands, eelgrass beds, and maerl beds), which are often associated with different physiographic features (e.g. estuaries, open coast, bays, sea lochs). The differing character of this habitat around the UK coast has also been taken into account.

The Severn Estuary subtidal sandbanks can be considered to contribute to the gravelly and clean sand sandbank resource. The Severn Estuary contributes approximately 3% of the UK Natura 2000 resource for subtidal sandbanks, by area.[23]

[22] A flood hydrograph is a dual plot of river discharge (line) and rainfall (bars) over time

[23] Based on Natura 2000 Standard data forms for all UK Natura 2000 sites which have estuaries as a feature- source: JNCC website http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H1130

### 3.2.2 Extent and Distribution

The subtidal sandbanks are largely restricted to the middle and outer parts of the estuary. The sand banks of the Middle and Welsh Grounds are relatively permanent sandbank features in the Severn Estuary, along with other long established sandbank features at Cardiff Grounds and in Bridgwater Bay. The tops of these banks are intertidal, and the permanently submerged parts of the banks are considered to contribute to the subtidal sandbanks habitat

There are other areas of subtidal sandbank habitat within the Estuary, again sometimes the top of the bank may be exposed at low tide, with the submerged sections contributing to the subtidal sandbanks habitat. These banks are more ephemeral in nature, but are still considered part of the feature, and reflect the dynamic nature of the Severn Estuary. The areas where ephemeral subtidal sandbanks are known to occur include areas offshore from Avonmouth and at English Grounds (near Clevedon).

The approximate area of the more permanent subtidal sandbanks is 1,300 hectares and there are approximately 10,440 hectares of associated ephemeral sandbanks. Areas of associated sediments have been defined by using the sediment environments of the Bristol Channel Marine Aggregates Resources and Constraints project, commissioned by the National Assembly for Wales (Posford Duvivier and ABP, 2000). Further detail is given in section 4.1.2.1.

### 3.2.3 Structure and Function

The subtidal area of the Severn Estuary is subject to strong tidal currents resulting in the high mobility of sediments which range from gravely to muddy sands. The high mobility of the sediments and high turbidity means that these habitats only support animals that can tolerate the shifting seabed and scouring action of suspended sand.

As described above the subtidal sandbanks habitat includes some long established and relatively permanent sandbank features and associated sediments which form more ephemeral sandbanks. The sediments of both the more permanent sandbank features and the associated sediments (ephemeral banks) together comprise the subtidal sandbanks feature of the SAC (see map in Appendix 3).

These subtidal areas play an important role in holding and supplying sediment for other habitats notably the intertidal mud and sandflats, saltmarshes and reef features and it is likely that subtidal invertebrate communities play a role as a food resource for some species of the fish assemblage feature of the SAC and Ramsar Site.

### 3.2.4 Typical species

The subtidal sandbanks feature has two distinct sub-features composed of communities which are determined principally by the degree of sediment mobility, grade of sediments, mix of sediments (in terms of proportions of sand and mud) and salinity.

The first sub-feature is composed of sand and muddy sand communities dominated by worms, and burrowing shrimps which can tolerate the high sediment mobility. The second sub feature is composed of mud and sandy mud dominated communities which are slightly more stable and support a greater abundance of burrowing worms.

The typical species of these communities include a range of worms, shrimps, snails and bivalves. The species diversity of these habitats is often low but overall biomass can be high.

### 3.2.5 Natural Processes

Subtidal sandbanks are dynamic features with their size, shape, aspect and orientation, as well as the macro- and micro-topography and sediment characteristics largely determined by the sediment supply and the influence of the hydrodynamic processes affecting each bank. They change shape over time and while some are ephemeral others may be relatively stable and long established. Mobile sediments that form temporary

sandbanks are considered to be associated sediments that should be retained in the system but their location may change.

## 3.3 Intertidal mudflats and sandflats

### 3.3.1 Range

Intertidal mudflats and sandflats are submerged at high tide and exposed at low tide. They form a major component of Estuaries and Large shallow inlets and bays in the UK but also occur extensively along the open coast and in lagoonal inlets. The physical structure of the intertidal flats ranges from mobile, coarse-sand beaches on wave-exposed coasts to stable, fine-sediment mudflats in estuaries and other marine inlets. This habitat type can be divided into three broad categories (clean sands, muddy sands and muds), although in practice there is a continuous gradation between them. Within this range the plant and animal communities present vary according to the type of sediment, its stability and the salinity of the water.

Mudflats and sandflats not covered by sea water at low tide are a widespread habitat type on coasts of Atlantic Europe, particularly around the North Sea, and occur widely throughout the UK.

Sites have been selected to encompass the range of geographical, physical and ecological variation shown by this habitat type in the UK. Examples of clean sands, muddy sands, and mudflats have all been included. Sites with large areas of intertidal flats, as well as a range of environmental conditions and an associated diversity of communities, were favoured.

The intertidal part of the Severn Estuary supports extensive mudflats and sandflats. These cover an area of approximately 20,300 ha - the fourth largest area in a UK estuary and representing approximately 7 % of the total UK resource of this habitat type (approximately 10% of the UK Natura 2000 resource for Intertidal mudflats and sandflats, by area.[24])

The intertidal mudflats and sandflats of the Severn Estuary are representative of estuarine mudflats and sandflats influenced by strong tidal streams and extreme silt loading.

### 3.3.2 Extent and Distribution

The Intertidal mudlfats and sandflats feature in the Severn Estuary covers an area of approximately 20,300ha.

The Intertidal mudflats and sandflats feature is distributed throughout the Severn Estuary with extensive mudflats fronting the Welsh shore and Bridgwater Bay, and large banks of clean sands in the more central parts of the estuary at Middle and Welsh Grounds.

### 3.3.3 Structure and Function

This habitat type can be divided into three broad categories (which form the three main sub-features identified for this feature in the Severn Estuary), clean sands and gravels, muddy sands, and muds, although in practice there is a continuous gradation between them (Countryside Council for Wales, 2006; English Nature, 2006). The composition of the sediments and level of consolidation are the most important factors in determining the fauna of these communities and individual species distribution is largely dependant on the salinity which limits the penetration of marine species upstream where freshwater influences are strongest.

[24] Based on Natura 2000 Standard data forms for all UK Natura 2000 sites which have estuaries as a feature- source: JNCC website http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H1130

The gravel and clean sand communities occur predominantly in the mid and upper parts of the estuary forming large banks in the centre the estuary (Frampton Sands, Lydney Sands, Oldbury Sands, Bedwyn Sands and the Welsh Grounds) through which the main tidal channel flows keeping sediments mobile.

The sandy mud communities occur in restricted locations forming the transition between the clean sand and mud communities particularly in the mid estuary and at the lowest extremes of the tide and at the flanks of the main channel.

The mud communities form in the sheltered edges of the estuary particularly where the coastline forms natural embayments and are predominantly found in the mid to outer estuary at Bridgewater Bay and on the Cardiff and Newport frontages although a narrow fringe of these communities is present throughout the estuary. These communities take the form of firm mud banks adjacent to the saltmarshes often with a liquid mud surface kept fluid by the high tidal currents.

### 3.3.4 Typical Species

Muddy areas in the Estuary such as those between Cardiff to Newport are generally soft and mobile, colonised by high densities of relatively few species characterised by *Hediste diversicolor* and *Macoma balthica.* Other typical species include *Nephtys hombergii*, *Hydrobia ulvae*, *Tubificoides benedii*, *Streblospio shrubsolii*, *Pygospio elegans*, and Enchytraeidae. *Corophium volutator* is also widespread in these muddy areas especially near the mudflat saltmarsh boundary. In some mid shore areas with sandier sediments *Arenicola marina*, and *Macoma balthica* are present.

Lower shore coarse sand banks such as Bedwyn and Oldbury, are dominated by mobile species such as *Bathyporeia pelagica*, *Eurydice pulchra*, and *Nephtys cirrosa.* The south side of the lower estuary has pockets of littoral muddy sand on the upper shore characterised by *Macoma balthica*, *Hydrobia ulvae*, *Bathyporeia pelagica*, and *Nephtys hombergii*. Lower down the shore the sediments become muddier and support species such as *Scoloplos armiger*, *Aphelochaeta marioni* and *Hediste diversicolor.*

Upstream of Sudbrook the infauna becomes less diverse as the salinity decreases. Mud flats here support ragworm *Hediste diversicolor*, patchy Baltic tellin *Macoma balthica* and laver spire shell *Hydrobia ulvae*, with occasional peppery furrow shell *Scrobicularia plana* near the back of the shore. Within the pills along the site and in the upper reaches towards the road crossing the soft mud often supports few species including *Hediste diversicolor* and *Oligochaeta* spp.

The high biomass of invertebrates in the mudflats of the Severn provide an important food source for a diverse range and large number of fish and benthic predators. These intertidal areas are therefore important in supporting the fish assemblage subfeature of the SAC and Ramsar Site.

Mudflats also provide a valuable feeding, roosting and resting area for a wide range of species of wading birds and waterfowl and are therefore important supporting habitats for the wintering and passage bird features of the SPA and Ramsar Site.

### 3.3.5 Natural Processes

Intertidal mudflats and sandflats are dynamic features. Their distribution, extent, shape, topography, aspect and orientation is the product of complex interaction between hydrodynamic and sediment transport processes, sediment supply and coastal morphology. Hydrographic functions that structure intertidal mudflats and sandflats encompass highly dynamic hydrodynamic and other properties that vary with short and long-term natural cycles, climate influences and stochastic events.

The structure of intertidal muflats and sandflats varies depending on the physical conditions and forces acting on them (in particular the degree of exposure to wave action and tidal currents) as well as the nature of the sediments occurring in any one location. The sediments vary from mobile coarse sand in more wave exposed areas to stable, fine sediment expanses of mudflat in estuaries and other marine inlets.

Intertidal mudflats and sandflats support a variety of different wildlife communities. These are predominantly infaunal communities of a variety of different animal species such as worms, molluscs and crustaceans living within the sediment habitat. The type of sediment, its stability and the salinity of the water have a large influence on the wildlife species present.

## 3.4 Atlantic salt meadow

### 3.4.1 Range

Atlantic salt meadows develop when halophytic vegetation colonises soft intertidal sediments of mud and sand in areas protected from strong wave action. This vegetation forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented and the saltmarshes can cover large areas, especially where there has been little or no enclosure on the landward side. The vegetation varies with climate and the frequency and duration of tidal inundation. Grazing by domestic livestock is particularly significant in determining the structure and species composition of the habitat type and in determining its relative value for plants, for invertebrates and for wintering or breeding waterfowl.

This Annex I type is predominantly found on Atlantic coasts in western Europe. Atlantic salt meadows occur on North Sea, English Channel and Atlantic shores. There are more than 29,000 ha of the habitat type in the UK, mostly in the large, sheltered estuaries of south-east, south-west and north-west England and in south Wales. Smaller areas of saltmarsh are found in Scotland.

Sites have been selected to cover the geographical range and ecological variation of Atlantic salt meadows in the UK. The sites selected are for the most part the largest examples of this habitat type, with good structure and function, and which support a well-developed zonation of plant communities within the saltmarsh. There are transitions to other high-quality habitat assemblages at many of the sites that have been selected. Sites with complete sequences of vegetation and transitions to other habitats, such as sand dunes, represent the range of variation of the habitat type, and this has been an important consideration in site selection.

The Severn Estuary holds the largest aggregation of saltmarsh in the south and south-west of the UK. It covers approximately 1,400 ha, representing about 4% of the total area of saltmarsh in the UK (Dargie, 2000).

### 3.4.2 Extent and Distribution

The Severn Estuary is fringed by saltmarsh. The huge tidal range in the Severn Estuary has led to extensive saltmarsh community development with an expanded zonation.

### 3.4.3 Structure and Function

The saltmarshes of the Severn Estuary have four principal zones corresponding to the four main sub-features that have been identified for this feature. Two of these zones (the lower to mid marsh communities and the mid to upper marsh communities) contain the principle saltmarsh types which are defined as Atlantic salt meadow as per the Annex 1 habitat description. However these occur in an intimate mosaic and in transition with the communities of the other two zones (in the pioneer saltmarsh and transitional high marsh communities) which are therefore considered in this advice as part of the feature. Section 4.1.4.1 and Table 11 provide further details of these zones and their typical species.

The pioneer saltmarsh communities play an important role in saltmarsh development as colonising plants (*eg Spartina sp.and Salicornia sp*.) stabilise and trap sediments. The upper marsh transitions to terrestrial and freshwater habitats support a range of nationally scarce and uncommon plant species and support tidal debris strandlines of value for invertebrates which are important components of the estuary feature.

Some of the saltmarshes show a sequence of saltmarsh cliffs or steps related to past cycles of accretion and erosion and in places the saltmarshes are also cut transversely by "pills" where freshwater streams enter the estuary. These features add diversity to the saltmarsh by initiating new patterns of species zonation. Recent monitoring has identified that there is a complicated present day pattern of erosion and accretion of the saltmarshes throughout the estuary and some parts appear to be exhibiting the effects of coastal squeeze – the constriction of saltmarsh habitats between rising sea levels and hard defences at the back of the saltmarsh .

Saltmarshes and mudflats have an important role to play in estuarine processes, both through the recycling of nutrients within the estuary and through their role as soft sea defences, dissipating wave energy. They are highly productive biologically, providing organic material that support other features within the marine ecosystem and they also have an important physical role, acting as a sediment store to the estuary as a whole.

Saltmarshes also provide a valuable feeding and roosting and resting areas (particularly at high tide) for a wide range of species of waterfowl and are therefore very important supporting habitats for the wintering and passage bird features of the SPA and Ramsar Site. The habitats within the "pills" provide important shelter and feeding habitats for both fish and bird species.

The Severn Estuary saltmarshes are generally grazed by sheep and/or cattle. Grazing is a significant factor in determining the plant communities found within them and their value for dependant species such as birds and rare plants.

### 3.4.4 Typical Species

The saltmarsh communities present relate to the four principal zones referred to above.

The low to mid marsh communities include transitional low saltmarsh with *Puccinellia maritima*, annual *Salicornia* sp. and *Suaeda maritima; Aster tripolium* (rayed) saltmarsh; *Puccinellia maritima* saltmarsh; *Atriplex portulacoides* saltmarsh; and *Juncus maritimus - Triglochin maritima* saltmarsh.

The mid to upper marsh communities include *Festuca rubra* saltmarsh; *Artemisia maritime* saltmarsh; and *Juncus maritimus* salt-marsh.

The transitional high marsh communities include *Spergularia marina - Puccinellia distans* saltmarsh; *Elytrigia atherica* saltmarsh; *Elytrigia repens* saltmarsh; *Festuca rubra - Agrostis stolonifera - Potentilla anserina* inundation grassland; *Festuca arundinacea* coarse grassland; *Agrostis stolonifera - Alopecurus geniculatus* inundation grassland; *Phragmites australis* reedbed; *Bolboshoenus maritimus* swamp; and *Agrostis stolonifera* sub-community.

The pioneer saltmarsh communities include *Spartina anglica* saltmarsh; Annual *Salicornia* saltmarsh; and *Suaeda maritima* saltmarsh.

Several notable species are also present *Alopecurus bulbosus, Althaea officinalis, Bupleurum tenuissimum, Hordeum marinum, Puccinellia rupestris, Trifolium squamosum, Lepidium latifolium, Allium oleraceum, and Petroselinum segetum (Dargie 1998).*

### 3.4.5 Natural Processes

The location, character, and dynamic behaviour of saltmeadows are governed by four physical factors: sediment supply, tidal regime, wind-wave climate and the movement of relative sea level. There are four elements necessary for the development and growth of a salt marsh: (1) a relatively stable area of sediment that is covered by the tide for a shorter period than the time it is exposed; (2) a supply of suitable sediment available within the period of tidal cover; (3) water velocities that are sufficiently low for some of the sediment to settle out; and (4) a supply of seeds or other propagules for the establishment of vegetation cover.

The topography and microtopography of areas of Atlantic salt meadow are the product of complex interaction between hydrodynamic and sediment transport processes, sediment supply and coastal

morphology. These can be highly dynamic and vary with short and long-term natural cycles, climate influences and stochastic events, including: tidal range and excursion, salinity, water temperature and suspended particulate concentrations.

The marsh-edge morphology provides information on the short to medium term trends of marsh morphodynamics. Accreting and stable seaward marsh edges have an accretional ramp upon which pioneer and low-marsh vegetation can become established. Erosional margins are characterised either by the presence of mud-mound topography or by marsh-edge cliffs fronted by toppled cliff blocks with live or dying vegetation, rotational slide or overhanging (cantilever) blocks. Terraced marsh margins indicate episodic erosion and accretion on timescales over decades to centuries.

The Severn Estuary saltmarshes do not generally contain a pattern of creeks and pans more typical of extensive saltmarshes in estuaries with less extreme tidal ranges. Instead the saltmarshes are dissected by "pills" (steep sided natural drainage channels cutting through the saltmarsh) where freshwater streams flow into the estuary. These are often deep and steep sided funnel shaped features, often with pioneer vegetation established along their banks although in many cases the natural structure of the pill is truncated by tidal flaps or flow valves. In a few locations natural salt pans occur within the saltmarshes.

Major erosion of saltmarsh is indicated by internal dissection and enlargement of the drainage network, ultimately leading to the creation of mud basins.

Nutrient levels are a strong influence on the growth of estuarine saltmarsh plants. Nutrient cycling within saltmarshes can also have a significant effect on coastal and estuarine water quality. In this respect, healthy, functional saltmarsh habitat may have an important role to play in the control of nutrients, which are important in determining water quality.

Given favourable conditions, depending on sediment supply and hydrodynamic regime, mudflats evolve into saltmarshes by way of substrate stabilisation by algae, diatoms and early pioneer plants, giving rise to enhanced sediment accretion rates.

## 3.5 Reef

### 3.5.1 Range

Reefs are rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed to the air at low tide. Intertidal areas are only included within this Annex I type where they are connected to subtidal reefs. Reefs are very variable in form and in the communities that they support. Two main types of reef can be recognised: those where animal and plant communities develop on rock or stable boulders and cobbles, and those where structure is created by the animals themselves (biogenic reefs).

Rocky reefs are extremely variable, both in structure and in the communities they support. A wide range of topographical reef forms meet the EU definition of this habitat type. These range from vertical rock walls to horizontal ledges, sloping or flat bed rock, broken rock, boulder fields, and aggregations of cobbles. In contrast to the variety of rocky reefs, there is somewhat less variation in biogenic reefs, but the associated communities can vary according to local conditions of water movement, salinity, depth and turbidity. The main species which form biogenic reefs in the UK are blue mussels *Mytilus edulis*, horse mussels *Modiolus modiolus*, ross worms *Sabellaria* spp., the serpulid worm *Serpula vermicularis*, and cold-water corals such as *Lophelia pertusa*.

Reefs occur widely around the UK coast, and are found in both inshore and offshore waters. There is a far greater range and extent of rocky reefs than biogenic concretions. Only a few invertebrate species are able to develop biogenic reefs, and these have a restricted distribution and extent in the UK.

The Severn Estuary has areas of biogenic reefs, formed by the tube-dwelling polychaete worm *Sabellaria alveolata*. *Sabellaria alveolata* reefs in the UK are predominantly an intertidal habitat but the Severn Estuary

is one of the few places where *Sabellaria alveolata* reefs occur extensively in the subtidal, as well as the intertidal.

### 3.5.2 Extent and Distribution

There are patches of intertidal *Sabellaria alveolata* reef throughout the Estuary, although it tends to be more common on the English side. The subtidal *Sabellaria alveolata* tends to be in the outer parts of the Estuary, southwest of a line between Clevedon and Newport. The exact distribution of subtidal *Sabellaria alveolata* reef in the Severn Estuary is unknown, partly due to the difficulties in sampling this habitat.

### 3.5.3 Structure and Function

*Sabellaria alveolata* is a species of small worm which constructs tubes using sand particles, to build honeycomb-like structures. *Sabellaria alveolata* reefs are often also known as honeycomb worm reefs.

These biogenic reefs tend to increase habitat diversity for other species (Holt et al 1998), sometimes leading to higher species diversity within *Sabellaria* reefs compared to the surrounding sediment or rock habitats (Dubois et al 2002). *Sabellaria alveolata* reefs cycle through different phases, from newly settled worms through vigorous fast growing reef to older, more biodiverse hummocks (Cunningham et al, 1984). At other sites each of these phases tends to have a different community of plants and animals associated with it, so all phases are considered important for biodiversity (Collins, 2001; Dubois et al, 2002).

In order to thrive, *Sabellaria alveolata* requires an abundance of suitable coarse sand to support tube building (and therefore reef growth), as well as the availability of suitable substrates (pebbles, cobbles, boulders, bedrock) to attach to. Larval supply is also important and *Sabellaria* larvae are thought to stay in the water column for one to six months (Jackson 2008). The worms are filter feeders and therefore food within the water column (suspended detritus material) is also needed. *Sabellaria* larvae are thought to settle preferentially in areas where *Sabellaria* reef has been present in the past (Holt et al, 1998).

### 3.5.4 Typical Species

The *Sabellaria alveolata* reef biotopes which have been recorded in the Severn Estuary are *Sabellaria alveolata on variable salinity sublittoral mixed sediment* and *Sabellaria alveolata reefs on sand-abraded eulittoral rock.*

In the Severn Estuary (both subtidal and intertidal) the presence of *Sabellaria alveolata* reefs generally increases species diversity, relative to the surrounding rock or sediment, although the diversity of *Sabellaria alveolata* reefs in the Severn is still thought to be comparatively low compared to other areas of the UK. Species commonly found associated with subtidal *Sabellaria alveolata* reef from infaunal samples include *Eulalia tripunctata, Mediomastus fragilis, Typosyllis armillaris, Melinna cristata, Harpinia pectinata, Ampharete grubei, Golfingia vulgaris, Pygospio elegans, Arenicola marina, Autolytus sp, Sphenia binghami* and *Harmothoe impar* (Mettam et al. 1994 and Marine Recorder database).
Species found in intertidal *Sabellaria alveolata* reefs in the Severn Estuary at Goldcliff and Lavernock point include *Crangon crangon, Actinia equina, Cancer pagarus, Porcellana platycheles, Littorina spp., Pholas dactylus, Elminius modestus, Fucus serratus, Corralina officinalis and Enteromorpha spp.*(O'Riordan, 2006).

### 3.5.5 Natural Processes

Little is known about the nature of the *Sabellaria alveolata* reef in the Severn Estuary, especially in the subtidal. However, at other sites *Sabellaria alveolata* is known to have a very variable recruitment and the cover in any one area may vary greatly over a number of years (Wilson, 1974). A typical life span of 4-5 years for worms in colonies forming reefs on bedrock and large boulders has been reported from other areas (Wilson, 1971), with a likely maximum of around 9 years (Gruet, 1982; Wilson, 1971). However, it is suspected that there are many colonies on intertidal cobble and small boulder scars on moderately exposed shores where shorter lifespans are likely due to the unstable nature of the substratum (Holt et al, 1998). As

mentioned above, *Sabellaria alveolata* reefs cycle through several different phases, all of which are considered important for biodiversity.

## 3.6 Other estuarine habitats : Hard substrate habitats (rocky shores) and eel grass beds

### 3.6.1 Extent and Distribution

There is approximately 1,500 ha of hard substrate habitat within the Severn Estuary, consisting of boulders, rock, mussel/cobble scars, rocky pools and shingle (Countryside Council for Wales, 2006; English Nature, 2006). The largest areas of hard substrate are located towards the outer estuary at Brean Down, Anchor Head and Sand Point together with rocky platforms and cliffs at Clevedon and Portishead. There are also extensive rock platforms at English stones, Aust and Beachley.

Beds of eelgrass (*Zostera* spp.), the largest in Wales, occur on some of the more sheltered mixed hard substrate areas around the Welsh side of the Second Severn Crossing.

### 3.6.2 Structure and Function

Hard substrate habitats in the Severn Estuary display different characteristics to other areas in Wales. Where there is bedrock, fucoid algae cover is dense but with little associated flora and fauna. Areas of soft clay rock around Penarth also support the boring bivalves *Barnea candida* and *Pholas datylus*. Pebble and cobble shores tend to be dominated by barnacles mostly *Elminius modestus*, and sparse rough periwinkles and winkles. In the sublittoral fringe on bedrock, cobbles and pebbles, hydroids, bryozoans, sponges and barnacles dominate. These species form communities that are usually associated with subtidal habitats (adapted from Brazier et al 2007).

These habitats provide a wide range of services for estuarine species. They are important components of the SAC Estuary feature, important supporting habitats for the wintering and passage bird features of the SPA and Ramsar Site and also important supporting habitats for the fish assemblage of the SAC and Ramsar designations.

Seagrass beds are one of the most productive habitats of shallow water coastal ecosystems supporting large numbers of algae, invertebrates and fish and are an important food source for several species of ducks and geese including wigeon and European white-fronted geese. The *Zostera* beds in the Severn are unusual in that they occur in an area of mixed cobbles, sand and mud with large boulders, in other parts of Wales they are associated with mudflats. Both species of *Zostera* occur within the bed. On more dry elevated areas of sediment *Zostera noltii* can be found, whereas wet depressions and channels are dominated by *Zostera marina*. *Zostera* coverage can be patchy but locally abundant. Hard substrata within the *Zostera* bed is dominated by fucoid algae, ephemeral green algae and barnacles.

### 3.6.3 Typical Species

Typical fauna and flora of rocky and mixed shore areas of the Severn include spiral wrack, bladder wrack, eggwrack and serrated wrack, periwinkles, limpets, barnacles and whelks. On lower shore rock, cobbles and pebbles barnacles dominate including the barnacle *Balanus crenatus* and hydroids *Tubularia indivisa* and *Sertularia cupressina* the bryozoan *Alcyonidium diaphanum* and mermaids glove sponge *Haliclona oculata* .

Both species of eelgrass, *Zostera marina*, and *Z. noltii* have been recorded in the estuary. These are of restricted distribution in British estuaries. It is unusual to have both species in one location.

### 3.6.4 Natural Processes

The extent and distribution of the rocky shore habitat is largely determined by the underlying geology and sedimentology, along with orientation and aspect and the influence of the prevailing physical conditions such as the degree of exposure to wave action and tidal currents. These factors, combined with the influence of others, such as water quality (including turbidity) and sediment chemistry, influence the assemblages of marine species associated with the different rocky habitats throughout the estuary.

Seagrass beds typically occur in sheltered environments such as shallow inlets and are usually found on soft sediments. The Zostera beds in the Severn are unusual in that they occur in an area of mixed cobbles gravel sand and mud.

## 3.7 Fish

### 3.7.1 Introduction

The fish fauna of the Severn Estuary is very diverse (Potts & Swaby 1994, Bird 2008). More than 110 species of fish have been identified including a wide range of migratory species and estuarine specialists and some more typically marine and freshwater species reflecting the influence of the wider Bristol Channel and major rivers entering the estuary (Severn, Wye, Usk, Avon Parrett).

### 3.7.2 Fish features of the Severn Estuary European Marine Site

The Severn Estuary is of particular importance for migratory fish. The estuary is one of the most important British estuaries for three rare species - river lamprey *Lampetra fluviatilis,* sea lamprey *Petromyzon marinus* and twaite shad *Alosa fallax* which are designated features of the SAC. These species together with salmon *Salmo salar*, sea trout *Salmo trutta*, eel *Anguilla anguilla* and allis shad *Alosa alosa* are also a designated feature of the Ramsar Site.

The wider assemblage of fish species, which includes the migratory species, estuarine specialists and the more typically marine and freshwater species, is a designated feature of the Ramsar Site and a component of the estuary feature of the SAC.

### 3.7.3 Supporting habitats

The estuary habitats, tidal stretches of the feeding rivers and saltmarsh morphological features such as drainage channels, known locally as “pills” and “rhines” (“reens” in Wales) provide important feeding, breeding and sheltered nursery areas for a wide range of fish.

### 3.7.4 Migratory fish

The river and sea lamprey are a primitive type of fish having a distinctive suckered mouth but no jaws. Although numbers of lamprey have declined over the last 100 years, the UK is still one of their strongholds. Sea and river lampreys spend their adult life in the sea or estuaries but spawn and spend the juvenile phase in rivers. They use the Severn Estuary as a migratory passage to and from their spawning and nursery grounds in the rivers.

Allis and twaite shad are the only two members of the herring family found in fresh water in the UK. Both look like large herring and were formerly eaten in this country before numbers declined and the fisheries collapsed. In the middle of the 19$^{th}$ Century, the value of shad rivalled that of salmon, and in the River Severn, shad made up about one-third of all catches. Three of the four confirmed UK spawning populations of twaite shad are in the rivers Severn, Usk and Wye respectively. The major part of the spawning population of Twaite shad consists of fish that have spawned and passed up and down through the estuary more than once. The shad enter estuaries in spring and move up into the rivers to spawn. The estuary serves as a nursery area for juvenile shad where they feed on plankton.

The Severn Estuary supports an important run of migratory salmon and sea trout which pass through the estuary on their way to and from their spawning grounds in the upper reaches of the rivers and the open sea. The Severn Estuary has the largest eel run in Great Britain.

### 3.7.5 Assemblage of fish species

The assemblage of fish species includes the migratory species (referred to in section 3.8.4 above), as well as the following:

- Estuarine species
    - Species typically occurring and breeding in estuaries (Bird, 2008)
    - Marine species occurring in large numbers in estuaries (Bird, 2008)
- Marine species
    - Predominantly marine species occurring infrequently in the Severn (Bird, 2008)
- Freshwater species
    - Species typically occurring and breeding in freshwater and recorded within the Severn cSAC (Bird, 2008)

**Estuarine species**

These species of fish rely on the estuary for some aspect of their life-cycle. As a result of this dependence, these species are often the most vulnerable to anthropogenic and environmental factors that could affect the habitat and ecology of the estuary. Marine species occurring in large numbers in estuaries are all marine species who spend the first few years of life in the sheltered waters of the estuary where suitable food is abundant and there are fewer predators. The Severn Estuary ranks as one of the top ten estuaries in the UK for the number of marine estuarine-opportunistic species it supports (Potts & Swaby 1993). Marine estuarine-opportunists can be present in the estuary in very large numbers at particular times of year. These include sprat, herring, whiting, bib, poor cod, bass and common goby (Bird, 2008).

There are a few species that spend their entire life-cycle within the estuary. These include common goby, black goby, sand smolt and 3- spined stickleback (Bird, 2008).

**Marine species**

These fish normally spend their entire life-cycle in the sea and only occasionally enter estuaries. Therefore, they have only a minor role to play in the estuarine ecosystem. Thus, only four species, the conger eel, Norway pout, red mullet and plaice; are ever caught in numbers exceeding about 10 per year in power station samples. They probably have little impact, either as prey or as predators on other estuarine species. While they add to the biodiversity of the fish assemblage, their main populations occur in the sea. (Bird, 2008)

**Freshwater species**

These species typically occur and breed in freshwater, but have occasionally been recorded within the Severn Estuary. The specimens recovered at Oldbury and/or Berkeley power stations are presumably fish that have inadvertently been swept downstream and entered brackish water. They include perch, three-spined stickleback, tench, roach and chub. The numbers of freshwater species recovered at Oldbury is always low, and usually related to increases in fresh water discharge in the spring and autumn months after heavy rain. The only exception to this generalisation concerns the three-spined stickleback which occurs in considerable numbers at Oldbury and can be regarded as both a freshwater and an estuarine species (Bird, 2008)

## 3.8 Birds

### 3.8.1 Introduction

Many estuaries in the UK are of great importance to migratory and wintering wildfowl and waders. The Severn Estuary forms part of the complex chain of estuary sites along the western coast of the UK that provide habitats for migratory waterfowl. The relatively mild winter weather conditions found here compared to continental Europe at similar latitudes can be of additional importance to the survival of wintering waterfowl during periods of severe weather. It is especially important when there is severe weather affecting other sites further north and on the east coast of Britain.

The Severn Estuary ranks amongst the top ten British estuaries for the size of visiting waterfowl populations that it supports over winter (Musgrove *et. al*., 2001). Outside of this period, it is of particular importance as a staging area in autumn and spring for migratory waterfowl species as it lies on the East Atlantic Flyway route. Bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and many other factors. Different bird species exploit different parts of a marine area and different prey species.

### 3.8.2 Bird features of the Severn Estuary European Marine Site

The migratory wintering and passage populations of birds in the Severn Estuary are designated features of the SPA (see section 2.2) and Ramsar Site (see section 2.3) which supports in excess of 70,000 birds in winter. These include internationally and nationally important populations of key bird species in winter for which the UK has particular importance in both Europe and the world. The bird assemblage is also part of the Estuaries feature of the SAC.

### 3.8.3 Low-tide distribution of waterbirds on the Severn Estuary SPA and Ramsar Site

Natural England and the CCW commissioned the British Trust for Ornithology (BTO) to organise , as part of the series of WeBS Low Tide Counts, a complete low tide survey of the Severn Estuary during the winter of 2002/03 (Burton et al., 2003). The mean numbers and distribution of total waterbird species recorded on each count section on the Severn Estuary in the winters 1987/88 to 1991/92 and in 2002/03 from this BTO low-tide count data for various individual species and the bird assemblage are illustrated in Appendix 9. The Figures generally indicate that the waterfowl are distributed extensively across virtually the entire intertidal area with some obviously high concentrations in specific areas.

These maps are indicative only and several constraints on their use should be noted when attempting to interpret them. Firstly, it should be noted that in each winter only a maximum of four counts were made of each count section, one a month from November to February. Observation of the central areas of the estuary is also very difficult with all observations being made from land and it is possible that the numbers of birds using these areas were underestimated. Gulls were only recorded in the 2002/03 survey. However, even in that survey, coverage of these species was patchy. The Severn is a highly dynamic estuary and thus the location and extent of many of the intertidal areas may have changed since the Ordnance Survey maps used for this project were created. The movements of sediments may potentially also cause marked differences in the distributions of invertebrates and thus waterbirds between years. It should also be noted that the numbers of birds recorded on the Severn Estuary may vary annually due to weather conditions. In cold winters, the west coast of Britain may act as a refuge for many waterbirds that in milder winters would occur on the east coast or on the Continent. In cold winters, therefore, waterbirds may be more widely distributed across the estuary than they would in milder winters. Lastly, in assessing the importance of different intertidal mudflats, it is also essential to note that some species may use different areas during the night to those where they are recorded in the day.

### 3.8.4 Relationship between bird populations and supporting habitats

In recognition of the fact that bird populations on a site may change in response to wider national or international trends or events, this Regulation 33 advice addresses the habitat conditions on the site necessary to support the bird populations, as well as the bird populations themselves. “Supporting habitats” are

identified which describe the key habitats within the European Marine Site necessary to support the interest features i.e. the qualifying bird species (see Table 3 for the SPA and Tables 5 and 7 for the Ramsar Site. The Favourable Condition Tables (section 4.2; Table 15 for the SPA and Section 4.3 Table 20 for the Ramsar Site) contain further details on habitat conditions.

The key supporting habitats are the intertidal mudflats and sandflats, saltmarshes and hard substrate habitats (rocky shores). Reference should also be made to sections of this document that relate to the Severn Estuary SAC interest features which provides advice in respect of these habitats (section 4.1 and Tables 8, 10 and 11).

Bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and many other factors. Different bird species exploit different parts of a marine area and different prey species. Changes in the habitat may therefore affect them differently. The most important factors related to this are:

- current extent and distribution of suitable feeding and roosting habitat (eg saltmarsh, mudflats, shingle and rocky shores);
- sufficient prey availability (eg crustaceans, small fish, molluscs, worms and seeds);
- levels of disturbance maintained at or below levels necessary to provide favourable conditions for birds' feeding and roosting areas;
- water quality necessary to maintain intertidal plant and animal communities; and
- fresh water quantity, tidal flows, salinity gradients and grazing necessary to maintain saltmarsh conditions suitable for bird feeding and roosting.

There are also a number of habitats, such as the wet coastal grazing marsh, improved grassland and open standing waters that support the qualifying bird species and occur within the SPA and Ramsar Site boundary. However, these habitats lie above highest astronomical tide and therefore are not within the European Marine Site. Objectives to maintain these aspects of bird interest in favourable condition are found within Natural England and CCW's conservation objectives for the relevant SSSI within the SPA and Ramsar site boundary and will be dealt with through relevant procedures outlined in the Conservation (Natural Habitats &c.) Regulations 1994.

Some species will also use areas of land and coastal waters outside the boundaries of both the European Marine Site, SPA and Ramsar Site. Relevant authorities need to have regard to such adjacent interests, as they might be affected by activities taking place within, or adjacent to the European Marine Site.

### 3.8.5 Bird count data and assessing condition of bird features and their habitats

Natural England and CCW's conservation objectives at the site level focus on maintaining both the populations of the qualifying species and the habitats used by them. Site management should therefore aim to avoid both damage to the supporting habitats and disturbance to the birds. In reporting on the conservation status, account will need to be taken of both habitat conditions and the status of the bird populations.

Accordingly, Natural England and CCW will use annual counts, in the context of five year peak means for qualifying species, together with available information on population and distribution trends, to assess whether an SPA is continuing to make an appropriate contribution to the Favourable Conservation Status of the species. Count information will be assessed in combination with information on habitat condition, at the appropriate time within the reporting cycle, in order to report to the European Union.

In addition to focusing on avoiding deterioration to the habitats of the qualifying species, the Habitats Directive also requires that actions be taken to avoid significant disturbance to the species for which the site was designated. Such disturbance may result in alterations in population trends and/or distribution patterns. Avoiding disturbance to species requirements is mentioned in the favourable condition table accompanying the conservation objectives for the SPA and Ramsar Site (Tables 16 and 21). In this context, five-year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.

Attention is also directed to the inclusion of disturbance in the advice on operations provided in Section 5. Where disturbance is highlighted in such advice, relevant authorities need to avoid damaging disturbance to qualifying species when exercising their functions under the Directive.

### 3.8.6 Description of the Severn Estuary bird features and their supporting habitats

#### 3.8.6.1 Internationally important populations of waterfowl

This comprises:

A. Internationally important populations of regularly occurring Annex 1 species : Bewick's Swan
B. Internationally important populations of regularly occurring migratory species of the SPA
C. Internationally important populations of waterfowl of the Ramsar Site

#### A. Annex 1 species of the SPA

**Description of the Feature**

The species listed in Annex 1 of the Birds Directive are the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution. Species listed on Annex 1 are in danger of extinction, rare or vulnerable. Annex 1 species that regularly occur at levels over 1% of the national population meet the SPA qualifying criteria. The Severn Estuary SPA supports internationally important populations of one Annex I species

- **Bewick's swan** *Cygnus columbianus bewickii*
  (Note : this species is also part of C. internationally important populations of waterfowl of the Ramsar Site)

**Key supporting habitats for Bewick's swan**

**Intertidal mudflats and sandflats** - The focal area for the Bewick's swans is the upper Severn Estuary in the vicinity of the New Grounds, Slimbridge area. The mudflats and sandflats exposed as the tide falls where the estuary widens in the upper reaches of the site at Waveridge Sands, Frampton Sands and The Noose are used as a safe refuge areas when the birds are disturbed.

**Saltmarsh communities -** The birds feed on the saltmarsh and the transition from saltmarsh to coastal grazing marsh in front of the sea defences in the upper estuary at The Dumbles, where areas of the high marsh are mainly affected only by brackish water during tidal inundation. They favour areas that have unrestricted views for the early detection of predators.

Bewick's swan graze on a range of 'soft' meadow grasses such as *Agrostis stolonifera* and *Alopecurus geniculatus* found in wet meadows which are outwith the European Marine Site boundary.

## B. Internationally important populations of regularly occurring migratory species of the SPA and C. Internationally important populations of waterfowl of the Ramsar Site

### Description of the features

Migratory species that regularly occur at levels of 1% or more of the total biogeographic population meet the SPA criteria and qualify for designation in their own right.

Wintering species that regularly occur at levels of 1% or more of the total biogeographic population meet the Ramsar criteria (3c) and qualify for designation in their own right.

The following qualifying species of both the SPA and Ramsar are:

- **European white-fronted goose** *Anser albifrons*
- **Dunlin** Calidris alpina alpina
- **Redshank** Tringa totanus totanus
- **Shelduck** Tadorna tadorna
- **Gadwall** Anas strepera

Note : previous Regulation 33 advice issued in respect of the Severn Estuary SPA in February 2005 excluded gadwall as they were considered not to make use of the European Marine Site to any significant degree but further recent evidence (2000/01 Low Tide Bird Counts) has demonstrated that this species does make use of the EMS and has consequently now been included.

### Key supporting habitats

**Intertidal mudflats and sandflats** - The extensive mudflats and sandflats of the Severn Estuary provide undisturbed refuge and a rich resource of intertidal invertebrates as food for many species of migratory birds. The Severn supports massive populations of birds, many of which are highly mobile, feeding and roosting in different areas, depending on food availability and the state of the tide.

The European white-fronted geese roost at night on estuarine sandbanks and usually fly less than 10km to the daytime feeding grounds. Therefore conservation of traditional roosting sites is necessary to enable the population to exploit potential feeding habitats. The sandbanks adjacent to the New Grounds at Slimbridge are a long established, traditional wintering area for the European white-fronted geese (Owen *et al.,* 1986) where they use Waveridge Sand, Frampton Sand and the Noose. Only occasionally will small numbers occur at other localities within the Severn Estuary. Shelduck exploit the rich resources of invertebrates found in the intertidal mudflats where they forage for molluscs and other invertebrates such as the mudsnail *Hydrobia* spp, mussels *Mytilus edulis* and small crustaceans such as the common shore crab *Carcinus maenas.* They feed in groups, and are distributed widely throughout the estuary where there are extensive areas of intertidal flats, but there are major concentrations on Bridgwater Bay, around the mouth of the Rhymney river and, prior to construction of the Cardiff Barrage, in Cardiff Bay (Ferns, 1980a; Fox & Salmon, 1988a; Clarke, 1989; WWT Wetlands Advisory Service, April 2003). Bridgwater Bay is a long established traditional moulting area for shelduck during late summer and autumn (Eltringham & Boyd, 1960, 1963; Morley, 1966; Fox & Salmon, 1988a). It is the largest single moulting area in Europe away from Waddensea.

Redshank and dunlin are distributed widely and feed throughout the estuary on marine polychaete worms, crustaceans and molluscs such as the Baltic tellin *Macoma balthica*. They frequently feed along undisturbed strandlines throughout the estuary. They favour areas that have abundant invertebrate prey species and unrestricted views for the early detection of predators. The location of

feeding birds on the intertidal flats is a reflection of the invertebrate species found there which, in turn, are dependent on the sediment type. Dunlin and redshank mainly feed on invertebrates in the muddier finer sediments. Dunlin are found mostly on the mid shore whereas redshank are more thinly distributed and are often found in smaller groups in the creeks and sub-estuaries. The Severn has the third largest wintering population of Dunlin in Britain. Feeding flocks are widely distributed around the estuary particularly downstream of the first Severn Bridge, with particular concentrations at Rhymney/Peterstone, Uskmouth, Welsh Grounds, Undy, Clevedon and Bridgwater Bay (Ferns, 1977; Mudge, 1979; Ferns, 1980a; Clark, 1989). There are notable concentrations of redshank at the mouths of the Rhymney, Wye, Avon and Parrett rivers (Ferns, 1977, 1980a; Clark, 1989; WWT Wetlands Advisory Service, April 2003).

Gadwall are predominantly a frewshwater species preferring the wetland habitats tht occur within the SPA behind the flood defences and therefore outside the European Marine Site- most notably the freshwater wetlands at Slimbridge and Bridgwater bay. However, they do make use of the estuary but this is largely restricted to areas where freshwater flows come into the estuary, particularly larger pills and rivers- most notably at Avonmouth, between the two Severn Bridges and at Woodspring and Weston Bays.

**Saltmarsh** - Upper and lower saltmarsh provide important feeding and roosting areas for the internationally important migratory birds throughout the estuary. The saltmarshes provide a rich feeding habitat for redshank and shelduck, which feed on invertebrate species in the sediments, such as the mudsnail *Hydrobia.* The European white-fronted geese graze on a range of saltmarsh grasses and herbs such as common saltmarsh grass *Puccinellia maritima* and sea barley *Hordeum marinum*. The birds feed on the saltmarsh and the transition to coastal grazing marsh in front of the sea defences in the upper estuary and particularly at the The Dumbles.

The saltmarshes also have an important function providing a safe haven from the tides that flood the mudflats twice a day. The low-growing dense vegetation provides a suitable roosting habitat for redshank and dunlin, which prefer to roost on areas of short vegetation ensuring good visibility. The saltmarshes throughout the estuary provide an important communal roosting site for redshank, dunlin and shelduck. Upper saltmarsh in particular makes ideal highwater roost sites and there are main high tide roosts in some areas with little human disturbance where waders congregate from their feeding areas.

**Hard substrate habitats (rocky shores)** - the shingle and rocks in the estuary provide feeding areas for dunlin and redshank and some limited foraging at high tide. It is also provides important roost sites at high tide particularly for the dunlin and redshank. Many of the rocks are off shore and are therefore generally free from human disturbance. These include Guscar Rocks in the upper reaches, Blackstone Rocks at Clevedon and Stert Island in Bridgwater Bay.

**Freshwater coastal grazing marsh, improved grassland and open standing waters** – these supporting habitats lie outside the European Marine Site boundary but within the SPA. They provide key areas for feeding and roosting for all the migratory species particularly at high tide, and mainly on the English side of the Estuary.

### 3.8.6.2 Internationally important assemblage of waterfowl

#### Description of the feature

In addition to supporting internationally important populations of individual birds, the Severn Estuary also qualifies under Article 4.2 as a wetland of international importance by regularly supporting over 20,000 waterfowl (Cranswick *et al.*, 1999, JNCC website). A peak count of over 100,000 waterfowl was recorded in the winter season of 1992-93 (Waters *et al*., 1993). The wintering waterfowl assemblage (consisting of over 68,000 birds) includes all regularly occurring waterfowl.

Species that qualify as a listed component of the assemblage include all the birds covered by section 3.8.6.1 and species present in nationally important numbers.

These species are:

- **Dunlin** (migratory passage populations)
- **Redshank** (migratory passage populations)
- **Wigeon**
- **Teal**
- **Pintail**
- **Pochard**
- **Tufted duck**
- **Ringed plover**
- **Grey plover**
- **Curlew**
- **Whimbrel**
- **Spotted redshank**

The JNCC website also lists lapwing, *m*allard and shoveler as qualifying for future inclusion as part of this assemblage (Stroud, DA, et al., 2001. *The UK SPA network: its scope and content.* JNCC, Peterborough)

**Key supporting habitats for the waterfowl assemblage**

Since a number of species comprising the waterfowl assemblage are qualifying species in their own right, their habitat requirements are described in sections 3.4 and 3.5 above. This section therefore mainly deals with the habitat requirements of the other assemblage species which form part of the waterfowl assemblage.

**Intertidal mudflats and sandflats** - Many of the bird species found within the Severn Estuary are highly mobile, feeding and roosting in different areas, depending on food availability, weather and tides. They favour areas that have abundant prey species and unrestricted views for the early detection of predators. Some species of wader such as ringed plover and turnstone will feed on the rich invertebrate fauna associated with rotting seaweed occurring along undisturbed strandlines.

Pintail and Teal are widely distributed around the estuary with a notable concentration at the New Grounds. Pintail are also found at Peterstone/Rhymney. Pochard and tufted duck have a highly clumped daytime distribution mainly at New Grounds with most others at Peterstone and the mouth of the Rhymney. Large numbers of pochard move onto the estuary in periods of sustained cold weather. There is a large number of wintering ringed plover on the estuary and these numbers swell during the spring and autumn when there is a considerable passage of migrants through the Severn Estuary. There are major concentrations of curlew on the flats above the first Severn Bridge as well as Bridgwater Bay and the Welsh Grounds. The Severn Estuary is a particularly important staging post for whimbrel during autumn and spring passage periods where some birds feed on the mudflats. Spotted redshank are occasionally found on the Axe and Yeo estuaries.

**Saltmarsh** - Upper and lower saltmarsh provide important feeding and roosting areas for the internationally important assemblage of waterfowl throughout the estuary. The European white-fronted geese graze on a range of saltmarsh grasses and herbs. The birds feed on the saltmarsh and the transition to coastal grazing marsh in front of the sea defences in the upper estuary.

There are areas of well grazed saltmarsh with saltpans at the River Axe and in the upper reaches of the estuary, which are used by wigeon and other wildfowl. Pools in the higher marsh at Bridgwater Bay and in the saltmarsh above the Severn bridges are also attractive to waders and wildfowl, providing invertebrates and shelter. In the winter, ducks such as teal and pintail feed on seeds of saltmarsh plants such as *Salicornia* sp. and *Atriplex* sp. Probing waders such as curlew also feed on the saltmarsh.

The saltmarsh provides a safe haven for the feeding waders and wildfowl from the tides that flood the mudflats twice a day. Upper saltmarsh in particular makes ideal high water roost sites and there are main high tide roosts in some areas with little human disturbance where waders congregate from their feeding areas. Waders in particular, require very short vegetation to afford unrestricted views for the early detection of predators.

**Hard substrate habitats (rocky shores) -** The shingle and rocks in the estuary provide feeding areas for many wildfowl and waders and important roost sites at high tide. Many of the rocks are off shore and are therefore generally free from human disturbance. These include Guscar Rocks in the upper reaches, Blackstone Rocks at Clevedon and Stert Island in Bridgwater Bay. Whimbrel have major night roosts at Collister Pill and Stert Island and the Stert Island roost is the largest of its kind in Britain. Spotted redshank are also found around Stert Island. Some areas of hard substrate support eelgrass beds which provide a food source for grazing wildfowl species particularly European white-fronted goose and wigeon.

**Freshwater coastal grazing marsh, improved grassland and open standing waters** – these supporting habitats lie outside the European Marine Site boundary but within the SPA. They provide key areas for breeding, feeding and roosting for all the assemblage species particularly at high tide.

# 4. Conservation Objectives and Favourable Condition Tables For the European Marine Site

## 4.1 Conservation objectives for the Severn Estuary / Môr Hafren SAC

The protection and management of the SAC in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

### 4.1.1 SAC interest feature 1: Estuaries

**The conservation objective for the "estuaries" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met

i. the total extent of the estuary[2] is maintained;

ii. the characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime) of the estuary is maintained;

iii. the characteristic range and relative proportions of sediment sizes and sediment budget[3] within the site is maintained;

iv. the extent, variety and spatial distribution[4] of estuarine habitat communities[5] within the site is maintained[6];

v. the extent, variety, spatial distribution[4] and community composition of hard substrate habitats and their notable communities[5(v)] is maintained;

vi. the abundance of the notable estuarine species assemblages[7] is maintained or increased;

vii. the physico-chemical characteristics[8] of the water column[9] support the ecological objectives described above;

viii. Toxic contaminants in water column[9] and sediment are below levels which would pose a risk to the ecological objectives described above.

ix. Airborne nutrient and contaminant loads are below levels which would pose a risk to the ecological objectives described above

The meaning of terms [1-9] above is explained in **section 4.1.1.1**

Appendix 2 shows the extent of the "estuaries" feature within the Severn Estuary SAC European Marine Site.

#### 4.1.1.1 Explanatory information for the "estuaries" conservation objective

**[1] Natural processes in respect of the SAC**

Each feature may be subject to both natural processes and human influence. Human influence on the interest features is acceptable provided that it is proved to be / can be established to be compatible with the achievement of the conditions set out under the definition of favourable condition for each interest feature. A failure to meet these conditions, which is entirely a result of natural process will not constitute unfavourable condition, but may trigger a review of the definition of favourable condition.

Dynamic physical process within estuaries can stem from variable weather conditions including one off storm events, and result in changes in wave exposure, riverine floods or tidal surges. These events can move large quantities of sediments and alter channel morphology, which affect current patterns and sediment transport within the estuary.

Where these processes occur without significant anthropogenic influence they fall under the umbrella of 'natural change'. Because estuaries are dynamic systems we can expect the amount and gross distribution of habitats to change in the future. In general estuarine communities and their supporting habitats are intrinsically more dynamic over short timescales when compared to other marine and terrestrial habitats. Some estuarine communities occur in cycles dependent upon the prevailing physical conditions. Features should not necessarily be considered in unfavourable condition caused by to the short term disappearance of a particular community due to natural processes.

An important example of natural processes occurring over a longer timescale is that estuaries have a natural tendency to accumulate sediment, thereby changing their form from their original glacial morphology to a state where tidal energy is dissipated by sediment banks and other features such as saltmarsh. This, with other forces of natural change, will therefore cause the width and depth of the estuary to change over time, moving towards a state of dynamic equilibrium or 'most probable state'. As part of this process, the location and extent of saltmarshes and mudflats may change, provided there is capacity to accommodate readjustment. Future developments should aim to avoid impact on the future evolution of the system as where this process is constrained by human influence, the capacity of habitats to accommodate readjustment may be affected.

**[2] Extent of the estuary**

The landward limit of the estuary feature is the limit of highest astronomical tide or the site boundary where it is below highest astronomical tide, except where the landward limit is defined as straight lines across the mouths of rivers entering the estuary. The seaward limit is as shown in the map in Appendix 2. Where other Habitats Directive Annex I habitat types occur within the estuary, they also form part of the estuary feature. In addition, there are areas of the estuary which do not form part of other Annex I habitat types.

**[3] Sediment budget**

The sediment budget refers to the total amount of sediment within the Severn Estuary taking into account the balance of sediment inputs and outputs.

**[4] Spatial distribution**

Spatial distribution of estuarine communities refers to the macro spatial pattern in which communities are distributed around the estuary. This statement does not require micro-distribution of communities e.g. the exact mapped positions of specific communities to be maintained.

**[5] Estuarine habitat communities**

> ***Note:*** *sections i – iv below list the habitat types which are also features of the Severn Estuary SAC in their own right as well as being 'sub-features' of the estuary feature. The detailed definitions of favourable conservation status for these features are provided under their respective conservation objectives.*

i. Subtidal sandbanks *(see section 4.1.2 for the conservation objective for this feature)*
   - Sublittoral Sands and Muddy Sands
   - Sublittoral cohesive mud and sandy mud communities

ii. Intertidal mudflats and sandflats (*see section 4.1.3 for the conservation objective for this feature)*
   - Intertidal gravel and clean sands
   - Intertidal muddy sands
   - Intertidal muds

iii. Atlantic saltmeadows (*see section 4.1.4 for the conservation objective for this feature)*
- Low – mid marsh communities
- Mid – upper marsh communities
- Transitional high marsh communities
- Pioneer marsh communities

iv. Reefs of *Sabellaria alveolata (see section 4.1.5 for the conservation objective for this feature)*
- *Sabellaria alveolata* on variable salinity sublittoral mixed sediment (subtidal)
- *Sabellaria alveolata* reefs on sand-abraded eulittoral rock (contiguous subtidal and intertidal)

v. Hard substrate habitat notable communities
- *Sabellaria alveolata reefs on sand-abraded eulittoral rock* (MLR.Sab.Salv)
- *Hydroids, ephemeral seaweeds and Littorina littorea in shallow eulittoral mixed substrata pools.* **(**LR.RkpH)
- *Balanus crenatus and Tubularia indivisa on extremely tide-swept circalittoral rock.* (ECR.BS.BalTub)
- *Fucus serratus* and piddocks on lower eulittoral soft rock (MLR.Fser.Pid)
- *Mytilus edulis* and piddocks on eulittoral firm clay (MLR.MytPid)
- *Balanus crenatus*, *Halichondria panacea* and *Alcyonidium diaphanum* on extremely tide-swept sheltered circalittoral rock (ECR.BalHpan)
- *Sertularia cupressina* and *Hydrallmania falcate* on tide-swept sublittoral cobbles or pebbles in coarse sand (IGS.ScupHyd).
- *Corrallina officinalis* and coralline crusts in shallow eulittoral rockpools (LR.Rkp.Cor)
- Eel grass (*Zostera*) beds
- Peat and clay exposures
- Any other notable hard substrata communities that may be identified.

**[6] Maintained**

Since the late 1990s Natural England's condition assessment has identified that parts of the saltmarsh within the Severn Estuary appear to be exhibiting the effects of coastal squeeze. For this reason NE and CCW do not consider it sufficient simply to seek to maintain the existing saltmarsh resource, rather it is our advice that measures will be required which seek to recreate the approximate extent of saltmarsh habitat present within the estuary in 1995 (the year the Severn Estuary was first identified as a proposed SAC); whilst at all times working within the framework of seeking a sustainable estuary form. N.B. This is based upon a site specific consideration of the state of habitats within the Severn Estuary, and should not be extended to other sites on the basis of this advice.

**[7] Notable estuarine species assemblages**

i. Assemblage of fish species:
- Migratory species
    - River and Sea Lamprey and Twaite shad (Annex 1 species) and Allis shad
    - Sea trout, salmon, eel,
- Estuarine species
    - Species typically occurring and breeding in estuaries (Bird, 2008)
    - Marine species occurring in large numbers in estuaries (Bird, 2008)
- Marine species
    - Predominantly marine species occurring infrequently in the Severn (Bird, 2008)
- Freshwater species
    - Species typically occurring and breeding in freshwater and recorded within the Severn cSAC (Bird, 2008)

ii Assemblage of waterfowl species (refer also sections 4.2 and 4.3 on the SPA and Ramsar Site):
- Regularly occurring Annex 1 species - Bewicks' swan
- Regularly occurring migratory species - European white-fronted goose, dunlin, redshank, shelduck, gadwall
- Nationally important bird populations - wigeon, teal, pintail, pochard, tufted duck, ringed plover, grey plover, curlew, whimbrel and spotted redshank

iii. Assemblage of vascular plant species:
- Salt marsh species (refer to notes 5 and 6 in section 4.1.4.1 - explanatory information on the conservation objective for the Atlantic salt meadows feature)
- Eel grass *(Zostera)* species.

**[8] Physico-chemical characteristics**

These include nutrients, oxygen, turbidity, pH, temperature and salinity.

**[9] Water column**

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

## 4.1.2 SAC interest feature 2: Subtidal sandbanks which are covered by sea water all the time (subtidal sandbanks)

**The conservation objective for the "subtidal sandbanks" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met:

i. the total extent of the subtidal sandbanks[2] within the site is maintained;

ii. the extent and distribution[3] of the individual subtidal sandbank communities[4] within the site is maintained;

iii. the community composition[5] of the subtidal sandbank feature within the site is maintained;

iv. the variety and distribution[3] of sediment types across the subtidal sandbank feature is maintained;

v. the gross morphology (depth, distribution and profile) of the subtidal sandbank feature within the site is maintained.

The meaning of terms [1-5] above is explained in **section 4.1.2.1**

Appendix 3 shows the extent of the "subtidal sandbanks" feature within the Severn Estuary SAC European Marine Site.

### 4.1.2.1 Explanatory information for the "subtidal sandbanks" conservation objective

**[1] Natural processes in respect of the SAC**

The meaning of 'natural processes' is explained in **section 4.1.1.1**

**[2] Extent of subtidal sandbanks**

The subtidal sandbanks in the Severn Estuary change their shape over time and many are ephemeral in nature, although some are relatively stable and long established. The extent of the Annex 1 habitat is considered to include both the actual sandbanks and their associated sediments. Areas of associated sediments have been defined by using the sediment environments of the Bristol Channel Marine Aggregates Resources and Constraints project, commissioned by the National Assembly for Wales (Posford Duvivier and ABP, 2000) Associated sediments have been defined as any area of of subtidal sand-sized sediment within the same sediment environment as a subtidal sandbank. Mobile sediments that form temporary sandbanks are considered to be associated sediments that should be retained in the system, but their location may change. Areas of holocence valley infill (relict sediment) are not mobile under present day estuarine conditions. Therefore, where Holocence infill is exposed, it is not considered to form part of the associated sediments. However, any mobile sand deposited over the infill does contribute to the associated sediments.

**[3] Distribution**

Distribution of sandbank communities and sediments refers to the macro spatial pattern in which these are distributed around the estuary. This statement does not require micro-distribution of communities or sediments e.g. the exact mapped positions of specific communities or sediments to be maintained.

The sand banks of the Middle and Welsh Grounds are relatively permanent sandbank features in the Severn Estuary, along with other long established sandbank features at Cardiff Grounds and in Bridgwater Bay. The tops of these banks are intertidal, and the permanently submerged parts of the banks are considered to contribute to the subtidal sandbanks habitat.

There are other areas of subtidal sandbank habitat within the Estuary, again sometimes the top of the bank may be exposed at low tide, with the submerged sections contributing to the subtidal sandbanks habitat. These banks are more ephemeral in nature, but are still considered part of the feature, and reflect the dynamic nature of the Severn Estuary. The areas where ephemeral subtidal sandbanks are known to occur include areas offshore from Avonmouth and at English Grounds (near Clevedon).

The macro-scale distribution of the subtidal sandbanks should be maintained, and there should be continued presence of ephemeral subtidal sandbanks in the Estuary.

**[4] Subtidal sandbank communities**

There are two groups of communities comprising the 'sub-features' of the subtidal sandbanks feature:

- Sublittoral Sands and Muddy Sands:

i. Infralittoral mobile sand in variable salinity (estuaries)
ii. Infralittoral mobile clean sand with sparse fauna
iii. *Nephtys cirrosa* and *Macoma balthica* in variable salinity infralittoral mobile sand
iv. *Neomysis integer* and *Gammarus* spp. in fluctuating low salinity infralittoral mobile sand

- Sublittoral cohesive mud and sandy mud communities:

i. *Capitella capitata* in enriched sublittoral muddy sediments
ii. *Nephtys hombergii* and *Tubificoides* spp. in variable salinity infralittoral soft mud
iii. *Capitella capitata* and *Tubificoides* spp. in reduced salinity infralittoral muddy sediment*
iv. *Nephtys hombergii* and *Macoma balthica* in infralittoral sandy mud*

(* these records have a lower degree of confidence than the other communities listed, i.e. the biotope assessor was uncertain regarding precisely which biotope should be recorded).

**[5] Community composition**

Species typical of the subtidal sandbank communities:

*Aricidea minuta*
*Capitella capitata*
*Diastylis rathkei typica*
*Eurydice pulchra*
*Gammarus salinus*
*Harpinia pectinata*
*Mediomastus fragilis*
*Nephtys cirrosa*
*Nephtys hombergii*
*Oligochaeta*
*Pygospio elegans*
*Pontocrates arenarius*
*Pseudocuma longicornis*
*Retusa obtusa*
*Tubificoides amplivasatus*

## 4.1.3 SAC interest feature 3 : Mudflats and sandflats not covered by seawater at low tide (mudflats and sandflats)

**The conservation objective for "mudflats and sandflats" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met:

i. The total extent of the mudflats and sandflats feature[2] is maintained;

ii. the variety and extent of individual mudflats and sandflats communities[3] within the site is maintained;

iii. the distribution[4] of individual mudflats and sandflats communities[3] within the site is maintained;

iv. the community composition[5] of the mudflats and sandflats feature within the site is maintained;

v. the topography of the intertidal flats and the morphology (dynamic processes of sediment movement and channel migration across the flats) are maintained.

The meaning of terms [1-5] above is explained in **section 4.1.3.1.**

Appendix 4 shows the extent of the "mudflats and sandflats" feature within the Severn Estuary SAC European Marine Site.

### 4.1.3.1 Explanatory information for the "mudflats and sandflats" conservation objective

**[1] Natural processes in respect of the SAC**

The meaning of 'natural processes' is explained in **section 4.1.1.1.**

**[2]Extent of the intertidal mudflats and sandflats**

The extent of the feature is defined using intertidal Phase 1 survey information, which gives the seaward limit of the feature as the low water mark of spring tides (MLWS) because that is in practice the lower limit to which Phase 1 survey is possible. The feature does not include other intertidal habitats which are not mudflats and sandflats, such as intertidal reefs and rocky shores. This is the basis on which the feature is shown in the map in Figure 4, the total extent being 20,271 ha. However in addition there will be some areas of intertidal mudflat and sandflat seaward of MLWS and down to Lowest Astronomical Tide, which is the absolute seaward limit of this habitat type.

**[3] Mudflat and sandflat communities**

There are three groups of communities comprising the "sub-features" of the "Mudflats and sandflats not covered by seawater at low tide" feature:

• Intertidal gravel and clean sand communities

i. Barren coarse sand shores; **LGS.S.BarSnd**
ii. Burrowing amphipods and *Eurydice pulchra* in well drained clean sand shores; **LGS.S.AEur**
iii. Burrowing amphipods and polychaetes in clean sand shores. **LGS.S.AP**
iv. Talitrid amphipods in decomposing seaweed on the strandline **LGS.S.Tal**
v. Dense *Lanice conchilega* in tide-swept lower shore sand **LGS.S.Lan**
vi. Barren shingle or gravel shores **LGS.Sh.BarSh**

• Intertidal muddy sand communities :

i. Polychaetes and *Cerastoderma edule* in fine sand or muddy sand shores **LMS.MS.PCer**
ii. *Bathyporeia pilosa* and *Corophium spp.* in upper shore slightly muddy fine sand shores **LMS.MS.BatCor**
iii. *Macoma balthica* and *Arenicola marina* in muddy sand shores. **LMS.MS.MacAre**

• Intertidal mud communities:

i. *Hediste diversicolor* and *Macoma balthica* in sandy mud shores: **LMU.SMu.HedMac**
ii. *Hediste diversicolor, Macoma balthica* and *Arenicola marina* in muddy sand or sandy mud shores **LMU.SMu.HedMacAre**
iii. *Hediste diversicolor* and *Scrobicularia plana* in reduced salinity mud shores **LMU.Mu.HedScr**
iv. *Hediste diversicolor* and oligochaetes in low salinity mud shores **LMU.Mu.HedOl**
v. *Hediste diversicolor* and *Streblospio shrubsolii* in sandy mud or soft mud shores **LMU.Mu Hed Str**

Appendix 4a shows the extent of the "mudflats and sandflats" subfeatures within the Severn Estuary SAC European Marine Site.

**[4] Distribution**

The distribution of mudflats and sandflats communities refers to the macro spatial pattern in which these communities are distributed around the estuary. This statement does not require micro-distribution of communities e.g. the exact mapped positions of specific communities to be maintained.

**[5] Community composition**

Species typical of the mudflat and sandflat communities:

*Aphelochaeta marioni*
*Arenicola marina*
*Bathyporeia pelagica*
*Corophium volutator*
*Enchytraeidae*
*Eurydice pulchra*
*Hediste diversicolor*
*Hydrobia ulvae*
*Macoma balthica*
*Nephtys cirrosa*
*Nephtys hombergii*
*Oligochaeta indet.*
*Pygospio elegans*
*Scoloplos armiger*
*Scrobicularia plana*
*Streblospio shrubsolii*
*Tubificoides benedii*

## 4.1.4 SAC interest feature 4: Atlantic salt meadow

**The conservation objective for the "Atlantic salt meadow" feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met:

i. the total extent of Atlantic salt meadow and associated transitional vegetation communities[2] within the site is maintained[3];

ii. the extent and distribution[4] of the individual Atlantic salt meadow and associated transitional vegetation communities[2] within the site is maintained;

iii. the zonation of Atlantic salt meadow vegetation communities and their associated transitions[2] to other estuary habitats is maintained;

iv. the relative abundance of the typical species[5] of the Atlantic salt meadow and associated transitional vegetation communities[2] is maintained;

v. the abundance of the notable species[6]of the Atlantic salt meadow and associated transitional vegetation communities[2] is maintained.

vi. the structural variation of the salt marsh sward (resulting from grazing) is maintained within limits sufficient to satisfy the requirements of conditions iv and v above and the requirements of the Ramsar and SPA features[7]

vii. the characteristic stepped morphology of the salt marshes and associated creeks, pills, drainage ditches and pans, and the estuarine processes that enable their development, is maintained.

viii Any areas of *Spartina anglica* salt marsh (SM6) are capable of developing naturally into other saltmarsh communities.[8]

The meaning of terms [1-8] above is explained in **section 4.1.4.1.**

Appendix 5 shows the extent of Atlantic salt meadow and its associated transitional vegetation communities within the Severn Estuary SAC European Marine Site.

### 4.1.4.1 Explanatory information for the "Atlantic salt meadow" conservation objective

**[1] Natural processes in respect of the SAC**

The meaning of 'natural processes' is explained in **section 4.1.1.1**.

**[2] Atlantic salt meadow and associated transitional vegetation communities**

The vegetation communities comprising the Atlantic Salt Meadow feature can be grouped into four 'sub-features', namely:

(a) low to mid marsh communities
(b) mid to upper marsh communities
(c) transitional high marsh communities
(d) pioneer saltmarsh communities

The communities in each of these sub-features are listed below.

Sub-features (a) and (b) contain the National Vegetation Classification (NVC) communities which fall within the definition of Atlantic Salt Meadow in the EU Interpretation Manual. The extent of these two sub-features within the SAC is currently estimated at 656 ha. The communities in (c) and (d) do not fall within the Atlantic Salt Meadow definition, but are considered to be important components of this feature as they represent its landward and seaward transitions to other habitat types, namely non-saline vegetation and pioneer salt marsh respectively. Atlantic salt meadow is a naturally dynamic habitat and these transitional communities are considered to be an integral part of the Atlantic Salt Meadow feature and essential elements of its structure and function. The total extent of all four of the above sub-features in the SAC is estimated to be 1400 ha, distributed in the SAC as shown in Appendix 5a.

(a) Low to mid marsh communities:

i. Transitional low saltmarsh with *Puccinellia maritima*, annual *Salicornia* sp. and *Suaeda maritima* SM10
ii. *Aster tripolium* (rayed) saltmarsh SM12
iii. *Puccinellia maritima* saltmarsh SM13
    - *Puccinellia maritima* sub-community SM13a
    - *Glaux maritima* sub-community SM13b
    - *Limonium vulgare - Armeria maritima* sub-community SM13c
    - *Plantago maritima - Armeria maritima* sub-community SM13d
    - *Plantago maritima–Triglochin maritima* sub-community SM13x (provisional)
    - *Spartina anglica* sub-community SM13y (provisional)
iv. *Atriplex portulacoides* saltmarsh SM14
    - *Atriplex portulacoides* sub-community SM14a
v. *Juncus maritimus - Triglochin maritima* saltmarsh SM15

(b) Mid to upper marsh communities:

i. *Festuca rubra* salt-marsh SM16
    - *Puccinellia maritima* sub-community SM16a
    - *Juncus gerardii* sub-community SM16b
    - *Glaux maritima* sub-community SM16c
    - *Festuca rubra* sub-community SM16d
    - *Leontondon autumnalis* sub-community SM16e
    - *Aster tripolium* sub-community SM16x (provisional)
ii. *Artemisia maritima* saltmarsh SM17
iii. *Juncus maritimus* salt-marsh SM18
    - *Festuca arundinacea* sub-community SM18c

(c) Transitional high marsh communities:

i. *Spergularia marina - Puccinellia distans* saltmarsh SM23
ii. *Elytrigia atherica* saltmarsh SM24
iii. *Elytrigia repens* saltmarsh SM28
iv. *Festuca rubra - Agrostis stolonifera - Potentilla anserina* inundation grassland MG11
v. *Festuca arundinacea* coarse grassland MG12
vi. *Agrostis stolonifera - Alopecurus geniculatus* inundation grassland MG13
vii. *Phragmites australis* reedbed S4
    - *Phragmites australis* sub-community S4a

xiii. *Bolboshoenus maritimus* swamp S21
    - *B. maritimus* sub-community S21a

*Agrostis stolonifera* sub-community S21c

(d) Pioneer saltmarsh communities:

i. *Spartina anglica* saltmarsh SM6
ii Annual *Salicornia* saltmarsh SM8
iii. *Suaeda maritima* saltmarsh SM9

**[3] Maintained**

Since the late 1990s Natural England's condition assessment has identified that parts of the saltmarsh within the Severn Estuary appear to be exhibiting the effects of coastal squeeze. For this reason NE and CCW do not consider it sufficient simply to seek to maintain the existing saltmarsh resource, rather it is our advice that measures will be required which seek to recreate the approximate extent of saltmarsh habitat present within the estuary in 1995 (the year the Severn Estuary was first identified as a proposed SAC); whilst at all times working within the framework of seeking a sustainable estuary form. N.B. This is based upon a site specific consideration of the state of habitats within the Severn Estuary, and should not be extended to other sites on the basis of this advice.

**[4]Distribution**

The distribution Atlantic salt meadow communities refers to the macro spatial pattern in which these are distributed around the estuary. This statement does not require micro-distribution of communities e.g. the exact mapped positions of specific communities to be maintained.

**[5] Typical species of the Atlantic salt meadow**

*Festuca arundinacea*
*Festuca rubra*
*Juncus gerardii*
*Triglochin maritimum*
*Carex extensa*
*Agrostis stolonifera*
*Juncus maritimus*
*Oenanthe lachenalii*
*Puccinellia maritima,*
*Salicornia spp.*
*Suaeda maritima*
*Aster tripolium*
*Glaux maritima*
*Plantago maritima*
*Armeria maritima*
*Elytrigia atherica*
*Atriplex prostrata*
*Phragmites australis*
*Spartina anglica*
*Spergularia media*
*Puccinellia distans*
*Cochlearia anglica*
*Cochlearia officinalis*
*Limonium vulgare*
*Atriplex portulacoides*
*Seriphidium maritimum*
*Plantago coronopus*
*Beta vulgaris maritima*

**[6] Notable Atlantic salt meadow vegetation species**

*Alopecurus bulbosus*
*Althaea officinalis*
*Bupleurum tenuissimum*
*Hordeum marinum*
*Puccinellia rupestris*
*Trifolium squamosum*
*Lepidium latifolium*

*Allium oleraceum*
*Petroselinum segetum*

**[7] Severn Estuary SPA and Severn Estuary Ramsar Site Conservation Objectives**
Refer to sections 4.2 and 4.3 of this document

**[8] *Spartina anglica* SM6**
*Spartina* in the Severn is considered to be an invasive species and these conservation objectives do not seek the maintenance of the extent or condition of this habitat type. However, SM6 is considered to be a transitional salt marsh community and the conservation objectives seek to protect the ability of areas of *Spartina* to develop into other Atlantic Salt Meadow or transitional communities.

## 4.1.5 SAC interest feature 5 : Reefs

**The conservation objective for the "reefs" feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met:

i. the total extent and distribution[2] of *Sabellaria* reef [3] is maintained;

ii. the community composition[4] of the *Sabellaria* reef is maintained;

iii. the full range of different age structures of *Sabellaria* reef are present;

iv. the physical[5]and ecological processes[6] necessary to support *Sabellaria* reef are maintained.

The meaning of terms [1 – 6] above is explained in **section 4.1.5.1** below.

Appendix 6 shows the extent of the "reef" feature within the Severn Estuary SAC European Marine Site.

### 4.1.5.1 Explanatory information for the "reefs" conservation objective

**[1] Natural processes in respect of the SAC**

The meaning of 'natural processes' is explained in section **4.1.1.1**

**[2] Distribution**

The distribution of reefs refers to the macro spatial pattern in which the reefs are distributed around the estuary. This statement does not require micro-distribution of the reefs e.g. the exact mapped positions of specific reefs to be maintained.

**[3]*Sabellaria* reef**

Little is known about the nature of the *Sabellaria alveolata* reef in the Severn Estuary, especially in the subtidal. However, at other sites *S. alveolata* is known to have a very variable recruitment and the cover in any one area may vary greatly over a number of years. *S. alveolata* reefs also cycle through different phases, from newly settled worms through vigorous fast growing reef to older hummocks. It is likely that subtidal *S. alveolata* reef in the Severn Estuary will exhibit reduced growth forms (lower elevation) in comparison to the intertidal reef habitat. The easiest of these phases to identify is the fast growing reef and for the purposes of these conservation objectives this is defined as a dense aggregation of worms (over 1000 per $m^2$, as a rough guide), generally forming a thick (2 cm or more) crust of tubes. The area covered by the habitat would generally exceed 25 $m^2$ although there could be patchiness within this area. The other phases of growth are also important and are encompassed in point iii of the objective.

The *S. alveolata* reef biotopes recorded in the Severn Estuary are SS.SBR.PoR.SalvMx *Sabellaria alveolata on variable salinity sublittoral mixed sediment* and LS.LBR.Sab.Salv *Sabellaria alveolata reefs on sand-abraded eulittoral rock.*

**[4] Community composition**
Species associated with dense aggregations of *Sabellaria alveolata* in the Severn estuary:

***Subtidal***
*Sabellaria alveolata*
*Eulalia tripunctata*

*Mediomastus fragilis*
*Typosyllis armillaris*
*Ampharete grubei*
*Harpinia pectinata*
*Melinna cristata*
*Pygospio elegans*
*Scoloplos armiger*
*Nemertea*
*Nucula nitidosa*
*Nucula nucleus*
*Tubificoides amplivasatus*
*Golfingia vulgaris vulgaris*
*Gammarus salinus*
*Tubificoides*
*Arenicola marina*
*Sphenia binghami*
*Eumida sanguinea*
*Nephtys hombergii*
*Autolytus prolifera*
*Harmothoe impar*
*Nematoda*
*Polycirrus*
*Dodecaceria concharum*
*Harmothoe*
*Syllidae*
*Enchytraeidae*

***Intertidal***

*Sabellaria alveolata,*
*Actinia equina*
*Cancer pagurus*
*Elminius modestus*
*Littorina saxatilis*
*L.littorea*
*L.obtusata*
*Pholas dactylus*
*Pomatocerus lamarcki*
*Porcellana platycheles*
*Semibalanus balanoides*
*Halichondrea sp*
*Corallina officinalis*
*Enteromorpha sp.*
*Fucus serratus*
*Fucus vesiculosus*
*Pelvetia canaliculata*
*Porphyra sp*
*Ulva sp*

**[5]Physical processes**

- abundance of suitable coarse sediments to support reef growth (tube building)
- the availability of suitable substrates where *Sabellaria* has been known to occur in the past

**[6]Ecological Processes**

- supply of *Sabellaria* larvae (within the water column)
- abundance of food (suspended detritus material) within the water column to support feeding

## 4.1.6 SAC interest feature 6 : River lamprey *Lampetra fluviatilis*

**The conservation objective for the river lamprey *Lampetra fluviatilis* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met:

i. the migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;

ii the size of the river lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;

iii. the abundance of prey species[2] forming the river lamprey's food resource within the estuary, is maintained.

iv. Toxic contaminants in the water column[3] and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms [1-3] above is explained in **section 4.1.6.1**.

**Note :** The river lamprey population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary river lamprey feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC river lamprey feature are also met in full and there is a continued recorded presence of this species in the River Severn.

### 4.1.6.1 Explanatory information for the river lamprey *Lampetra fluviatilis* conservation objective

**[1] Natural processes in respect of the SAC fish features**

**River lamprey population:**

The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

**Supporting habitats**
The general meaning of 'natural processes' with respect to the supporting habitats of river lamprey within the estuary is explained in **section 4.1.1.1**

**[2] Prey species**

Sea trout *Salmo trutta*, shad *Alosa fallax/Alosa alosa*, herring *Clupea harengu*s, sprat *Sprattus sprattu*s, flounder *Platichthys flesu*s and small gadoids such as whiting *Merlangius merlangu*s and pout *Trisopterus luscu*s are all potential prey species for the river lamprey found within the Severn Estuary (Bird 2008).

**[3]Water column**

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

## 4.1.7 SAC interest feature 7: The conservation objective for sea lamprey *Petromyzon marinus*

**The conservation objective for the sea lamprey *Petromyzon marinus* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met:

i. the migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;

ii. the size of the sea lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained as is at a level that is sustainable in the long term;

iii. the abundance of prey species[2] forming the sea lamprey's food resource within the estuary, is maintained.

vi. Toxic contaminants in the water column[3] and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms [1-3] above is explained in **section 4.1.7.1**.

**Note :** The sea lamprey population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary sea lamprey feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC sea lamprey shad feature are also met in full and there is a continued recorded presence of this species in the River Severn.

### 4.1.7.1 Explanatory information for the sea lamprey *Petromyzon marinus* conservation objective

**[1] Natural processes in respect of the SAC fish features**

**Sea lamprey population:**
The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

**Supporting habitats:**
The general meaning of 'natural processes' with respect to the supporting habitats of sea lamprey within the estuary is explained in **section 4.1.1.1**.

**[2]Prey species**

Eel *Anguilla anguilla*, cod *Gadus morhua*, and haddock *Melanogrammus aeglefinus* are all potential prey species for the sea lamprey found within the Severn Estuary (Bird 2008)

**[3]Water column**

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

## 4.1.8 SAC interest feature 8: The conservation objective for twaite shad *Alosa fallax*

**The conservation objective for the twaite Shad *Alosa fallax* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[1], each of the following conditions are met:

i. the migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and their spawning rivers is not obstructed or impeded by physical barriers, changes in flows or poor water quality;

ii. the size of the twaite shad population within the Severn Estuary and the rivers draining into it is at least maintained and is at a level that is sustainable in the long term.

iii. the abundance of prey species[2] forming the twaite shad's food resource within the estuary, in particular at the salt wedge[3], is maintained.

iv. Toxic contaminants in the water column[4] and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms[1-4] above is explained in **section 4.1.8.1**.

**Note :** The twaite shad population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary twaite shad feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC twaite shad feature are also met in full and there is a continued recorded presence of this species in the River Severn.

### 4.1.8.1 Explanatory information for the Twaite shad *Alosa fallax* conservation objective

**[1] Natural processes in respect of the SAC fish features**

**Twaite shad population:**
The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

**Supporting habitats:**
The general meaning of 'natural processes' with respect to the supporting habitats of twaite shad within the estuary is explained in **section 4.1.1.1**.

**[2] Prey species**

Small custaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003).

**[3] Salt wedge**

This the area within the estuary where fresh and saline water meet and where the abundance of prey species is particularly important to the twaite shad population. The actual position varies according to the state of the tide and volume of freshwater input to the estuary.

## [4] Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

## 4.1.9 Favourable Condition Tables for the SAC interest features of the Severn Estuary European Marine Site

Background information on the role of favourable condition tables and the information provided in each column is provided in Section 1.8 of this document, and a concise glossary of terms used is provided in Section 7.

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

These tables set out all the attributes that **may** be used to monitor the condition of the features of the SAC. Where possible we will seek available information from others which can inform our assessment process.

It will be possible to monitor many of the attributes at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the first reporting cycle in order to characterise the site and establish the baseline. Where relevant, abbreviations of National Vegetation Classification (NVC) codes are used for simplicity (Rodwell, 2000).

Comprising :

**Table 8** – Favourable condition table for the “estuaries” feature of the Severn Estuary SAC and (in part) for the Ramsar Site (refer to section 4.3.1)

**Table 9** – Favourable condition table for the “subtidal sandbanks” feature of the Severn Estuary SAC

**Table 10** – Favourable condition table for the “intertidal mudflats and sandflats” feature of the Severn Estuary SAC

**Table 11** – Favourable condition table for the “Atlantic salt meadows” feature of the Severn Estuary SAC

**Table 12** – Favourable condition table for the “reefs” feature of the Severn Estuary SAC

**Table 13** – Favourable condition table for the “river lamprey” and “sea lamprey” features of the Severn Estuary SAC

**Table 14** – Favourable condition table for the “twaite shad” feature of the Severn Estuary SAC

## Table 8 – Favourable condition table for the "estuaries" feature of the Severn Estuary SAC and (in part) for the Ramsar Site (refer to section 4.3.1)

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **A1** | ***SAC interest feature 1:*** **Estuaries** | | **Extent**<br><br>*(Total extent of the estuaries feature - section 4.1.1.i of the conservation objectives)* | Total area (ha) of estuary feature | No decrease in extent due to man induced changes from the established baseline<br><br>*The baseline is the extent of all areas subject to tidal influence within the boundary of the designation of the pSAC in 2000 - see also map in Appendix 2* | Extent is an attribute on which reporting is required by the Habitats Directive. |
| **A2** | | All sub-features | **Morphology**<br><br>*(Characteristic physical form and flow - section 4.1.1.ii of the conservation objectives)* | Intra and inter-estuarine Tidal Prism/Cross Section ratio (TP/CS ratio) measured during the reporting cycle using remote sensing (frequency to be determined). | The intra- and inter- estuarine TP/CS relationship should not deviate significantly from an established baseline subject to natural processes<br><br>(* includes recognition of fixed hard geology formations)<br><br>*Baseline to be established :-*<br>*Data to be used is Hydrological Office bathymetry data (intertidal and subtidal) and Environment Agency LIDAR survey* | TP = Tidal Prism = total volume of water crossing a given cross section during the flood tide ($m^3$).<br>CS = Area of a given cross section at high water springs ($m^2$).<br>The relationship between TP & CS provides a measure of the way the estuary has adjusted to tidal energy. Substantial departures from this characteristic relationship (determined on a regional basis) may indicate the influence of anthropogenic factors and this would trigger more detailed evaluation of potential problems.<br><br>The identification of a suitable baseline for TP/CS relationship will need to take account of the highly dynamic nature of the Severn and potential impacts of natural processes (including sea level rise) in altering the profile of the estuary – with a view to maintaining or promoting the movement of the estuary towards "dynamic equilibrium".<br><br>*The hard geology formations (headlands, cliffs and rock platforms) have a major role in influencing the characteristic physical form and flow of the estuary (many are protected in their own right as geological SSSI). |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **A3** | ***SAC interest feature 1:*** **Estuaries** | | **Tidal regime and flows** (saline water and freshwater contributions )<br><br>*(characteristic physical form and flow - section 4.1.1.ii of the conservation objectives)* | Tidal range, measured from tide gauges at specified locations, and flows measured from current estuary and river meters . Locations and frequency to be determined | No decrease in tidal range subject to natural processes.<br><br>Tidal currents should not deviate significantly from an established baseline subject to natural processes<br><br>Riverine flows (Rivers Wye, Usk and Severn) and estuarine flows must be sufficient to ensure Water Framework Directive target of Good Ecological Status (GES) is met.<br><br>*Baseline to be established :-*<br>*Data to be used is existing tide gauge and current meter data from EA ca 2000, and agreed WFD monitoring measures.* | |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| A4 | | | **Sediment budget**<br><br>*(characteristic range and relative proportions of sediment sizes and sediment budget - section 4.1.1.iii of the conservation objectives)* | Evaluation of the sediment fluxes, sources and sinks, using a variety of measures including bathymetry, suspended sediment concentrations, fluvial and marine influx/efflux, man-made changes (e.g. navigational dredging/marine minerals extraction), cliff erosion etc) | No decrease in sediment budget from the established baseline<br><br>*Baseline to be established :-*<br>*Data to be used is Severn Estuary Coastal Habitat Management Plan (CHaMP) Part F- Sediment Budget Analysis* | A sediment budget is a balance of the sediment volume entering and exiting a particular section of the coast or an estuary. Sediment budget analysis consists of the evaluation of sediment fluxes, sources and sinks from different processes that give rise to additions and subtractions within a control volume (e.g. a section of coast or an estuary) in order to gain a better understanding of the estuary system.<br><br>An estuary provides a readily defined control volume, where point sources and sinks exist in the form of rivers, other terrestrial outfalls and the open sea. Line sources and sinks may be defined in terms of erosion from cliffs and transfers to or from saltmarshes, wetlands or other intertidal areas. The subtidal beds also needs consideration as an important source/sink as does material stored in suspension within the volume of water that moves back and forth under tidal action within the estuary.<br><br>Identification and quantification of all the mechanisms giving rise to sediment transfers can be difficult, and for the most part are approximate estimates of sediment exchange between sources and sinks.<br><br>Reference ; ABPmer and HR Wallingford (2007). |
| A5 | ***SAC interest feature 1:*** **Estuaries** | | **Sediment size, range and distribution**<br><br>*(characteristic range and proportions of sediment sizes and sediment budget - section 4.1.1.iii of the conservation objectives )* | Sediment size distribution characterised and measured by particle size analysis (PSA) at a series of locations across the estuary during the reporting cycle (locations and frequency to be determined) | Sediment size distribution should not deviate from an established baseline.<br><br>*Baseline to be established :-*<br>*Data to be used is* BGS seabed sediment data and other relevant datasets ? | PSA measures parameters including percentage sand/silt/gravel, mean and median grain size and sorting co-efficient, used to characterise sediment type. Sediment character is key to the structure of the features and reflects the physical processes acting on it – it may vary across the estuary and can be used to indicate the spatial distribution of sediment types reflecting the stability of the features and the processes supporting it.. |
| **A6** | | Subtidal sandbanks | **Extent, variety and spatial distribution of estuarine habitat communities**<br><br>*(section 4.1.1.iv of the conservation objectives)* | *For information on the attributes of the subtidal sandbank communities sub-feature see the sections of this table which relate to the subtidal sandbanks which are covered by seawater all the time feature, see Table 9* | | |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **A7** | | Intertidal mudflat and sandflat communities | **Extent, variety and spatial distribution of estuarine habitat communities** *(section 4.1.1.iv of the conservation objectives)* | *For information on the attributes of the intertidal mudflat & sandflat communities sub-feature see the sections of this table which relate to the intertidal mudflats and sandflats not covered by seawater at low tide feature, see Table 10* | | |
| **A8** | | Atlantic salt meadow (and associated transition habitats) | **Extent, variety and spatial distribution of estuarine habitat communities** *(section 4.1.1.iv of the conservation objectives)* | *For information on the attributes of the Atlantic salt meadow communities sub-feature see the sections of this table which relate to Atlantic salt meadow feature, see Table 11* | | |
| **A9** | | Reefs of *Sabellaria alveolata* | **Extent, variety and spatial distribution of estuarine habitat communities** *(section 4.1.1.iv of the conservation objectives)* | *For information on the attributes of the Reef sub-feature see the sections of this table which relate to the Reef feature, see Table 12* | | |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **A10** | ***SAC interest feature 1:*** **Estuaries** | Hard substrate habitats and their notable communities | **Extent & variety**<br><br>*(extent, variety, spatial distribution and community composition of hard substrate habitats and their notable communities - section 4.1.1.v of the conservation objectives)* | Area (ha) and range of types of hard substrate habitats and their notable communities, measured periodically during the reporting cycle along sampling transects or grids (frequency to be determined). | No decrease in extent or range of types of hard substrate habitats and their notable communities from the established baseline subject to natural processes.<br><br>*Baseline is the CCW and English Nature Intertidal Biotope Surveys 2006.* | Loss of hard substrate habitats and their notable communities is likely to be detrimental to the structure of the interest feature, e.g. associated with a change in estuary processes and may indicate long term changes in the physical conditions of the estuaries interest feature.<br><br>Notable communities of the Severn Estuary comprise the following<br>• *Sabellaria alveolata reefs on sand-abraded eulittoral rock* (MLR.Sab.Salv)<br>• *Hydroids, ephemeral seaweeds and Littorina littorea in shallow eulittoral mixed substrata pools.* **(**LR.RkpH)<br>• *Balanus crenatus and Tubularia indivisa on extremely tide-swept circalittoral rock.*(ECR.BS.BalTub)<br>• *Fucus serratus* and piddocks on lower eulittoral soft rock (MLR.Fser.Pid)<br>• *Mytilus edulis* and piddocks on eulittoral firm clay (MLR.MytPid)<br>• *Balanus crenatus, Halichondrea panicea* and *Alcyonidium diaphanum* on extremely tide-swept sheltered circalittoral rock (ECR.BalHpan)<br>• *Sertularia cupressina and Hydrallmania falcate* on tide-swept sublittoral cobbles or pebbles in coarse sand (IGS.ScupHyd).<br>• *Corralina officinalis* and coralline crusts in shallow eulittoral rockpools (LR.rkp.Cor)<br>• Eel grass (*Zostera*) beds<br>• Any other notable hard substrata communities that may be identified. |
| **A11** | | | **Spatial distribution**<br><br>*(extent, variety, spatial distribution and community composition of notable communities - section 4.1.1.v of the conservation objectives)* | Spatial distribution of notable communities measured periodically during the reporting cycle using a combination of remote sensing and ground truthing using GPS (frequency to be determined). | Macroscale distribution of notable communities should not deviate significantly from the established baselines, subject to natural processes.<br><br>*Baseline is the CCW and English Nature Intertidal Biotope Surveys 2006.* | Changes in the variety or distribution of notable estuarine communities may indicate long term changes in the physical conditions of the estuary interest feature or individual subfeatures. |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **A12** | ***SAC interest feature 1:*** **Estuaries** | Hard substrate habitats and their notable communities | **Community composition**<br><br>*(extent, variety, spatial distribution and community composition of notable communities - section 4.1.1.v of the conservation objectives)* | Assessment of community quality through survey of species composition (presence of typical species) within the notable communities measured periodically | No decline in community quality due to changes in species composition or loss of typical species from an established baseline<br><br>*Baseline to be established :*<br>*Data to be used : CCW and English Nature Intertidal Biotope Surveys 2006 and future surveys* | Different associations of plants, animals and their habitat are an important structural and functional aspect of the feature. Changes in the communities present within an area of a particular type may indicate long-term changes in physical conditions at the site.<br><br>Typical species of the notable communities to be determined. |
| **A13** | | Notable estuarine species assemblages : **Assemblage of fish species** | **Abundance**<br><br>*(abundance of notable estuarine species assemblages - section 4.1.1.vi of the conservation objectives )* | Numbers of species and population estimates | No significant reduction in overall diversity of species or in individual populations against an established baseline<br><br>*Baseline to be established :*<br>*Data to be used : Environment Agency and relevant Sea Fisheries Committee data* | Loss of notable communities may indicate long term changes in the physical conditions of the estuaries interest feature or individual subfeatures.<br><br>**Assemblage of fish species:** (Refer to section 4.1.1 note 7)<br>• Migratory species (see also section of this table which relates to the river lamprey, sea lamprey and twaite shad features)<br>• Estuarine species<br>• Marine species<br>• Freshwater species<br><br>Refer also to section 4.3.2 in relation to the assemblage of migratory fish species of the Ramsar Site. |
| **A14** | | Notable estuarine species assemblages : **Assemblage of waterfowl species** | **Abundance**<br><br>*(abundance of notable estuarine species assemblages - section 4.1.1.vi of the conservation objectives )* | Numbers of species and individual population sizes | No significant reduction in overall diversity of species or in individual populations against an established baseline<br><br>*Baselines are identified in the SPA section of this advice – see section 4.2* | Loss of notable communities may indicate long term changes in the physical conditions of the estuaries interest feature or individual subfeatures.<br><br>Refer also to section 4.2.7 in relation to the Internationally important **assemblage of waterfowl** of the Severn Estuary SPA and section 4.3.9 in relation to the Internationally important assemblage of waterfowl of the Severn Estuary Ramsar Site |
| **A15** | | Notable estuarine species assemblages : **Assemblage of vascular plant species** | **Abundance of saltmarsh species**<br><br>*(abundance of notable estuarine species assemblages - section 4.1.1.vi of the conservation objectives )* | Number of species and population sizes | No significant reduction in overall diversity of species or in individual populations against an established baseline<br><br>*Baselines to be established:*<br>*Data to be used is 1998 NVC Scarce plant survey, county botanical records and CCW/NE site records* | Loss of notable communities may indicate long term changes in the physical conditions of the estuaries interest feature or individual subfeatures.<br><br>**Assemblage of vascular plant species includes**:<br>• Salt marsh species<br><br>Note : maintaining the conditions necessary for these species are covered by the Atlantic salt meadows table attributes Table 11 |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **A16** | ***SAC interest feature 1:*** **Estuaries** | Notable estuarine species assemblages : **Assemblage of vascular plant species** | **Abundance of Eel grass** | Extent and density of Eel grass species | No significant reduction in overall extent and density against as established baseline<br><br>*Baseline is CCW and English Nature Intertidal Biotope Surveys 2006 plus Severn Second Crossing monitoring data 1989-95/6* | **Assemblage of vascular plant species includes**:<br>• Eel grass *(Zostera)* species. |
| **A17** | | All sub-features | **Water quality – physico-chemical parameters**<br><br>(Including temperature, salinity, oxygen, nutrients, pH and turbidity etc)<br><br>*(physico chemical characteristics of the water column - section 4.1.1.vii of the conservation objectives)* | Physico-chemical parameters measured periodically throughout the reporting cycle (frequency to be determined). | Physico-chemical parameters should not pose a risk to the ecology* of the habitats and species of the SAC, SPA or Ramsar Site.<br>Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive. | Changes in any of the physico-chemical parameters in the water column can impact on the quality of the estuary habitat and hence could lead to changes in the presence and distribution of species (along with recruitment processes and spawning behaviour) and those at the edge of their geographic ranges and non-natives.<br><br>*ie does not compromise the quality, extent, distribution or species composition of habitats or their ability to support species features (eg feeding, breeding, resting) – the outcome sought is the healthy functioning of the estuary. |
| **A18** | | | **Phytoplankton**<br><br>*(physico chemical characteristics of the water column - section 4.1.1.vii of the conservation objectives)* | Average **phytoplankton biomass and characteristic species** in summer, measured periodically during the reporting cycle. | Growth of phytoplankton does not cause an undesirable disturbance to the estuary habitats and species<br><br>Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive. | |
| **A19** | | | **Macroalgae** | Average **macroalgal cover and density** in summer, measured periodically during the reporting cycle. | Average macroalgal cover and density should not compromise the ecology * of the estuary habitats and species<br><br>Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive. | *ie does not compromise the quality, extent, distribution or species composition of habitats or their ability to support species features (eg feeding, breeding, resting) – the outcome sought is the healthy functioning of the estuary. |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **A20** | ***SAC interest feature 1:*** **Estuaries** | | **Toxic contaminants**<br><br>*(toxic contaminants in water column and sediment - section 4.1.1.viii of the conservation objectives)* | Toxic contaminants measured periodically throughout the reporting cycle (frequency to be determined). | Toxic contaminants in water column and sediment should be below levels which would pose a risk to the ecology* of the estuary habitats and species<br><br>Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive | Elevated concentrations of toxic contaminants in the water column and sediment have the potential to cause lethal or sub-lethal harm to any features and sub-features.<br><br>*ie does not compromise the quality, extent, distribution or species composition of habitats or their ability to support species features (eg feeding, breeding, resting) – the outcome sought is the healthy functioning of the estuary. |
| **A21** | | | **Airborne nutrient and contaminants**<br><br>*(airborne contaminants - section 4.1.1.ix of the conservation objectives)* | Airborne contamiants measured periodically throughout the reporting cycle (frequency to be determined) | No exceedence of critical loads for:<br>Sulphur dioxide - 20µg/m³<br>Nitrous Oxides - 30µg/m³<br>Ozone - 3000 ppb<br>Ammonia - 3µg/m³<br>Nutrient Nitrogen - 30-40 kg/ha/yr. | Critical loads have been defined where possible (www.apis.ac.uk) for the conservation features of the European site. Where the critical load is exceeded features are at risk. As more in depth studies are undertaken critical loads will be altered to reflect best available scientific knowledge.<br><br>The impacts of air pollution on the vegetation need further investigation. If particularly damaging, point sources (or groups of point sources) can be identified, then emissions should be regulated toreduce the impacts. It will also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution. There is currently insufficient knowledge to make a judgment of the impacts on specific species. Decisions should be made at a site specific level." |

## Table 9 – Favourable condition table for the "subtidal sandbanks" feature of the Severn Estuary SAC

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **B1** | ***SAC interest feature 2:*** **Subtidal Sandbanks** | All sub-features | **Extent of feature**<br><br>*(total extent of subtidal sandbanks - section 4.1.2.i of the conservation objectives)* | Total extent assessed periodically against baseline map (using bathymetry data, and other geophysical techniques (e.g. sidescan sonar), and sediment grain-size data) | No decrease in extent of subtidal sandbanks features from an established baseline, subject to natural processes.<br><br>*Baseline is taken from 1994 admiralty charts, BGS seabed sediment data and sediment environments defined in the Bristol Channel Marine Aggregates Study (Posford Duvivier and ABP Research Consultancy, 2000).*<br><br>*Refer also to Map in Appendix 3* | Extent is an attribute on which reporting is required by the Habitats Directive.<br><br>Within the Severn the subtidal sandbanks feature includes both relatively permanent and stable banks (shown in Appendix XX as subtidal sandbanks) and more ephemeral banks which contribute sediment to the sandbanks (shown in Appendix XX as associated sediments) and which are therefore considered to be an integral part of the feature<br><br>In the long term loss of subtidal sandbank feature communities is likely to be detrimental to the structure of this interest feature and the intertidal mudflats and sandflats features, e.g. associated with a change in sediment budget or geomorphological regime, and may indicate long term changes in the physical conditions of the estuaries interest feature. |
| **B2** | | All sub-features | **Extent of the subtidal sandbank communities**<br><br>*(extent of subtidal sandbank communities -section 4.1.2.ii of the conservation objectives)* | Extent of subtidal sandbank communities within the site assessed periodically (method and frequency to be determined). | No decrease in extent of the communities from an established baseline subject to natural processes.<br><br>*Baseline is data held on Marine Recorder* | The subtidal sandbanks feature comprises two sub-features<br><br>**Sublittoral sands and muddy sand** :<br>This sub-feature comprises the following four communities:<br>• Infralittoral mobile sand in variable salinity<br>• Infralittoral mobile clean sands with sparse fauna<br>• Nephtys cirrosa and Macoma balthica in variable salinity infralittoral mobile sand<br>• Neomysis integer and Gammarus spp in fluctuating low salinity infralittoral mobile sand<br><br>**Sublittoral cohesive mud and sandy mud communities**<br>This sub-feature comprises the following four communities:<br>• Capitella capitata in enriched sublittoral muddy sediments<br>• Nephtys hombergii and Tubificiodes spp. In variable salinity infralittoral soft mud<br>• Capitella capitata and Tubificiodes spp. In reduced salinity infralittoral muddy sediment<br>• Nephtys hombergii and Macoma balthica in infralittoral sandy mud |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **B3** | ***SAC interest feature 2:*** **Subtidal Sandbanks** | | **Distribution of subtidal sandbank communities**<br><br>*(extent of subtidal sandbank communities -section 4.1.2.ii of the conservation objectives)* | Spatial distribution of subtidal sandbank communities measured periodically<br>(frequency to be determined). | No significant change in the macro scale distribution of the communities from an established baseline subject to natural processes<br><br>*Baseline is data held on Marine Recorder* | Some biotopes occur in a natural cycle linked to the dynamism of the prevailing conditions, and these may naturally appear and disappear over time. The feature should not be considered in unfavourable condition due to the short-term disappearance of such ephemeral biotopes |
| **B4** | | | **Community composition**<br><br>*(community composition of the subtidal sandbank communities -section 4.1.2.iii of the conservation objectives)* | Assessment of community quality through survey of species composition within the subtidal sandbank feature measured periodically | No decline in community quality due to changes in species composition or loss of typical species from an established baseline subject to natural processes<br><br>*Baseline is data held on Marine Recorder and EA WFD benthic sampling data* | Different associations of plants, animals and their habitat are an important structural and functional aspect of the feature. Changes in the communities present within an area of a particular type of sediment may indicate long-term changes in physical conditions at the site.<br><br>Typical species of the subtidal sandbanks communities include:<br>*Aricidea minuta, Capitella capitata, Diastylis rathkei typical, Eurydice pulchra, Gammarus salinus, Harpinia pectinata, Mediomastus fragilis, Nephtys cirrosa, Nephtys hombergii, Oligochaeta, Pygospio elegans, Pontocrates arenarius, Pseudocuma longicornis, Retusa obtuse, Tubificoides amplivasatus* |
| **B5** | | All sub-features | **Sediment character**<br><br>*(variety & distribution of sediment types - section 4.1.2.iv of the conservation objectives)* | Distribution of sediment types/grain sizes assessed across the site | No major change in composition of sediment type across the feature against an established baseline subject to natural processes<br><br>*Baseline to be established*<br>*Data to be used is BGS seabed sediment data and other relevant datasets* | |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **B6** | ***SAC interest feature 2:*** **Subtidal Sandbanks** | All sub-features | **Topography**<br><br>*(gross morphology – depth distribution and profile of subtidal sandbank feature - section 4.1.2.v of the conservation objectives)* | Depth distribution/profile of the sandbank feature measured across the site | No major alteration of topography of the subtidal sandbank feature against an established baseline<br><br>*Baseline to be established*<br>*Data to be used is Hydrographic Office bathymetric data and other relevant bathymetric datasets* | |

## Table 10 – Favourable condition table for the "intertidal mudflats and sandflats" feature of the Severn Estuary SAC

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **C1** | ***SAC interest feature 3:*** **Mudflats and sandflats** | All sub-features | **Extent of the feature**<br><br>*(total extent of the mudflats and sandflats feature - section 4.1.3.i of the conservation objectives)* | Total area (ha) of the intertidal mudflat and sandflat feature measured periodically during the reporting cycle using a combination of remote sensing and ground truthing of boundaries between communities using GPS (frequency to be determined). | No decrease in extent of intertidal mudflats and sandflats from an established baseline, subject to natural processes.<br><br>*Baseline is aerial photography dated 1999 and CCW/English Nature Intertidal Biotope Surveys 2006.*<br>*(Note air photo coverage from 1988 gives data for assessing trends in change of this attribute.) Refer also to maps in Appendix 4* | Extent is an attribute on which reporting is required by the Habitats Directive. In the long term loss of intertidal mudflat / sandflat communities is likely to be detrimental to the structure of the interest feature, e.g. associated with a change in sediment budget or geomorphological regime, and may indicate long term changes in the physical conditions of the estuaries interest feature. Some fluctuations in extent may occur which are directly attributable to natural coastal processes. These include reduced extent following storms or due to a change to another feature habitat such as saltmarsh. Such types of change in extent would form under the umbrella of 'natural change' |
| **C2** | | All sub-features | **Extent and variety of the mudflats and sandflats communities comprising each sub-feature**<br><br>*(variety and extent of the mudflat and sandflats communities – section 4.1.3.ii of the conservation objectives)* | Extent and range of types of intertidal mudflat and sandflat communities assessed along a sampling transect or grid and rapid phase 1 survey techniques using GPS (frequency to be determined). | No decrease in the extent or range of types of intertidal mudflat and sandflat communities from an established baseline, subject to natural processes<br><br>*Baseline is CCW/English Nature Intertidal Biotope Surveys 2006.* | Intertidal mudflat and sand flat feature comprises three sub-features:<br><br>**Intertidal gravel and clean sand communities**<br>• Barren coarse sand shores;<br>• Burrowing amphipods and *Eurydice pulchra* in well drained clean sand shores;<br>• Burrowing amphipods and polychaetes in clean sand shores.<br>• Talitrid amphipods in decomposing seaweed on the strandline<br>• Dense *Lanice conchilega* in tide-swept lower shore sand<br>• Barren shingle or gravel shores<br>**Intertidal muddy sand communities**<br>• Polychaetes and *Cerastoderma edule* in fine sand or muddy sand shores<br>• *Bathyporeia pilosa* and *Corophium* spp. in upper shore slightly muddy fine sand shores<br>• *Macoma balthica* and *Arenicola marina* in muddy sand shores.<br>• *Arenicola marina*, *Macoma balthica* and *Mya arenaria* in muddy sand shores.<br>• *Echinocardium cordatum* and *Ensis* sp. in lower shore or shallow sublittoral muddy fine sand<br>**Intertidal mud communities**<br>• *Hediste diversicolor* and *Macoma balthica* in sandy mud shores<br>• *Hediste diversicolor*, *Macoma balthica* and *Arenicola marina* in muddy sand or sandy mud shores<br>• *Hediste diversicolor*, *Macoma balthica* and *Mya arenaria* in sandy mud shores<br>• *Hediste diversicolor* and *Scrobicularia plana* in reduced salinity mud shores<br>• *Hediste diversicolor* and oligochaetes in low salinity mud shores |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **C3** | ***SAC interest feature 3:*** **Mudflats and sandflats** | All subfeatures | **Distribution of mudflats and sandflats communities**<br><br>*(distribution of communities - section 4.1.3.iii of the conservation objectives)* | Spatial distribution of mudflat and sandflat communities assessed along a sampling transect or grid and rapid phase 1 survey techniques using GPS (frequency to be determined). | Macro scale distribution of communities should not deviate significantly from an established baseline, subject to natural processes.<br><br>*Baseline is CCW/English Nature Intertidal Biotope Surveys 2006.* | Changes in the spatial distribution of biotopes within an area of a particular type of sediment may provide the first indications of long-term changes in physical conditions at the site.<br><br>Some biotopes occur in a natural cycle linked to the dynamism of the prevailing conditions, and these may naturally appear and disappear over time. The feature should not be considered in unfavourable condition due to the short-term disappearance of such ephemeral biotopes. |
| **C4** | | All subfeatures | **Community composition**<br><br>*(community composition of the feature - section 4.1.3.iv of the conservation objectives)* | Assessment of community quality through survey of species composition (presence of typical species) within the intertidal mudflats and sandflats feature measured periodically | No decline in community quality due to changes in species composition or loss of typical species from an established baseline, subject to natural processes.<br><br>*Baseline is CCW/English Nature Intertidal Biotope Surveys 2006.* | Different associations of plants, animals and their habitat are an important structural and functional aspect of the feature. Changes in the communities present within an area of a particular type of sediment may indicate long-term changes in physical conditions at the site.<br><br>Typical species of the intertidal mudflats and sandflats communities include: *Aphelochaeta marioni, Arenicola marina, Bathyporeia pelagica, Corophium volutator, Enchytraeidae, Eurydice pulchra, Hediste diversicolor, Hydrobia ulvae, Macoma balthica, Nephtys cirrosa, Nephtys hombergii, Oligochaeta indet, Pygospio elegans, Scoloplos armiger, Scrobicularia plana, Streblospio shrubsolii, Tubificoides benedii* |
| **C5** | | | **Topography**<br><br>*(Topography and morphology of the intertidal flats -section 4.1.3v of the conservation objectives)* | Tidal elevation and intertidal slope, measured along a series of transects across the estuary periodically during the reporting cycle using remote sensing or traditional surveying techniques (transect locations and survey frequency to be determined). | Intertidal profile should not deviate significantly from an established baseline, subject to natural processes.<br><br>*Baseline to be established:*<br>*Data to be used is Environment Agency LIDAR survey* | In the intertidal zone topography reflects the energy conditions and stability of the sediment, which is key to the structure of the interest feature. Topography is a major influence on the distribution of communities throughout the intertidal flats. Assessing topography also provides information on the position of channels through the interest feature.<br><br>. |
| **C6** | | | **Sediment character** | **Particle size analysis** (PSA). measured at a series of locations across the estuary. Locations and frequency to be determined | Average PSA parameters should not deviate significantly from an established baseline.<br><br>*Baseline to be established*<br>Data to be used *CCW/English Nature Intertidal Biotope Surveys 2006, BGS seabed sediment data and other relevant data sources* | Parameters include percentage sand / silt / gravel, mean and median grain size, and sorting coefficient, used to characterise sediment type<br><br>Sediment character defined by particle size analysis is key to the structure of the feature, and reflects all of the physical processes acting on it. Particle size composition varies across the feature and can be used to indicate spatial distribution of sediment types thus reflecting the stability of the feature and the processes supporting it. |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **C7** | ***SAC interest feature 3:*** **Mudflats and sandflats** | | | **Sediment penetrability** (degree of sinking) measured at a series of locations across the estuary (methodology, locations and frequency to be determined). | Average measure should not deviate significantly from an established baseline.<br><br>*Baseline to be established by future survey* | Penetrability is an indicator of sediment stability and degree of compaction; it indicates the shear strength of the sediment and thus the susceptibility of that sediment type to erosion. Compaction of the sediment influences the biological community within the sediment. Penetrability of the sediment is determined by a combination of grain size and water content, which may provide a surrogate index of the penetrability of the sediments. |
| **C8** | | | | **Sediment organic content** (% carbon) measured at a series of locations across the estuary (sampling locations and frequency to be determined). | Average organic carbon content should not deviate significantly from an established baseline.<br><br>*Baseline to be established by future survey* | Organic content critically influences the infaunal community and can cause deoxygenation of the feature, which can be detrimental to the biota. However, a balance needs to be struck as organic content provides a measure of the material available to detritivores. A reduction in organic content could lead to a reduction in detritivores, with subsequent knock on effects throughout the food chain. |
| **C9** | | | | **Oxidation - reduction potential** (depth of black anoxic layer) measured at a series of locations across the estuary (sampling locations and frequency to be determined). | Average black layer depth should not deviate significantly from an established baseline.<br><br>*Baseline to be established by future survey* | Degree of oxidation / reduction, reflecting oxygen availability within the sediment, critically influences the infaunal community and the mobility of chemical compounds. It is an indicator of the structure of the feature. |

## Table 11 – Favourable condition table for the "Atlantic salt meadows" feature of the Severn Estuary SAC

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **D1** | ***SAC interest feature 4:* Atlantic salt meadows** | All sub-features | **Extent of Atlantic salt meadow (and transitional habitats) feature**<br><br>*(extent of Atlantic salt meadow (and transitional habitats) feature - section 4.1.4.i of the conservation objectives)* | Total area (ha) of the Atlantic salt meadow feature (and associated transitional habitats) within the site measured periodically during the reporting cycle using a combination of remote sensing and ground truthing of boundaries between communities using GPS (frequency to be determined). | No decrease in total extent of Atlantic salt meadow and associated transitional habitats from the established baseline.<br><br>*Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998*<br><br>*Refer also to maps in Appendix 5* | Extent is an attribute on which reporting is required by the Habitats Directive.<br><br>Monitoring will need to take account of the dynamic nature of these habitats and seasonal and periodic random variations in vegetation types.<br><br>Coastal squeeze may result in the replacement of Atlantic salt meadows with pioneer saltmarsh. A reduction in extent could be further evaluated by a ground survey to assess for signs of erosion such as toppled vegetation blocks, signs of roots in intertidal mud, signs of stress/damage to plants. Extent needs to be measured at low tide. |
| **D2** | | All sub-features | **Extent of the Atlantic salt meadow communities and associated transitional vegetation communities**<br><br>*(extent and distribution of atlantic salt meadow and associated transitional vegetation communities - section 4.1.4.ii of the conservation objectives)* | Area (ha) of Atlantic salt meadow and associated transitional vegetation communities within the site measured periodically during the reporting cycle using a combination of remote sensing and ground truthing of boundaries between communities using GPS (frequency to be determined). | No decrease in extent of Atlantic salt meadow and associated transitional vegetation communities from the established baseline subject to natural processes<br><br>*Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998* | Assessment against this target will take account of the effects of the natural process of cyclical development and breakdown of saltmarshes within the Severn which results in the natural succession of saltmarsh communities over time ie the continued presence of all types in proportions reflecting the natural processes operating.<br><br>Some individual salt marsh communities occur in a natural cycle linked to the dynamism of the prevailing conditions, and these may naturally appear and disappear over time. The feature should not be considered in unfavourable condition due to the short-term disappearance of transient communities.<br><br>The outcome sought is the maintenance of the general character of the saltmarshes of the Severn in terms of the continued presence, abundance and variation of communities with local differences reflected – it is not to seek the retention of saltmarsh types in situ but to allow them to shift and evolve in line with natural processes<br><br>The Atlantic salt meadow feature comprises four sub-features:<br>**Low to mid marsh communities**<br>NVC communities: SM10, SM12, SM13a, SM13b, SM13c,SM13d, SM13x, SM13y,SM14a, SM15.<br>**Mid to upper marsh communities**<br>NVC communities: SM16a, SM16b, SM16c, SM16d, SM16e, SM16x, SM17, SM18c.<br>**Transitional high marsh communities**<br>NVC communities: SM23, SM24, SM28, MG11, MG12, MG13, S4a, S21a, S21c.<br>**Pioneer saltmarsh communities**<br>NVC communities: SM6, SM8, SM9 |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **D3** | ***SAC interest feature 4:*** **Atlantic salt meadows** | All sub-features | **Distribution of the Atlantic salt meadow communities and associated transitional vegetation communities**<br><br>*(extent and distribution of atlantic salt meadow and associated transitional vegetation communities - section 4.1.4.ii of the conservation objectives)* | Spatial distribution of Atlantic saltmeadow and associated transitional vegetation communities measured along a series of fixed transects (or other suitable method to be agreed) periodically during the reporting cycle using GPS (transect locations and frequency of survey to be determined). | The macro scale distribution of communities should not deviate significantly from an established baseline subject to natural processes.<br><br>*Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998* | The distribution of the Atlantic salt meadow communities refers to the macro spatial pattern in which these are distributed around the estuary. This statement does not require micro-distribution of communities (i.e. the exact mapped positions of specific communities to be maintained) but does require the distribution of some saltmarsh types which reflect the differences in estuary structure and function (eg in outer versus inner parts of the estuary, or the influence of freshwater inputs from the rivers) be taken into account.<br><br>Consideration of this attribute needs to take account of the wider scale and long-term changes and development of saltmarshes in the Severn Estuary which shows a pattern of episodic erosion and accretion evident in a series of saltmarsh terraces. This attribute is also linked with attributes covering zonation and morphology below. |
| **D4** | | All sub-features | **Extent of *Spartina anglica***<br><br>*(areas of Spartina anglica - section 4.1.4.viii of the conservation objectives)* | Total extent of Spartina anglica measured along a series of transects (or other suitable method to be agreed) around the estuary, periodically during the reporting cycle, using a combination of remote sensing and ground survey (transect locations and frequency of survey to be determined). | No increase in total extent of more than 10% over monitoring period;<br><br>*Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998* | *Spartina anglica* acts as a pioneer species in the Severn and can undergo succession to other saltmarsh habitats over time. As a consequence, although it may be colonising new areas in one part of the estuary, in others it may be developing into more mixed saltmarsh communities. There will be differences in the density, height and cover of the vegetation depending on where it is in the succession. These changes will need to be monitored to establish a baseline and rates of any gross change. An increase in *Spartina* at the expense of other saltmarsh could indicate changes in the sediment regime and/or tidal levels both in response to natural or anthropogenic processes. Monitoring will only focus on areas of gross expansion of *Spartina* into intertidal mudflat and saltmarsh communities. |
| **D5** | | All sub-features | **Zonation of vegetation**<br><br>*(zonation of Atlantic salt meadow communities - section 4.1.4.iii of the conservation objectives)* | Width of pioneer, low-mid marsh, mid-upper marsh, and transitional high marsh saltmarsh zones, measured along a series of transects (or other suitable method to be agreed) around the estuary, periodically during the reporting cycle, using a combination of remote sensing and ground survey (transect locations and frequency of survey to be determined). | The range of variation of zonation of saltmarsh communities around the estuary should not deviate significantly from an established baseline, subject to natural processes.<br><br>*Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998 (and English Nature condition assessment data collected in 2002 for Gloucestershire section of the estuary.* | Assessment against this target will take account of the effects of the natural process of cyclical development and breakdown of saltmarshes within the Severn which results in the natural succession of saltmarsh communities and changes to the zonation over time . ie the continued presence of all zones in proportions reflecting the natural processes operating.<br><br>The outcome sought is the maintenance of the general character of the saltmarshes of the Severn in terms of the continued presence and variation of the saltmarsh zones with local differences reflected – it is not to seek the retention of zones in situ but to allow them to shift and evolve in line with natural processes |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **D6** | ***SAC interest feature 4:*** **Atlantic salt meadows** | Low to mid marsh communities | **Species composition**<br><br>*(abundance of typical species - section 4.1.4.iv of the conservation objectives)* | Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle | Frequency of typical species of characteristic low to mid marsh communities should not deviate significantly from an established baseline.<br><br>*Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998* | The typical species for these communities include:<br>*Puccinellia maritima, Salicornia spp., Suaeda maritima, Aster tripolium, Spergularia marginata, Glaux maritima, Plantago maritima, Atriplex glabriuscula, Atriplex prostrata, Triglochin maritima, Limonium vulgare, Armeria maritima and Juncus maritimus*<br><br>*This target should not however prevent the enhancement of the diversity of swards where possible eg through the encouragement of a wider range of herbs through relaxation of grazing pressure in heavily grazed areas. |
| **D7** | | Mid to upper marsh communities | **Species composition**<br><br>*(abundance of typical species - section 4.1.4.iv of the conservation objectives)* | Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle | Frequency of typical species of characteristic mid to upper marsh communities should not deviate significantly from an established baseline.<br><br>*Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998* | The typical species for these communities include :<br>*Puccinellia maritima, Aster tripolium, Glaux maritima, Plantago maritima, Festuca rubra, Juncus gerardii, Triglochin maritima, , Agrostis stolonifera, Juncus maritimus , Spergularia marginata, Parapholis strigosa, Elymus pycnanthus,, Hordeum secalinum, Trifolium fragiferum and Atriplex glabriuscula,*<br><br>*(see note above) |
| **D8** | | Transitional high marsh communities | **Species composition**<br><br>*(abundance of typical species - section 4.1.4.iv of the conservation objectives)* | Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle | Frequency of typical species of characteristic high marsh communities should not deviate significantly from an established baseline.<br><br>*Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998* | The typical species for these communities include:<br>*Puccinellia distans, Puccinellia maritima, Puccinellia rupestris, Plantago coronopus, Parapholis strigosa, Atriplex glabriuscula, Spergularia marina, Festuca rubra, Agrostis stolonifera, Aster tripolium, Hordeum secalinum, Elymus pycnanthus, Elymus repens, Potentilla anserina, Lolium perenne, Alopecurus geniculatus, Phragmites australis, Bolboschoenus maritimus, Festuca arundinacea,*<br><br>*(see note above ) |
| **D9** | | Pioneer saltmarsh communities | **Species composition**<br><br>*(abundance of typical species - section 4.1.4.iv of the conservation objectives)* | Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle | Frequency of typical species of characteristic pioneer marsh communities should not deviate significantly from an established baseline.<br><br>*Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998* | The typical species for these communities include :<br><br>*Spartina anglica, Salicornia sp, Suaeda maritima* |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **D10** | ***SAC interest feature 4:*** **Atlantic salt meadows** | | **Abundance of locally occurring scarce and notable plant species**<br><br>*(abundance of notable species - section 4.1.4v of the conservation objectives)* | Number of discrete locations within the estuary where scarce and notable species are found and their abundance at each location. | No decrease in abundance of scarce and notable species from an established baseline.<br><br>*Baseline : CCW/English Nature saltmarsh rare/scarce plant survey survey by Dargie 1998*<br>*Individual county based records from plant recorders/record centres* | Nationally scarce and notable species within the Atlantic salt meadow and associated transitional vegetation communities comprise:<br>**Nationally scarce species:**<br>*Alopecurus bulbosus, Althaea officinalis, Bupleurum tenuissimum, Hordeum marinum, Trifolium squamosum, Puccinellia rupestris, Polygonum raii.*<br>**Other notable species occurring*:***<br>*Allium oleraceum, Lepidium latifolium, Petroselinum segetum*<br>Note that some of the nationally scarce and notable plants require levels of ground disturbance (resulting in openings in the sward) to establish. Localised tight grazing and /or poaching may provide sward openings for such species as well as the wider range of herbs and unless widespread and persistent should not necessarily regarded as a problem. |
| **D11** | | All sub-features | **Sward structure**<br><br>*(structural variation of the salt marsh sward - section 4.1.4 vi of the conservation objectives)* | Sward height of Atlantic salt meadow communities measured periodically during the reporting cycle in late summer using a combination of remote sensing and field visits. | The extent and distribution of vegetation communities exhibiting different sward heights should not deviate significantly from an established set of limits. The limits will be defined to ensure that the requirements of the typical and notable plants species and birds species designated within the Severn Estuary SPA and Ramsar, can be met<br><br>*Baselines are to be established from Nature Conservancy Council SSSI owner/occupier consent records dating from 1988 Severn Estuary SSSI notification (and subsequent consent reviews)*<br>*CCW and EN/NE site monitoring records* | Vegetation structure is largely affected by the impact of grazing (of wild or domesticated herbivores) interacting with different vegetation communities and ground hydrological conditions.<br>Not all Atlantic salt meadow within the Severn Estuary is grazed, but it is a widespread and long established practice and stocking levels need to be appropriate to the interest of the site. Over grazing can lead to a loss of structural diversity of rare plant species and affect bird use of these habitats while under grazing can lead to a loss of plant diversity by competitive exclusion. Introduction of grazing to previously ungrazed sites can result in deleterious changes to plant community composition and its value for wider conservation interests such as invertebrates.<br><br>Note that some of the nationally scarce and notable plants require levels of ground disturbance (resulting in openings in the sward) to establish. Localised tight grazing and /or poaching may provide sward openings for such species as well as the wider range of herbs and unless widespread and persistent should not necessarily regarded as a problem. Disturbance is also provided in areas where natural tidal debris accumulates scattered across the salt marsh and in driftlines (often at the base and on the seaward slope of the floodbank). As well as providing seed establishment points for scarce plants the debris also plays a role in creating variation in sward structure particularly in the mid/upper and transition high marsh zones and in supporting important populations of invertebrates (notable deadwood beetles). The continued presence of tidal debris and driftlines in some locations is therefore a desirable aspect of the saltmarsh management which delivers this attribute . They may also be of value for the bird populations which roost and feed on saltmarshes of the SPA and Ramsar Site. (see sections 4.2 and 4.3) |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **D12** | ***SAC interest feature 4:*** **Atlantic salt meadows** | | **Morphology**<br><br>*(characteristic stepped morphology and associated structural features - section 4.1.4.vii of the conservation objectives)* | Location and extent of established morphological features (saltmarsh terracing, creeks, pills, drainage ditches and pans) measured during the reporting cycle using remote sensing and field survey | No anthropogenic alteration of established morphological features from an established baseline.<br><br>*Baselines is taken from 1999 air photos , CCW/English Nature Saltmarsh NVC survey by Dargie 1998 and English Nature condition assessment data collected in 2002 for Gloucestershire section of the estuary.* | This target relates to features which have developed naturally as a result of the evolution of the saltmarshes or the presence of freshwater drainage systems entering the estuary and which have established conservation value (eg pill sides of value botanically, pills used for shelter, feeding and roosting by birds). The baseline dataset will establish the location and extent of these features and identify man made features which do not need to meet this target. |

## Table 12 – Favourable condition table for the "reefs" feature of the Severn Estuary SAC

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **E1** | ***SAC interest feature 4:*** **Reefs** | | **(Total) Extent and distribution**<br><br>*(total extent and distribution of reef - section 4.1.5.i of the conservation objectives)* | Measurement of the extent and distribution of the purely subtidal part of this feature in the Severn Estuary is challenging. Remote sensing methods (such as side scan sonar) and drop down video are unreliable in these conditions. Therefore limited grab sampling may be required.<br><br>Measurement of the subtidal component at the subtidal/intertidal interface may be possible by direct observation at very low tides.<br><br>Extent and distribution of the intertidal *Sabellaria* reef measured using Phase 1 mapping survey techniques | No reduction in the extent and distribution of the reef from an established baseline<br><br>*Baseline is comprised of grab sampling surveys by Mettam 1988 supplemented by Environment Agency data 1999 and data from Warwick et al.2001 which provide subtidal reef records.*<br><br>*CCW/English Nature Intertidal Biotope Surveys 2006 identify the distribution of intertidal Sabellaria alveolata and indication of locations for further survey for subtidal Sabellaria contiguous with these intertidal areas.* | Known occurrences of subtidal and subtidal contiguous with intertidal reefs are largely limited to the outer parts of the estuary (area seaward of a line drawn between Portishead and Newport). See appendix 6. Samples show that reef formation is not continuous within this area and is in varying stages of growth. Further work is required to establish the distribution of this feature particularly with respect to the subtidal and the intertidal/subtidal interface.<br><br>A further upstream zone of intertidal *Sabellaria* populations is recorded up to the old Severn Bridge (Beachley to Aust) . While not part of the reef feature the extent of solely intertidal *Sabellaria* is relevant as these areas will also contribute larvae to the estuary wide populations of this species.<br><br>The populations of *Sabellaria* within the Severn (subtidal,and intertidal) should be regarded as a metapopulation.<br><br>New technologies that may allow the measurement of *Sabellaria* reef in a non destructive way should be investigated if they present themselves. |
| **E2** | | | **Community composition**<br><br>*(community composition - section 4.1.5.ii of the conservation objectives)-* | Measurement of the community composition of this feature in the Severn Estuary is challenging. Remote sensing methods (such as side scan sonar) and drop down video are difficult. Therefore limited grab sampling may be required. | New samples of reef show no significant decline in community composition from baseline records<br><br>*Baseline is survey by Mettam 1988 supplemented by Environment Agency data 1999 and data from Warwick et al.2001* | The reefs feature comprise two communities :<br><br>*Sabellaria alveolata* on variable salinity sublittoral mixed sediment SS.SBR.PoR.SalvMx<br><br>*Sabellaria alveolata* reefs on sand-abraded eulittoral rock. LS.LBR.Sab.Salv<br><br>The typical species associated with subtidal and intertidal reefs in the Severn Estuary, derived from known samples, are listed in section 4.15.1 note 4 |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **E3** | ***SAC interest feature 4:*** **Reefs** | | **Age structure**<br><br>*(full range of age structures - section 4.1.5.iii of the conservation objectives)* | Measurement of the community composition of this feature in the Severn Estuary is challenging. Remote sensing methods (such as drop down video) are difficult. Therefore limited grab sampling may be required. | Different phases from newly settled worms through vigorous fast growing reef to older hummocks are present<br><br>*Baseline yet to be established.* | *Sabellaria alveolata* reefs cycle through different phases from newly settled worms through vigorous fast-growing reef to older hummocks. In a stable or increasing population all age phases are likely to be present .<br><br>The presence of areas of variable stages of growth is important in ensuring larval supply and also enhances the species diversity of the reef |
| **E4** | | | **Physical & ecological processes**<br><br>*(physical and ecological processes - section 4.1.5.iv of the conservation objectives)* | **Abundance of coarse sediments**<br>Presence of suitable sediment grades in subtidal and intertidal sediments within the defined reefs zone (see comment on extent and distribution above) measured periodically. | No change in the abundance of suitable sediment grades within the defined reefs zone against an established baseline<br><br>*Baseline yet to be established.* | An abundance of suitable coarse sediments (0.5-1mm sand) are required to support reef growth (tube building) |
| **E5** | | | | **Availability of suitable substrates**<br>Extent of available suitable (hard or long-term consolidated) substrates within the defined reef zone measured periodically | No change in overall extent of available suitable substrates within the defined reefs zone against an established baseline<br><br>*Baseline yet to be established – data from the BGS and the CCW/English Nature intertidal biotope survey 2006 may assist* | Within the Severn reefs have been recorded both on solid geology and on smaller rocks and cobbles. |
| **E6** | | | | **Supply of larvae**<br>Abundance of *Sabellaria* larvae within the water column measured through plankton sampling | No decrease in the abundance of *Sabellaria* larvae against an established baseline<br><br>*Baseline yet to be established – data may be available from existing plankton sampling surveys* | Area of sampling for this attribute should include both the reef zone and areas where intertidal populations are known as all areas supporting *Sabellaria alveolata* formations will be supplying larvae to the water column and hence may seed the reef feature.<br>Recruitment is likely to be variable between years. |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **E7** | | | | **Abundance of food in water column**<br>Methods to be determined . | No decrease in the abundance of suspended detritus within the water column of the defined reef zone against an established baseline<br><br>*Baseline yet to be established* | Area of sampling of the water column should include both the reef zone and intertidal populations (the estuary-wide metapopulation of *Sabellaria alveolata*) |

## Table 13 – Favourable condition table for the "river lamprey" and "sea lamprey" features of the Severn Estuary SAC

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **F1** | ***SAC interest feature 5:*** **River lamprey** ***Lampetra fluviatilis*** **and** ***SAC interest feature 6:*** **Sea lamprey** ***Petromyzon marinus*** | | **Migratory access (Barriers to migration)** *( migratory passage not impeded - sections 4.1.6.i and 4.1.7.i of the conservation objectives)* | **Water quality** measured regularly throughout the reporting cycle in the Bristol Channel, Severn Estuary, River Wye SAC, River Usk SAC and River Severn. *(see also Table 8, lines A17-20 relating to general water quality requirements for the estuary feature (and dependant sub features)* | Water quality is sufficient to support migratory passage. Levels (for temperature, salinity, turbidity, pH, and dissolved oxygen) should comply with targets established under the EA Review of Consents and the Water Framework Directive. *Baseline is water quality sampling data collected by the Environment Agency* | Significant variation in these physico-chemical parameters may act as barriers to migration. For example, the timing, duration and consistency of their upstream migration are believed to be closely related to temperature changes as well as pheromone triggers from the juveniles during periods of high water flow. Peak migration usually coincides with river temperatures that remain above $10^{o}$C and continues until temperatures reach $18^{o}$C. Dissolved oxygen can also be significantly reduced in stretches receiving significant BOD inputs, or through the re-suspension of organic rich sediments. Toxic contaminants may act as a barrier to migration. Environmental Quality Standards (EQSs) are set for dangerous substances as defined under the Dangerous Substances Directive or Government Policy for freshwater and marine environments |
| **F2** | | | | **Water flows** measured regularly throughout the reporting cycle (frequency to be determined) in the River Wye SAC, River Usk SAC and River Severn *(see also Table 8 line A3 relating to general tidal and water flow requirements for the estuary feature (and dependant sub features)* | Flows from the river into the estuary must be sufficient to allow migration. *Baseline is water flow sampling data collected by the Environment Agency provides a baseline. Severe low flow conditions that affect these species yet to be defined* | |
| **F3** | | | | **Physical barriers** Mapping and quantification of potential obstructions in relation to height, type and water depth below obstruction once during the reporting cycle. | No artificial barriers significantly impairing, adults from reaching existing and historical spawning grounds, or juveniles from moving downstream. *Baseline is the Environment Agency data on structures and flood defences* | Dams, navigation and other weirs may prevent lamprey from reaching their spawning grounds. In particular, sea lamprey is known to be poor at ascending obstacles. |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **F4** | ***SAC interest feature 5:*** **River lamprey** ***Lampetra fluviatilis*** **and** ***SAC interest feature 6:*** **Sea lamprey** ***Petromyzon marinus*** | | **Population size** (returning adults) *(size of populations - sections 4.1.6.ii and 4.1.7.ii of the conservation objectives)* | Number of returning adults measured using fish counters on the feeding rivers (Wye , Usk and Severn) during the migratory period. | No decline in number of returning adults from established baseline. *Baseline is yet to be established - fish counter data may be able to provide a baseline in future years.* | (Note that this attribute will not be able to be measured until the technological solutions are developed.) Fish counter technology is being developed to monitor adult lampreys but is not yet installed on the feeding rivers of the Severn Estuary. Fish counter technology should be further developed to monitor migrating adult river and sea lamprey. |
| **F5** | | | **Ammocoete population in tributary rivers** *(size of populations - sections 4.1.6.ii and 4.1.7.ii of the conservation objectives)* | Electrofishing surveys in $1m^2$ quadrats at a series of locations in the Rivers Usk, Wye (and Severn) | River population targets for the Usk and Wye must be met *Baseline is the survey of ammocoete abundance and distribution in the Rivers Usk and Wye commissioned by CCW in 2005 (Harvey et al. 2007).* | (Note that this attribute will not be able to be measured until the technological solutions are developed.) During the electrofishing survey all ammocoetes should be identified as *Lampetra* or *Petromyzon* and measured (mm). Surveys should be undertaken at the earliest in July but preferably between August and October. The rivers fauna CSM state three targets which must be met for the population attribute. These are; 1. Ammocoete population age structure For samples of 50 ammocoetes or less, at least 2 distinct size classes should normally be present. If more than 50 ammocoetes are collected, at least 3 size classes should be present. 2. Ammocoete distribution within catchment Lampreys should be present at not less than 2/3 of sites surveyed. 3. Ammocoete density; a. For *lampetra*; Optimal habitat $>10m^{-2}$ Overall catchment mean $>5m^{-2}$ b. For sea lamprey - Ammocoetes should be present in at least sampling sites each not less than 5km apart |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **F6** | | | **Prey species**<br><br>*(abundance of prey species - sections 4.1.6.iii and 4.1..7.iii of the conservation objectives))* | The abundance of key prey species measured periodically | No significant reduction in abundance of key prey species against an established baseline<br><br>*Baseline is yet to be established Data to be used is EA monitoring of river and fish populations and future surveys* | River and sea lamprey require a variety of other fish species to act as hosts throughout their lifecycle. Their principal host species are part of the estuarine fish assemblage which has measures and targets included within the "estuaries" feature – Table 8 |

## Table 14 – Favourable condition table for the "twaite shad" feature of the Severn Estuary SAC

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **G1** | ***SAC interest feature 7:* Twaite shad (*Alosa fallax*)** | | **Migratory access (Barriers to migration)**<br><br>*( migratory passage not impeded - section 4.1.8.i of the conservation objectives)* | **Water quality** measured regularly throughout the reporting cycle in the Bristol Channel, Severn Estuary, River Wye SAC, River Usk SAC and River Severn.<br><br>*(see also Table 8 line A 17-20 relating to general water quality requirements for the estuary feature (and dependant sub features)* | Water quality is sufficient to support migratory passage.<br><br>Levels (for temperature, salinity, turbidity, pH, and dissolved oxygen) should comply with targets established under the EA Review of Consents and the Water Framework Directive.<br><br>*Baseline is water quality sampling data collected by the Environment Agency* | Significant variation in these physico-chemical parameters may act as barriers to migration. For example, the timing, duration and consistency of their upstream migration are believed to be closely related to temperature changes . Peak migration usually coincides with river temperatures that remain above $10^{o}$C and continues until temperatures reach $18^{o}$C.<br>Dissolved oxygen can also be significantly reduced in stretches receiving significant BOD inputs, or through the resuspension of organic rich sediments.<br><br>Toxic contaminants may act as a barrier to migration. Environmental Quality Standards (EQSs) are set for dangerous substances as defined under the Dangerous Substances Directive or Government Policy for freshwater and marine environments. |
| **G2** | | | | **Water flows** measured regularly throughout the reporting cycle (frequency to be determined) in the River Wye SAC, River Usk SAC and River Severn<br><br>*(see also Table 8 line A3 relating to general tidal and water flow requirements for the estuary feature (and dependant sub features)* | Flows from the river into the estuary must be sufficient to allow migration<br><br>*Baseline is water flow sampling data collected by the Environment Agency provides a baseline. Severe low flow conditions that affect these species yet to be defined* | |
| **G3** | | | | **Physical barriers** Mapping and quantification of potential obstructions in relation to height, type and water depth below obstruction once during the reporting cycle. | No artificial barriers significantly impairing, adults from reaching existing and historical spawning grounds, or juveniles from moving downstream.<br><br>*Baseline is Environment Agency data on structures and flood defences* | Dams, navigation and other weirs may prevent shad reaching their spawning grounds. In particular, shad are known to be poor at ascending obstacles. |

| Ref | SAC Interest Feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|---|
| **G4** | ***SAC interest feature 7:*** **Twaite shad (*Alosa fallax*)** | | **Population size (returning adults)**<br><br>*(size of populations - section 4.1.8.ii of the conservation objectives)* | Number of returning adults measured using fish counters on the Usk and Wye rivers during the migratory period. | No drop in the annual run size greater than would be expected from variations in natural mortality alone.<br><br>*Baseline is yet to be established - fish counter data may be able to provide a baseline in future years. Noble et al. (2007) provides historical information on returning adults for the River Wye.* | (Note that this attribute will not be able to be measured until the technological solutions are developed.)<br><br>Fish counter technology is being developed to monitor adult shad but is not yet installed on the feeding rivers of the Severn Estuary. Fish counter technology should be further developed to monitor migrating adult shad. |
| **G5** | | | **River population**<br><br>*(size of populations - section 4.1.8.ii of the conservation objectives)* | Seine netting for juveniles in the lower rivers and upper estuaries and monitoring of shad eggs by kick sampling | River population targets for the Usk and Wye must be met<br><br>*Baseline yet to be established. Noble et al. (2007) provides some information on juvenile densities.* | (Note that this attribute will not be able to be measured until the technological solutions are developed.)<br><br>Seine netting should occur in lower rivers and upper estuaries. Netting should be carried out in late summer early autumn (July-October). For each river, juvenile densities should exceed a specified minimum target at least two years in six.<br><br>The extent of spawning should be monitored by kick sampling for eggs at a proportion of known spawning sites. A reduction in the spawning distribution of more than 50 % compared with the baseline will indicate an adverse change. Kick sampling should occur during May and June. |
| **G6** | | | **Prey species**<br><br>*(abundance of prey species – section 4.1.8.iii of the conservation objectives))* | The abundance of key prey species measured by EA in their routine monitoring of the rivers and estuary | No significant reduction in abundance of key prey species against an established baseline<br><br>*Baseline is yet to be established through fish surveys in estuary and rivers* | Twaite shad require a variety of invertebrates including crustacean, mysids and copepods, small fish and fish eggs particularly in that section of the estuary where saline and freshwaters meet. |

## 4.2 Conservation objectives for SPA European Marine Site interest features

The protection and management of the SPA in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

Note : The conservation objectives for areas of the SPA which lie outside the European Marine Site boundary are provided in separate documents by CCW and Natural England which are currently in preparation and will soon be available on request.

### 4.2.1 SPA Interest feature 1: Internationally important population of regularly occurring Annex 1 species : Bewick's swan

The conservation objective is to maintain the Bewick's swan population and its supporting habitats[1]in **favourable condition**, as defined below

The interest feature Bewick's swan will be considered to be in favourable condition when, subject to natural processes[2], each of the following conditions are met:

(i) the 5 year peak mean population size for the Bewick's swan population is no less than 289 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);

(ii) the extent of saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;

(iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix 8: Map 1) is maintained;

(iv) the extent of vegetation with an effective field size of >6 ha and with unrestricted bird sightlines > 500m at feeding, roosting and refuge sites (Appendix III) are maintained;

(v) greater than 25% cover of suitable soft leaved herbs and grasses[3] in winter season throughout the transitional saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;

(vi) aggregations of Bewick's swan at feeding, roosting and refuge sites are not subject to significant disturbance.

#### 4.2.1.1 Explanatory information for the Bewick's swan conservation objective

**[1] Key supporting habitats for the Annex I species**

- **Intertidal mudflats and sandflats**
- **Saltmarsh**

**[2]Natural processes in respect of the SPA**

Each interest feature is subject to both natural processes and human influences. Human influence on the interest features is acceptable provided that it is compatible with the achievement of the conditions set out under the definition of favourable condition for each interest feature. A failure to meet these conditions which is entirely a result of natural processes will not constitute unfavourable condition, but will trigger a review of the definition of favourable condition. This qualification is necessary because:

(a) the bird populations themselves are subject to natural factors, many of which arise outside the SPA, such as breeding success and winter temperatures;

(b) the supporting habitats of the birds are influenced by the evolution of the estuary. Natural adjustments within estuaries can take many forms. One important example is the tendency of estuaries to accumulate sediment, thereby changing their form from their original Holocene morphology to a state where tidal energy is dissipated by subtidal and intertidal sediment banks or features. This, with other natural processes, will therefore cause the width and depth of the estuary to change over time, moving towards a state of dynamic equilibrium or 'most probable state'. As part of this process, the location and extent of saltmarshes and mudflats may change, provided there is capacity to accommodate readjustment. However, where this process is constrained, the capacity of habitats to accommodate readjustment may be affected.

**[3]Key food plants of Bewick's swan**

eg *Agrostis stolonifera, Alopecurus geniculatus, Glyceria geniculatus.* (This list contains examples and is not exhaustive )

## 4.2.2 SPA interest feature 2: Internationally important population of regularly occurring migratory species: wintering European white-fronted goose

The conservation objective is to maintain the European white-fronted goose population and its supporting habitats[1] in **favourable condition**, as defined below.

The interest feature European white-fronted goose will be considered to be in favourable condition[2] when, subject to natural processes[2], each of the following conditions are met:

(i) the 5 year peak mean population size for the wintering European white fronted goose population is no less than 3,002 individuals (ie the 5 year peak mean between 1988/9-1992/3);

(ii) the extent of saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;

(iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix 8: Map 1) is maintained;

(iv) greater than 25% cover of suitable soft-leaved herbs and grasses[3] is maintained during the winter on saltmarsh areas (Appendix 8: Map 1);

(v) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;

(vi) aggregations of European white-fronted goose at feeding or roosting sites are not subject to significant disturbance.

### 4.2.2.1 Explanatory information for the wintering European white-fronted goose objective

**[1]Key supporting habitats for the migratory bird species**

- **Intertidal mudflats and sandflats**
- **Saltmarsh**

**[2]Natural processes in respect of the SPA**

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

**[3]Key food plants of European white-fronted goose**

eg *Alopecurus bulbosus, Festuca rubra, Hordeum marinum, Lolium perenne; Puccinellia maritima*. (This list contains examples and is not exhaustive )

## 4.2.3 SPA interest feature 3: Internationally important population of regularly occurring migratory species: wintering dunlin

The conservation objective is to maintain the dunlin population and its supporting habitats[1] in **favourable condition**, as defined below:

The interest feature dunlin will be considered to be in favourable condition when, subject to natural processes[2], each of the following conditions are met:

(i) the 5 year peak mean population size for the wintering dunlin population is no less than 41,683 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);

(ii) the extent of saltmarsh (Appendix 8)and associated strandlines is maintained;

(iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;

(iv) the extent of hard substrate habitats (Appendix 8) is maintained;

(v) the extent of vegetation with a sward height of <10cm is maintained throughout the saltmarsh (Appendix 8);

(vi) the abundance and macro-distribution of suitable invertebrates[3] in intertidal mudflats and sandflats (Appendix 8) is maintained;

(vii) the abundance and macro-distribution of suitable invertebrates[3] in hard substrate habitats (Appendix 8) is maintained;

(viii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;

(ix) aggregations of dunlin at feeding or roosting sites are not subject to significant disturbance.

### 4.2.3.1 Explanatory information for the wintering dunlin objective

**[1]Key supporting habitats for the migratory bird species**

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

**[2]Natural processes in respect of the SPA**

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

**[3]Key intertidal invertebrate prey species of dunlin**

eg *Carcinus, Crangon, Hydrobia, Macoma, Hediste,* and *Talitrus* spp.
(This list contains examples and is not exhaustive )

## 4.2.4 SPA interest feature 4: Internationally important population of regularly occurring migratory species: wintering redshank

The conservation objective is to maintain the redshank population and its supporting habitats[1] in **favourable condition**, as defined below

The interest feature redshank will be considered to be in favourable condition when, subject to natural processes[2] each of the following conditions are met:

(i) the 5 year peak mean population size for the wintering redshank population is no less than 2,013 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);

(ii) the extent of saltmarsh (Appendix 8) and associated strandlines is maintained;

(iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;

(iv) the extent of hard substrate habitats (Appendix IV) is maintained;

(v) the extent of vegetation with a sward height of <10cm throughout the saltmarsh (Appendix 8) is maintained;

(vi) the abundance and macro-distribution of suitable invertebrates[3] in intertidal mudflats and sandflats (Appendix 8) is maintained;

(vii) the abundance and macro-distribution of suitable invertebrates[3] in hard substrate habitats (Appendix 8) is maintained;

(viii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;

(ix) aggregations of redshank at feeding or roosting sites are not subject to significant disturbance.

### 4.2.4.1 Explanatory information for the wintering redshank objective

**[1]Key supporting habitats for the migratory bird species**

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

**[2]Natural processes in respect of the SPA**

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

**[3]Key intertidal invertebrate prey species of redshank**

eg *Carcinus, Crangon, Hydrobia, Macoma, Hediste,* and *Talitrus* spp.
(This list contains examples and is not exhaustive )

## 4.2.5 SPA interest feature 5: Internationally important population of regularly occurring migratory species: wintering shelduck

The conservation objective is to maintain the shelduck population and its supporting habitats[1] in **favourable condition**, as defined below:

The interest feature shelduck will be considered to be in favourable condition when, subject to natural processes[2], each of the following conditions are met:

(i) the 5 year peak mean population size for the wintering shelduck population is no less than 2,892 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);

(ii) the extent of saltmarsh (Appendix 8) is maintained;

(iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;

(iv) the extent of hard substrate habitats (Appendix 8) is maintained;

(v) the abundance and macro-distribution of suitable invertebrates[3] in intertidal mudflats and sandflats (Appendix 8) is maintained;

(vi) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;

(vii) aggregations of shelduck at feeding or roosting sites are not subject to significant disturbance.

### 4.2.5.1 Explanatory information for the wintering shelduck objective

**[1]Key supporting habitats for the migratory bird species**

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

**[2]Natural processes in respect of the SPA**

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

**[3]Key intertidal invertebrate prey species of shelduck**

eg *Carcinus, Corophium* , *Hydrobia, Macoma, Mytilus,* and *Hediste* spp
(This list contains examples and is not exhaustive )

## 4.2.6 SPA interest feature 6: Internationally important population of regularly occurring migratory species: wintering gadwall

The conservation objective is to maintain the gadwall population and its supporting habitats[1] in **favourable condition**, as defined below:

The interest feature gadwall will be considered to be in favourable condition when, subject to natural processes[2], each of the following conditions are met:

(i) the 5 year peak mean population size for the wintering gadwall population is no less than 330 (ie the 5 year peak mean between 1988/9 - 1992/3);

(ii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;

(iii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;

(iv) aggregations of gadwall at feeding or roosting sites are not subject to significant disturbance.

### 4.2.6.1 Explanatory information for the wintering gadwall objective

**[1]Key supporting habitats for the migratory bird species**

- **Intertidal mudflats and sandflats**

  Note : It is currently unclear what use this species is making of the estuary – they are clearly present in intertidal areas particularly around areas freshwater streams and pills enter the estuary. Although primarily freshwater plant feeders they do also take animal material including insects, molluscs, annelids and even small fish and small amphibians – it is possible that they are feeding on such matter in the freshwater influenced mud and sands. Recent evidence indicates this species is changing it general habits as it extends its range westwards. As a result the conservation objective for this species does not include a condition in respect of the key food sources as for other species at this time.

**[2]Natural processes in respect of the SPA**

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

## 4.2.7 SPA interest feature 7: Internationally important assemblage of waterfowl

The conservation objective is to maintain the waterfowl assemblage and its supporting habitats[1] in **favourable condition**, as defined below:

The interest feature waterfowl assemblage will be considered to be in favourable condition when, subject to natural processes[2] , each of the following conditions are met:

(i) the 5 year peak mean population size for the waterfowl assemblage is no less than 68,026 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);

(ii) the extent of saltmarsh (Appendix 8) and their associated strandlines is maintained;

(iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;

(iv) the extent of hard substrate habitats (Appendix 8) is maintained;

(v) extent of vegetation of <10cm throughout the saltmarsh (Appendix 8) is maintained;

(vi) the abundance and macroscale distribution of suitable invertebrates[3] in intertidal mudflats and sandflats (Appendix 8) is maintained;

(vii) the abundance and macroscale distribution of suitable invertebrates[3] in hard substrate habitats (Appendix IV) is maintained;

(viii) greater than 25% cover of suitable soft leaved herbs and grasses[4] during the winter on saltmarsh areas (Appendix 8) is maintained;

(ix) unrestricted bird sightlines of >500m at feeding and roosting sites are maintained;

(x) waterfowl aggregations at feeding or roosting sites are not subject to significant disturbance.

### 4.2.7.1 Explanatory information for the internationally important assemblage of waterfowl

**[1]Key supporting habitats for the waterfowl assemblage[1]**

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

**[2]Natural processes in respect of the SPA**

The meaning of 'natural processes' is explained in **section 4.1.1**.

**[3]Key intertidal invertebrate prey species of the waterfowl assemblage**

eg *Arenicola, Carcinus, Corophium, Crangon, Gammarus, Hydrobia, Macoma, Hediste, Notomastus and Talitrus* spp. - these lists are examples and are not exhaustive

**[4]Key saltmarsh food plants**

eg *Puccinellia maritima, Salicornia* spp., *Agrostis stolonifera, Atriplex* spp., *Hordeum marinum, Festuca rubra, Alopecurus bulbosus, Lolium perenne* - these lists are examples and are not exhaustive

## 4.2.8 Favourable Condition Tables for SPA interest features of the Severn Estuary European Marine Site

Background information on the role of favourable condition tables and the information provided in each column is provided in section 1.8 of this document, and a concise glossary of terms used is provided in Section 7.

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

These tables set out all the attributes that **may** be used to monitor the condition of the features of the SPA. Where possible we will seek available information from others which can inform our assessment process.

It will be possible to monitor many of the attributes at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the initial monitoring events in order to characterise the site and establish the baselines. Extreme events (such as storms reducing or increasing salinities, exceptionally cold winters or warm summers) also need to be recorded as they may be critical in influencing ecological issues in the Severn Estuary and may well be missed by routine monitoring.

Comprising :

**Table 15** – Favourable condition table for the supporting habitats of the bird interest features in the Severn Estuary SPA

**Table 16** – Favourable condition table for the qualifying bird features of the Severn Estuary SPA

Reference should also be made to Tables 8,10 and 11 - Favourable Condition Tables for the SAC habitat features relevant to the supporting habitats (intertidal mudflats and sandflats, saltmarsh and hard substrate habitats (rocky shores)) .

**Table 15 Favourable Condition Table for the supporting habitats of the bird interest features in the Severn Estuary SPA European Marine Site** (information on the populations of bird species using these habitats are given in Table 4)

| SPA interest feature | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *SPA interest feature 1:* **Internationally important Annex 1 species: Bewick's swan** | Saltmarsh | Habitat extent | Area (ha) measured once per reporting cycle. | At The Dumbles, no decrease in extent from 76 ha. | Saltmarsh provides an important feeding and roosting habitat for Bewick's swans on The Dumbles - saltmarsh/transition wet grassland in front of sea defences. |
| | | Vegetation characteristics | Abundance of suitable soft leaved herbs and grasses - % cover (frequency to be determined) | Greater than 25% cover during the winter season. | Bewick's swans graze on soft wet meadow grasses such as *Agrostis stolonifera, Glyceria fluitans* and *Alopecurus geniculatus* which are found in the transition of saltmarsh to grassland. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines. Areas of vegetation with an effective field size of >6ha | Bewick's swan require unrestricted views >500m to allow early detection of predators when feeding and roosting. |
| | Intertidal mudflats and sandflats | Habitat extent | Area (ha), measured once per reporting cycle. | At Frampton Sands, Waveridge Sands and the Noose, no decrease in extent from 980 ha. | The intertidal mudflats and sandflats at The Noose, Frampton Sand and Waveridge Sand are used as disturbance refuge for Bewick's swan. The extent and distribution of this sub-feature are important to maintain the population in favourable condition. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines. | Bewick's swan require unrestricted views >500m to allow early detection of predators when feeding and roosting. |

**Table 15 - continued**

| SPA interest feature | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *SPA interest features 2 - 6:* **Internationally important populations of regularly occurring migratory species**<br><br>and<br><br>*SPA interest feature 7:* **Internationally important assemblage of waterfowl** | Saltmarsh | Habitat extent | Area (ha), measured once per reporting cycle. | No decrease in extent from 1,400 ha.<br><br>At The Dumbles, no decrease in extent from 76 ha. | Saltmarsh and their communities are important habitats as they provide both roosting and feeding areas. |
| | | Food availability | Presence and abundance of suitable saltmarsh food plants measured periodically (frequency to be determined). | Presence and abundance of suitable saltmarsh food plants should not deviate significantly from an established baseline[1] | European white-fronted geese graze on a range of saltmarsh grasses and herbs. Wigeon feed on well-grazed saltmarsh with *Puccinella maritiae*, *Salicornia* and *Agrostis*. Teal and pintail feed on seeds from *Salicornia* and *Atriplex*. |
| | | Vegetation characteristics | Range of vegetation heights measured periodically (frequency to be determined). | Sward height and density throughout areas used for roosting should not deviate significantly from an established baseline[1]. | Vegetation of <10 cm is required throughout areas used by roosting waders. This is managed by grazing. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines. | Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting. |

## Table 15 - continued

| SPA interest feature | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *SPA interest features 2 - 6:* **Internationally important populations of regularly occurring migratory species**<br><br>and<br><br>*SPA interest feature 7:* **Internationally important assemblage of waterfowl** | Intertidal mudflats and sandflats | Habitat extent | Area (ha), measured once per reporting cycle. | No decrease in extent from 15,000 ha.<br><br>At Frampton Sands, Waveridge Sands and The Noose no decrease in extent from 980 ha. | Intertidal mudflats and sandflats and their communities are important habitats as they provide both roosting and feeding areas. |
| | | Food availability | Presence and abundance of suitable prey species measured periodically (frequency to be determined). | Presence and abundance of suitable prey species should not deviate significantly from an established baseline. [1] | Most of the waders and waterfowl within the assemblage including the internationally important regularly occurring migratory birds feed on invertebrates within and on the sediments. Diet includes *Arenicola, Crangon, Hydrobia,Hediste, Corophium, Macoma, Gammarus,* small molluscs and strandline plankton and seeds. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines. | Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting. |
| | Shingle and rocky shores | Habitat extent | Area (ha), measured once per reporting cycle. | No decrease in extent from 1,500 ha. | This habitat is used for feeding and roosting, particularly by waders. |
| | | Food availability | Presence and abundance of suitable intertidal invertebrates, measured periodically (frequency to be determined). | Presence and abundance of suitable food species should not deviate significantly from an established baseline[1] | Waders feed on worms, crustaceans and molluscs. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines. | Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting. |

[1] Baselines to be established

## Table 16 Favourable Condition Table for the qualifying bird features in the Severn Estuary European Marine Site

| SPA interest feature | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *SPA interest feature 1:* **Internationally important Annex 1 species: Bewick's swan** | | Population size | 5 year peak mean number of individuals | No less than 289 individuals [ie the 5 year peak mean between 1988/9 - 1992/3] | Mainly found in the Upper Severn Estuary at Slimbridge |
| | | Proportion of biogeographic population | % of NW European population | 1 % of NW European population | WeBS counts provide this information |
| | | Distribution | Number and location of sectors occupied at low tide | No decrease in use of the number of sectors and their distribution established as baseline[1] | WeBS low tide counts display distribution information by sector (not annual counts)<br>Birds use certain sectors to a greater or lesser degree from year to year |
| | | Disturbance in feeding and roosting areas | Reduction or displacement of wintering birds | No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline[1] | Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging. |
| *SPA interest features 2 - 6:* **Internationally important populations of regularly occurring migratory species**<br><br>and<br><br>*SPA interest feature 7:* **Internationally important assemblage of waterfowl** | | Population size | 5 year peak mean number of individuals | No less than 68,026 individuals in the assemblage [ie the 5 year peak mean between 1988/9 - 1992/3]<br><br>For individual species - no less than the 5 year peak mean between 1988/9 - 1992/3 detailed in Table 4 | Figures derived from WeBS counts.<br><br>The 5 year peak means for this period for each of the internationally important populations and species with nationally important populations which make up the internationally important assemblage are detailed in Table 4 |
| | | Distribution | Number and location of sectors occupied at low tide | No decrease in use of the number of sectors and their distribution established as baseline[1] | In some years birds use certain sectors to a greater or lesser degree.<br>WeBS low tide counts display distribution information by sector (not annual counts). |

| SPA interest feature | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| | | Disturbance in feeding and roosting areas. | Reduction or displacement of wintering birds | No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline[1]. | Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging. |

[1] Baselines to be established

## 4.3 Conservation objectives for the Severn Estuary / Môr Hafren Ramsar Site

The protection and management of the Ramsar in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

### 4.3.1 Ramsar interest feature 1: Estuaries

**The conservation objective for the "estuaries" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SAC "estuaries" feature" (refer to section 4.1.1 and Table 8 of this document), in so far as these objectives are applicable to the area designated as Ramsar Site and as defined below.**

#### 4.3.1.1 Explanatory information for the Ramsar Site "estuaries" conservation objective

The area of the estuarine ecosystem designated as Ramsar Site is smaller than that of the SAC as it is restricted to the terrestrial and intertidal areas and excludes all subtidal areas. There are therefore aspects of the SAC "estuaries" conservation objective that are not applicable to the Ramsar Site "estuaries" feature. The following Table 17 identifies the limits and restrictions, if any, that apply in respect of the Ramsar Site. The table layout follows the numbering of the SAC "estuaries" objective conditions given in section 4.1.1.

**Table 17 - Limits of the Ramsar "estuaries" feature**

| SAC "estuaries" objective conditions to be met | | Limits, if any, of the Ramsar |
|---|---|---|
| i. | the total extent of the estuary is maintained; | Limited to the lesser area of the Ramsar Site – excludes all subtidal areas - refer also to Appendix 2 |
| ii. | the characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime) of the estuary is maintained; | These requirements are related to the estuary regime, structure and function at a whole ecosystem level |
| iii. | the characteristic range and relative proportions of sediment sizes and sediment budget[3] within the site is maintained; | |
| iv. | the extent, variety and spatial distribution of estuarine habitat communities within the site is maintained; | Within the Ramsar Site this is limited to the habitats listed as Ramsar "estuarine habitats communities"[1] below |
| v. | the extent, variety, spatial distribution and community composition of hard substrate habitats and their notable communities is maintained; | Within the Ramsar Site this is limited to the habitats listed as Ramsar "hard substrate communities "[2] below |
| vi. | the abundance of the notable estuarine species assemblages is maintained or increased; | Within the Ramsar Site this is limited to the species listed as Ramsar "notable estuarine species assemblages"[3] below |
| vii. | the physico-chemical characteristics of the water column support the ecological objectives described above; | These requirements apply estuary wide at a whole ecosystem level |
| viii. | Toxic contaminants in water column and sediment are below levels which would pose a risk to the ecological objectives described above. | |

**[1]Ramsar "estuarine habitat communities"**

a. Intertidal mudflats and sandflats (refer also to maps in Appendices 4 and 4a)
   - Intertidal gravel and clean sands
   - Intertidal muddy sands
   - Intertidal muds

b. Saltmarshes (equivalent to the Atlantic saltmeadows feature of the SAC) (refer also to maps in Appendices 5 and 5a)
- Low – mid marsh communities
- Mid – upper marsh communities
- Transitional high marsh communities
- Pioneer marsh communities

**[2]Ramsar "hard substrate communities"**

These include all hard substrate (rocky shore) communities within the Ramsar Site boundary shown in the map in Appendix 7 which includes the following notable communities:

- *Sabellaria alveolata reefs on sand-abraded eulittoral rock* (MLR.Sab Salv) *****
- *Hydroids, ephemeral seaweeds and Littorina littorea in shallow eulittoral mixed substrata pools.* **(**LR.RkpH)
- *Balanus crenatus and Tubularia indivisa on extremely tide-swept circalittoral rock* ECR.BS.BalTub)
- *Fucus serratus* and piddocks on lower eulittoral soft rock (MLR.Fser.Pid)
- *Mytilus edulis* and piddocks on eulittoral firm clay (MLR.MytPid)
- *Balanus crenatus, Halichondrea panicea* and *Alcyonidium diaphanum* on extremely tide-swept sheltered circalittoral rock (ECR.BalHpan) .
- *Sertularia cupressina and Hydrallmania falcate* on tide-swept sublittoral cobbles or pebbles in coarse sand (IGS.ScupHyd).
- *Corralina officinalis* and coralline crusts in shallow eulittoral rockpools (LR.Rkp.Cor)
- Eel grass (*Zostera*) beds
- Any other notable hard substrata communities that may be identified.

*****Note : where this community is contiguous with the occurrence of subtidal *Sabellaria alveolata* reefs it forms part of the SAC reefs feature. Within the Ramsar it is regarded as a component of the hard substrates subfeature of the Ramsar estuaries feature .

**[3]Ramsar "notable estuarine species assemblages"**

i. Assemblage of fish species:
- Migratory species
  - River and Sea Lamprey and Twaite shad and Allis shad
  - Sea trout, salmon, eel,
- Estuarine species
  - Species typically occurring and breeding in estuaries (Bird, 2008)
  - Marine species occurring in large numbers in estuaries (Bird, 2008)
- Marine species
  - Predominantly marine species occurring infrequently in the Severn (Bird, 2008)
- Freshwater species
  - Species typically occurring and breeding in freshwater and recorded within the Severn (Bird, 2008)

ii Assemblage of waterfowl species (refer also to section 4.3.9)

Internationally important populations of waterfowl comprising :
- Regularly occurring Annex 1 species - Bewicks' swan
- Regularly occurring migratory species - European white-fronted goose, dunlin, redshank, shelduck, and gadwall

Internationally important assemblage of waterfowl comprising above species plus the following :
- Nationally important bird populations - wigeon, teal, pintail, pochard, tufted duck, ringed plover, grey plover, curlew, whimbrel and spotted redshank, lesser black-backed gull

iii. Assemblage of vascular plant species:

- Salt marsh species (refer to notes 5 and 6 in section 4.1.4.1 - explanatory information on the conservation objective for the Atlantic salt meadows feature)
- Eel grass *(Zostera)* species.

## 4.3.2 Ramsar interest feature 2: Assemblage of migratory fish species[1]

**The conservation objective for the "assemblage of migratory fish species" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined below:**

The feature will be considered to be in favourable condition when, subject to natural processes[2], each of the following conditions are met:

i. the migratory passage of both adults and juveniles of the assemblage of migratory fish species through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;

ii the size of the populations of the assemblage species in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;

iii. the abundance of prey species[3] forming the principle food resources for the assemblage species within the estuary, is maintained.

iv. Toxic contaminants in the water column[4] and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms [1-4] above is explained in **section 4.3.2.1**

**Note :** The populations of three of the assemblage species (river lamprey, sea lamprey and twaite shad) are designated as features of the SAC for which separate specific objectives have been written (refer to sections 4.1.6 to 4.1.8 of this document). The populations of these species depend on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore these features can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC are also met in full and there is a continued recorded presence of these species in the River Severn.

### 4.3.2.1 Explanatory information for the assemblage of migratory fish species conservation objective

**[1] Assemblage of migratory fish species**

**Species which are designated features of the SAC and for which individual conservation objectives have been written (refer to sections 4.1.6, 4.1.7 and 4.1.8)**

Sea lamprey *Petromyzon marinus*
River lamprey *Lampetra fluviatilis*
Twaite shad *Alosa. fallax*

**Other migratory species in the assemblage**

Allis shad *Alosa alosa*
Salmon *Salmo salar*
Sea trout *S. trutta*
Eel *Anguilla anguilla*.

**[2]Natural processes in respect of the Ramsar fish features**

**Assemblage populations :**
The size of the populations is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

**Supporting habitats**
The general meaning of 'natural processes' with respect to the supporting habitats of the migratory fish assemblage within the estuary is explained in **section 4.1.1.1**.

**[3]Prey species**

| Assemblage Species | Key prey species |
|---|---|
| Sea lamprey | Eel *Anguilla anguilla*, cod *Gadus morhua*, and haddock *Melanogrammus aeglefinus* are all potential prey species for the sea lamprey found within the Severn Estuary (Bird 2008) |
| River lamprey | Sea trout *Salmo trutta*, shad *Alosa fallax/Alosa alosa*, herring *Clupea harengu*s, sprat *Sprattus sprattu*s, flounder *Platichthys flesu*s and small gadoids such as whiting *Merlangius merlangu*s and pout *Trisopterus luscu*s are all potential prey species for the river lamprey found within the Severn Estuary (Bird 2008). |
| Twaite shad | Small custaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003). |
| Allis shad | Small custaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003). |
| Salmon | While at sea, salmon feed on a variety of fish (e.g. herring, sprat, sand eel, mackerel, and various gadoids) and crustaceans (e.g. euphausiid shrimps, prawns, gammarid amphipods and various crabs). (Bird, 2008) |
| Sea trout | The diet of this species at sea has not been much studied but is believed to include a range of fish species including sprat, young herring and sand eels as well as crustaceans such amphipods (e.g. Corophium), gammarids, decapods such as Crangon and mysid shrimps. Many of these prey items also occur in estuaries where sea trout are known to feed extensively. (Bird, 2008) |
| Eel | A range of benthic organisms that include crustaceans and small fish. (Bird, 2008) |

**[4]Water column**

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

### 4.3.3 Ramsar interest feature 3: Internationally important populations of waterfowl : Bewick's swan

**The conservation objective for the "Bewick's swan" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA "Bewick's swan " feature (refer to section 4.2.1)**

### 4.3.4 Ramsar interest feature 4 : Internationally important populations of waterfowl : European white-fronted goose

**The conservation objective for the "European white-fronted goose" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA "wintering European white-fronted goose" feature (refer to section 4.2.2)**

### 4.3.5 Ramsar interest feature 5: Internationally important populations of waterfowl : dunlin

**The conservation objective for the "dunlin" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA "wintering dunlin " feature (refer to section 4.2.3)**

### 4.3.6 Ramsar interest feature 6: Internationally important populations of waterfowl : redshank

**The conservation objective for the "redshank" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA "wintering redshank" feature (refer to section sections 4.2.4)**

### 4.3.7 Ramsar interest feature 7: Internationally important populations of waterfowl :shelduck

**The conservation objective for the "shelduck" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA "wintering shelduck" feature (refer to section 4.2.5)**

### 4.3.8 Ramsar interest feature 8: Internationally important populations of waterfowl : gadwall

**The conservation objective for the "gadwall" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA "wintering gadwall" feature (refer to section sections 4.2.6)**

## 4.3.9 Ramsar interest feature 9: Internationally important assemblage of waterfowl

**The conservation objective for the "internationally important assemblage of waterfowl" feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA "internationally important assemblage of waterfowl" feature (refer to section sections 4.2.7) – with special reference to the individual species listed and their population figures given in Table 6**

Note : This Ramsar Site feature incorporates both wintering and passage populations of some birds and hence some species are included more than once in lists given in Table 6

## 4.3.10 Favourable Condition Tables for the Ramsar Site interest features of the Severn Estuary European Marine Site

Background information on the role of favourable condition tables and the information provided in each column is provided in section 1.8 of this document, and a concise glossary of terms used is provided in Section 7.

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

These tables set out all the attributes that **may** be used to monitor the condition of the features of the Ramsar Site. Where possible we will seek available information from others which can inform our assessment process.

It will be possible to monitor many of the attributes at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the initial monitoring events in order to characterise the site and establish the baselines. Extreme events (such as storms reducing or increasing salinities, exceptionally cold winters or warm summers) also need to be recorded as they may be critical in influencing ecological issues in the Severn Estuary and may well be missed by routine monitoring.

Comprising :

**Table 18** – Favourable condition table for the “estuaries” feature of the Severn Estuary Ramsar Site

**Table 19** – Favourable condition table for the migratory fish assemblage of the Severn Estuary Ramsar Site

**Table 20** – Favourable condition table for the supporting habitats of the bird interest features (Ramsar features 3 to 9) in the Severn Estuary Ramsar Site

**Table 21** – Favourable condition table for the qualifying bird interest features in the Severn Estuary Ramsar Site
Favourable condition table for the “estuaries” feature of the Severn Estuary Ramsar Site

Reference should also be made to Tables 8,10 and 11 - Favourable Condition Tables for the SAC habitat features relevant to the supporting habitats (intertidal mudflats and sandflats, saltmarsh and hard substrate habitats (rocky shores)) .

**Table 18 Favourable Condition Table for the "estuaries" feature of the Severn Estuary Ramsar Site**

| Ramsar interest feature | Comments |
|---|---|
| *Ramsar Interest feature 1:* **Estuaries** | **The Favourable Condition Table for the "estuaries" feature of the Severn Estuary Ramsar Site is largely the same as that for the Severn Estuary SAC "estuaries" feature (see section 4.1 : Table 8).**<br><br>However the area of the estuarine ecosystem designated as Ramsar Site is smaller than that of the SAC as it is restricted to the terrestrial and intertidal areas and excludes all subtidal areas. Table 17 identifies the limits and restrictions that apply in respect of the Ramsar Site Conservation Objective.<br><br>**There are therefore aspects of the SAC "estuaries" Favourable Condition Table that are not applicable to the Ramsar Site "estuaries" feature as follows :**<br><br>• All attributes other than those referred to below - apply only in respect of the area within the Ramsar Boundary (as shown in Appendix 2)<br>• Line A6 - which relates to the subtidal sandbanks subfeature of the estuaries feature - this does not apply as these habitats lie outside the boundary of the Ramsar Site<br>• Line A9 - which relates to the reefs subfeature of the estuaries feature - this only applies in respect of areas where intertidal *Sabellaria alveolota* occurs contiguously with the subtidal reefs (yet to be fully defined). |

**Table 19 Favourable Condition Table for the Migratory fish assemblage feature of the Severn Estuary Ramsar Site**

| Ramsar interest feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *Ramsar Interest feature 2 :* **Migratory fish assemblage** | | **Migratory access (Barriers to migration)**<br><br>*( migratory passage not impeded - sections 4.6.i and 4.7.i of the conservation objectives)* | **Water quality** measured regularly throughout the reporting cycle in the Bristol Channel, Severn Estuary, River Wye SAC, River Usk SAC and River Severn.<br><br>*(see also lines A17- A20 of Table 8 relating to general water quality requirements for the estuary feature (and dependant sub features)* | Water quality is sufficient to support migratory passage.<br><br>Levels (for temperature, salinity, turbidity and pH, and dissolved oxygen) should comply with targets established under the EA Review of Consents and the Water Framework Directive.<br><br>*Baseline is water quality sampling data collected by the Environment Agency* | Significant variation in these physio-chemical parameters may act as barriers to migration. For example, the timing, duration and consistency of their upstream migration are believed to be closely related to temperature changes as well as pheromone triggers from the juveniles during periods of high water flow. Peak migration usually coincides with river temperatures that remain above $10^{o}$C and continues until temperatures reach $18^{o}$C.<br>Dissolved oxygen can also be significantly reduced in stretches receiving significant BOD inputs, or through the re-suspension of organic rich sediments.<br>Toxic contaminants may act as a barrier to migration. |
| | | | **Water flows** measured regularly throughout the reporting cycle (frequency to be determined) in the River Wye SAC, River Usk SAC and River Severn<br><br>*(see also line A3 of Table 8 relating to general tidal and water flow requirements for the estuary feature (and dependant sub features)* | Flows from the rivers into the estuary must be sufficient to allow migration<br><br>*Baseline is water flow sampling data collected by the Environment Agency provides a baseline. Severe low flow conditions that affect these species yet to be defined* | |
| | | | **Physical barriers** Mapping and quantification of potential obstructions in relation to height, type and water depth below obstruction once during the reporting cycle. | No artificial barriers significantly impairing, adults from reaching existing and historical spawning grounds, or juveniles from moving downstream.<br><br>*Baseline is the Environment Agency data on structures and flood defences* | Dams, navigation and other weirs may prevent fish from reaching their spawning grounds. In particular, sea lamprey is known to be poor at ascending obstacles. |

| Ramsar interest feature | Sub-feature | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| | | **Population sizes** (returning adults)<br><br>*(size of populations - sections 4.6.ii and 4.7.ii of the conservation objectives)* | Number of returning adults measured using fish counters on the feeding rivers (Wye , Usk and Severn) during the migratory period. | No decline in number of returning adults from established baseline.<br><br>*Baseline is yet to be established - fish counter data may be able to provide a baseline in future years.* | (Note that this attribute will not be able to be measured until the technological solutions for monitoring some species (notably lampreys and shad) are developed.) |
| | | **River populations**<br><br>*(size of populations - sections 4.6.ii and 4.7.ii of the conservation objectives)* | Survey through various methods (Electrofishing, seine netting , line fishing records, licencing returns) at a series of locations in the Rivers Wye, Usk and Severn | No decline in populations of the Rivers Wye and Usk<br><br>*Baseline is yet to be established - fish counter data may be able to provide a baseline in future years.* | Details of methods for river and sea lamprey are outlined in section 4.1.9, Table 13 and for Twaite shad in Table 14 - the individual FCT for these species within the SAC section of this document |
| | | **Prey species**<br><br>*(abundance of prey species - sections 4.6.iii and 4.7.iii of the conservation objectives))* | The abundance of key prey species measured by EA in their routine monitoring of the rivers and estuary | No significant reduction in abundance of key prey species against an established baseline<br><br>*Baseline is yet to be established through fish surveys in estuary and rivers* | River and sea lamprey require a variety of other fish species to act as hosts throughout their lifecycle. Their principal host species are part of the estuarine fish assemblage which has measures and targets included within Table 8.<br><br>Twaite shad require a variety of invertebrates including crustacean, mysids and copepods, small fish and fish eggs particularly in that section of the estuary where saline and freshwaters meet.<br><br>While at sea, salmon feed on a variety of fish (e.g. herring, sprat, sand eel, mackerel, and various gadoids) and crustaceans (e.g. euphausiid shrimps, prawns, gammarid amphipods and various crabs). (Bird, 2008)<br><br>The diet of sea trout at sea is believed to include a range of fish species including sprat, young herring and sand eels as well as crustaceans such amphipods (e.g. Corophium), gammarids, decapods such as Crangon and mysid shrimps.<br><br>Eeels feed on a range of benthic organisms that include crustaceans and small fish. (Bird, 2008) |

**Table 20 Favourable Condition Table for the supporting habitats of the bird interest features (Ramsar interest features 3 to 9) in the Severn Estuary Ramsar Site** (Numbers of bird species using these habitats are given in Table 6)

| Ramsar interest features | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *Ramsar Interest features 3-8 :* **Internationally important populations of waterfowl**<br><br>and<br><br>*Ramsar Interest feature 9 :* **Internationally important assemblage of waterfowl** | Saltmarsh | Habitat extent | Area (ha) measured once per reporting cycle. | No decrease in extent from 1,400 ha.<br>At The Dumbles, no decrease in extent from 76 ha. | Saltmarsh and their communities are important habitats as they provide both roosting and feeding areas. |
| | | Food availability | Presence and abundance of suitable saltmarsh food plants measured periodically (frequency to be determined). | Presence and abundance of suitable saltmarsh food plants should not deviate significantly from an established baseline[1]. | European white-fronted geese graze on a range of saltmarsh grasses and herbs. Wigeon feed on well-grazed saltmarsh with *Puccinella maritiae, Salicornia* and *Agrostis*. Teal and pintail feed on seeds from *Salicornia* and *Atriplex.* |
| | | Vegetation characteristics | Abundance of suitable soft leaved herbs and grasses - % cover (frequency to be determined) | Greater than 25% cover during the winter season. | Bewick's swans graze on soft wet meadow grasses such as *Agrostis stolonifera, Glyceria fluitans* and *Alopecurus geniculatus* which are found in the transition of saltmarsh to grassland. |
| | | Vegetation characteristics | Range of vegetation heights measured periodically (frequency to be determined). | Sward height and density throughout areas used for roosting should not deviate significantly from an established baseline[1]. | Vegetation of <10 cm is required throughout areas used by roosting waders. This is managed by grazing. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines.<br><br>Areas of vegetation with an effective field size of >6ha at the Dumbles (Bewicks swan) | Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting. |

**Table 20 continued**

| Ramsar interest features | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *Ramsar Interest features 3-8 :* **Internationally important populations of waterfowl**<br><br>and<br><br>*Ramsar Interest feature 9 :* **Internationally important assemblage of waterfowl** | Intertidal mudflats and sandflats | Habitat extent | Area (ha), measured once per reporting cycle. | No decrease in extent from 15,000 ha.<br><br>At Frampton Sands, Waveridge Sands and The Noose no decrease in extent from 980 ha. | Intertidal mudflats and sandflats and their communities are important habitats as they provide both roosting and feeding areas.<br><br>The intertidal mudflats and sandflats at The Noose, Frampton Sand and Waveridge Sand are used as disturbance refuge for Bewick's swan. The extent and distribution of this sub-feature are important to maintain the population in favourable condition. |
| | | Food availability | Presence and abundance of suitable prey species measured periodically (frequency to be determined). | Presence and abundance of suitable prey species should not deviate significantly from an established baseline[1].. | Most of the waders and waterfowl within the assemblage including the internationally important population of waterfowl feed on invertebrates within and on the sediments. Diet includes *Arenicola, Crangon, Hydrobia,Hediste, Corophium, Macoma, Gammarus,* small molluscs and strandline plankton and seeds. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines. | Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting. |
| | Shingle and rocky shores | Habitat extent | Area (ha), measured once per reporting cycle. | No decrease in extent from 1,500 ha. | This habitat is used for feeding and roosting, particularly by waders. |
| | | Food availability | Presence and abundance of suitable intertidal invertebrates, measured periodically (frequency to be determined). | Presence and abundance of suitable food species should not deviate significantly from an established baseline[1]. | Waders feed on worms, crustaceans and molluscs. |
| | | Unimpeded sightlines at feeding and roosting sites | Openness of terrain unrestricted by obstructions | No increase in obstructions to existing bird sightlines. | Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting. |

[1] Baselines to be established

## Table 21 Favourable Condition Table for the qualifying bird features in the Severn Estuary Ramsar Site

| Ramsar interest features | Supporting Habitat | Attribute | Measure | Target | Comments |
|---|---|---|---|---|---|
| *Ramsar Interest features 3-8 :* **Internationally important populations of waterfowl**<br><br>and<br><br>*Ramsar Interest feature 9 :* **Internationally important assemblage of waterfowl** | | Population size | 5 year peak mean number of individuals | No less than 68,026 individuals in the assemblage [ie the 5 year peak mean between 1988/9 - 1992/3]<br>For individual species - no less than the 5 year peak mean between 1988/9 - 1992/3 detailed in Table 6 | Figures derived from WeBS counts.<br><br>The 5 year peak means for this period for each of the internationally important populations and species with nationally important populations which make up the internationally important assemblage are detailed in Table 6 |
| | | Distribution | Number and location of sectors occupied at low tide | No decrease in use of the number of sectors and their distribution established as baseline[1]. | WeBS low tide counts display distribution information by sector (not annual counts)<br>Birds use certain sectors to a greater or lesser degree from year to year |
| | | Disturbance in feeding and roosting areas. | Reduction or displacement of wintering birds | No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline[1]. | Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging. |

[1] Baselines to be established

# 5. Advice on Operations

**CCW and Natural England have a duty under Regulation 33(2)(b) of The Conservation (Natural Habitats &c.) Regulations 1994 to advise other relevant authorities as to any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species, for which the site has been designated. Information on how CCW and Natural England have developed this advice is given in section 5.2, and on how it may be reviewed and updated in the future in section 5.3.**

The Advice on Operations concerning the SAC are provided in detail in Table 22 and section 5.6. The Advice on Operations concerning the SPA is provided in Table 23 and section 5.7. These include recommendations regarding specific interest features and their supporting habitats. The Advice on Operations concerning the Ramsar Site is provided by cross reference to the subsections of the advice for the SAC and SPA which are relevant to the Ramsar Site interest features.

## 5.1. Purpose of advice

The aim of this advice is to provide CCW and Natural England's Advice on Operations as required by Regulation 33 (2)(b)for the Severn Estuary European Marine Site and thereby enable all relevant authorities to direct and prioritise their work on the management of activities that pose the greatest potential threat to the favourable condition of interest features on the Severn Estuary European Marine Site. The advice should be read in conjunction with the Conservation Objectives for the SAC, SPA and Ramsar Sites interest features given in sections 4.1, 4.2 and 4.3 respectively and it is intended to provide the basis for detailed discussions to formulate and agree a management scheme for the European Marine Sites.

General advice on sensitivity, exposure (and therefore vulnerability) contained within this document is presented against broad categories of operation which may cause the deterioration of natural habitats or the habitats of species, or the disturbance of species (refer to section 5.2). It reflects activities and plans and projects. Generic examples of some of the types of operation that are covered under the broad category headings are given for illustration.

The advice is based on best available information at the time of preparation of the Regulation 33 advice for the Severn Estuary in 2008/09. For a current assessment of levels of disturbance of specific types of activity across the Severn Estuary (relevant solely to the SPA interest features), reference should be made to the SPA Scheme of Management, available at the ASERA website (http://www.severnestuary.net/asera/). It should be noted, however, that the frequency, intensity, effects and level of risk to the SPA features that certain activities may have are still being investigated under the existing Severn Estuary Scheme of Management.

## 5.2 Methods for assessment

The advice provided here is within six broad categories of operation which may cause the deterioration of natural habitats or the habitats of species, or the disturbance of species. These categories are:

- Physical loss
- Physical damage
- Non-physical disturbance
- Toxic contamination
- Non-toxic contamination
- Biological disturbance

Within these categories are environmental impacts that may result from operations. Example sources of activities are provided in the MarLIN *Maritime and coastal activities to environmental factors matrix* (see Appendix 10), although these are by no means inclusive of all potentially damaging activities.

Given current knowledge of the nature and extent of activities taking place within the Severn Estuary European Marine Site, this approach therefore:

- enables links to be made between human activities and the ecological requirements of the habitats or species, as required under Article 6 of the Habitats Directive;
- provides a consistent framework to enable relevant authorities in England and Wales to assess the effects of activities and identify priorities for management within their areas of responsibility; and
- is appropriately robust to take into account the development of novel activities or operations which may cause deterioration or disturbance to the interest features of the site and should have sufficient stability to need only infrequent review and updating by the CCW and Natural England.

These broad categories provide a clear framework against which relevant authorities can assess activities or operations under their responsibility. The more detailed information in Tables 22 and 23 (covering both the SAC and SPA) provides competent authorities with a context against which to consider an assessment of 'significant effect' of any plans or projects which may affect the site and a basis to inform on the scope and nature of appropriate assessments required in relation to plans and projects. It is important to note that this advice is only a starting point for assessing impacts. It does not remove the need for the relevant or competent authorities to consult CCW or Natural England formally over individual plans and projects where required to do so under the Regulations.

This Advice on Operations for the site is based on a three-step process involving:

- an assessment of the **sensitivity** of the interest features or their component supporting habitats to operations;
- an assessment of the **current exposure** of each interest feature or their component supporting habitats to operations; and
- a final assessment of **current vulnerability** of interest features or their component supporting habitats to operations.

Note that in respect of the SPA, sensitivity, exposure and vulnerability have been assessed largely in relation to the use of habitats by birds, but may also take into account direct effects on the bird species themselves (such as 'shooting' or 'disturbance').

This three-step process builds up a level of information necessary to manage activities in and around the European Marine Site in an effective manner and to identify to competent and relevant authorities those operations which pose the most immediate threats to the favourable condition of the interest features of the European Marine Site.

The assessment of relative sensitivity, exposure and vulnerability is derived using best available scientific information and informed scientific interpretation and judgement. The process uses sufficiently coarse categorisation to minimise uncertainty in information, reflecting the current state of knowledge and understanding of the marine environment. Where possible, the sensitivity, exposure and vulnerability are assessed on a three-point scale of 'Low', 'Moderate' or 'High'. To assist with interpretation, these levels have been colour-coded in Tables 22 & 23.

### 5.2.1 Sensitivity assessment

The sensitivity assessment used is an assessment of the relative sensitivity of the interest features or the component supporting habitats of the Severn Estuary European Marine Site to the effects of six broad categories of human activities. In relation to this assessment, **sensitivity** has been defined as **'the intolerance of a habitat, community or individual (or individual colony) of a species to damage, or death, from an external factor and the time taken for its subsequent recovery'** (MarLIN, 2003). For

example, a very sensitive species or habitat is one that is very adversely affected by an external factor arising from human activities or natural events (killed/destroyed, 'high' intolerance) and is expected to recover over a very long period of time, i.e. >10 or up to 25 years ('low' recoverability).

The sensitivity assessments are based on current information but may develop with improvements in scientific knowledge and understanding. The sensitivity of interest features (and scientific understanding of sensitivity) may change over time; hence an operation which is not currently considered to have a negative effect, may do so in the future.

English Nature (now Natural England) and Scottish Natural Heritage commissioned the Marine Biological Association of the UK, through its Marine Life Information Network (MarLIN) to provide detailed sensitivity information to underpin this advice. Detailed sensitivity information at a biotope or species level is available via MarLIN's website (www.marlin.ac.uk). The sensitivity assessments are indicative qualitative judgements based on the best available scientific information. They represent the most likely (probable) result of a given change in a factor. The sensitivity assessments of the interest features or their component supporting habitats of the Severn Estuary SAC, SPA and Ramsar Site are based upon MarLIN sensitivity assessments for biotopes (components of the Annex I habitats) and species supplemented by local knowledge and professional judgement to provide a site specific assessment that reflect the unusual and extreme character of the Severn Estuary.

The sensitivities of each of the SAC Annex I habitat features have been assessed on the component biotopes represented within each of the habitats (where information is available). Where information has not been available, such as for subtidal *Sabellaria alveolata* reefs or for Atlantic saltmeadow communities, a number of scientific review documents have been consulted, including reports produced for the UK Marine SAC LIFE project (see Bibliography section for a full list of these).

Assessments for the Annex II migratory fish have been based on current knowledge (best available scientific knowledge), which is limited for the life phase that shad and lamprey spend in estuarine waters. Given the paucity of information, it has not been possible to assess the level of sensitivity on a three-point scale; they have been assessed to be either 'sensitive' or 'not sensitive'.

For the SPA, the sensitivities have been assessed in relation to the use of habitats by birds and the sensitivities of the individual species themselves to certain activities. For example, wintering birds are highly sensitive to the loss of their roosting or feeding grounds; and they are highly sensitive to the noise of shooting. The sensitivity assessments of the interest features or their component supporting habitats of the Severn Estuary SPA are based on a number of scientific review documents. These include reports produced for the UK Marine SAC LIFE project (Davison & Hughes 1998; Elliott *et al.*, 1998), the Countryside Council for Wales Science Report (Holt *et al.*, 1995) and the Marine Habitats Review (Jones *et al.*, 2000.).

The magnitude or scale of the effect of an activity and the resultant change in environmental factors are site specific. For the purpose of this advice, the assessments of sensitivity have been adjusted for *changes in suspended sediments* and *turbidity* to reflect the particular conditions affecting the site. As a result of the high tidal energy of the site, the concentration of suspended sediment and turbidity are naturally very high. The marine fauna, including the migratory fish, are adapted to such high concentrations of suspended sediment and thus they are unlikely to have any significant effect. Consequently the sensitivities relating to *changes in suspended sediments* and *turbidity* have been downgraded.

Table 22 shows the sensitivity assessments for the SAC features and sensitivity assessments for the SPA can be seen in Table 23.

### 5.2.2 Exposure assessment

Exposure assessment has been undertaken for the Severn Estuary European Marine Site by assessing the relative exposure of the interest features or their component supporting habitats to the effects of broad categories of operations, resulting from human activities currently occurring on the site. Exposure has been assessed against a matrix which relates activities to operation pressures (see Appendix 10). The

matrix has been used as a guide and interpreted to assess the exposure to current activities known to be present within the site.

In assigning a three-point score (High, Moderate or Low) to the exposure, each activity is considered for:

- Spatial extent of the pressure
- Frequency of the pressure and
- Intensity of the pressure

For the SPA, the exposure has been assessed in relation to the use of habitats by birds and on the bird species themselves. As an example, the feeding and roosting grounds of wintering birds may be considered highly exposed to toxic contamination from synthetic compounds due to the locations and intensity of discharges into an area.

### 5.2.3 Vulnerability assessment

The third step in the process is to determine the vulnerability of interest features or their component supporting habitats to operations. This category results from an integration of sensitivity and exposure. Only if a feature is both sensitive and exposed to a human activity will it be considered vulnerable. In this context therefore, 'vulnerability' has been defined as **'the exposure of a habitat, community or individual (or individual colony) of a species to an external factor to which it is sensitive'** (Hiscock, 1996).

Tables 22 and 23 show the vulnerability assessments for the SAC features and the SPA features respectively.

### 5.3 Update and review of advice

Information as to the categories of operations which may cause the deterioration of natural habitats or the habitats or disturbance of species for which the site has been designated, is provided in light of what CCW and Natural England know about current activities and patterns of usage within the Severn Estuary European Marine Site. The general information on current activities and patterns of usage (which was used in part to derive Table 23) has been refined at the local level in producing the management scheme for the SPA and through further discussion with the relevant authorities. This management scheme is available at the ASERA website (http://www.severnestuary.net/asera/) although this will require review following this more detailed analysis of impacts on the estuarine habitats that are supporting habitats for the birds of the SPA.

The information provided in this advice on the sensitivity of interest features or their supporting habitats (Table 23) will change as a result of an improvement in our scientific knowledge, which will be a relatively long term process. It is suggested that advice for sites be kept under review and is periodically updated through discussion with relevant authorities and others to reflect significant changes in our understanding of sensitivity together with the potential effects of plans and projects on the marine environment.

## 5.4 Plans and Projects

Under Regulation 48(1), an appropriate assessment must be undertaken by competent authorities in respect of any plan or project which:

a. either alone or in combination with other plans or projects is likely to have a ***significant effect*** on a European site; and
b. is not directly connected with or necessary to the management of the site for nature conservation.

This legal requirement applies to all European sites (SACs and SPAs). Regulation 48 is also applied, as a matter of Government policy, to proposed SPAs and listed Ramsar sites.

Tables 22 and 23 provides competent authorities with a guide against which to initiate an assessment of the 'significance' of any plans or projects (and on-going operations or activities) proposed for the site, although this will only be a starting point for assessing impacts and does not remove the need for competent authorities to consult CCW or Natural England formally over individual plans and projects where required under the Regulations.

## 5.5 Review of consents

Regulation 50 of the Conservation (Natural Habitats, &c.) Regulations 1994 requires a competent authority to undertake a review of any existing consent or permission to which Regulation 48(1) would apply if it were to be reconsidered as of the date on which the site became a European site. Where a review is required under these provisions it must be carried out as soon as reasonably practicable after classification of the European Marine Site. Consents will need to be reviewed in the light of these objectives.

## 5.6 Specific Advice on Operations for the Severn Estuary SAC

This section provides information to help relate general advice to each of the specific interest features of the Severn Estuary SAC. Where specific examples are given they are provided to aid understanding of possible impacts and are not intended to be a comprehensive list of all relevant operations.

This advice relates to the vulnerability of the interest features and supporting habitats of the Severn Estuary SAC as set out in more detail in Table 22. A brief explanation of the sensitivity of the interest features or supporting habitats follows, with an explanation of their exposure and consequently their vulnerability to damage or disturbance from the listed categories of operations is also given. This enables links between the categories of operation and the ecological requirements of the European Marine Site and Ramsar Site interest features to be made.

The precise impact of any category of operation occurring on the site will be dependent upon the nature, scale, location and timing of events. In accordance with Government policy guidance, the Advice on Operations provided here, is feature and site specific, and provided in the light of current activities and patterns of usage at the site.

As such, it is important that future consideration of this advice by relevant authorities, and others, takes account of changes in usage patterns that have occurred at the site over the intervening period. Advice for sites should be kept under review: it is suggested that periodic discussions with relevant authorities and others be undertaken to reflect significant changes in the understanding of sensitivities, as well as the potential effects of future plans or projects on the marine environment.

## 5.6.1 Estuaries feature

**(Note : this advice is also relevant to the "estuaries" feature of the Ramsar Site – refer also to section 5.8)**

### 5.6.1.1 Sensitivity

The **estuary** and its associated biological communities are **moderately to highly sensitive** to:

- **physical loss**
- **physical damage**
- **toxic contamination**
- **non-toxic contamination** and
- **biological disturbance**

These result from a range of activities known to occur in the estuary. Further details are provided in points i) to xiv) below, with details of the level of sensitivity set out in Table 22.

### 5.6.1.2 Exposure

The **estuary** and its associated biological communities are **moderately to highly exposed** to:

- **substratum loss**
- **smothering**
- **changes in suspended sediment**
- **changes in water flow rate**
- **changes in wave exposure**
- **abrasion and physical disturbance**
- **noise and visual disturbance**
- **toxic contamination (introduction of synthetic & non synthetic compounds)**
- **changes in nutrient loading**
- **changes in thermal regime**
- **changes in turbidity**
- **changes in salinity**
- **changes in oxygenation**
- **introduction of microbial pathogens**
- **introduction of non-native species**
- **selective extraction of species**

### 5.6.1.3 Vulnerability

The **estuary** and its associated biological communities are **moderately to highly vulnerable** to:

**i. Substratum loss**

The estuary feature is considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to substratum loss.

The physical loss of areas of intertidal habitats may be caused directly through a change in land use, or indirectly as a consequence of changes to sedimentation processes (e.g. resulting from the construction of groynes or of seawalls). Subtidal sedimentary habitats will be directly affected by the removal of material during maintenance dredging and aggregate extraction in particular. These activities, coupled with strong current flows, result in material being suspended in the water column and removed away from their point of origin. Removal of the substratum will lead to partial loss of faunal diversity, exposure of the underlying sediment and changes in the topography of the area. Intertidal seagrass beds will be adversely affected by substratum loss, with recoverability depending upon recruitment from other populations.

**ii. Smothering**

The estuary feature is considered to have **high sensitivity** and **moderate exposure** and therefore **high vulnerability** to smothering

Smothering of organisms is likely to occur as a result of the direct deposition of material on top of them and/or on their habitat. Examples of activities causing smothering in intertidal areas include beach replenishment, port developments, archaeological activities, coastal farming, industrial effluent discharge, oil spills, land runoff including highways discharge and sewage discharge. In subtidal areas, dumping of spoil from dredging operations is responsible for most smothering events. Both intertidal and subtidal seagrass beds are considered to be highly sensitive to smothering. A seagrass bed close to the second Severn crossing is known to have been adversely affected by smothering as a result of changes to sediment movements due to temporary works associated with the bridge construction in the early 1990's.

**iii. Changes in suspended sediment**

The estuary feature is considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in suspended sediment

As a result of the high tidal energy of the site, the concentration of suspended sediment and turbidity are naturally very high. This high tidal energy is one of the reasons for site selection as part of the Natura 2000 series. The marine fauna, including the migratory fish, are adapted to high concentrations of suspended sediment. Increase in sediment in suspension is unlikely to cause problems unless it leads to smothering (see smothering). Of greater concern in the Severn estuary would be the decrease in suspended sediments leading to increased light penetration and changes in the habitats and their plant and animal communities.

Activities likely to result in changes in suspended sediment would include those which would affect sediment availability or the water flow rate (coastal defences, development, construction and dredging).

**iv. Changes in water flow rate**

The estuary feature is currently considered to have be **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in water flow rate.

The estuary is considered to have high exposure due to its highly constrained nature (by man made hard defences). Increases or decreases to the water flow rate are likely to lead to, respectively, increased sediment erosion or accretion in certain areas. Seagrass beds in particular are intolerant to any activity that changes the sediment regime. Activities/structures responsible for changing the water flow rate could include in-estuary construction; groynes, beach replenishment, sea walls/breakwaters, port developments and aggregate extraction.

**v. Changes in wave exposure**

The estuary feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in wave exposure.

The estuary is considered to have high exposure due to its highly constrained nature (coastal defence structures; groynes, seawalls, breakwaters and beach replenishment) and presence of significant aggregate extraction which can cause changes in wave exposure. Storms and intense wave action may move or remove substrata from shallow subtidal sandbanks. Increased wave action will disrupt feeding and burrowing, and reduce species abundance, richness and biomass. Decreased wave exposure will result in increased food availability, but suspension feeders are intolerant of sediment increases in silt/clay content and therefore the proportion of suspension feeders may decrease in favour of deposit feeders. Both intertidal and subtidal seagrass beds are highly sensitive to changes in wave exposure, with an increase leading to loss of substrata and exposure of rhizomes, and a decrease causing deposition of fine particles on leaves which may result in smothering.

**vi. Abrasion and physical disturbance**

The estuary feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to physical disturbance and abrasion.

This factor includes mechanical interference, crushing, trampling, rubbing or erosion of the organism or habitat of interest. The activities most likely to cause abrasion include beach replenishment, development of port facilities, maintenance dredging, aggregate extraction, fixed netting, benthic trawls, sea-based recreation (including anchoring, power boat and jet ski wash), archaeology, coastal farming, educational visits, shipping, litter and debris. Habitats/communities that are moderately sensitive to abrasion include saltmarsh - see section 4.4 (at risk from overgrazing, erosion from moored boats or from trampling or vehicles), intertidal mudflats and sandflats (see section 4.3), and seagrass beds in particular.

**vii. Toxic contamination**

The estuary feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to toxic contamination. (Note that there is currently insufficient scientific information on the sensitivities of the estuarine habitats to radionuclides to determine any vulnerability).

This category includes contamination from synthetic compounds (including pesticides and herbicides), non-synthetic compounds (including heavy metals) and hydrocarbons (oil related products). As a result of the predominance of physical conditions within the Estuary, for the majority of biological communities there is little unequivocal evidence of additional impact due to contaminants across the Estuary as a whole. Individual populations may have been impacted close to major discharges however.

A number of synthetic compounds may be present locally in elevated concentrations. Riverine inputs are probably responsible for the majority of these compounds entering the Estuary. The concentration of metals in sediments (cadmium, arsenic, chromium, silver, copper, zinc and nickel in particular) are commonly above interim sediment quality guidelines over much of the Estuary, but only occasionally exceed probable effects levels (Langston et al., 2003). Bioaccumulation of metals occurs widely in invertebrates, though the ecological significance is still uncertain. Hydrocarbon compounds may also be present locally in elevated concentrations. Sources include a combination of fossil fuel combustion, shipping, urban run-off, sewage treatment works and various point-source and diffuse discharges from industrialised areas. Moderately high levels of poly-aromatic hydrocarbons (PAHs) are present in sediments across much of the Estuary. Overall vulnerability to all toxic contamination is considered 'high' (due to the exposure from sewage inputs being classed as 'high' and also with 'moderate' levels from industrial inputs etc.).

Note that there is currently insufficient scientific information on the sensitivities of the estuarine habitats to radionuclides to determine any vulnerability. However despite the presence of several potential sources of radionuclides (Berkeley, Oldbury and Hinkley Nuclear Power Plants, a manufacturer of radiopharmaceuticals in Cardiff and a number of other smaller sources) the accumulation of radionuclides in the Severn Estuary is generally low compared with samples from the Irish Sea. The exceptions to this are Tritium and Carbon 14, which have been found locally at significant levels. This is thought to be related to discharges from the radiopharmaceutical company in Cardiff, for which remedial action is being taken. (Langston et al, 2003).

**viii. Changes in nutrient loading**

The estuary feature is considered to have **high sensitivity** and **high exposure** to changes in nutrient loading but **is *not* considered vulnerable to changes in nutrient loading due to the high natural turbidity.**

Whilst nutrient levels and loadings within the Estuary are considered significant in UK terms (and thus have been scored as high for sensitivity and high for exposure), the high natural turbidity of the system negates these high levels, with algal productivity being generally low except in localised hotspots. Where these do occur, nutrient enrichment may lead to significant shifts in community composition on/in subtidal sandbanks (see section 5.2) and on/in intertidal mudflats and sandflats (see section 5.3), but recoverability is likely to be high. Should there be a decrease in natural turbidity levels, then the overall associated 'masking effect' would be lessened and there would be a higher risk of nutrient enrichment.

At the present time, despite the high sensitivity and high exposure scores discussed above, the high natural turbidity levels across most of the estuary lead to a conclusion that the estuary is not considered vulnerable to changes in nutrient loading.

**ix. Changes in thermal regime**

The estuary feature is considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in thermal regime

Temperature can affect many biological, physical and chemical geochemical processes within the water column including stratification, mixing and turbidity, nutrients, oxygenation, salinity and pH. For example, activities which can cause short or longterm changes in temperature can include thermal discharges (eg from power station cooling waters and other discharges). Thermal discharges are likely to be between 2 and 10 degrees above ambient temperature and a long term duration of changes may impact on the larval forms and breeding cycles of marine organisms.

**x. Changes in salinity**

The estuary feature is considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in salinity.

Decreases in salinity within the Estuary are likely to result from heavy rain events and associated land/waterfront run-off and riverine inputs. The vast floodplain and catchment area of the Severn Estuary results in annual extreme flooding events and prolonged periods of freshwater input the estuary so the exposure is considered to be high. Localised salinity changes may also result around discharges. Certain biotopes associated with subtidal sandbanks occur in conditions of reduced salinity and these biotopes are considered to be moderately vulnerable to any long-term increases in salinity levels.

**xi. Changes in oxygenation**

The estuary feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in oxygenation.

A cycle of changes in oxygenation occurs within the Severn as a result of both seasonal and tidal cycles and is linked to fluctuating sediment regimes. In addition occasional, intermittent oxygen sags occur in low salinity regions of the Severn and in some of the principal rivers feeding the Estuary. These probably originate from high densities of suspended solids and associated particulate organic matter, perhaps enhanced by discharge outfalls. Other causes include maintenance dredging, aggregate extraction, spoil dumping, coastal farming and shipping.

Oxygen-deficient marine areas are characterized by a decline in the number and diversity of species. Certain communities occurring within the Estuary's intertidal mudflats and sandflats are moderately sensitive to decreases in dissolved oxygen levels . However, recoverability of these areas should be rapid upon return to normal conditions. The fish assemblage is also likely to be sensitive to decreases in dissolved oxygen levels, although it is unclear what the level of sensitivity is at the present time.

**xii. Introduction of microbial pathogens**

The estuary feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in microbial pathogens.

Microbial pathogens are most likely to enter the Severn's ecosystem by means of sewage discharges, be these from port facilities, recreational boating, shipping or the outfalls from sewage treatment works. For the majority of biological communities there is insufficient information available to be able to make an assessment of their sensitivity to microbial pathogens. Of the few known impacts, subtidal seagrass beds of *Zostera marina* are known to be highly sensitive to the marine fungus *Labyrinthula macrocystis* which causes 'wasting disease'. The disease causes the death of leaves and, after 2-3 seasons, can lead to the death of regenerative shoots, rhizomes and the loss of up to 90% of the population and its associated

biotope. However, no information has been found which confirms the presence of the wasting disease in the Estuary.

While no infomation has been found which confirms the presence of the wasting disease in the estuary, the potential significant consequences for one of this notable estuarine community in particular has lead to the conclusion that estuary is highly sensitive to microbial pathogens. The exposure is considered to be high due to the high number of sewage discharges.

**xiii. Introduction of non-native species**

The estuary feature is currently considered to have **high sensitivity** and **moderate exposure** and therefore **high vulnerability** to the introduction of non-native species.

The saltmarsh cordgrass *Spartina anglica* is an invasive pioneer species whose rapid growth consolidates sediment, raises mudflats and reduces sediment availability elsewhere. It is regarded as being a potential threat to intertidal beds of *Zostera noltei* in particular. However, whilst recognising *S. anglica* as an invasive species, it also has a role in saltmarsh formation and the community SM6 in which it features should be allowed to develop into other Atlantic Salt Meadow or transitional communities. The Japanese seaweed *Sargassum muticum* is another non-native species which is thought to compete for space with the subtidal seagrass *Zostera marina*, though evidence for actual competition is conflicting. The presence of another non-native, the slipper limpet *Crepidula fornicata*, in large numbers may alter the species composition within certain soft mud habitats leading to a decline in overall species richness. However, *C. fornicata* has yet to penetrate the Estuary, possibly due to the strong water flows. The exposure to introduction of non-natives to the estuary is considered to be moderate because of the considerable volume of ship traffic, including transport to and from the major ports at Cardiff, Newport and Bristol.

**xiv. Selective extraction of species**

The estuary feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to the selective extraction of species.

This category refers to the removal of key species within a biotope or of a prey species. Activities which occur within the Estuary which are likely to be implicated bait digging, fixed netting, commercial fishing, recreational angling, wildfowling and educational visits. Whilst the majority of biotopes have a low sensitivity to such activities, intertidal *Zostera noltei* beds are highly sensitive to grazing by species of wildfowl. Significant amounts of dwarf eelgrass can be consumed by wildfowl, particularly during the autumn and winter months. However as these grazers are also part of the natural estuarine ecosystem and designated features in their own right their impact is not judged to be detrimental.

## 5.6.2 Subtidal sandbanks feature

### 5.6.2.1 Sensitivity

The **sandbanks** and their associated biological communities are **moderately to highly sensitive** to:

- **physical loss**
- **physical damage**
- **toxic contamination**
- **non-toxic contamination**
- **biological disturbance**

These result from a range of activities known to occur in the vicinity of the sandbanks. Further details are provided in points i) to vii) below, with details of the level of sensitivity set out in Table 22.

### 5.6.2.2 Exposure

The **sandbanks** and their associated biological communities are **moderately to highly exposed** to:

- **substratum loss**
- **smothering**
- **changes in suspended sediment**
- **abrasion and physical disturbance**
- **noise** and **visual disturbance**
- **toxic contamination (introduction of synthetic & non synthetic compounds)**
- **changes in nutrient loading**
- **changes in turbidity**
- **changes in salinity**
- **changes in oxygenation**
- **introduction of microbial pathogens**

### 5.6.2.3 Vulnerability

The **s**ubtidal sandbanks communities are **moderately to highly vulnerable** to:

**i. Substratum loss**

The subtidal sandbanks feature is currently considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to substratum loss.

The physical loss of subtidal sandbanks will occur through the removal of material during maintenance dredging and aggregate extraction in particular. These activities, coupled with strong current flows, result in material being suspended in the water column and removed away from their point of origin. Removal of the substratum will lead to partial loss of faunal diversity, exposure of the underlying sediment and changes in the topography of the area. Recolonisation of the biotope might occur within a few months, but the biotope would be unlikely to be recognized until after six months. Cohesive mud and sandy mud communities are considered to be moderately sensitive to substratum loss.

**ii. Changes in suspended sediment**

The subtidal sandbanks feature is currently considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in suspended sediment.

Increase in sediment in suspension are unlikely to cause problems unless it leads to smothering (see smothering). A decrease in suspended sediments may lead to increased light penetration and changes in the sandbank communities.

Activities likely to result in changes in suspended sediment would include those which would affect sediment availability or the water flow rate (coastal defences, development, construction and dredging).

**iii. Toxic contamination**

The subtidal sandbanks feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to toxic contamination. (Note that there is currently insufficient scientific information on the sensitivities of subtidal sandbank communities to radionuclides to determine their vulnerability).

This category includes contamination from synthetic compounds (including pesticides and herbicides), non-synthetic compounds (including heavy metals) and hydrocarbons (oil related products). As a result of the domination of physical conditions within the Estuary, for the majority of biological communities there is little unequivocal evidence of additional impact due to contaminants across the Estuary as a whole. Individual populations may have been impacted close to major discharges however.

Moderately high levels of poly-aromatic hydrocarbons (PAHs) are present in sediments across much of the Estuary (Langston et al., 2003). Generally speaking however, subtidal sediments are less likely to be at risk from oil spills than intertidal sediments unless oil dispersants are used or if wave action causes dispersion of oil into the water column and sediment mobility drives oil into the sediment. Certain species such as amphipods which occur within the Estuary's infralittoral mobile clean sand community have been found to be moderately sensitive to oil pollution. (See also section 5.1).

Despite the presence of several potential sources of radionuclides (Berkeley, Oldbury and Hinkley Nuclear Power Plants, a manufacturer of radiopharmaceuticals in Cardiff and a number of other smaller sources) the accumulation of radionuclides in the Severn Estuary is generally low compared with samples from the Irish Sea. The exceptions to this are Tritium and Carbon 14, which have been found at locally at significant levels. This is thought to be related to discharges from the radiopharmaceutical company in Cardiff, for which remedial action is being taken. The exposure for subtidal sandbanks is therfore thought to be low.

**iv. Changes in nutrient loading**

The subtidal sandbanks feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in nutrient loading

Whilst nutrient levels and loadings within the Estuary are considered significant in UK terms the high natural turbidity of the system negates these high levels, with algal productivity being generally low except in localised hotspots. Where these do occur, nutrient enrichment may lead to significant shifts in community composition on/in subtidal sandbanks but recoverability is likely to be high.

**v. Changes in salinity**

The subtidal sandbanks feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in salinity.

*Aphelochaeta marioni*, a polychaete worm which characterizes the shallow sandbanks' biotope of variable salinity infralittoral mobile sand, is very tolerant of low salinity conditions but would be moderately vulnerable to any long-term increases in salinity levels. This species has a wide distribution throughout the Estuary, being present on subtidal and intertidal sand habitats on both sides of the Estuary.

**vi. Changes in oxygenation**

The subtidal sandbanks feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in oxygenation.

A cycle of changes in oxygenation occurs within the Severn as a result of both seasonal and tidal cycles and is linked to fluctuating sediment regimes. In addition occasional, intermittent oxygen sags occur in low salinity regions of the Severn and in some of the principal rivers feeding the Estuary.

Decreases in oxygenation levels can result from maintenance dredging, aggregate extraction, industrial effluent discharge, land/waterfront runoff and sewage discharge (Langston et al., 2003). Oxygen-deficient

marine areas are characterized by a decline in the number and diversity of species. Certain communities occurring within the Estuary's subtidal sandbanks are moderately sensitive to decreases in dissolved oxygen levels. However, recoverability of these areas should be rapid upon return to normal conditions.

**vii. Introduction of microbial pathogens**

The subtidal sandbanks feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to the introduction of microbial pathogens.

Microbial pathogens are most likely to enter the Severn's ecosystem by means of sewage discharges. For the majority of biological communities there is insufficient information available to be able to make an assessment of their sensitivity to microbial pathogens. However, some research has been undertaken on marine bivalves, several species of which occur within the Estuary's sandbanks. Mass mortalities of bivalves can result from diseases caused by bacteria, viruses (over 20 have been described for marine bivalves) or protozoans. There is a greater likelihood of such events occurring in areas adjacent to outfalls than elsewhere. Recovery of populations is probable.

## 5.6.3 Mudflats and sandflats feature

**(Note : this advice is also relevant to the Ramsar Site as the mudflats and sandflats are both a subfeature of the estuaries feature and a supporting habitat of the birds species, for which the Ramsar Site has been designated – refer also to section 5.8)**

### 5.6.3.1 Sensitivity

The **mudflats and sandflats** and their associated biological communities are **moderately to highly sensitive** to:

- **physical loss**
- **physical damage**
- **toxic contamination**
- **non-toxic contamination**
- **biological disturbance**

These result from a range of activities known to occur in the vicinity of the mudflats and sandflats. Further details are provided in points i) to xiii) below, with details of the level of sensitivity set out in Table 22.

### 5.6.3.2 Exposure

The **mudflats and sandflats** and their associated biological communities are **moderately to highly exposed** to:

- **substratum loss**
- **smothering**
- **changes in suspended sediment**
- **changes in water flow rate**
- **changes in wave exposure**
- **abrasion and physical disturbance**
- **toxic contamination(introduction of synthetic & non synthetic compounds)**
- **changes in nutrient loading**
- **changes in thermal regime**
- **changes in turbidity**
- **changes in salinity**
- **changes in oxygenation**
- **introduction of microbial pathogens**

### 5.6.3.3 Vulnerability

The **intertidal mudflats and sandflats** communities are **moderately to highly vulnerable** to:

**i. Substratum loss**

The intertidal mudflats and sandflats feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to substratum loss.

Areas of intertidal habitats will be lost as a direct result of land claim or developments, or indirectly as a consequence of changes to sedimentation processes (e.g. resulting from the construction of groynes or of seawalls). Consequently, there is moderate to high exposure of mudflats and sandflats to substratum loss. The sediment infauna reside in the uppermost layers of the substratum and the removal of this layer would cause a major decline in species richness as they would have been removed with it. Thus the sensitivity of the biotopes in question is high. Fortunately, recovery of the community is also regarded as being high as recolonisation is likely following deposition of suitable substrata.

**ii. Smothering**

The intertidal mudflats and sandflats feature is considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to smothering

Smothering of organisms is likely to occur as a result of the direct deposition of material on top of them and/or on their habitat. Examples of activities causing smothering in intertidal areas include beach replenishment, port developments, archaeological activities, coastal farming, industrial effluent discharge, oil spills, land runoff including highways discharge and sewage discharge.

**iii. Changes in suspended sediment**

The intertidal mudflats and sandflats feature feature is considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in suspended sediment

Changes in suspended sediments could change the extent and nature of intertidal habitats including affecting estuary-wide erosion and accretion patterns. Increase in sediment in suspension are unlikely to cause problems unless it leads to smothering (see smothering) and in some cases the invertebrate communities associated with the sediment may provide additional food resources for feeding birds. A decrease in suspended sediments may lead to increased light penetration and changes in the intertidal mud and sandflat communities.

Activities likely to result in changes in suspended sediment would include those which would affect sediment availability or the water flow rate (coastal defences, development, construction and dredging).

**iv. Changes in water flow rate**

The intertidal mudflats and sandflats feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in water flow rate.

Increases or decreases to the water flow rate are likely to lead to, respectively, increased sediment erosion or accretion in certain areas. Activities/structures responsible for changing the water flow rate include construction activities, groynes, beach replenishment, sea walls/breakwaters, port developments and aggregate extraction.

**v. Changes in wave exposure**

The intertidal mudflats and sandflats feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in wave exposure.

Changes in wave exposure result from coastal defence structures (groynes, seawalls, breakwaters and beach replenishment), shipping and possibly aggregate extraction. Increased wave action will disrupt feeding and burrowing, and reduce species abundance, richness and biomass. The strength of wave action determines the topography, steepness and shore width of the intertidal zone.

**vi. Abrasion and physical disturbance**

The intertidal mudflats and sandflats feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to physical disturbance and abrasion.

The activities most likely to cause abrasion to mudflats and sandflats include beach replenishment, bait digging, maintenance dredging, aggregate extraction, land-based recreation and archaeology. Boating, anchoring, trampling or the use of vehicles are also likely to cause physical disturbance, with compaction of the substratum being of particular concern. For example, the use of vehicles on mudflats or sandflats appears to have a potentially severe impact on gaper clams *Mya arenaria*. Large clams live in permanent burrows and are therefore susceptible to burrow collapse and sediment compaction through trampling and especially vehicle use. Another two key species found in muddy sand, the heart urchin *Echinocardium cordatum* and the razor shell *Ensis ensis*, are probably highly sensitive to physical disturbance. Recovery is likely to be moderate because, although the individual key species may recolonize an area within five years, several of the species are very long-lived and so the biotope may take longer to return to its original age structure and species diversity.

**vii. Toxic contamination**

The intertidal mudflats and sandflats feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to toxic contamination by synthetic and non-synthetic compounds. (Note that there is currently insufficient scientific information on the sensitivities of communities present on/in intertidal mudflats and sandflats to radionuclides to determine their vulnerability).

This category includes contamination from synthetic compounds (including pesticides and herbicides), non-synthetic compounds (including heavy metals) and hydrocarbons (oil related products). Infaunal populations present within intertidal sediments are likely to have been impacted close to major discharges, with a number of synthetic compounds known to have elevated concentrations locally (Langston et al.,2003). However, because of the energetic hydrodynamic regime in the Severn, and the resultant high turbidity, there is considerable mixing and redistribution of fines and their associated contamination burden, resulting in a fairly homogenous distribution.

Whilst the concentration of metals within the Estuary's sediments (cadmium, arsenic, chromium, silver, copper, zinc and nickel in particular) are commonly above interim sediment quality guidelines, these only occasionally exceed probable effects levels (Langston et al.,2003).. Contamination loadings of metals will be highest where fine particulates predominate (for example between Avonmouth and Severn Beach, Caldicot Flats, the River Parrett and outer Bridgewater Bay, and between the mouths of the Usk and Taff), and lowest on sands (for example the Middle to Welsh Grounds, and Culver Sands). Bioaccumulation of metals is known to occur widely in invertebrates, though the ecological significance is still uncertain. Note also that the toxicity of metals to many invertebrates increases with decreased salinity and elevated temperature (Langston et al.,2003). Thus many benthic invertebrates living within their normal salinity range may be less susceptible to heavy metal pollution than those living in salinities near the lower limit of their salinity tolerance.

Hydrocarbon compounds are present locally in elevated concentrations (Langston et al.,2003).. Sources include a combination of fossil fuel combustion, shipping, urban run-off, sewage treatment works and various point-source and diffuse discharges from industrialised areas. Moderately high levels of poly-aromatic hydrocarbons (PAHs) are present in sediments across much of the Estuary (Langston et al.,2003).

Overall vulnerability to all toxic contamination is considered 'high' (due to the exposure from sewage inputs being classed as 'high' and also with 'moderate' levels from industrial inputs etc.).
Despite the presence of several potential sources of radionuclides (Berkeley, Oldbury and Hinkley Nuclear Power Plants, a manufacturer of radiopharmaceuticals in Cardiff and a number of other smaller sources) the accumulation of radionuclides in the Severn Estuary is generally low compared with samples from the Irish Sea. The exceptions to this are Tritium and Carbon 14, which have been found at locally at significant levels. This is thought to be related to discharges from the radiopharmaceutical company in Cardiff, for which remedial action is being taken. The intertidal mudlfats and sandflats are therefore thought to be moderately exposed to radionuclides (Langston et al, 2003).

**viii. Changes in nutrient loading**

The intertidal mudflats and sandflats feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in nutrient loading.

The most obvious sign of an increase in nutrient loading (or organic enrichment) on mudflats is the lush growth of green seaweeds on the surface. Such increases coupled with reduced oxygenation typically lead to anaerobic conditions predominating within the sediment. Moderate organic enrichment does provide food which can enhance species diversity but with greater enrichment, the diversity declines and the community becomes increasingly dominated by a few, pollution tolerant, opportunistic species such as the polychaete *Capitella capitata*. In sandier sediments where particle size is greater, the effects of an increase in organic enrichment are less dramatic. However, the structure of the community is still likely to change from one dominated by suspension feeders to one favouring deposit feeders, accompanied by an increase in the abundance of opportunistic species and a decrease in species richness. Note, however,

that the high natural turbidity of the system negates many of these effects, and algal productivity is generally low except in localised hotspots.

**ix. Changes in thermal regime**

The intertidal mudflats and sandflats feature is currently considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in thermal regime

Temperature can affect many biological, physical and chemical geochemical processes within the water column including stratification, mixing and turbidity, nutrients, oxygenation, salinity and pH. For example, activities which can cause short or longterm changes in temperature can include thermal discharges (eg from power station cooling waters and other discharges). Thermal discharges are likely to be between 2 and 10 degrees above ambient temperature and a long term duration of changes may impact on the larval forms and breeding cycles of marine organisms.

**x. Changes in salinity**

The intertidal mudflats and sandflats feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in salinity

Decreases in salinity are likely to result from heavy rain events and associated land/waterfront run-off and riverine inputs. Localised salinity changes may also result around discharges. The vast floodplain and catchment area of the Severn Estuary results in annual extreme flooding events and prolonged periods of freshwater input to the intertidal areas so the exposure is considered to be high. However the metabolism of intertidal communities cope with vast extremes of conditions which result from the dynamic nature of the estuary's tidal regime and so are considered to have low sensitivity.

**xi. Changes in oxygenation**

The intertidal mudflats and sandflats feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in oxygenation.

A cycle of changes in oxygenation occurs within the Severn as a result of both seasonal and tidal cycles and is linked to fluctuating sediment regimes. In addition occasional, intermittent oxygen sags occur in low salinity regions of the Severn and in some of the principal rivers feeding the Estuary.

Decreases in oxygenation levels will result from maintenance dredging, aggregate extraction, industrial effluent discharge, land/waterfront runoff and sewage discharge. Oxygen-deficient marine areas are characterized by a decline in the number and diversity of species. Certain communities occurring within the Estuary's intertidal mudflats and sandflats are moderately sensitive to decreases in dissolved oxygen levels. However, recoverability of these areas should be rapid upon return to normal conditions.

**xii. Introduction of microbial pathogens**

The intertidal mudflats and sandflats feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to the introduction of microbial pathogens.

Microbial pathogens are most likely to enter the Severn's ecosystem by means of sewage discharges. For the majority of biological communities there is insufficient information available to be able to make an assessment of their sensitivity to microbial pathogens. However, some research has been undertaken on marine bivalves, several species of which occur within the Estuary's intertidal sandbanks. Mass mortalities of bivalves can result from diseases caused by bacteria, viruses (over 20 have been described for marine bivalves) or protozoans. There is a greater likelihood of such events occurring in areas adjacent to outfalls than elsewhere. Recovery of populations is probable.

**xiii. Introduction of non-native species**

The intertidal mudflats and sandflats feature is currently considered to have **high sensitivity** and **low exposure** and therefore **moderate vulnerability** to the introduction of non-native species.

The saltmarsh cordgrass *Spartina anglica* is an invasive pioneer species whose rapid growth consolidates sediment, raises mudflats and reduces sediment availability elsewhere. It is regarded as being a potential threat to intertidal beds of *Zostera noltei* in particular. However, whilst recognising *S. anglica* as an invasive species, it also has a role in saltmarsh formation and the community SM6 in which it features should be allowed to develop into other Atlantic Salt Meadow or transitional communities. The presence of another non-native, the slipper limpet *Crepidula fornicata*, in large numbers may alter the species composition within certain soft mud habitats leading to a decline in overall species richness. However, *C. fornicata* has yet to penetrate the Estuary, possibly due to the strong water flows.

*Note, in relation to '**noise and visual disturbance'**, that while mudflats and sandflats communities have **moderate exposure** to both noise and visual disturbance, these habitats are **not sensitive** to these factors but they do provide a vitally important role as supporting habitats for waterfowl that use these areas for roosting and feeding and these are considered **highly sensitive to** both noise and visual disturbance – see sections 5.7.1 & 5.7.2). So while the habitats themselves have **low vulnerability** their dependant bird species have high vulnerability.*

## 5.6.4 Atlantic salt meadow feature

**(Note : this advice is also relevant to the Ramsar Site as the Atlantic saltmeadows are both a subfeature of the estuaries feature and a supporting habitat of the birds species, for which the Ramsar Site has been designated – refer also to section 5.8)**

### 5.6.4.1 Sensitivity

The **Atlantic salt meadow** and its associated biological communities are **moderately or highly sensitive** to:

- **physical loss**
- **physical damage**
- **toxic contamination**
- **non-toxic contamination**

These result from a range of activities known to occur on or in the vicinity of the salt meadows. Further details are provided in points i) to xiii) below, with details of the level of sensitivity set out in Table 22.

### 5.6.4.2 Exposure

The **Atlantic salt meadow** and its associated biological communities are **moderately to highly exposed** to:

- **substratum loss**
- **smothering**
- **changes in suspended sediment**
- **changes in water flow rate**
- **changes in wave exposure**
- **abrasion and physical disturbance**
- **changes in grazing management**
- **noise and visual disturbance**
- **toxic contamination(introduction of synthetic & non synthetic compounds)**
- **changes in nutrient loading**
- **changes in salinity**
- **changes in oxygenation**
- **introduction of microbial pathogens**

### 5.6.4.3 Vulnerability

The **saltmarsh** communities are **moderately to highly vulnerable** to:

**i. Substratum loss**

The Atlantic salt meadows and their associated communities feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to substratum loss

Saltmarshes, cordgrass and *Salicornia* are highly sensitive to physical loss. This can occur mostly through one-off developments such as infrastructure construction and modification involving land claim and changes in land management and coastal farming, and also as a result of coastal squeeze. This is a process by which coastal features such as saltmarshes and *Salicornia* are eroded as they become trapped between man-made structures such as sea walls and rising sea levels. Where this occurs on saltmarshes, it may result in the replacement of mid-marsh communities by pioneer saltmarsh communities or through erosion changing saltmarsh to intertidal mud and sand. Changes to coastal processes may also affect the sediment budget of estuaries and reduce the supply of sediment to saltmarsh, *Salicornia* and cordgrass areas. Whilst some areas of the Estuary are subject to these pressures, others are not, yet it remains a real

threat as is reflected in the moderate to high exposure score. When combined with high sensitivity this leads to a high vulnerability.

**ii. Smothering**

The Atlantic salt meadows feature is considered to have **high sensitivity** and **moderate exposure** and therefore **high vulnerability** to smothering.

Smothering of saltmarsh is likely to occur as a result of the direct deposition of material on the surface. This can happen by either direct deposition of materials on land or through silt-laden tides. The saltmarshes of the Severn are subject to spring tides each year which can in some locations deposit a thick layer of sediment on the surface which can persist for some months. Normally the level of this natural deposition is compatible with the speed of vertical accretion and growth of the saltmarsh. Higher levels of sediment deposition which may be associated with development activities (increasing sediment suspension) can cause smothering to occur resulting in loss of vegetation or shifts in community composition and zonation. Examples of activities likely to cause smothering from tidal deposition include coastal defence works, dredging, construction and archaeological works. Examples of direct deposition are fly tipping and accumulation of tidal debris.

**iii. Changes in suspended sediment**

The Atlantic salt meadows and their associated communities feature is currently considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in suspended sediment

Changes in suspended sediments could change the extent and nature of saltmarsh communities and other intertidal habitats including affecting estuary-wide erosion and accretion patterns. Increases in suspended sediment are unlikely to cause problems unless it leads to smothering (see smothering).

Activities likely to result in changes in suspended sediment would include those which would affect sediment availability or the water flow rate (coastal defences, development, construction and dredging).

**iv. Desiccation and changes in emergence regime**

The Atlantic salt meadows and their associated communities feature is currently considered to have **high sensitivity** and **low exposure** and therefore **moderate vulnerability** to desiccation and changes in emergence regime

Changes in the emergence regime will result in changes in the time habitats or species spend either covered in water or exposed to the air, one consequence of which is the desiccation (drying) of habitats and species. Examples of activities which may induce these changes are the construction of coastal and flood defences and other developments which change the tidal regime and water flow characteristics of the estuary.

The morphology, zonation and composition of saltmarshes are determined by their position within the tidal frame. They therefore considered highly sensitive to changes in the emergence regime and desiccation in particular.

These changes occurring in saltmarshes may result in either the stranding and exposure of communities or lengthened periods of inundation and lack of drying out with consequent impacts on species composition of swards (through dieback and shifts in community types) and affecting their suitability for species dependant on them. These changes may also cause the expansion of *Spartina* into both saltmarsh habitats and across adjacent mudflats.

The size of the estuary means that most small scale activities will have limited impacts with only large scale or estuary-wide activities likely to be of concern and exposure to this operation is therefore currently considered as low.

**v. Changes in water flow rate**

The Atlantic salt meadows and their associated communities feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in water flow rate.

A reduction in the rate of water flow over the saltmarsh will result in an increase in the deposition of sediment. The rate at which this occurs will depend on the sediment supply, the duration of the tidal cover and the extent to which the tidal flow is impeded by the vegetation itself to facilitate deposition. Saltmarsh communities actually require a degree of sediment deposition in order to survive and flourish and they have been assessed as having a low to moderate sensitivity. Exposure to changes in water flow rate on saltmarsh communities will vary throughout the Estuary.

**vi. Changes in wave exposure**

The Atlantic salt meadows and their associated communities feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in wave exposure.

Changes in wave exposure result from the presence of coastal defence structures (groynes, seawalls, breakwaters), beach replenishment and possibly aggregate extraction. Increased wave action can have two opposing effects. On the one hand it is likely to lead to a greater amount of suspended sediment being carried to the saltmarsh, while on the other hand the greater energy regime is likely to prevent the settlement of this material and may even remove material from the saltmarsh through erosion at the saltmarsh edge. A decrease in wave action will lead to greater sediment deposition with the possibility of smothering.

**vii. Abrasion and physical disturbance**

The Atlantic salt meadows and their associated communities feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to physical disturbance and abrasion.

Physical disturbance or abrasion to saltmarsh communities may result from a wide range of activities including recreational usage (both land-based and water-based), any of which may damage individual saltmarsh plants or areas of saltmarsh. Trampling by foot, and particularly by off-road vehicles, causes localised damage which may impact upon the ecological structure and function of larger areas, and requiring long-term recovery. Saltmarshes are also sensitive to erosion as a result of trampling or overgrazing, with communities that support succulents such as *Limonium* spp. being very susceptible to any form of grazing. In addition, it is widely recognised that shipping and boating can increase saltmarsh erosion from their wash.

**viii. Changes in grazing management**

The Atlantic salt meadows and their associated communities feature is currently considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in grazing management.

The presence, duration and intensity of grazing management can alter the vegetation composition and structure of saltmarsh habitats. Abandonment or introduction of grazing can result in changes in the saltmarsh plant and animal communities which are important in their own right and which also provide food resources for passage and wintering birds. Grazing changes may also affect the suitability of saltmarsh areas as resting and roosting sites for birds where open terrain with low vegetation is an important factor. Changes may also affect the presence of specific niches for scarce and notable plants.

**ix. Toxic contamination**

The Atlantic salt meadows and their associated communities feature is currently considered to have **moderate to high sensitivity** and **high exposure** and therefore **high vulnerability** to toxic contamination from both synthetic and non-synthetic compounds.

Atlantic salt meadows, cordgrass swards and *Salicornia* within the Estuary are considered to have a moderate sensitivity to toxic contamination by synthetic compounds (which includes domestic/industrial effluent, pesticides, anti-foulant paints and PCBs) and a high sensitivity to non-synthetic compounds

(which includes domestic/industrial effluent, heavy metals and hydrocarbons). Although saltmarsh plants may be reasonably tolerant of certain synthetic substances, they can bioaccumulate toxic compounds and act as sinks for them. This could have implications for wildfowl which feed on saltmarsh plants.
Saltmarsh communities are also highly sensitive to oil and oil products, even at relatively low levels. This is mainly by virtue of their ability to trap sediments. Acute events, such as oil spills, can be particularly damaging to saltmarsh plants. Dispersants used to treat oil spills can also have a toxic effect on saltmarsh plants, sometimes to a greater degree that the spilled oil itself. Saltmarshes have been reported to recover from chronic oil pollution, where denuded of vegetation, within ten years, although recovery depends largely on the degree to which oil is retained in the sediment and the clean up procedures used.

**x. Changes in nutrient loading**

The Atlantic salt meadows and their associated communities feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in nutrient loading.

The Estuary's saltmarshes and associated communities are thought to be more susceptible to nutrient enrichment than was previously realised (Deegan, L. A. et al. 2007), so they have been assessed as being of high sensitivity to increases in nutrient loading and/or organic enrichment. However, increased growth of certain seaweed species may result from elevated levels of nitrates and phosphates and cause local smothering which is known to have a detrimental effect on glasswort (*Salicornia* spp.) in low marsh communities. In addition, the species composition of the plants on the saltmarsh may be altered by changes in nutrient loading leading to a change in the structure of the sward.

**xi. Changes in salinity**

The Atlantic salt meadows and their associated communities feature is currently considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in salinity.

Changes to the salinity of water flowing across the saltmarshes as a result of the tides are likely to occur following heavy rain events and associated land/waterfront run-off and riverine inputs. The vast floodplain and catchment area of the Severn Estuary results in annual extreme flooding events and prolonged periods of freshwater input to the intertidal areas so the exposure is considered to be high. The botanical composition of the saltmarshes reflects salinity. The saltmarshes, while capable of tolerating a wide range of salinities, are considered moderately sensitive to changes in salinity particularly prolonged periods of change which can cause shifts in composition and zonation.

**xii. Changes in oxygenation**

The Atlantic salt meadows and their associated communities feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in oxygenation.

A cycle of changes in oxygenation occurs within the Severn as a result of both seasonal and tidal cycles and is linked to fluctuating sediment regimes. In addition occasional, intermittent oxygen sags occur in low salinity regions of the Severn and in some of the principal rivers feeding the Estuary.

**xiii. Introduction of microbial pathogens**

The Atlantic salt meadows and their associated communities feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to the introduction of microbial pathogens

For the majority of saltmarsh communities there is insufficient information available to be able to make an assessment of their sensitivity to microbial pathogens.

*Note, in relation to '**noise and visual disturbance'**, that while Atlantic salt meadows and their associated plant communities have **high exposure** to both noise and visual disturbance, these habitats are **not sensitive** to these factors but they do provide a vitally important role as supporting habitats for waterfowl that use these areas for roosting and feeding and these are considered **highly sensitive** to both noise and*

*visual disturbance – see sections 5.7.1 & 5.7.2). So while the habitats themselves have* ***low vulnerability*** *their dependant bird species have high vulnerability.*

## 5.6.5 Reefs feature

### 5.6.5.1 Sensitivity

The **reefs** and their associated biological communities are **moderately to highly sensitive** to:

- **physical loss**
- **physical damage**

These result from a range of activities. Note that there is currently insufficient scientific information to assess the degree of sensitivity of reefs to **toxic** & **non-toxic contamination** and also to **biological disturbance**. In these cases, the precautionary principle has been applied with a **moderate level of sensitivity** being assumed until proven otherwise**.** Further details are provided in points i) to vii) below, with details of the level of sensitivity set out in Table 22.

### 5.6.5.2 Exposure

The **reefs** and associated biological communities are **moderately to highly exposed** to:

- **changes in suspended sediment**
- **toxic contamination(introduction of synthetic & non synthetic compounds)**
- **changes in nutrient loading**
- **changes in turbidity**
- **changes in salinity**
- **changes in oxygenation**
- **introduction of microbial pathogens**

The reefs of the Severn Estuary are biogenic in origin, that is, they are built by a concretion-forming organism creating elevated structures. The organism in this case is the honeycomb worm *Sabellaria alveolata.* These reefs occur both in the intertidal (where one might expect to find them) and, most unusually, in the subtidal. Indeed, the Severn Estuary has the only extensive subtidal *Sabellaria alveolata* reef in Britain. There has been little research undertaken on these subtidal *Sabellaria alveolata* reefs, so the scientific information on their sensitivities is extremely limited. In the advice given here, much has been drawn on the information known about subtidal reefs of the closely related *Sabellaria spinulosa*.

### 5.6.5.3 Vulnerability

The **reef** communities are **moderately to highly vulnerable** to:

**i. Changes in suspended sediment**

The reefs feature is currently considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in suspended sediment

The reduced availability of sand, essential for *S. alveolata* tube building, may lead to the reduced development of *S. alveolata* reefs and the decline of colonies. Increase in suspended sediment is unlikely to cause problems unless it leads to smothering of the reef. Activities likely to result in changes in suspended sediment would include those which would affect sediment availability or the water flow rate (coastal defences, development, construction and dredging).

**ii. Toxic contamination**

The **sensitivity** of *Sabellaria alveolata* to toxic contaminants (domestic effluent, industrial effluent, heavy metals, hydrocarbons) entering the water is **not known**. The precautionary principle should therefore be applied.

The reefs are considered to have **high exposure** to both synthetic compounds and non-synthetic compounds (industrial effluents, heavy metals, hydrocarbons etc.),

The reefs are therefore **moderately vulnerable** to the introduction of synthetic compounds and non-synthetic compounds .

**iii. Changes in nutrient loading**

The reefs feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in nutrients.

**iv. Changes in salinity**

The reefs feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in salinity.

Decreases in salinity within the Estuary are likely to result from heavy rain events and associated land/waterfront run-off and riverine inputs. The vast floodplain and catchment area of the Severn Estuary results in annual extreme flooding events and prolonged periods of freshwater input the estuary so the exposure is considered to be high.

**v. Changes in oxygenation**

The reefs feature is currently considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in oxygenation.

A cycle of changes in oxygenation occurs within the Severn as a result of both seasonal and tidal cycles and is linked to fluctuating sediment regimes. In addition occasional, intermittent oxygen sags occur in low salinity regions of the Severn and in some of the principal rivers feeding the Estuary.

**vi. Introduction of microbial pathogens**

Microbial pathogens are most likely to enter the Severn's ecosystem by means of sewage discharges. There is considered to be **high exposure** to microbial pathogens due to the high number of sewage discharges within the estuary.

For the majority of biological communities there is insufficient information available to be able to make an assessment of their sensitivity to microbial pathogens and there is currently no information on the sensitivity of *Sabellaria* reefs to the introduction of microbial pathogens. The vulnerability of the *Sabellaria* reefs therefore remains unknown and the precautionary principle should be applied.

**vii. Introduction of non-native species**

There is insufficient information on the sensitivity of reefs to introduction of non native species therefore the vulnerability is unknown.

## 5.6.6 Shad and lamprey features

**(Note : this advice is also relevant to the Ramsar Site as these features are also part of the "assemblage of migratory fish species" for which the Ramsar Site has been designated – refer also to section 5.8)**

Note that in the explanatory text that follows, the term 'shad and lamprey' refer to three species of migratory fish: twaite shad *Alosa fallax*, river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus*.

As the populations of these migratory fish depend upon the freshwater habitats of the Rivers Usk, Wye and Severn as well as the estuarine habitats of the Severn Estuary during their lifetime, the advice presented here should be read in conjunction with the advice given for the River Usk SAC and the River Wye SAC (Management Plans and Conservation Objectives) available from CCW and Natural England on request.

### 5.6.6.1 Sensitivity

The **shad and lamprey** are considered **sensitive** to:

- **physical damage** of their supporting habitats
- **non-physical disturbance**
- **toxic contamination**
- **non-toxic contamination**
- **biological disturbance**

These result from a range of activities known to occur within the Estuary on which further details are provided in points i) to xi) below.

### 5.6.6.2 Exposure

The **shad and lamprey** and their supporting habitats (whilst within the Estuary) are **moderately to highly exposed** to:

- **noise** (part of 'noise and visual presence' but latter not applicable)
- **toxic contamination(introduction of synthetic & non synthetic compounds)**
- **changes in nutrient loading**
- **changes in thermal regime**
- **changes in turbidity**
- **changes in salinity**
- **changes in oxygenation**
- **introduction of microbial pathogens**

The Estuary provides an important migration route for these three rare species, to and from their spawning and nursery grounds. Shad and lamprey are known to be present in coastal and estuarine waters throughout the year, though there remains a lack of information on these migratory species during the time they actually spend in the Estuary. More information exists for the rivers where they migrate to spawn and for the subsequent development of juveniles. Little is known of their biology and distribution during the marine part of their life cycle.
In the assessments given below, it is assumed that these species would be capable of avoiding unsuitable areas, that is, given the size of the Estuary, localized activities are unlikely to adversely affect the population.

**5.6.6.3 Vulnerability**

Assessment of vulnerability of these features is particularly difficult given that there is little or no information to enable the level of sensitivity to be established. In line with the "precautionary principle" **where there is moderate to high exposure the feature is considered vulnerable.**

Therefore the **shad and lamprey** are considered **vulnerable** to:

**i. Noise** (part of 'noise and visual presence' but latter not applicable)
Research has shown that shad are sensitive to vibration which can arise from noisy activities. High frequency vibration (70 – 300Khtz) can be barrier to migration affecting movement both up and downstream and preventing fish reaching spawning areas. In some circumstances high frequency vibrations can be fatal. Vibration sources need to be assessed at the planning and consent stage and their potential impacts mitigated for, particularly during the key upstream migration phase.

**ii. Toxic contamination**
A decrease in water quality within the Estuary may impede the migration of these fish to their spawning grounds in the rivers. Poor water quality may also affect their supply of food. Shad require a good supply of small crustacean prey species, especially mysids and small fish (particularly clupeids). At sea, river lamprey feed on a variety of small fish such as clupeids, whilst sea lamprey feed on larger fish including salmon. Pollution tolerance levels of shad and lamprey are unknown, but EA water quality policy is that levels should comply with targets established under the EA Review of Consents and the Water Framework Directive.

**iii. Changes in nutrient loading**
It is possible that changes in nutrient levels may affect the food supply of the shad and lamprey. However, due to the natural high turbidity of the system and the volumes of water involved, it is thought that any effects would be minimal.
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**iv. Changes in thermal regime**
Water temperature is believed to act as a trigger for the shad to migrate upstream to spawn in the rivers. There could be changes in water temperature in the vicinity of the power stations (eg Hinkley Point and Oldbury) and from other discharges

**v. Changes in turbidity**
It is not known whether the migratory fish are sensitive to changes in turbidity within the Estuary. Given the extremely high background levels of turbidity, it is unlikely that any changes in turbidity will have any significant impact on the shad and lamprey whilst in the estuarine waters.

**vi. Changes in salinity**
Decreases in salinity within the Estuary are likely to result from heavy rain events and associated land/waterfront run-off and riverine inputs. The vast floodplain and catchment area of the Severn Estuary results in annual extreme flooding events and prolonged periods of freshwater input the estuary so the exposure is considered to be high. Within the Estuary, juvenile twaite shad prey on mysids feeding at the salt wedge near the head of the tide. It must be assumed that any activities affecting the salinity regime of the estuary would in turn affect the distribution of these prey species, which may have consequences for the shad.

**vii. Changes in oxygenation**
A cycle of changes in oxygenation occurs within the Severn as a result of both seasonal and tidal cycles and is linked to fluctuating sediment regimes. In addition occasional, intermittent oxygen sags occur in low salinity regions of the Severn and in some of the principal rivers feeding the Estuary. Shad and lamprey may therefore be vulnerable to changes in oxygenation given the high exposure to changes resulting from operations within the Estuary.

**viii. Introduction of microbial pathogens**

There is insufficient information available to make any meaningful assessment on the introduction of microbial pathogens to these species of fish, but there is potential for high exposure.

***Note regarding 'changes in water flow rate'***

*It is thought unlikely that changes in water flow rate within the Estuary will affect these fish but they are likely to be affected (and therefore vulnerable) once in the rivers where water abstraction and freshwater flows may have more of a bearing.*

***Note regarding 'selective estraction of species'***

*After hatching in the rivers, young shad gradually move downstream into the upper estuary where they feed and mature until the end of their second summer before moving into coastal waters. Young shad feed on estuarine invertebrates while adult shad feed on mysids and other fish (particularly other clupeids such as sprat and herring). Both river and sea lamprey spend several years of development in riverine mud and then, after a relatively rapid metamorphosis, migrate downstream to the estuary. River lamprey feed on a variety of estuarine fish, particularly herring, sprat and flounder. At sea, sea lamprey feed on larger fish including large salmon.*

*Extraction of target species - it is reported that twaite shad are vulnerable to capture on cooling water intakes, particularly those associated with power stations, where the numbers killed can be considerable.*

*Extraction on non target species - the shad and lamprey may be vulnerable to the extraction of their prey species (levels unknown) affecting their feeding behavior and patterns and long-term survival.*

**Table 22 Sensitivity, exposure and vulnerability of the Severn Estuary SAC to physical, chemical and biological pressures**

| Sensitivity | | Exposure | | Vulnerability | |
|---|---|---|---|---|---|
| High sensitivity | OOO O | High Exposure | ×××× | High vulnerability | ⊗⊗⊗⊗ ⊗⊗⊗O ⊗⊗⊗× |
| Moderate sensitivity | OOO | Medium Exposure | ××× | Moderate vulnerability | ⊗⊗OO ⊗⊗×× ⊗⊗⊗ |
| Low sensitivity | OO | Low Exposure | ×× | Low vulnerability | ⊗⊗O ⊗⊗× ⊗⊗ ⊗××× ⊗×× ⊗× |
| No detectable sensitivity | O | No exposure | × | No vulnerability | ⊗O |
| **?S** =Insufficient information on sensitivity; ✓ = migratory fish considered to be sensitive, but insufficient information to assess level of sensitivity | | | | Unknown vulnerability | |

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| **Categories of operations which may cause deterioration or disturbance**[25] | **Annex I features** | | | | | **Annex II species** |
|---|---|---|---|---|---|---|
| | **Estuaries** | **Subtidal Sandbanks** | **Mudflats & sandflats** | **Atlantic saltmeadow** | **Reefs** | **Fish**[26] |
| **Physical loss** | | | | | | |
| Removal / substratum loss | ⊗⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗O | ⊗× |
| Smothering | ⊗⊗⊗O | ⊗⊗× | ⊗⊗⊗ | ⊗⊗⊗O | ⊗⊗ | ⊗× |
| **Physical damage** | | | | | | |
| Changes in suspended sediment | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ | ⊗× |
| Desiccation & changes in emergence regime | ⊗⊗O | ⊗O | ⊗⊗O | ⊗⊗OO | ⊗O | ✓×× |
| Changes in water flow rate | ⊗⊗⊗× | ⊗⊗O | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗O | ✓×× |
| Changes in wave exposure | ⊗⊗⊗⊗ | ⊗⊗O | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗O | ⊗× |
| Abrasion / physical disturbance (of habitats) | ⊗⊗⊗× | ⊗⊗× | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗O | ✓×× |
| Changes in grazing management | ⊗⊗ | Not relevant | Not relevant | ⊗⊗⊗⊗ | Not relevant | Not relevant |
| **Non-physical disturbance** | | | | | | |
| Noise & visual presence | ⊗×× | ⊗×× | ⊗⊗× | ⊗××× | ⊗× | ✓××× |
| **Toxic contamination** | | | | | | |
| Introduction of synthetic compounds | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗⊗⊗ | ⊗⊗⊗× | ⊗⊗×× | ✓×××× |
| Introduction of non-synthetic compounds | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ?S×××× | ✓×××× |
| Introduction of radionuclides | ?S×× | ?S×× | ?S×× | ?S×× | ?S×× | ✓×× |
| **Non-toxic contamination**[27] | | | | | | |
| Changes in nutrient loading | ⊗⊗⊗⊗[28] | ⊗⊗×× | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗×× | ✓×××× |
| Changes in thermal regime | ⊗⊗⊗ | ⊗⊗ | ⊗⊗⊗ | ⊗⊗ | ⊗⊗ | ✓×××× |
| Changes in turbidity[29] (light penetration) | ⊗⊗× | ⊗⊗× | ⊗⊗× | ⊗× | ⊗×× | ✓××× |
| Changes in salinity | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗×× | ⊗⊗⊗× | ⊗⊗×× | ✓×××× |
| Changes in oxygenation | ⊗⊗⊗× | ⊗⊗×× | ⊗⊗×× | ⊗⊗×× | ⊗⊗×× | ✓×××× |
| **Biological disturbance** | | | | | | |
| Introduction of microbial pathogens | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗×× | ?S×××× | ✓×××× |
| Introduction of non-native species | ⊗⊗⊗O | ⊗⊗O | ⊗⊗OO | ⊗⊗ | ?S×× | ✓×× |
| Selective extraction of species | ⊗⊗⊗× | ⊗⊗ | ⊗⊗ | ⊗⊗ | ⊗⊗ | ✓×× |

[25] For a further explanation of each category see http://www.marlin.ac.uk/sah/baskitemplate.php?benchmarks
[26] River lamprey, sea lamprey & twaite shad
[27] All elements of non toxic contamination are interrelated and also link closely with changes in suspended sediment (physical damage)
[28] The high natural turbidity of the estuary negates these high levels with algal productivity being generally low – the estuary feature is therefore not considered vulnerable – see section 5.6.1.3.(viii)
[29] Turbidity here incorporates light penetration; suspended sediment under 'changes in suspended sediment' and its deposition under 'smothering'

## 5.7 Specific Advice on Operations for the Severn Estuary SPA

This section provides information to help relate general advice to each of the specific interest features of the Severn Estuary SPA. Where specific examples are given they are provided to aid understanding of possible impacts and are not intended to be a comprehensive list of all relevant operations.

This advice relates to the vulnerability of the interest features and supporting habitats of the Severn Estuary SPA as set out in Table 23. An explanation of the sensitivity of the interest features or supporting habitats follows with an explanation of their exposure and therefore their vulnerability to damage or disturbance from the listed categories of operations. This enables links between the categories of operation and the ecological requirements of the SPA's interest features (as set out in Section 2.2) to be made. It should be noted that sensitivity scorings are a combination of whether the habitat itself is likely to be affected by a particular operation (which is drawn from the SAC scores in Table 22), in combination with an assessment as to whether the outcome is likely to affect the bird's use of that habitat.

Note that this advice for the SPA supercedes that issued to ASERA in February 2005 following reassessment of exposure, sensitivity and vulnerability to take account of availability of new information in the Severn Estuary CHaMP and MarLIN sensitivities and following the more detailed analysis of impacts on the SAC estuarine habitats that are supporting habitats for the birds of the SPA.

## 5.7.1 Internationally important populations of regularly occurring Annex 1 species (Bewick's swan)

**(Note : this advice is also relevant to the Ramsar Site's internationally important population of waterfowl "Bewick's swan" feature and as part of the "internationally important assemblage of waterfowl" feature for which the Ramsar Site has been designated – refer also to section 5.8)**

### 5.7.1.1 Sensitivity

The Annex 1 species is **moderately to highly sensitive** to :

- **Physical loss**
- **Physical damage**
- **Non-physical disturbance**
- **Toxic contamination**
- **Non- toxic contamination**
- **Biological disturbance**

These result from a range of activities known to occur within the Estuary. Further details are provided in points i) to xii) below, with details of the level of sensitivity set out in Table 23.

### 5.7.1.2 Exposure

The Annex 1 species is **moderately to highly exposed** to:

- **Substratum loss and smothering**
- **Changes in suspended sediment**
- **Desiccation and changes in emergence regime**
- **Changes in water flow**
- **Changes in wave exposure**
- **Changes in grazing regime**
- **Noise and visual disturbance**
- **Toxic contamination**
- **Changes in nutrient loading**
- **Changes in salinity**
- **Changes in oxygenation**
- **Introduction of microbial pathogens**

### 5.7.1.3 Vulnerability

The Annex 1 species is **moderately to highly vulnerable** to:

**i. Substratum loss and smothering**

The intertidal habitats and therefore the Bewick's Swan feature which these habitats support are considered to have **moderate to high sensitivity** and **moderate to high exposure** and therefore **moderate to high vulnerability** to physical loss (removal and smothering).

The physical loss of areas of intertidal habitats may be caused directly through change of land use or indirectly as a consequence of changes to sedimentation processes (e.g. coastal defences) as well as via the effects of smothering by artificial structures (e.g. jetties) or the disposal of spoils. Activities or developments resulting in physical loss of the intertidal supporting habitats are likely to reduce the availability of food and roosting habitat and thus be detrimental to the favourable condition of the SPA interest features including the Annex 1 species, Bewick's swan. The intertidal mudflats and sandflats and the saltmarsh are highly sensitive to removal by land reclamation and major construction activities.

**ii. Changes in suspended sediment**

It is thought unlikely that changes in the suspended sediment within the Estuary will affect the Bewick's Swan directly but such changes may have marked effects on the supporting habitats on which they are dependant for roosting and feeding. The saltmarshes and intertidal mudflats and sandflats are currently considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in suspended sediments . (Refer also to sections 5.6.3 and 5.6.4). Impacts on the suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**iii. Desiccation and changes in emergence regime**

It is thought unlikely that changes in the emergence regime within the Estuary will affect the Bewick's Swan directly but such changes may have marked effects on the supporting habitats on which they are dependant for roosting and feeding. The saltmarshes are currently considered to have **high sensitivity** and **low exposure** and therefore **moderate vulnerability** to desiccation and changes in emergence regime. (Refer also to section 5.6.4.) Impacts on the suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**iv. Changes in water flow rate**

It is thought unlikely that changes in water flow rate within the Estuary will affect the Bewick's Swan directly but such changes may have marked effects on the supporting habitats on which they are dependant for roosting and feeding. The saltmarshes and intertidal mudflats and sandflats of the estuary are considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in water flow rate . (Refer also to sections 5.6.3 and 5.6.4). Impacts on the suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**v. Changes in wave exposure**

It is thought unlikely that changes in wave exposure within the Estuary will affect the Bewick's Swan directly but such changes may have marked effects on the supporting habitats on which they are dependant for roosting and feeding. The saltmarshes and intertidal mudflats and sandflats of the estuary are considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in water flow rate . (Refer also to sections 5.6.3 and 5.6.4). . Impacts on the extent and suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**vi. Changes in grazing management**

The Bewicks Swan feature, which is dependent on the saltmarsh habitats, is considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in grazing management.

The vegetation composition of saltmarsh habitats can be altered by changes in grazing management. This can affect the palatability of the sward for grazing Bewick's swans and therefore affect the availability of adequate preferred feeding areas within the SPA. There are critical areas for this species located at the Dumbles in the uppermost part of the estuary all of which are grazed.

**vii. Noise and visual presence**

Overwintering birds are disturbed by sudden movements and sudden noises. This can displace the birds from their feeding grounds. Disturbance can prevent the birds from feeding and in response they either a) decrease their energy intake at their present (disturbed) feeding site through displacement activity, or b) move to an alternative less favoured feeding site. Such a response affects energy budgets and thus survival. There is intermittent disturbance from both the landward and seaward side of the site. Bewick's swans are mainly affected by disturbance from the landward side and any increase in disturbance should be avoided. At present the Annex 1 species are **moderately vulnerable** to noise and visual disturbance on the intertidal mudflats and sandflats and have a **high vulnerability** to this category of operation on the saltmarsh.

**viii. Toxic contamination through the introduction of synthetic and/or non-synthetic compounds**

Waterfowl are subject to the accumulation of toxins through the food chain or through direct contact with toxic substances when roosting or feeding. Their ability to feed can also be affected by the abundance or change in palatability of their prey caused by toxic contamination. At the moment there is no evidence to show that this is the case, but the estuary is vulnerable to oil spills and there is a continuous discharge of toxins into the estuary,

some of which bind to the sediments. This is an area which requires further assessment and is likely to be addressed by work arising from both the Water Framework Directive and ongoing Review of Consents by the Environment Agency. The Bewick's swans has a **moderate vulnerability** to toxic contamination.

ix. **Changes in nutrient loading**

Changes in organic or nutrient loading can change the species composition of the plants on the saltmarsh and thus the structure of the sward. This could affect the palatability of the sward for grazing Bewick's swans and therefore affect the availability of adequate preferred feeding areas within the SPA. There are critical areas for this species located at the Dumbles in the uppermost part of the estuary all of which are grazed.

**x. Changes in salinity**

It is thought unlikely that changes in salinity within the Estuary will affect the Bewicks Swan feature directly but such changes may have marked effects on the supporting saltmarsh habitats on which this species are dependant for feeding. The saltmarshes of the estuary are considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in salinity. Impacts on these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**xi. Changes in oxygenation**

It is thought unlikely that changes in oxygenation within the Estuary will affect the Bewicks Swan feature directly but such changes may have an effect on the community composition of supporting saltmarsh habitats on which this species are dependant for feeding. The saltmarshes of the estuary are considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in oxygenation. Impacts on these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**xii. Introduction of microbial pathogens**

Bewicks swan is considered to have **low sensitivity** and **high exposure** (due to the high number of sewage discharges) and therefore **moderate vulnerability** to the introduction of microbial pathogens.

Microbial pathogens are most likely to enter the Severn's ecosystem by means of sewage discharges. Bewicks swans on their feeding or roosting grounds may be affected by direct infection by pathogens ( bacteria or viruses) present in the water or river sediments and through the release of endo or exotoxins bacterial toxins. Infection may cause mortality, loss of condition and behavioural changes in individuals and within the population using the site through onward contamination.

## 5.7.2 Internationally important waterfowl assemblage including populations of regularly occurring migratory species

**(Note : this advice is also relevant to the Ramsar Site's "internationally important populations of waterfowl" features and the "internationally important assemblage of waterfowl" feature for which the Ramsar Site has been designated – refer also to section 5.8)**

### 5.7.2.1 Sensitivity

The Internationally important waterfowl assemblage including populations of regularly occurring migratory species is **moderately to highly sensitive** to:

- **Physical loss**
- **Physical damage**
- **Non-physical disturbance**
- **Toxic contamination**
- **Non-Toxic contamination**
- **Biological disturbance**

These result from a range of activities known to occur within the Estuary. Further details are provided in points i) to xvi) below, with details of the level of sensitivity set out in Table 23.

### 5.7.2.2 Exposure

The Internationally important waterfowl assemblage including populations of regularly occurring migratory species is **moderately to highly exposed** to:

- **Substratum loss and smothering**
- **Changes in suspended sediment**
- **Desiccation and changes in emergence regime**
- **Changes in water flow**
- **Changes in wave exposure**
- **Abrasion and physical disturbance**
- **Grazing management**
- **Noise and visual disturbance**
- **Toxic contamination**
- **Changes in nutrient loading**
- **Changes in thermal regime**
- **Changes in salinity**
- **Changes in oxygenation**
- **Introduction of microbial pathogens**
- **Introduction of non-native species**
- **Selective extraction of species**

### 5.7.2.3 Vulnerability

The Internationally important waterfowl assemblage including populations of regularly occurring migratory species has **moderate to high vulnerability** to:

**i. Substratum loss and smothering**

The intertidal habitats and therefore the waterfowl assemblage feature which these habitats support are considered to have **moderate to high sensitivity** and **moderate to high exposure** and therefore **moderate to high vulnerability** to physical loss (substratum loss and smothering).

The physical loss of areas of intertidal habitats may be caused directly through change of land use or indirectly as a consequence of changes to sedimentation processes (e.g. coastal defences) as well as via the effects of smothering by artificial structures (e.g. jetties) or the disposal of spoils. Activities or developments resulting in

physical loss of the intertidal supporting habitats are likely to reduce the availability of food and roosting habitat and thus be detrimental to the favourable condition of the SPA interest features including all the migratory species and waterfowl assemblage. The intertidal mudflats and sandflats and the saltmarsh are highly sensitive to removal by land reclamation and major construction activities.

Eelgrass beds (which are a food source for some species of the assemblage) are being affected by siltation due to changes in sediment movement after construction of the Second Severn Crossing which has resulted in smothering.

**ii. Changes in suspended sediment**

It is thought unlikely that changes in the suspended sediment within the Estuary will affect the waterfowl assemblage directly but such changes may have marked effects on the supporting habitats on which they are dependant for roosting and feeding.. (Refer also to sections 5.6.1, 5.6.3 and 5.6.4). The supporting habitats are all are currently considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to desiccation and changes in emergence regime. Impacts on the suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**iii. Desiccation and changes in emergence regime**

It is thought unlikely that changes in the emergence regime within the Estuary will affect the waterfowl assemblage directly but such changes may have marked effects on the supporting habitats on which they are dependant for roosting and feeding.. (Refer also to sections 5.6.1, 5.6.3 and 5.6.4). The saltmarshes are currently considered to have **high sensitivity** and **low exposure** and therefore **moderate vulnerability** to desiccation and changes in emergence regime. Impacts on the suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**iv. Changes in water flow rate**

It is thought unlikely that changes in water flow rate within the Estuary will affect the designated bird species of the assemblage directly but such changes may have marked effects on the supporting habitats on which these species are dependant for roosting and feeding. All the supporting habitats are considered to have **moderate sensitivity** and **high exposure** and therefore **high vulnerability** to changes in water flow rate . (Refer also to sections 5.6.1, 5.6.3 and 5.6.4). Impacts on the suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**v. Changes in wave exposure**

It is thought unlikely that changes in wave exposure within the Estuary will affect the designated bird species of the assemblage directly but such changes may have marked effects on the supporting habitats on which these species are dependant for roosting and feeding. All the supporting habitats are considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in water flow rate . (Refer also to sections 5.6.1, 5.6.3 and 5.6.4). Impacts on the extent and suitability of these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**vi. Abrasion and physical disturbance**

Saltmarsh may be physically damaged from overgrazing or eroded when boats are moored on it and when paths are worn through it to reach moored boats on foot or via vehicles. Currently all supporting habitats are considered to be moderately vulnerable to abrasion. Intertidal habitats are **highly sensitive** to damage by direct and indirect effects of aggregate dredging. The intertidal mudflats and sandflats and the shingle and rocky shore are therefore considered **highly vulnerable** to selective extraction.

**vii. Changes in grazing management**

The waterfowl assemblage which is in part dependant on the saltmarsh habitats is considered to have **high sensitivity** and **high exposure** and therefore **high vulnerability** to changes in grazing management.

The vegetation composition of saltmarsh habitats can be altered by changes in grazing management. This can affect the palatability of the sward for grazing wildfowl and availability of invertebrate food sources and therefore affect the availability of adequate preferred feeding areas within the SPA. Grazing changes may also

affect the suitability saltmarsh areas as resting and roosting sites for birds where open terrain with low vegetation is an important factor.

**viii. Noise or visual disturbance**

Overwintering birds are disturbed by sudden movements and sudden noises. This can have the effect of displacing the birds from their feeding grounds. Disturbance can prevent the birds from feeding and in response they either a) decrease their energy intake at their present (disturbed) feeding site through displacement activity, or b) move to an alternative less favoured feeding site. Such a response affects energy budgets and thus survival. There is intermittent disturbance to the internationally important migratory species and the waterfowl assemblage from both the landward and seaward side of the site which has increased in recent years, due to the estuary becoming more populated and the development of all weather recreational pursuits. All supporting habitats are currently **highly vulnerable** to noise and visual disturbance.

**ix. Toxic contamination through the introduction of synthetic and/or non-synthetic compounds**

Waterfowl are subject to the accumulation of toxins through the food chain or through direct contact with toxic substances when roosting or feeding. Their ability to feed can also be affected by the abundance or change in palatability of their prey caused by toxic contamination. At the moment there is no evidence to show that this is the case on the Severn Estuary, but the estuary is vulnerable to oil spills and there is a continuous discharge of toxins into the estuary, some of which bind to the sediments. This is an area that requires further assessment. The intertidal mudflats and sandflats and the saltmarsh are currently **highly vulnerable** to the introduction of synthetic and non-synthetic compounds.

**x. Changes in nutrient loading**

Changes in organic or nutrient loading can change the species composition of the plants on the saltmarsh and thus the structure of the sward. Increases in nutrients can cause excessive algal growth on the mudflats, denying the birds access to their invertebrate prey and changing the invertebrate species composition in the sediment. However, high nutrient loads can also be beneficial to some species of birds by increasing the density and size of prey items. Though the water quality has been improved in recent years there are still local areas of concern. On balance, any increase in nutrient loading should be avoided. At present the intertidal mudflats and sandflats are **moderately vulnerable** to this category of operation.

**xi. Changes in thermal regime**

It is thought unlikely that changes in the thermal regime within the Estuary will affect the designated bird species of the assemblage directly but such changes may have marked effects on the community composition of supporting habitats on which these species are dependant for feeding. The intertidal mudflats and sandflats of the estuary are considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to changes in thermal regime. Impacts on these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**xii. Changes in salinity**

It is thought unlikely that changes in salinity within the Estuary will affect the waterfowl assemblage feature directly but such changes may have marked effects on the supporting habitats on which these species are dependant for feeding. The saltmarshes, intertidal mudfalts and sand flats and hard substrate habitats (rocky shores) of the estuary are considered to have **low to moderate sensitivity** and **high exposure** and therefore **moderate to high vulnerability** to changes in salinity. Impacts on these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**xiii. Changes in oxygenation**

It is thought unlikely that changes in oxygenation within the Estuary will affect the waterfowl assemblage feature directly but such changes may have marked effects on the community composition of supporting habitats on which these species are dependant for feeding. The saltmarshes, intertidal mudfalts and sand flats and hard substrate habitats (rocky shores) of the estuary are considered to have **low sensitivity** and **high exposure** and therefore **moderate vulnerability** to changes in oxygenation. Impacts on these habitats may affect the long term survival of individuals (in terms of energy and competition) or alter behavior and patterns of use or distribution.

**xiv. Introduction of microbial pathogens**

The bird assemblage is considered to have **low to high sensitivity** and **high exposure** (due to the high number of sewage discharges) and therefore **moderate vulnerability** to the introduction of microbial pathogens.

Microbial pathogens are most likely to enter the Severn's ecosystem by means of sewage discharges. Waterfowl may be affected by microbial pathogens (bacteria or viruses) on their feeding or roosting grounds and are considered to be particularly highly exposed when feeding and roosting on the intertidal mudflats and sandflats and hard substrate habitats where there may be bioaccumulation of pathogens within food sources (filter feeding organisms). Birds may also be affected by direct infection by pathogens present in the water or river sediments and through the release of endo or exotoxins bacterial toxins. Infection may cause mortality, loss of condition and behavioural changes in individuals and within the population using the site through onward contamination.

**xv. Introduction of non-native species**

The birds assemblage is considered to have **high sensitivity** and **low exposure** and therefore **moderate vulnerability** to the introduction of non native species.

The saltmarsh cordgrass *Spartina anglica* is an invasive pioneer species whose rapid growth consolidates sediment, raises mudflats and reduces sediment availability elsewhere. This expansion can affect areas of intertidal habitats (mud and sandflats and hard substrate habitats) which are key habitats for roosting and feeding birds. Such expansion is regarded as being a potential threat to intertidal beds of eelgrass *Zostera noltei* in particular which are a food source for some species within the assemblage (Wigeon and European white-fronted goose). However, whilst recognising *S. anglica* as an invasive species, it also has a role in saltmarsh formation and the community SM6 in which it features should be allowed to develop into other Atlantic Salt Meadow or transitional communities which are also of value as feeding and roosting habitats for birds within the assemblage.

The presence of another non-native, the slipper limpet *Crepidula fornicata*, in large numbers may alter the species composition within certain soft mud habitats leading to a decline in overall species richness and consequent implications on food availability for feeding birds. However, *C. fornicata* has yet to penetrate the Estuary, possibly due to the strong water flows.

**xvi. Selective extraction of species**

The birds assemblage is considered to have **moderate sensitivity** and **moderate exposure** and therefore **moderate vulnerability** to the selective extraction of species.

Wildfowling is carried out all around the estuary. It is believed that there is currently no direct detrimental effect on the overall bird populations but wildfowling is one of many activities that may be contributing (through disturbance) to the decline in some species on the Severn. Continuing monitoring and regulation of wildfowling is achieved by the countyside agencies and through the management of wildfowling by a British Association of Shooting and Conservation (BASC) affiliated associations, applying the BASC wildfowlers code of conduct.

Bait digging is also carried out in localised areas of the mid and outer estuary. Extensive areas of digging can change the availability of prey in the sediment as the area needs a period of recovery and recolonisation. There is currently no evidence that existing levels of activity is detrimental to the birds on the European Marine Site.

The removal of strandline vegetation by beach cleaning removes an important habitat for invertebrates, as well as many of the invertebrates themselves, reducing the quantity and variety of prey available to the birds. Much of the saltmarsh is managed by grazing and changes in management can alter the availability of prey and suitability of roosting sites.

**Table 23 Sensitivity, exposure and vulnerability of the Severn Estuary SPA to physical, chemical and biological pressures** *(See note in section 5.7 on changes to this table since version issued in1995.)*

| Sensitivity | | Exposure | | Vulnerability | |
|---|---|---|---|---|---|
| High sensitivity | OOOO | High Exposure | ××××  | High vulnerability | ⊗⊗⊗⊗<br>⊗⊗⊗O<br>⊗⊗⊗× |
| Moderate sensitivity | OOO | Medium Exposure | ××× | Moderate vulnerability | ⊗⊗OO<br>⊗⊗× ×<br>⊗⊗⊗ |
| Low sensitivity | OO | Low Exposure | ×× | Low vulnerability | ⊗⊗O ⊗×××<br>⊗⊗× ⊗××<br>⊗⊗ ⊗× |
| No detectable sensitivity | O | No exposure | × | No vulnerability | ⊗O |
| **?S** =Insufficient information on sensitivity | | | | Unknown vulnerability | |

| Categories of operations which may cause deterioration or disturbance | Internationally important populations of regularly occurring Annex 1 species | | Internationally important migratory species and waterfowl assemblage | | |
|---|---|---|---|---|---|
| | Intertidal mudflats and sandflats | Saltmarsh | Intertidal mudflats and sandflats | Saltmarsh | Hard substrates |
| **Physical Loss** | | | | | |
| Removal/substratum loss | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ |
| Smothering | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ |
| **Physical Damage** | | | | | |
| Changes in suspended sediment | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗ |
| Desiccation and changes in emergence regime | ⊗⊗O | ⊗⊗OO | ⊗⊗O | ⊗⊗OO | ⊗⊗O |
| Changes in water flow | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗⊗× |
| Changes in wave exposure | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ |
| Abrasion / physical disturbance (of habitats) | ⊗⊗ | ⊗⊗O | ⊗⊗⊗⊗ | ⊗⊗⊗× | ⊗⊗⊗× |
| Grazing management | Not relevant | ⊗⊗⊗⊗ | Not relevant | ⊗⊗⊗⊗ | Not relevant |
| **Non-physical disturbance** | | | | | |
| Noise & visual presence | ⊗⊗OO | ⊗⊗⊗O | ⊗⊗⊗O | ⊗⊗⊗⊗ | ⊗⊗⊗O |
| **Toxic contamination** | | | | | |
| Introduction of synthetic compounds | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗× | ⊗⊗⊗× |
| Introduction of non-synthetic compounds | ⊗⊗⊗ | ⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗⊗ | ⊗⊗⊗× |
| Introduction of radionuclides | **?S**×× | **?S**×× | **?S**×× | **?S**×× | **?S**×× |
| **Non-toxic contamination** | | | | | |
| Changes in nutrient loading | ⊗××× | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗⊗× | ⊗⊗×× |
| Changes in thermal regime | ⊗× | ⊗⊗ | ⊗⊗⊗ | ⊗⊗ | ⊗⊗ |
| Changes in turbidity (light penetration) | ⊗×× | ⊗× | ⊗⊗× | ⊗× | ⊗⊗× |
| Changes in salinity | ⊗××× | ⊗⊗⊗× | ⊗⊗×× | ⊗⊗⊗× | ⊗⊗×× |
| Changes in oxygenation | ⊗××× | ⊗⊗×× | ⊗⊗×× | ⊗⊗×× | ⊗⊗×× |
| **Biological disturbance** | | | | | |
| Introduction of microbial pathogens | ⊗⊗×× | ⊗⊗×× | ⊗⊗⊗⊗ | ⊗⊗×× | ⊗⊗⊗⊗ |
| Introduction of non-native species | ⊗× | ⊗⊗ | ⊗⊗OO | ⊗⊗ | ⊗⊗OO |
| Selective extraction of species | ⊗⊗O | ⊗⊗O | ⊗⊗⊗ | ⊗⊗⊗ | ⊗×× |

## 5.8 Specific Advice on Operations for the Severn Estuary Ramsar Site

Separate advice for the Ramsar Site features has not been produced here as it repeats the advice given in the previous sections (5.6 and 5.7) for the SAC and SPA respectively due to the overlapping nature of the Ramsar features. The following table therefore cross references the features of these designations and provides a direct reference to the section where advice relevant to the Ramsar features can be found.

**Table 24 Cross reference table relating features of the Ramsar Site to the advice on operations for the SAC and SPA**

| Ramsar interest features | Relevant SAC and SPA features and supporting habitats | Reference section for advice on operations relevant to the Ramsar features |
|---|---|---|
| *Ramsar Interest feature 1 :* **Estuaries** | **SAC: Annex I habitats**<br>Estuaries<br>Intertidal mudflats and sandflats<br>Atlantic Salt Meadows | <br>Section 5.6..1 & Table 22<br>Section 5.6.3 & Table 22<br>Section 5.6.4 & Table 22 |
| *Ramsar Interest feature 2 :* **Migratory fish assemblage** | **SAC : Annex II species**<br>River lamprey *Lampetra fluviatilis*;<br>Sea lamprey *Petromyzon marinus*;<br>Twaite shad *Alosa fallax* | <br>Section 5.6.6 & Table 22<br>Section 5.6.6 & Table 22<br>Section 5.6.6 & Table 22 |
| **Internationally important populations of waterfowl**<br><br>*Ramsar Interest feature 3:* **Bewick's swan**<br><br>*Ramsar Interest feature 4:* **European white-fronted goose**<br>*Ramsar Interest feature 5:* **Dunlin**<br>*Ramsar Interest feature 6:* **Redshank**<br>*Ramsar Interest feature 7:* **Shelduck**<br>*Ramsar Interest feature 8:***Gadwall** | <br><br>**SPA : Internationally important populations of regularly occurring Annex 1 species (Bewick's swan)**<br><br>SPA: **Internationally important populations of regularly occurring migratory species (same species as column to left)**<br><br>**Supporting habitats**<br>Intertidal mudflats and sandflats<br>Saltmarsh<br>Hard substrates<br>. | <br><br>Section 5.7.1 & Table 23<br><br>Section 5.7.2 & Table 23<br><br><br><br><br>Section 5.6.3 & Table 22<br>Section 5.6.4 & Table 22 |
| *Ramsar Interest feature 9*<br>**Internationally important assemblage of waterfowl** | SPA: **Internationally important assemblage of waterfowl**<br><br>**Supporting habitats**<br>Intertidal mudflats and sandflats<br>Saltmarsh<br>Hard substrates | Section 5.7.2 & Table 23<br><br><br><br>Section 5.6.3 & Table 22<br>Section 5.6.4 & Table 22 |

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# 7. Glossary

| | |
|---|---|
| **Advisory Group** | The body of the representatives from local interests, user groups and conservation groups, formed to advise the management group |
| **Annex 1 Bird species** | The species listed in Annex 1 of the Birds Directive are the subject of special conservation measures concerning their habitat. These measures ensure the survival and reproduction of the birds in their area of distribution. Species listed on Annex 1 are in danger of extinction, rare or vulnerable |
| **Annex I habitat type(s)** | A natural habitat(s) listed in Annex I of the Habitats Directive for which Special Areas of Conservation can be selected. |
| **Annex II species** | A species listed in Annex II of the Habitats Directive for which Special Areas of Conservation can be selected. |
| **Annex V** | The listing, in the Habitats Directive, of the animal and plant species whose taking in the wild and exploitation may be subject to management measures. |
| **Assemblage** | A collection of plants and/or animals characteristically associated with a particular environment. |
| **Attribute** | Characteristic of an interest feature or supporting habitat which provides an indication of the condition of the feature or supporting habitat to which it applies. |
| **BASC** | British Association of Shooting and Conservation |
| **Benthos** | Those organisms attached to, or living on, in or near, the seabed, including that part which is exposed by tides. |
| **Birds Directive** | The abbreviated term of *Council Directive* 79/409/*EEC of 1979 on the conservation of wild birds.* |
| **Biodiversity** | The total variety of life on earth. This includes diversity within species, between species and ecosystems. |
| **Biotope** | The physical habitat with its biological community; a term which refers to the combination of physical environment and its distinctive assemblage of conspicuous species. |
| **BTO** | British Trust for Ornithology |
| **CCW** | Countryside Council for Wales |
| **Characteristic** | Special to, or especially abundant in, a particular situation or biotope. Characteristic species should be immediately conspicuous and easily identified. |
| **Community** | A group or organisms occurring in a particular environment, presumably interacting with each other and with the environment, and identifiable by means of ecological survey from other groups. |
| **Competent authority** | Any Minister, government department, public or statutory undertaker, public body or person holding a public office that exercises legislative powers. |
| **Conservation objective** | A statement of the nature conservation aspirations for a site, expressed in terms of the favourable condition that we wish to see the species and/or habitats for which the site has been selected to attain. Conservation objectives for European Marine Sites relate to the aims of the Habitats Directive. |
| **DEFRA** | Department for Environment, Food and Rural Affairs |
| **DETR** | Department of the Environment, Transport and the Regions |
| **Epifauna** | Benthic animals living on the seabed. |
| **EN** | English Nature (now incorporated into Natural England). |
| **Eulittoral** | The main part of the intertidal zone characterised by limpets, barnacles, mussels, fucoid algae and with red algae often abundant on the lower part. |

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|---|---|
| **European Marine Site** | A European site which consists of, or in so far as it consists of, areas covered intermittently or continuously by seawater. |
| **European Site** | A classified SPA, designated SAC, site of Community importance (a site selected as a candidate SAC, adopted by the European Commission but not yet designated), a candidate SAC (in England only) or a site hosting a priority species in respect of which Article 5 of the Habitats directive applies. |
| **Favourable condition** | The condition represented by the achievement of the conservation objectives, in other words the desired condition for a designated habitat or a species on an individual site. |
| **Favourable conservation status (FCS)** | A range of conditions for a natural habitat or species at which the sum of the influences acting upon that habitat or species are not adversely affecting its distribution, abundance, structure or function throughout the EC in the long term. The condition in which the habitat or species is capable of sustaining itself on a long-term basis. |
| **Habitat** | The place in which a plant or animal lives. |
| **Habitats Directive** | The abbreviated term of *Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora.* It is the aim of this Directive to promote the conservation of certain habitats and species within the European Union. |
| **Habs Regs** | The Conservation (Natural Habitats &c.) Regulations 1994. |
| **HAT** | Highest Astronomical Tide. |
| **Infauna** | Benthic animals which live within the sediment. |
| **Infralittoral** | The subtidal zone in which upward facing rocks are dominated by erect algae, typically kelps. |
| **Interest feature** | A natural or semi-natural feature for which a European site has been selected. This includes any Habitats Directive Annex I habitat, or any Annex II species and any population of a bird species for which an SPA has been designated under the Birds Directive. |
| **JNCC** | Joint Nature Conservation Committee. |
| **Maintain** | The action required for an interest feature when it is considered to be in favourable condition. |
| **Management group** | The body of relevant authorities formed to manage the European Marine Site. |
| **Management scheme** | The framework established by the relevant authorities at a European Marine Site under which their functions are exercised to secure, in relation to that site, compliance with the requirements of the Habitats Directive. |
| **MNR** | Marine Nature Reserve. |
| **Nationally scarce/rare** | For marine purposes, these are regarded as species of limited national occurrence. |
| **Natura 2000** | The European network of protected sites established under the Birds Directive and the Habitats Directive. |
| **NNR** | National Nature Reserve. |
| **Notable species** | A species that is considered to be notable due to its importance as an indicator, and may also be of nature conservation importance, and which is unlikely to be a 'characteristic species.' |
| **Operations which may cause deterioration or disturbance** | Any activity or operation taking place within, adjacent to, or remote from a European Marine Site that has the potential to cause deterioration to the natural habitats for which the site was designated, or disturbance to the species and its habitats for which the site was designated. |
| **PCB** | Polychlorinated Biphenyls. |

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|---|---|
| **Peak mean counts (5 yr)** | The Severn Estuary is broken down into count sectors. Over the winter months WeBS volunteers count all the birds which are visible within each sector. The yearly figures for each species in the Severn Estuary are then averaged over a five year period to give the 5 yr peak mean count. |
| **Plan or project** | Any operation that is within a competent authority's (including relevant authorities) function to control, or over which a competent authority (including relevant authorities) has a statutory function to decide on applications for consents, authorisations, licences or permissions. There is no generally accepted definition of the term "plan or project". This definition may be subject to review and may require further discussion in the context of developing a management scheme for the Severn Estuary SPA. |
| **Ramsar** | Site designated under the 1971 Ramsar Convention as a wetland of international importance. |
| **Relevant authority** | The specific competent authority which has powers or functions which have, or could have, an impact on the marine environment, or adjacent to, a European Marine Site. |
| **Reporting period** | The cycle within which a definitive report on the condition of features protected within the site series will be produced, set as once in every 6 years. |
| **Restore** | The action required for an interest feature when it is not considered to be in a favourable condition. |
| **SAC** | Special Area of Conservation. |
| **Sensitivity** | The intolerance of a habitat, community or individual species to damage from an external force. |
| **SPA** | Special Protection Area for birds. |
| **SSSI** | Site of Special Scientific Interest. |
| **Strandline** | The organic matter particularly rotting seaweed deposited by the tide anywhere along the intertidal. |
| **Supporting Habitats** | The key habitats within the European Marine Site necessary to support the interest feature. |
| **TAN 5** | Planning Guidance (Wales) Technical Advice Note (TAN)5: Nature Conservation and Planning (Welsh Assembly Government) |
| **TBT** | Tri-butyl tin |
| **Vulnerability** | The exposure of a habitat, community or individual of a species to an external factor to which it is sensitive. |
| **WeBS** | Wetland Bird Survey: a collaborative national surveillance scheme of the UK's waterfowl based on counts undertaken once per month outside of the breeding season. |
| **WWT** | Wildfowl & Wetlands Trust |

# Surface water abstraction from River Severn at Penarth Feeder, Newtown for Montgomery Canal (CRT286)

## 1. Purpose of this document

This report:

- explains how the applications for transitional transfer abstraction licences (also known as 'New Authorisation' licences) have been determined;
- provides a record of the decision-making process;
- shows how all relevant factors have been taken into account; and
- justifies the use of specific bespoke conditions within the licence.

In determining these applications, NRW has exercised its duties and powers under The Water Abstraction (Transitional Provisions) Regulations 2017.

## 2. Table of Contents

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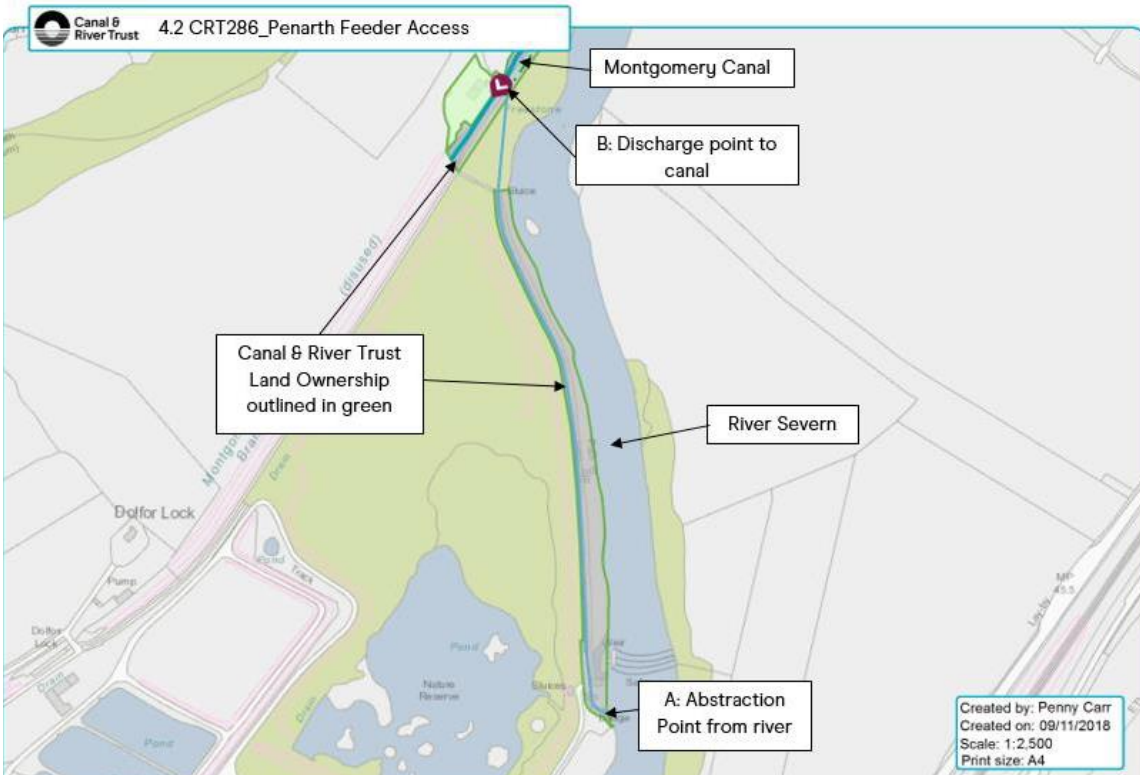
## 3. Summary of the application

Application by Canal & River Trust to licence an existing transfer of water, for the purpose of 'operations in the course of carrying out functions as a Navigation Authority'. The abstraction is from the River Severn at Penarth and water is discharged into the Montgomery Canal via the Penarth Feeder, as detailed in the following map:

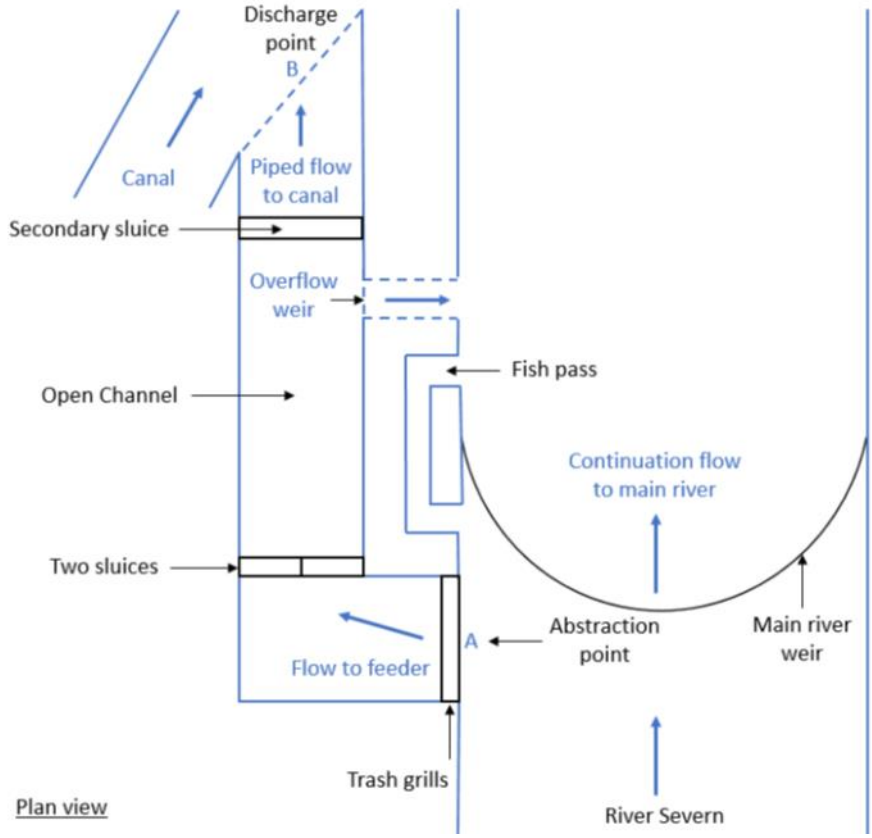
**Map showing site layout:** Point of abstraction from the River Severn and discharge location into the Montgomery Canal.




The abstraction is necessary to maintain the water level within the canal within a 'Normal Operating Zone', to avoid business risk including damage to infrastructure (caused by overtopping, damage to canal lining and canal bank collapse), and maintaining a navigable depth. Further detail is included within the supporting information document saved to DMS dated 19/09/2019. The Montgomery Canal is designated as a Special Area of Conservation (SAC) and a Site of Special Scientific Interest (SSSI) and the abstracted water is also necessary to maintain the designations, see sections 9.6 and 9.7 below for further detail.

Abstracted water flows under gravity via trash grilles into an open feeder channel via two sluice gates with dimensions not exceeding 570 millimetres (mm) by 550mm (which are generally operated alternately), any excess flow passing through the primary sluice gate(s) is discharged back into the River Severn via an overflow weir at National Grid Reference SO 13957 92773. The necessary abstracted water then follows through a secondary sluice as a final control before entering a culverted section of the feeder, which then discharges into the Montgomery Canal. As detailed in the following plan view drawing:

**Plan view drawing:** showing site insfrastructure in further detail.




The applicant states that the abstraction is subject to section 9 of the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987, which details restrictions on the abstraction during a period of River Severn Regulation, see section 9.10 for further detail.

The abstraction was previously exempt from licensing, under section 26 of the Water Resources Act 1991. The Water Act 2003 included provisions to remove this exemption, which came into force on the 01/01/2018 following the introduction of the Water Abstraction (Transitional Provisions) Regulations 2017. As a result of these legislative changes, CRT submitted a licence application under the transitional licence application process to licence their previously exempt abstraction.

We have decided to issue the licence on 21/12/2022. Licensing this abstraction is considered a first step to move towards sustainable abstraction and it will continue to be reviewed through future sustainability review processes.

## 4. Application and licence determination details

| Application details | |
|---|---|
| Applicant name and address[1] | Canal & River Trust |

[1] The applicant address is different to that provided in Form WRH, but was confirmed by the applicant in email correspondence dated 13/6/2022.

| | |
|---|---|
| | National Waterways Museum Ellesmere Port<br>South Pier Road<br>Ellesmere Port<br>Cheshire<br>England<br>CH65 4FW |
| Application contact details | Dr Adam Comerford and Kathryn Maye<br>Address: Canal & River Trust, First Floor North Station House, 500 Elder Gate, Milton Keynes, MK9 1BB.<br>Emails: New.Authorisations@canalrivertrust.org.uk<br>Adam.Comerford@canalrivertrust.org.uk<br>Kathryn.Maye@canalrivertrust.org.uk<br><br>**Nicholas Saiz**<br>Project Manager<br>Nicholas.Saiz@canalrivertrust.org.uk<br>Tel: 07584 543214 |
| Application reference number | PAN-007395 |
| New licence number | WA/054/0001/0123 |
| WFD Waterbody number & name | GB109054049310 Severn - conf Afon Dulas to conf R Camlad |
| Abstraction Licensing Strategy (ALS) | Severn Corridor |
| Catchment and sub-catchment | 054 / 0001I: Severn (Upper, above Montfort) |
| NRW Area | Mid Wales |

| **Determination process details** | |
|---|---|
| Date application received | 08/10/2019 |
| Date technical checks undertaken | 17/12/2019 |
| Date any final further information received, and application validated | 17/12/2019 |
| Reason abstraction was previously exempt | All transfers of water in the course of or resulting from the operations of a navigation authority in carrying out its navigation functions were exempt from the need for a licence under section 26 of the Water Resources Act 1991. |
| Non- statutory determination date | 21/12/2022 |
| Application publication | This advertising decision was agreed by the NA Panel on 14/01/2021 and recorded in the NA Screening spreadsheet.<br><br>Application advertised in the County Times on 18/06/2021. No public representations or comments received from statutory bodies. A copy of the advertisement voucher can be found on DMS. |
| National Park notification | Not relevant as abstraction not located within a National Park. |
| External Consultation | Environment Agency |

| | |
|---|---|
| | This proposal is within a cross border ALS. The EA were consulted during the determination, for advice on what flow restrictions would be appropriate for the proposal, see email dated 22/06/2022. EA confirmed that they were unable to provide requested information in an email dated 06/07/2022. The EA were sent a draft copy of the licence ahead of issue for awareness, see email dated 09/12/2022, with a request to send any comments by 16/12/2022. No comments were received.<br><br>Historic Environment<br>Clwyd-Powys Welsh Archaeological Trust were consulted by email on 19/05/2022, with no response received, therefore no concerns considered.<br><br>Cadw / Local Authority: were not consulted as part of this determination, see section 9.6 below for historic features identified during screening. It is noted the applicant should engage with these consultees to discuss the screening requirements at the point of abstraction and on the overflow weir. The applicant was made aware of this in an email dated 24/11/2022 and a note shall be included within the issue letter. |
| Environmental Impact Assessment Regulations (EIA) requirements | The proposal is not relevant under these regulations; therefore, no environmental statement is required. |

| **Abstraction details** | **Licence details** |
|---|---|
| Location of abstraction | Penarth Feeder, Newtown. |
| Source of supply | Inland water (river) known as River Severn. |
| Point of abstraction (NGR) (single point) | At National Grid Reference SO 13965 92624 marked 'Point A' on the map. |
| Purpose of abstraction | Transfer for the purpose of operations in the course of carrying out functions as a Navigation Authority. |
| Period of abstraction | All year |
| Quantities and rates: | |
| cubic metres per hour | 821.3 |
| cubic metres per day | 14,574 |
| cubic metres per year | 2,311,216 |
| Means of abstraction | Gravity flow to an open channel controlled by a weir and sluice gates. |
| Measurement of abstraction | (i) No abstraction shall take place unless the Licence Holder has installed a measuring device at Byles Lock to measure quantities of water abstracted.<br>(ii) The Licence Holder shall position and install the measuring device in accordance with any written directions given by NRW.<br>(iii) The Licence Holder shall maintain, repair, or replace the measuring device to ensure that accurate measurements are recorded at all times.<br>(iv) The Licence Holder shall keep all records of measuring device repair or replacement including evidence of current certification for a period of 6 years. |

| Abstraction details | Licence details |
|---|---|
| Frequency of measurement | Daily |
| Frequency of recording / reporting | Daily |
| Annual returns requirement | Yes |
| Licence end date | 31/03/2034 in accordance with the Severn Corridor ALS. |
| Minimum value condition (Y/N) | N |
| Issue date | 21/12/2022 |
| Effective date | 21/12/2022 |

## 5. Advertisement of application

Application advertised in the County Times on 18/06/2021. No representations were received - see section 4 'application publication' above for further detail.

NRW considers that the application has been advertised / consulted on appropriately.

## 6. Location of abstraction and discharge

The applicant stated on application form WRH that the point of abstraction from the River Severn was at National Grid Reference (NGR) SO 13966 92623. They later confirmed the correct point of abstraction to be at NGR SO 13965 92624, and provided a map detailing this, see email dated 17/12/2019 and saved to DMS. Also refer to section 4 above.

The applicant stated on application form WRH that the point of discharge of abstracted water into the Montgomery Canal to be at NGR SO 13906 93017.

## 7. Rights of Access

The applicant stated the following on application form WRH:
*'Absolute freehold – Title number CYM662578'*

The map provided by the applicant on 17/12/2019, includes an outline of the applicant's landownership boundary and demonstrates that the abstraction point lies within their land ownership.

## 8. Historical Evidence of abstraction and volumes

As part of the transitional licence application, applicants were required to submit evidence to demonstrate that abstraction took place during the seven year 'qualifying period' (January 2011 – December 2017) and how the abstraction quantities applied for have been evidenced. The following information was provided by the applicant: application form WRH, the supporting information report and emails dated 17/12/2019 and 05/05/2022.

Historical evidence of abstraction

The abstraction is monitored via a Supervisory Control and Data Acquisition (SCADA) telemetry system located approximately 2.5km downstream of the point of abstraction at Byles Lock within the Montgomery Canal. Byles Lock includes a lock, and a bypass channel around the lock. The volumes of abstracted water are measured at this location as follows:

**Measurement of flows through the bypass channel**

A thin plate weir is installed at the downstream end of the bypass channel around the lock. The head of water over the weir crest is recorded using the SCADA system every 5 minutes. Flow is then calculated from the recorded head over the weir using the following standard weir equation for thin plate weirs:

$Q_B = Cd \times (2/3 \times \sqrt{2g}) \times b \times (h^{3/2})$

- $Q_B$ is the bypass flow in $m^3/s$
- Cd is the coefficient of discharge
- g is acceleration due to gravity in $m/s^2$
- b is the breadth of the weir in m
- h is the recorded head of water over the weir in m

The applicant confirmed the thin plate weir dimensions as follows:

- b is the measured width of the notch in m, b = 0.600m
- B is the width of the approach channel in m, B = 1.650m
- p is the height of the crest relative to the floor in m, p = 0.200m
- H max is the maximum head above crest level in m, H max = 0.360m

The rating equation used to calculate flow from the recorded head over weir is as follows:

$Q_B = 3.794 \times h^{1.492}$

- $Q_B$ is the volumetric rate of flow in $m^3/s$
- h is the head above crest level in m

**Measurement of flows through the lock**

The filling and emptying of a lock chamber referred to as 'lockage' is monitored using a lock counter. Lockage flow is derived from the following equation:

$Q_L = L \times V$

- $Q_L$ is the lockage flow in $m^3$
- L is the recorded lockage
- V is the lock volume in $m^3$

The applicant confirmed the lock volume to be $121m^3$.

**Total volume of abstracted water flowing through the bypass channel and lock**

Therefore, the total volume of abstracted water is calculated using the following equation:

$Q = Q_B + Q_L$

- Q is the total flow / abstracted water in $m^3$
- $Q_B$ is the bypass flow in $m^3/s$
- $Q_L$ is the lockage flow in $m^3$

**Supporting evidence**

The applicant provided a spreadsheet detailing the following records from between 01/01/2011 and 31/12/2017, see DMS record dated 17/12/2019:

- Daily recorded lockage and lockage flow in $m^3$/day
- Total daily abstraction volumes in $m^3$/day, calculated from the 5 minute SCADA data and the formulae detailed above.

The supporting evidence also demonstrated the abstraction period of all year, as abstraction occurred each day for the qualifying period.

The applicant confirmed that the abstraction was compliant with section 9 of the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987, during the qualifying period. See section 9.2 for further detail on how the Bill restriction conditions during a period of river regulation will be accounted for under the NA licence, and section 9.10 for further detail on the Bill.

Licence Volumes

The supporting evidence provided by the applicant confirmed the following maximum abstraction quantities:

- 14,574m$^3$/day – from the total daily abstraction record for 13/10/2016.
- 2,311,216m$^3$/year – based on the sum of the daily total daily abstraction records for 2017.

The maximum hourly abstraction quantity of 821.3m$^3$/hour was calculated from the 5 minute SCADA data from 2016. NRW were satisfied with the supporting evidence provided by the applicant and did not request the unprocessed 5 minute SCADA data records from the applicant.

Although the instantaneous abstraction rate of 228.1l/s from 2017 will not be included on the licence, the applicant confirmed the method of calculation as follows:
*'For sites with SCADA, we have calculated the maximum peak instantaneous flow rate from the maximum daily abstraction on the day when the maximum hourly abstraction rate was recorded in each year.'.*

NRW considers the volumes applied for acceptable. The evidence submitted supports the application and demonstrates that the abstraction has occurred during the qualifying period.

## 9. Technical assessment of the proposal

The application has been screened according to the New Authorisations (NA) screening process and the results are recorded within the NA screening spreadsheet. Following this the application has been assigned a high risk and complexity score. This score was agreed by the NA Panel on 14/01/2021.

### 9.1 Water Framework Directive Regulations 2017

The abstraction is located within the Severn - conf Afon Dulas to conf R Camlad GB109054049310 WFD River Waterbody, which is a heavily modified water body. The status of the waterbody is at Moderate Ecological Potential[1]. The waterbody has failed for chemical status as follows: Zinc, Copper, Mitigation Measures Assessment as detailed within the WFD Classification data spreadsheet. However flows are considered sufficient to support GEP.

No scoping / detailed assessment was required under the WFD Regulations 2017 as it is considered there would be no deterioration in GEP as it is an existing abstraction and the intake structure has been in place for a number of years.

The abstraction will be licensed based on historic operation so there will be no change in river flows or ecological potnetial of the waterbody. Fisheries issues were considered / addressed through the HRA / Appendix 4 process (see sections 9.3 and 9.6 below).

Licensing this abstraction is considered a first step towards sustainable abstraction and it will continue to be reviewed through future sustainability review processes.

### 9.2 Hydrology and low flows protection

The River Severn is approximately 350 kilometres (km) in length from source to discharge. The Source of the Severn is on Plynlimon, close to the Powys border near Llanidloes, in the Cambrian Mountains of Mid Wales. It then flows through Shrewsbury, Worcestershire, and Gloucestershire, before discharging into the Bristol Channel. This abstraction is from the River Severn at Penarth in the upper reaches of the River Severn.

The abstraction has been occurring lawfully for many years, and in recognition of this the 2017 Government response allows NRW as the regulator to have some discretion about the application flow restrictions or HoFs to transitional licences.

Existing scenario

The River Severn is subject to river regulation, which means water is released from Llyn Clywedog (and other sources) to offset / support large abstractions from the Severn further downstream. Regulation results in increased flows in the Severn than would naturally be observed. The flows in the Severn at Penarth are higher during periods of river regulation than would typically be expected, as the abstraction is downstream of the releases and upstream of the large abstractions. It is important to note that the River Severn could be in a period of low flows, without regulation taking place.

Hydrology flow standards are based around deviation from natural flow, therefore, based on the impact of river regulation at Penarth, it is important to consider 'naturalised' flows, when considering any impacts from the historic abstraction. See Hydrology slide showing flow standards document dated 26/09/2022 saved to DMS.

The maximum abstraction rates applied for equate to a high proportion of naturalised low flows at $Q_{nat}95$ flows, as outlined in the following table:

| Units | Maximum abstraction rate applied for | $Q_{nat}95$ low flow rate | Maximum abstraction rate as a % of Q95 flows |
|---|---|---|---|
| l/s | 228.1 | 1,300 | 18 |
| $m^3$/hour | 821.3 | 4,680 | 18 |
| $m^3$/day | 14,574 | 112,320 | 13 |

When comparing the maximum abstraction rates applied for with the $Q_{nat}95$ low flow rates, there is potential for between 13% and 18% of the available low flows to be abstracted, as detailed in the above table. The current flow standards indicate that for flows less than Q95 the percentage deviation for daily naturalised flows should not exceed 10% and for flows between Q70 and Q95 this deviation should not exceed15%.

The historic abstraction is not in line with our current flow standards as flows reduce within the river. Therefore, there is potential to impact on local hydrodynamics through excessive fluctuations in flow, and abstraction of a large proportion of the river flows

during low flow conditions. This could impact on the movement of migratory fish species and subsequently population size / assemblage of migratory fish species (Eel, Atlantic Salmon, Sea lamprey, River lamprey and Sea trout) protected under the Severn Estuary designations (SSSI, SAC and Ramsar), see sections 9.3, 9.6 and 9.7 for further detail.

Maximum abstraction quantities and flow restrictions

Following assessment of the historic abstraction, which is also necessary to maintain the Montgomery Canal SAC (and SSSI), maximum abstraction quantities and bespoke flow restrictions have been deemed necessary in order establish that the project will not adversely affect the integrity of any Natura 2000/Ramsar site, as detailed below:

- **Maximum abstraction quantities – when the River Severn is not in a period of low flows.**
  When the flow in the River Severn as gauged at Dolwen Gaugin Station are greater than or equal to 0.86$m^3$/s, the following maximum hourly and daily abstraction quantities shall be conditioned on the licence (in addition to the annual), based the following quantities evidenced during the qualifying period:
  - 821.3$m^3$/hour
  - 14,574$m^3$/day
  - 2,311,216$m^3$/year.

  This will ensure the abstraction is in line with current flow standards (see graph below) and prevent risk of excessive fluctuations in flow when the River Severn is not in a period of low flows.

- **Flow restrictions – when the River Severn is in a period of low flows.**
  When the flow in the River Severn as gauged at Dolwen Gaugin Station are less than 0.86$m^3$/s, the following restrictions on abstraction shall apply, as set out in Table 1 below:

| **Table 1** | | |
|---|---|---|
| **When the flow (cubic metres per second) in the River Severn as gauged at Dolwen Gauging Station is:** | **The maximum quantity of water to be abstracted shall not exceed:** | |
| | **cubic metres per hour** | **cubic metres per day** |
| less than 0.86 and greater than or equal to 0.7 | 360 | 8,640 |
| less than 0.7 | 180 | 4,320 |

**NB:** See section 9.10 below for further detail on how the above flow restrictions have been reflected in the current operation under section 9 of the British Waterways Bill.

Figure 1 below demonstrates that the above conditions will ensure the maximum abstraction rates authorised by the licence will be in line with current flow standards (green dashed line) down to Q99 flows. The 'current scenario' line (purple) represents the maximum abstraction rates that were evidenced and applied for and shall be conditioned when the river is not in a period of low flows. The '2 restrictions' line (black) represents the two low flow restrictions detailed in table 1 above. The '1 restriction' line (red) option was initially considered and is no longer relevant. See revised hydrology report dated 29/11/2022 and email dated 30/11/2022 for further detail.

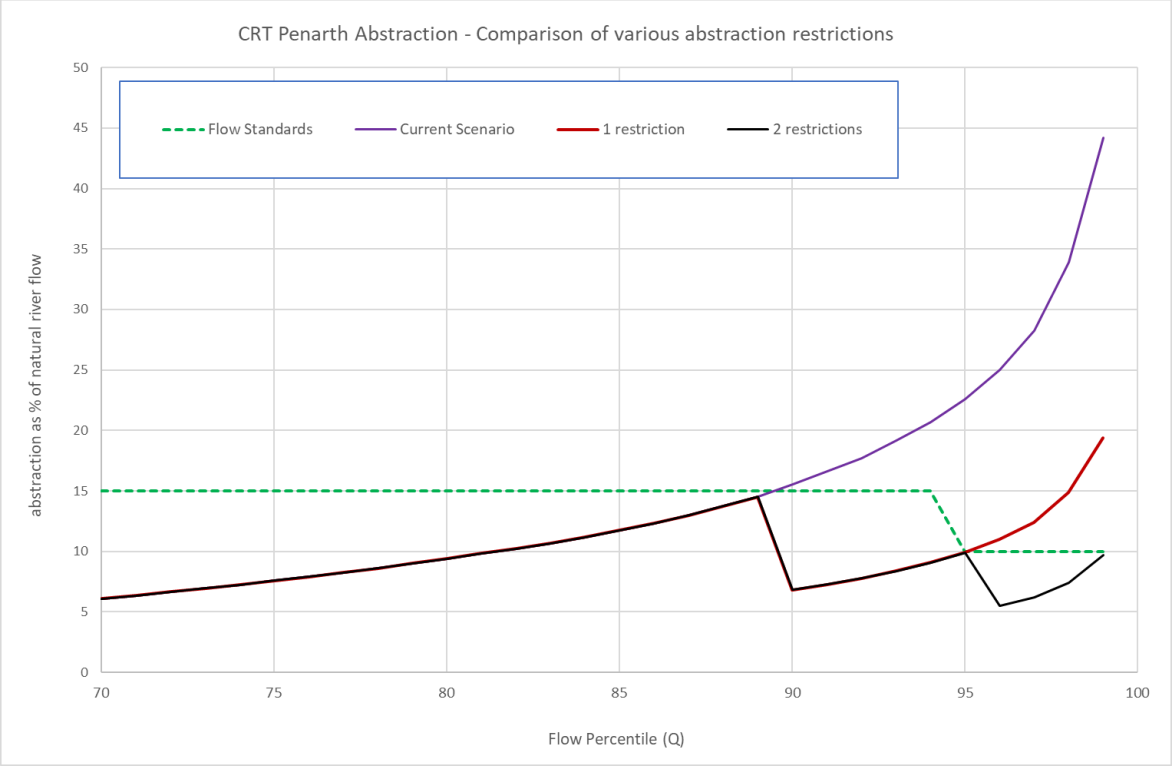



**Figure 1:** Abstraction impacts as percentage of NATURAL river flow, versus the flow standards.

NRW's gauging station data is available on our website; river flows are depicted as levels and the applicant will be provided with the equivalent river level equal to 0.86m$^3$/s and 0.7m$^3$/s flows in the River Severn as gauged at Dolwen Gauging Station in the licence issue letter (see 'Flow level equivalent at gauging station for issue letters' document dated 05/12/2022 for further detail on this). NRW are satisfied that the use of the gauging station to provide the relevant level for the is the simplest and easiest method of implementing the low flow restrictions. Using this method will minimise the burden for the applicant who has previously been abstracting legally without any restrictions.

- **Impact of the low flow restrictions on abstractable volumes for the Montgomery Canal SAC.**
  Flow data was utilised from 2021 (months Jan - Dec) and 2022 (months Jan – October) to provide an indication of how abstraction volumes from the River Severn could be affected by the proposed restrictions, on the assumption that the applicant abstracts at the maximum permitted rates (in line with the qualifying period), regardless of intake limitations (i.e., the maximum permitted rates may not be possible). These years were assessed as NRW were confident which days the Severn was being regulated. See hydrology report dated 29/11/2022 for further detail. The 2021 data used demonstrates potential impacts during a more typical year; whilst the 2022 data demonstrates potential impacts during a period of sustained low flows / drought conditions.

  Potential impacts on abstractable volumes for the Montgomery Canal, shown as a percentage reduction in abstractable volumes over a month:

- 2021: between 2-14% reduction (potentially affecting 5 months, and 0% on 7 months), and
- 2022: between 2-7% reduction (potentially affecting 3 months, and 0% on 7 months).

The 2022 data demonstrated that the proposed low flow restrictions could have less of an impact on the abstractable volumes during a period of drought, when compared with a more typical year as demonstrated by the 2021 data - % reduction and number of months affected. The reason the proposed restrictions could have has less of an impact on abstractable volumes for the canal is due to additional flows in the Severn during a period of river regulation. River regulation means that the flows within the Severn at Penarth would be less likely to be sufficiently low for the proposed low flow restrictions to apply, even during a period of drought.

NRW are satisfied that the flow restriction mitigation measures detailed above will not adversely affect the integrity of the Montgomery Canal SAC.

It is recognised that applying the above bespoke low flow restrictions condition may not be in line with the Abstraction Licensing Strategy (ALS) for the Severn Corridor, however it is considered in accordance with the 2017 Transitional Regulations and 2017 Government response. Licensing the abstraction is considered a first step towards sustainable management, through future sustainability review processes.

NRW are satisfied that the maximum abstraction quantities and bespoke flow restrictions outlined above are necessary in order establish that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site, see sections 9.3, 9.6 and 9.7 below for further detail.

During determination of this application, a query was raised regarding consistency with the approach taken for other applications submitted by CRT. In consultation with relevant hydrology and fisheries colleagues, a check of the different conditions being applied was carried out and any differences in approach were considered justified. For further information refer to correspondence and documents saved to the DMS here.

### 9.3 Impact on fisheries

The large historic weir associated with the Penarth feeder, is a significant barrier to migration for most fish species. The weir includes a historic fish pass to assist with the upstream migration of Salmon.

NRW survey Salmon and Trout at three locations (1054, 1035 & 1024) upstream of the abstraction, for further detail, please see the summary of salmon and trout survey data between 2013 and 2021 located here. The data demonstrates the presence of:

- **Salmon upstream of the abstraction**. NRW are satisfied that the habitat at the intake would be unsuitable for the early lifecycle stages of Salmon (from egg to parr), however, there is suitable habitat further upstream. Therefore, only smolt or adult Salmon would be able to access the intake location.
- **'Trout' upstream of both points of abstraction**. NRW are satisfied that the monitoring records should relate to native brown trout rather than Sea trout. Sea trout are not anticipated to be present at the intake due to their lifecycles within the catchment and distance upstream from the estuary.

As native Brown trout are the same species as Sea trout, it is acknowledged that it would be possible for a small number of native Trout to choose to migrate to the sea to become Sea trout. It should also be noted that the habitat required for the early lifecycle stages of Sea trout (from egg to parr), would be the same as for Salmon (i.e., not at the intake location, but upstream) and that only smolts and adult Sea trout would be able to access the intake location.

Therefore, based on the above, we do not anticipate there would be many, or any Sea trout present at intake location.

- **Eel:** have been identified upstream of the abstraction point, however, due the distance upstream in the catchment, as well as multiple downstream barriers, only large adult Eel are considered able to reach the point of abstraction.
- **Lamprey:** Sea lamprey eDNA has been identified in the Lower Vyrnwy indicating their presence at the Severn / Vyrnwy confluence. NRW do not routinely survey for the presence of Lamprey currently, however, due to barriers to migration we do not anticipate there to be many or any Sea or River lamprey present at the intake location.

NRW are satisfied that the maximum abstraction quantities and flow restrictions outlined in section 9.3 above are in line with flow standards down to Q99 flows and are considered sufficient to protect the above fish species.

Twaite shad and Allis shad have been recorded within the River Severn at Stourport which is over 100km downstream from this proposal. NRW were satisfied that these species would not be impacted by this proposal due to the distance downstream.

The following fish screens are necessary and shall be conditioned on the licence:

- An intake screen with spacing no greater than 10mm to prevent the entrapment, entrainment, or impingement of Salmon (smolt that would be migrating downstream towards the sea as part of their lifecycle, as well as adults) and large Eel.
- A discharge screen with spacing no greater than 40mm to prevent the entrapment, entrainment, or impingement of the adult Salmon and Large adult Eel could be present and become attracted to the discharge.

It is acknowledged that if measures are not in place would mean CRT would need to cease abstraction. However, the above screening conditions are deemed necessary in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. See sections 9.6 and 9.7 below for further detail.

## 9.4 Impact on water quality

Following MyMap screening 52 discharges have been identified downstream of the abstraction. As the abstraction has been occurring for considerable time and there have been no reported impacts to local water quality, NRW are satisfied that any risk to water quality is insignificant.

In addition, the regulated flow regime detailed in section 9.2 above, is considered to mitigate potential impacts on water quality as it is considered to increase low flows and therefore increase dilution.

The water abstracted under this proposal is transferred and discharged into the Montgomery Canal 400m North of the abstraction point. A condition is included within

the licence to ensure that all water abstracted is discharged to the nearby watercourse ensuring that the abstraction can be classed as a transfer from one source of supply to another. The transfer of abstracted uncontaminated water does not require a discharge permit.

## 9.5 Protected rights and lawful users

Following MyMap screening and consultation screening 7 licensed abstractions and lawful users have been identified downstream of the abstraction, as detailed in the following table:

| Licence serial number | Distance and direction from abstraction |
|---|---|
| 18/54/01/0536 (surface water) | 9km Northeast |
| MD/054/0001/044 (surface water) | 50m East |
| 18/54/01/0598 (surface water) | 33km Northeast |
| 18/54/01/0218 – deregulated (groundwater) | 11km Northeast |
| 18/54/01/0219 – deregulated (groundwater) | 6km Northeast |
| 18/54/01/0370 - deregulated (groundwater) | 9km Northeast |
| 18/54/01/0454 - deregulated (groundwater) | 13km Northeast |

NRW acknowledges that the existing abstraction has been operating lawfully for many years under an exemption, without any concerns about impact to other water users / abstractors being raised.

In addition, the regulated flow regime detailed in section 9.2 above mean that no impacts to downstream abstractors / water users are anticipated.

NRW considers the abstraction poses no risk to existing water users and should be licensed.

## 9.6 Habitats Directive, CROW Act, Conservation, heritage, and landscape impacts

The following sites have been identified as a result of screening the application using MyMap. See MyMap screening report dated 28/08/2020, see DMS for full details.

| Designation Type | Name of Site | Potential Impact | Distance & Direction from abstraction |
|---|---|---|---|
| SAC | Montgomery Canal | Yes, see below | 350m Northwest |
| | Severn Estuary | | >150km downstream |
| SPA | Severn Estuary | No, see below | >150km downstream |
| RAMSAR | Severn Estuary | Yes, see below | >150km downstream |
| SSSI Wales | Montgomery Canal | Yes, see below | 350m Northwest |
| | Severn Estuary | | >150km downstream |
| SSSI England | River Severn at Montford | Yes, see below | 60km downstream |
| | Severn Estuary | | >150km downstream |
| | Buildwas River Section | No, see below | >100km downstream |
| | Tick Wood & Benthall Edge | | |

| | | | |
|---|---|---|---|
| | Wyre Forest | | |
| | Eymore Railway Cutting | | |
| | Grimley Brick Pits | | |
| | Northwick Marsh | | |
| | River Teme | | |
| | Upton Ham | | >150km downstream |
| | Severn Ham, Tewkesbury | | |
| | Wainlode Cliff | | |
| | Garden Cliff | | |
| | Upper Severn Estuary | | |
| | Lydney Cliff | | |
| AONB | Shropshire Hills | No, the abstraction has been occurring lawfully with no reported impacts, and in accordance with Government policy a 'light touch risk-based' approach to licensing needs to be applied. | >100km downstream |
| National Nature Reserve (NNR) England | Wyre Forest | No, the abstraction has been occurring lawfully with no reported impacts, and in accordance with Government policy a 'light touch risk-based' approach to licensing needs to be applied. | >100km downstream |
| Local Nature Reserve (LNR) | None identified | N/A | N/A |
| Ancient Woodland | Ancient Semi Natural Woodland | No, the abstraction has been occurring lawfully with no reported impacts, and in accordance with Government policy a 'light touch risk-based' approach to licensing needs to be applied. | 1.5km |
| | Multiple downstream | | See full screening report |
| Listed Buildings | Penarth Feeder Weir | | 0m |
| | Multiple downstream | | See full screening report |
| Historic Monuments | Montgomeryshire Canal; Penarth Feeder Weir | | 0m |
| | Multiple downstream | | See full screening report |

| | | | |
|---|---|---|---|
| Scheduled Ancient Monuments (SAMs) | Forden with Leighton and Trelystan | See section 4 above. | 12km downstream |
| | Multiple downstream | | See full screening report |
| World Heritage Sites | None identified | N/A | N/A |
| Heritage Coast | None identified | N/A | N/A |
| SINC | None identified | N/A | N/A |
| Protected habitat | Purple moor grass and rush pastures | No, the abstraction has been occurring lawfully with no reported impacts, and in accordance with Government policy a 'light touch risk-based' approach to licensing needs to be applied. | 22km |
| | Multiple records | | See full screening report |
| Protected Species | European Eel migratory route | Yes, some records were assessed as part of the HRA as designated features, see below.<br>/<br>For additional records: No, the abstraction has been occurring lawfully with no reported impacts, and in accordance with Government policy a 'light touch risk-based' approach to licensing needs to be applied. | 0km |
| | Atlantic Salmon migratory route | | |
| | Multiple records | | See full screening report |
| Source Protection zone | None identified | N/A | N/A |
| National Park | None identified | No, see section 4 above. | N/A |

**HRA Conclusion:**

- **Severn Estuary SPA:** The potential for the project to affect the Natura 2000 site was initially considered, but immediately ruled out without further consideration.
- **Severn Estuary SAC, Ramsar and Montgomery Canal SAC:** As the relevant protected sites advisors did not agree with permitting's conclusion of no likely significant effect, the case was referred to the Leadership Group manager, in line with section 6.3 of OGN 200. The referral was supported by an options paper dated 02/12/2022 (saved to the DMS), which was reviewed by NRW legal, with legal advice provided 07/12/2022. On 07/12/2022 the HRA was signed-off and the Leadership Group manager confirmed the 'minded to issue' decision – also see the Transfer of Responsibility Form dated 07/12/2022 saved to DMS, which was necessary for the 'sign off' of the Form 1. Further information is provided within section 7 of the final version of the HRA.

For further detail, please refer to Form 1 version 2 (and Form 2 version 2) – saved on DMS as “to be assessed” for public register purposes.

**Appendix 4 Conclusions:**

- **For those sites with a potential impact (Yes):** The permission is **not likely to damage** any of the flora, fauna or geological or physiological features which are of special interest because of **conditions**.
- **For those sites with no potential impact (No):** The proposed permissions are **not likely to damage** any of the flora, fauna or geological or physiological features which are of special interest.

Appendix 4 assessments - saved on DMS as “to be assessed” for public register purposes. Also see Appendix 6 Notification of issue sent to NRW Montgomery Canal SSSI Officer (15/12/2022) and Natural England (16/12/2022).

## 9.7 Serious Damage

Under the 2017 Government response and Transitional Regulations 2017, applications are only expected to be significantly curtailed to protect the environment from ‘serious damage’ and in these situations compensation will not be payable.

NRW considers serious damage to apply where an abstraction is affecting or has the potential to affect sites designated under the Habitats Regulations. This means that conditions required to conclude ‘no adverse effects’ to protected sites are also required to protect against serious damage.

As detailed in sections 9.2 (Hydrology and low flows protection) 9.3 (Impact on fisheries) and 9.6 (HRA, CRoW Act etc) above, a Habitats Regulations Assessment (HRA) has been completed for this application, which concluded it necessary to include the following conditions on the licence:

- Maximum abstraction quantities.
- Flow restrictions during low flows.
- An intake screen.
- A screen on the discharge to the River Severn from the overflow weir at Penarth.

Although it is recognised the Licence Holder may not be able to implement these measures with immediate effect, they are considered necessary to ensure that the project not adversely affect the integrity of any Natura 2000 / Ramsar site, and therefore to protect against serious damage. As a result, no additional serious damage assessment required.

## 9.8 Cumulative Impacts

It was noted during the screening consultation that the following features are close to the point of abstraction:

- Sewage Treatment Works – with associated permitted discharges, see section 9.4 for further detail.
- Nature Reserve – not identified during the MyMap Impact Assessment Screening, see section 9.6.
- Abstraction licence serial number MD/054/0001/044 50m to the East, see section 9.5 for further detail.

The abstraction has been ongoing for many years with no reported impacts. The HRA detailed in section 9.6 above, considered impacts from this abstraction, and CRT's abstraction from the River Tanat. In addition, the HRA assessed in-combination effects with three other CRT new authorisation abstractions in the Severn Corridor catchment and concluded no adverse impacts. Therefore, we are satisfied that there are no anticipated cumulative / in-combination impacts.

### 9.9 Subsidence and Desiccation

The abstraction has been ongoing for many years with no reported impacts; therefore, we are satisfied that there are no anticipated impacts relating to subsidence and desiccation.

### 9.10 Existing legislation and permissions

The previously exempt abstraction is subject to section 9 of the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987 which details the following:

- No abstraction when the capacity of Llyn Clywedog is less than 25% of its capacity.
- A maximum abstraction rate of 50 mega litres (Ml) over 7 days when a drought order is in force
- Maximum abstraction rates during a period of river regulation dependent upon rate of flow discharged from Llyn Clywedog as follows:
    - Llyn Clywedog releases exceeds 300 mega litres per day (Ml/d) and less than 500Ml/d: 150 mega litres (Ml) over 7 days
    - Llyn Clywedog releases attain 500Ml/d: 115Ml over 7 days
- Efficiency measures
- Permission to abstract flood water during a period of river regulation
- Specifies the requirement to measure and record flows of water in the canal through gauge(s), along with maintenance and inspection
- Operating rules
- Review period
- Defines river regulation period.

A copy of the bill is included within the supporting information provided by the applicant for this proposal.

**As the applicant confirmed that they observed the conditions of the Bill during the qualifying period, it was deemed appropriate to include the following conditions on the licence:**

During any 'river regulation period':

- No abstraction shall take place when the storage capacity of Llyn Clywedog is less than 25%.
- When a drought order is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by NRW at its flow gauging station at Dolwen is greater than or equal to 0.7 cubic metres per second, abstraction shall not exceed 50 mega litres in any period of 7 days.
- When a drought order is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by

NRW at its flow gauging station at Dolwen is less than 0.7 cubic metres per second, abstraction shall not exceed 180 cubic metres per hour and 4,320 cubic metres per day.

For further detail of how these conditions were considered, please see 'How Waterways Bill Restrictions should be considered within the licences document' saved to DMS dated 05/12/2022.

## 10. Means of measurement of abstraction

See section 4 above for conditions to be included on the licence, as agreed following operator review. For further detail see 'NRW response to operator review of draft licences' document saved to DMS dated 19/12/2022.

## 11. Considerations of SMNR – Compliance with our General Purpose

We are satisfied that this decision is compatible with our general purpose of pursing the sustainable management of natural resources in relation to Wales and applying the principles of sustainable management of natural resources.

## 12. Criticality, PALS purposes and abstraction annual charges

**Criticality Class**

Highly Critical

**PALS Purposes**

| Primary Code | Secondary Code | Use/Loss Level code |
|---|---|---|
| I: Industrial, Commercial, Public Services | NAV: Navigation | 650: Transfer between Sources (Post Water Act 2003) - Very Low |

**Abstraction annual charges**

Annual charges are not applicable in accordance with our abstraction charges scheme; the application is for a transfer licence.

# Common Standards Monitoring Guidance (CSMG) Hydrology Flow standards

**rCSMG Table 3 Flow targets in relation to river size and discharge**

| River size | < Qn95 (low flows) | Qn50-95 (low to moderate flows) | QN10-50 (moderate to high flows) | >Qn10 (high flows) |
|---|---|---|---|---|
| Headwater | 5 | 10 | 15 | 15 |
| River | 10 | 15 | 20 | 10 |
| Large river | 15 | 20 | 20 | 20 |

Qn: daily naturalised flows. Figures are percentage deviation for daily naturalised flow

# Penarth

<table>
<tr><th>Scenario included on waterway bill</th><th colspan="2">Penarth abstraction restrictions</th><th>Comparing volumes applied for / notes on possible conditions</th><th>How to reflect in NA licence</th></tr>
<tr><td rowspan="2">During any river (Severn) regulation period</td><td>Clywedog discharges >300Ml/d and <500Ml/d</td><td>150Ml over 7 days</td><td>14,574 cubic metres per day = 14.574ML/day<br>14.574ML/day x 7 = 102.018ML/7 days<br><br>The maximum daily quantities applied for would not enable them to achieve 150Ml over 7 days. Therefore, the volumes actually required have been demonstrated to be less than the Bill authorises. New quantities proposed to supersede?<br>Maximum abstraction quantities would supersede this agreed with Rob.<br>RB: Agreed.</td><td rowspan="2">Supersede:<br><br>MAXIMUM QUANTITIES OF WATER TO BE ABSTRACTED<br>6.1<br>821.3 cubic metres per hour<br>14,574 cubic metres per day<br>2,311,216 cubic metres per year</td></tr>
<tr><td>Clywedog discharges =500Ml/d</td><td>115Ml over 7days</td><td>As above. Maximum abstraction quantities would supersede this agreed with Rob.<br>RB: Agreed.</td></tr>
<tr><td>When Llyn Clywedog storage <25% of capacity</td><td colspan="2">No abstraction permitted would need to be an additional condition as agreed with Rob.<br>RB: Agreed</td><td>This is more restrictive than what we have proposed and could be replicated as a new condition on the NA licence to reflect the Bill?</td><td rowspan="2"><s>Based on consideration of initial flow restrictions – static 10% of Q95</s><br><s>Replicate</s><br><s>FURTHER CONDITIONS</s><br><s>9.1 During any 'river regulation period':</s><br><br><s>(i) No abstraction shall take place when the storage capacity of Llyn Clywedog is less than 25%.</s><br><s>(ii) Abstraction shall not exceed 50 mega litres in any period over 7 days when an order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged from Llyn Clywedog.</s><br><br>Considering the implications of the Bill with the following revised low flow restrictions x 2:<br><table><tr><th rowspan="2">Flow Range at Dolwen GS m³/s</th><th colspan="2">Maximum abstraction rates</th></tr><tr><th>Hourly m³/hour</th><th>Daily m³/day</th></tr><tr><td>Flows less than 0.86 and greater than or equal to 0.7</td><td>360</td><td>8,640</td></tr><tr><td>Flows less than 0.7</td><td>180</td><td>4,320</td></tr></table><br>Capacity – replicate and abstraction restrictions – Supersede<br><br>FURTHER CONDITIONS<br>9.1 During any 'river regulation period':<br><br>(i) No abstraction shall take place when the storage capacity of Llyn Clywedog is less than 25%.<br>(ii) When an order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by NRW at its flow gauging station at Dolwen is greater than or equal to 0.7 cubic metres per second, abstraction shall not exceed 50 mega litres in any period of 7 days.<br>(iii) When an order under the Drought Act 1976 is in force reducing the quantity of water required to be discharged from Llyn Clywedog and the flow in the River Severn as gauged by NRW at its flow gauging station at Dolwen is less than 0.7 cubic metres per second, abstraction shall not exceed 180 cubic metres per hour and 4,320 cubic metres per day.<br><br>REASONS FOR CONDITIONS<br>Conditions 9.1 (i): To reflect the Licence Holder's existing obligations under the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987 Condition 9(b).<br><br>Conditions 9.1 (ii): To reflect the Licence Holder's existing obligations under the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987 Condition 9(c)(iii).<br><br>Conditions 9.1 (iii): To reflect the Licence Holder's existing obligations under the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987 Condition 9(c)(iii), and in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. This is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.<br><br>IMPORTANT NOTES<br>Definition: 'River regulation period' means any period of time that water is being or about to be released from Llyn Clywedog to support the flow in the River Severn.</td></tr>
<tr><td>Drought order in force</td><td colspan="2">50Ml over 7 days would need to be an additional condition as agreed with Rob.<br>RB: Agreed</td><td>This is more restrictive than multiplying the: maximum daily abstraction rates applied for by 7; and multiplying up the low flow restriction of 100l/s.<br><br>Therefore, possible to replicated as a new condition on the NA licence to reflect the Bill?</td></tr>
</table>

**Commented [LC1]:** 50Ml/7days is more restrictive than the 1st low flow restriction which would allow 8,640m3/day which x by 7 equals 60,480m3/7days (60.5Ml/7days).

**Commented [LC2]:** The 2nd flow restriction is more restrictive than 50ml/7days
2nd flow restriction allows 4,320m3/day, which x by 7 equals 30,240m3/7days (30.2Ml/7dayd)

**Commented [LC3]:** Link to Bill: from page 22 of the supporting information document

# Tanat

<table>
<tr><th>Scenario included on waterway bill</th><th>Tanat abstraction restrictions</th><th>Comparing volumes applied for / notes on initial restriction conditions</th><th>How to reflect in NA licence</th></tr>
<tr><td>During any river (Severn) regulation period</td><td>Abstraction limited to 49Ml over 7 days<br>would need to be an additional condition as agreed with Rob.<br>RB: Agreed<br><br>OR<br><br>Lesser amount in order to maintain a residual flow of 15Ml/d downstream of Carreghofa weir<br>– Average residual flow of 173.6l/s by my calcs<br><br>Low flow restriction condition would protect this and could supersede as agreed with Rob.<br>RB: UPDATED now we’re going with 3 abstraction “restrictions”. Not quite. Modelling shows abstraction would cause flows to fall below this residual flow figure on 10 days out of a 49 year record. These would likely be clustered together in an exceptional drought. Most other licences don’t have this sort of protection. It broadly equates to a Q99.9 HOF.</td><td>9,100 cubic metres per day = 9.1ML/day<br>9.1ML/day x 7 = 63.7ML/7 days<br><br>The maximum daily quantities applied for are less restrictive, therefore not appropriate.<br><br>OR<br><br>To compare the low flow restriction on 62l/s (10 % of Q95), where Q95 flow = 620l/s.<br>If the low flow restriction were removed from flow (at Q95 flows), there would be 558l/s residual flow at Q95 flows. This would indicate that this requirement of the Bill is required to protect flows during a low flow period.<br><br>Therefore, Rob to confirm whether the proposed low flow restriction could supersede this requirement from the Bill? As from my understanding, we should ensure higher residual flow volumes, protect low flows and also ensure that the water accounted for as part of the River Severn Regulation would still be available.</td><td rowspan="2"><s>Based on consideration of initial flow restrictions – static 10% of Q95</s><br><s>Replicate</s><br><s>FURTHER CONDITIONS</s><br><s>9.1 During any ‘river regulation period’:</s><br><s>(i) No abstraction shall take place when the storage capacity of Llyn Clywedog is less than 25%.</s><br><s>(ii) Abstraction shall not exceed 49 mega litres in any period of 7 days, when the flow in the River Tanat immediately downstream of the authorised point of abstraction, marked as Point A as specified in condition 2.1, is equal to or greater than 15 mega litres per day and the abstraction shall not cause the flow immediately downstream of the said abstraction point to fall below that rate.</s><br><br>Considering the implications of the Bill with the following revised low flow restrictions x 3:<br><table><tr><th rowspan="2">Flow Range at Llanyblodwel GS m³/s</th><th colspan="2">Maximum abstraction rates</th></tr><tr><th>Hourly m³/hour</th><th>Daily m³/day</th></tr><tr><td>Flows less than 1.03 and greater than or equal to 0.84</td><td>432</td><td>9,100</td></tr><tr><td>Flows less than 0.84 and greater than or equal to 0.61</td><td>227</td><td>5,448</td></tr><tr><td>Flows less than 0.61</td><td>133</td><td>3,192</td></tr></table><br>Capacity – replicate / abstraction restrictions - Supersede<br><br>9.1 During any ‘river regulation period’:<br><br>(i) No abstraction shall take place when the storage capacity of Llyn Clywedog is less than 25%.<br>(ii) No abstraction shall take place when the flow in the River Tanat as gauged at Llanyblodwel Gauging Station is less than xx 0.205cubic metres per second.<br>(iii) Abstraction shall not exceed 49 mega litres in any period of 7 days, when the flow in the River Tanat as gauged at Llanyblodwel Gauging Station is greater than or equal to 0.84 cubic metres per second.<br>(iv) When the flow in the River Tanat as gauged at Llanyblodwel Gauging Station is less than 0.84 cubic metres per second and greater than or equal txx 0.205 cubic metres per second, the restrictions on abstraction as set out in Table 1 below shall apply:<br><table><tr><th rowspan="2">Flow Range at Llanyblodwel GS m³/s</th><th colspan="2">Maximum abstraction rates</th></tr><tr><th>Hourly m³/hour</th><th>Daily m³/day</th></tr><tr><td>Flows less than 0.84 and greater than or equal to 0.61</td><td>227</td><td>5,448</td></tr><tr><td>Flows less than 0.61 and greater than or equal to xx0.205</td><td>133</td><td>3,192</td></tr></table><br>REASONS FOR CONDITIONS<br>Conditions 9.1 (i): To reflect the Licence Holder’s existing obligations under the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987 Condition 9(b).<br><br>Conditions 9.1 (ii): To reflect the Licence Holder’s existing obligations under the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987 Condition 9(d)(ii).<br><br>Conditions 9.1 (iii) and (iv): To reflect the Licence Holder’s existing obligations under the British Waterways Bill: Agreement Respecting the Montgomery Canal dated 19 October 1987 Condition 9(d)(i), and in order to established that the project will not adversely affect the integrity of any Natura 2000 / Ramsar site. Thi is in accordance with the Water Abstraction (Transitional Provisions) Regulations 2017.<br><br>IMPORTANT NOTES<br>Definition: ‘River regulation period’ means any period of time that water is being or about to be released from Llyn Clywedog to support the flow in the River Severn.</td></tr>
<tr><td>When Llyn Clywedog storage <25% of capacity</td><td>No abstraction permitted<br>would need to be an additional condition as agreed with Rob.<br>RB: Agreed</td><td>This is more restrictive than what we have proposed and could be replicated as a new condition on the NA licence to reflect the Bill.</td></tr>
</table>

**Commented [BR4]:** Is this table going in the licence under “During any River Severn Regulation Period”? Or is it just here for information? The first row (flow range <1.03 and >=0.84) allows up to 63.7Ml to be abstracted over 7 days, versus the 49Ml stated in the Bill.

**Commented [LC5R4]:** Included for information to demonstrate how initial conditions drafted above have been revised to consider the low flow restrictions.

**Commented [BR6]:** removed “equal to” as it contradicts conditions below.

**Commented [LC7]:** HoF: Flow rate at Llanyblodwel to ensure 15Ml/d is maintained in the River Tanat in line with Bill – more restrictive than our lowest flow restriction.

**Commented [BR8R7]:** 0.205m3/s.

Should point out that this is slightly more restrictive than what the Bill says. EG 0.205m3/s is based on CRT abstracting the most they can at low flows (proposed 37l/s), so it would prevent them abstracting at a rate less than 37l/s in order to maintain the residual flow. BUT 0.205m3/s is a really low flow - roughly Q99.8, which means it would only restrict them on 11 days in a 49 year record.

**Commented [LC9]:** 49Ml/7 days during river reg is more restrictive than the max abstraction quantities under 6.1 and also the 1st low flow restriction. However, 49Ml/7 days is less restrictive than the 2nd and 3rd low flow restrictions, which is the reason for condition 9.1 (iv) below.

**Commented [LC10]:** HoF: Flow rate at Llanyblodwel to ensure 15Ml/d is maintained in the River Tanat in line with Bill – more restrictive than our lowest flow restriction.

**Commented [LC11]:** Sets the upper and lower flow restriction range

**Commented [LC12]:** Flow rate at Llanyblodwel to ensure 15Ml/d is maintained in the River Tanat

**Commented [LC13]:** Link to Bill: from page 22 of the supporting information document

## Lillywhite, Charlotte

**From:** Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Sent:** 01 December 2022 16:42
**To:** Lillywhite, Charlotte; Kathryn Maye; Nicholas Saiz
**Cc:** WA 2003 New Authorisations; Beckett, Mary; Hotchkiss, Alastair; Lansdown, Ashley
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Dear Charlotte,

Thank you for your email. I'm sure you can appreciate, this is a lot for the Trust to review and assess the impacts of, at such short notice prior to the statutory deadline for licences to be issued. We would therefore like to make the following points:

- For the Trust to properly quantify the impacts of your proposals on abstraction to the canal, we need to review all of the data used to derive/calculate the stepped flow bands in the attached document. Please can you provide the underlying daily time series (in spreadsheet format) of river flows covering the licence application qualifying period i.e. 2011 to 2017, plus 2018 to present day, as used in your calculations, as a matter of urgency?
- For the **appropriate assessment** of the **likely significant effects** of the abstraction restrictions on the **site integrity** of the Montgomery Canal SAC, we consider the Habitats Regulations Assessment (HRA) process needs to be followed. It appears from your email that this has not been done yet. Please can you confirm if this is the case, or provide the HRA Stage 1 and Stage 2 documentation if it has?

We look forward to hearing from you as soon as possible on the points raised above.

Regards,
Adam

**Adam Comerford**
National Hydrology Manager
**Canal & River Trust**

**M** 07810 856554
**E** adam.comerford@canalrivertrust.org.uk

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**From:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Sent:** 30 November 2022 16:43
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Cc:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>; Beckett, Mary <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>; Hotchkiss, Alastair <Alastair.Hotchkiss@cyfoethnaturiolcymru.gov.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation
**Importance:** High

**CAUTION: This email originated from an external source. DO NOT CLICK/OPEN links or attachments unless you are certain of their origin.**

Hi All,

I have an update on the flow restrictions we consider necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar. The most plausible licensing scenario would be to include 2 flow restrictions on the River Severn at Penarth, and 3 flow restrictions on the River Tanat at Carreghofa. Please see attached document for further detail on these scenarios, as well as impacts on abstractable volumes for the Montgomery Canal.

We are keen to know whether you would have any further information or supplementary data to allow us to better understand how the proposed restrictions could impact on water levels within the canal (SAC). Would this information be available and if so, would you be able to provide it with some urgency please?

Kathryn, I note that you do not work on Fridays, would it be possible to give you a call tomorrow to discuss please?

Bes wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**
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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

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**From:** Lillywhite, Charlotte
**Sent:** 24 November 2022 10:33
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Cc:** New.Authorisations@canalrivertrust.org.uk; Mary Beckett (Mary.Beckett@cyfoethnaturiolcymru.gov.uk) <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Hi All,

At our last meeting you requested the modelling for our initial proposed low flow restrictions, I have been unable to send these, as we have continued our internal discussions around what flow restrictions are necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar, as well as to ensure sufficient water for the canal SAC during periods of low flows. I will receive further modelling by tomorrow and following this I will send an email to get your feedback on our proposed scenarios – i.e., the impact of the flow restriction proposals on how you have historically operated the canal e.g., volumes and depths.

I realise this is unlikely, but would you have any availability for a meeting next week to discuss the above? If not, I will request your feedback by email, and send you draft copies of the licences as soon as possible.

Internal consultees have confirmed the following screening (outlined in my email 18/10/2022) to be acceptable:

- The inclusion of a condition on both licences requiring a screen with spacing no greater than 10mm at the point of abstraction.
- The inclusion of a condition requiring a screen with spacing no greater than 40mm on the overflow weir (at the intake structure) at Penarth.

It would be useful to include the National Grid Reference for the overflow weir within the condition, please can you provide this.

I am sure you aware that the Penarth Feeder is a listed building and a historic monument, and the Tanat Feeder is a historic monument; I wanted to flag that you should engage with Cadw and the Local Authority to discuss the above screening requirements.

Best wishes

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

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**Cadw mewn cysylltiad**
Cofrestrwch i dderbyn e-gylchlythyr Glandŵr Cymru https://canalrivertrust.org.uk/newsletter
Cefnogwch ni ar https://www.facebook.com/canalrivertrust
Dilynwch ni ar https://twitter.com/canalrivertrust ac https://www.instagram.com/canalrivertrust

Mae'r e-bost hwn a'i atodiadau ar gyfer defnydd y derbynnydd bwriedig yn unig. Os nad chi yw derbynnydd bwriedig yr e-bost hwn a'i atodiadau, ni ddylech gymryd unrhyw gamau ar sail y cynnwys, ond yn hytrach dylech eu dileu heb eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

Mae Glandŵr Cymru yn gwmni cyfyngedig drwy warant a gofrestrwyd yng Nghymru a Lloegr gyda rhif cwmni 7807276 a rhif elusen gofrestredig 1146792. Swyddfa gofrestredig: National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 02 December 2022 16:03
**To:** Adam Comerford; Kathryn Maye; Nicholas Saiz
**Cc:** WA 2003 New Authorisations; Beckett, Mary; Hotchkiss, Alastair; Lansdown, Ashley
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Hi Adam,

Thank you for your response.

We appreciate our request has come late within the determination window; however, it follows multiple internal discussions around what restrictions are necessary to protect the Severn Estuary SAC and Ramsar, as well as considering the potential impacts on abstractable volumes to the Montgomery Canal SAC.

We can assure you that we have followed the HRA process and have consulted with our Advisory colleagues. The flow restrictions that have been sent to you are a result of this HRA exercise. To ensure we can conclude there will be no impact to the migratory species of the Severn Estuary SAC and Ramsar, i.e., the project will not adversely affect the sites integrity, these flow restrictions must be applied. This is consistent with the approach we have applied to other New Authorisations applications that will be subject to restrictions to meet existing flow standards.

We recognise that any restriction to flows could have an impact of the Canal SAC, however, in balancing the needs of the Severn Estuary and the Montgomery Canal Designations, we feel that this is the most appropriate way forward. We have come to this view based on the information we currently have available to us, the consultation response from our Advisory colleagues and recognising that having no licence to abstract beyond 31 December would have the greatest impact on the Montgomery Canal SAC.

Discussions are ongoing to finalise the outcome of the HRA, but we wanted to share with you the likely flow restrictions as quickly as we could within the short time we have remaining as these requirements are unlikely to change. We felt the additional data requested would provide further support for this decision but as it is not readily available, we have to consider our timescales to conclude these matters. Logically the next step, following the issue of these licences will be to investigate this aspect further and we are in dialogue with our Operational Colleagues to see how best to do this and when this can be undertaken.

The information you have requested to inform our request can be provided but there will be a delay in getting this to you. Our Hydrologist is on annual leave and will not be back until the week commencing 12th December. Once they are back from leave, I can request the information you have outlined below upon their return; however, we do not anticipate there will be sufficient time to consider our proposed restrictions further, ahead of the statutory determination date for these licences.

It is important that we determine the applications, ahead of the statutory determination window to ensure that you are still able to abstract water for the canal – the alternative would be that there would be no licences and you then be limited to abstracting 20 cubic metres per day at each location, without the requirement for licences.

Best wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

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We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

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**From:** Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Sent:** 01 December 2022 16:42
**To:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>; Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>
**Cc:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>; Beckett, Mary <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>; Hotchkiss, Alastair <Alastair.Hotchkiss@cyfoethnaturiolcymru.gov.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Dear Charlotte,

Thank you for your email. I'm sure you can appreciate, this is a lot for the Trust to review and assess the impacts of, at such short notice prior to the statutory deadline for licences to be issued. We would therefore like to make the following points:

- For the Trust to properly quantify the impacts of your proposals on abstraction to the canal, we need to review all of the data used to derive/calculate the stepped flow bands in the attached document. Please can you provide the underlying daily time series (in spreadsheet format) of river flows covering the licence application qualifying period i.e. 2011 to 2017, plus 2018 to present day, as used in your calculations, as a matter of urgency?
- For the **appropriate assessment** of the **likely significant effects** of the abstraction restrictions on the **site integrity** of the Montgomery Canal SAC, we consider the Habitats Regulations Assessment (HRA) process needs to be followed. It appears from your email that this has not been done yet. Please can you confirm if this is the case, or provide the HRA Stage 1 and Stage 2 documentation if it has?

We look forward to hearing from you as soon as possible on the points raised above.

Regards,

Adam

**Adam Comerford**
National Hydrology Manager
**Canal & River Trust**

**M** 07810 856554
**E** adam.comerford@canalrivertrust.org.uk

---

**From:** Lillywhite, Charlotte <Charlotte.Lillywhite@cyfoethnaturiolcymru.gov.uk>
**Sent:** 30 November 2022 16:43
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Cc:** WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>; Beckett, Mary <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>; Hotchkiss, Alastair <Alastair.Hotchkiss@cyfoethnaturiolcymru.gov.uk>; Lansdown, Ashley <Ashley.Lansdown@cyfoethnaturiolcymru.gov.uk>
**Subject:** RE: PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation
**Importance:** High

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Hi All,

I have an update on the flow restrictions we consider necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar. The most plausible licensing scenario would be to include 2 flow restrictions on the River Severn at Penarth, and 3 flow restrictions on the River Tanat at Carreghofa. Please see attached document for further detail on these scenarios, as well as impacts on abstractable volumes for the Montgomery Canal.

We are keen to know whether you would have any further information or supplementary data to allow us to better understand how the proposed restrictions could impact on water levels within the canal (SAC). Would this information be available and if so, would you be able to provide it with some urgency please?

Kathryn, I note that you do not work on Fridays, would it be possible to give you a call tomorrow to discuss please?

Bes wishes,

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

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We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

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**From:** Lillywhite, Charlotte
**Sent:** 24 November 2022 10:33
**To:** Kathryn Maye <Kathryn.Maye@canalrivertrust.org.uk>; Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>; Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>
**Cc:** New.Authorisations@canalrivertrust.org.uk; Mary Beckett (Mary.Beckett@cyfoethnaturiolcymru.gov.uk) <Mary.Beckett@cyfoethnaturiolcymru.gov.uk>
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Hi All,

At our last meeting you requested the modelling for our initial proposed low flow restrictions, I have been unable to send these, as we have continued our internal discussions around what flow restrictions are necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar, as well as to ensure sufficient water for the canal SAC during periods of low flows. I will receive further modelling by tomorrow and following this I will send an email to get your feedback on our proposed scenarios – i.e., the impact of the flow restriction proposals on how you have historically operated the canal e.g., volumes and depths.

I realise this is unlikely, but would you have any availability for a meeting next week to discuss the above? If not, I will request your feedback by email, and send you draft copies of the licences as soon as possible.

Internal consultees have confirmed the following screening (outlined in my email 18/10/2022) to be acceptable:

- The inclusion of a condition on both licences requiring a screen with spacing no greater than 10mm at the point of abstraction.
- The inclusion of a condition requiring a screen with spacing no greater than 40mm on the overflow weir (at the intake structure) at Penarth.

It would be useful to include the National Grid Reference for the overflow weir within the condition, please can you provide this.

I am sure you aware that the Penarth Feeder is a listed building and a historic monument, and the Tanat Feeder is a historic monument; I wanted to flag that you should engage with Cadw and the Local Authority to discuss the above screening requirements.

Best wishes

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer
Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921
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eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

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## Lillywhite, Charlotte

**From:** Lee, David
**Sent:** 13 March 2023 12:22
**To:** Lillywhite, Charlotte
**Subject:** FW: New Authorisations licence compliance - Tanat and Penarth feeder
**Attachments:** Penarth Feeder- Programme V1 ALL LEVELS.pdf; Tanat Feeder- Programme V1 ALL LEVELS.pdf

**Follow Up Flag:** Follow up
**Flag Status:** Completed

**Categories:** Filed

fyi

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**From:** Nicholas Saiz <Nicholas.Saiz@canalrivertrust.org.uk>
**Sent:** 06 March 2023 11:39
**To:** Lee, David <David.Lee@cyfoethnaturiolcymru.gov.uk>
**Cc:** Adam Comerford <Adam.Comerford@canalrivertrust.org.uk>; Helen Sillitto <Helen.Sillitto@canalrivertrust.org.uk>; Kathryn Smith <Kathryn.Smith@canalrivertrust.org.uk>; WA 2003 New Authorisations <New.Authorisations@canalrivertrust.org.uk>
**Subject:** FW: New Authorisations licence compliance - Tanat and Penarth feeder

Hi David,
Apologies for the delayed response to your query. I have been project managing the licensing process with our Water Team have also worked with our construction projects team on a timetable to implement the fish screening requirements on the Severn tributaries. Since seeing the issued licence conditions we have appealed both of these licences and so any plan is conditional on the outcome of this appeal, although we have already started work on project scope and briefs for the screens to avoid any delay.

The licenced flow conditions are in appeal, but if upheld will be complied with by our current system of SCADA monitoring and manual control of sluices. Your licensing colleagues have said that they are open to discussion on the balance of environmental needs of the canal SSSI and the Severn SAC, so this is an area that we should begin to work together to get better information on this balance and hopefully reach agreement on a minimum flow for the canal.

I have attached the full project programmes for screening the 2 sites on the Montgomery Canal. Broadly, these give us B23 to work on options and appraisals, B24 to work up the design and get planning, environment and heritage approvals, B25 and B26 to finalise design and approvals and budgets, B26 and B27 to implement. This plan timings are conservative estimates due to concerns about heritage, planning, flood consents, electricity supply and land ownership over which we have no control.

I hope that you can see we are progressing with the fish screening work, with some caveats around the appeal, and I propose we arrange a meeting to decide on the next steps to investigate the needs of the canal SSSI.

All the best,

**Nicholas Saiz**
Project Manager
**M** 07584 543214
**E** nicholas.saiz@canalrivertrust.org.uk

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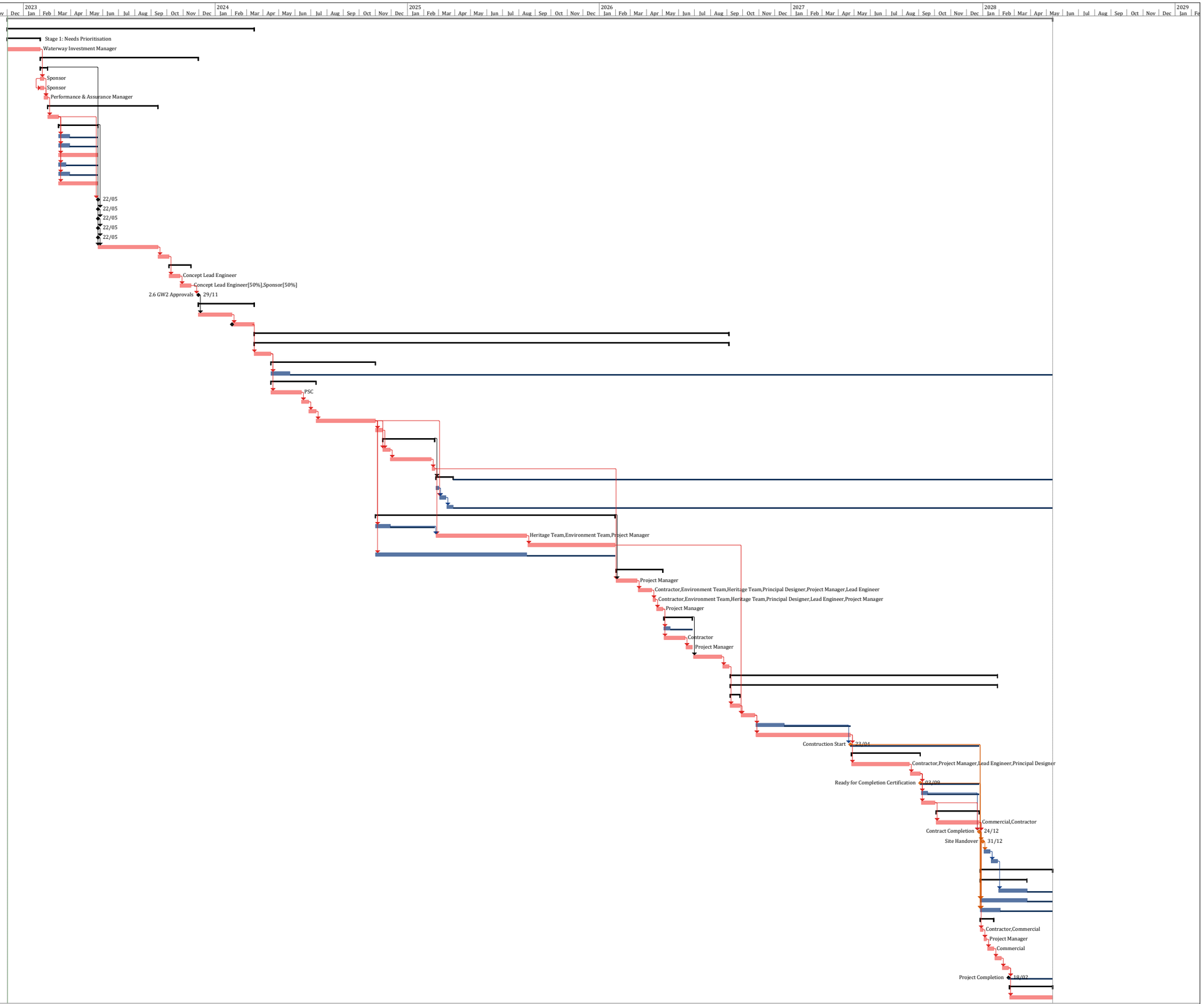
| ID | Task Mode | Task Name | Duration | Start | Finish | Predece |
|---|---|---|---|---|---|---|
| 0 | | Penarth Feeder | 1395 days | Thu 01/12/22 | Fri 12/05/28 | |
| 1 | | Concept Phase | 320 days | Thu 01/12/22 | Thu 14/03/24 | |
| 2 | | Stage 1: Needs Prioritisation | 40 days | Thu 01/12/22 | Wed 01/02/23 | |
| 3 | | 1.9 GW1 Approval | 40 days | Thu 01/12/22 | Wed 01/02/23 | |
| 4 | | Stage 2: Concept Design | 210 days | Thu 02/02/23 | Wed 29/11/23 | |
| 5 | | 2.1 Initiate Project Brief & complete CDM forms | 10 days | Thu 02/02/23 | Wed 15/02/23 | |
| 6 | | Submit scoping Environmental Appraisal | 1 wk | Thu 02/02/23 | Wed 08/02/23 | 3 |
| 7 | | Complete Pre-construction H&S Information | 1 wk | Thu 02/02/23 | Wed 08/02/23 | 6SS |
| 8 | | Initial Project Brief completed and issued | 5 days | Thu 09/02/23 | Wed 15/02/23 | 7,6 |
| 9 | | 2.2 Design Conceptual Solution(s) | 145 days | Thu 16/02/23 | Wed 13/09/23 | |
| 10 | | **Review Fishtek Report and identify potential option** | **3 wks** | **Thu 16/02/23** | **Wed 08/03/23** | 8 |
| 11 | | Identify constraints | 50 days | Thu 09/03/23 | Mon 22/05/23 | |
| 12 | | Heritage | 3 wks | Thu 09/03/23 | Wed 29/03/23 | 10 |
| 13 | | **Environment** | **3 wks** | **Thu 09/03/23** | **Wed 29/03/23** | **10** |
| 14 | | **Electrical supply** | **10 wks** | **Thu 09/03/23** | **Mon 22/05/23** | **10** |
| 15 | | **Navigation** | **2 wks** | **Thu 09/03/23** | **Wed 22/03/23** | **10** |
| 16 | | **Buildability** | **3 wks** | **Thu 09/03/23** | **Wed 29/03/23** | **10** |
| 17 | | **Early consulation with stakeholders including sewage works** | **10 wks** | **Thu 09/03/23** | **Mon 22/05/23** | **10** |
| 18 | | Site Investigation | 0 days | Mon 22/05/23 | Mon 22/05/23 | 10 |
| 19 | | Site Investigation Brief(s) | 0 wks | Mon 22/05/23 | Mon 22/05/23 | 11 |
| 20 | | Site Investigation(s) Procurement | 0 wks | Mon 22/05/23 | Mon 22/05/23 | 19 |
| 21 | | Undertake Site Investigation(s) | 0 wks | Mon 22/05/23 | Mon 22/05/23 | 20 |
| 22 | | Prepare Report | 0 wks | Mon 22/05/23 | Mon 22/05/23 | 21 |
| 23 | | Design Concept Solution(s) | 4 mons | Tue 23/05/23 | Wed 13/09/23 | 22,5 |
| 24 | | 2.3 Level B Cost Estimate(s) | 3 wks | Thu 14/09/23 | Wed 04/10/23 | 23 |
| 25 | | 2.4 Option Selection | 30 days | Thu 05/10/23 | Wed 15/11/23 | |
| 26 | | Options Report & Final Selection | 3 wks | Thu 05/10/23 | Wed 25/10/23 | 24 |
| 27 | | Complete Project Brief and GW2 presenation | 3 wks | Thu 26/10/23 | Wed 15/11/23 | 26 |
| 28 | | 2.6 GW2 Approvals | 2 wks | Thu 16/11/23 | Wed 29/11/23 | 27 |
| 29 | | Stage 2A: Business Planning | 70 days | Thu 30/11/23 | Thu 14/03/24 | |
| 30 | | 2a.5 Business Plan Approval | 8 wks | Thu 30/11/23 | Thu 01/02/24 | 28 |
| 31 | | 2.7 GW2a Approvals | 6 wks | Fri 02/02/24 | Thu 14/03/24 | 30 |
| 32 | | Definition Phase | 635 days | Fri 15/03/24 | Fri 04/09/26 | |
| 33 | | Stage 3: Design & Delivery Planning | 635 days | Fri 15/03/24 | Fri 04/09/26 | |
| 34 | | 3.1 Initiate Project | 4 wks | Fri 15/03/24 | Mon 15/04/24 | 31 |
| 35 | | 3.2 Complete Outline Design | 140 days | Tue 16/04/24 | Thu 31/10/24 | |
| 36 | | Procure Outline Design | 5 wks | Tue 16/04/24 | Tue 21/05/24 | 34 |
| 37 | | Investigations | 60 days | Tue 16/04/24 | Wed 10/07/24 | |
| 38 | | Procure site investigation | 8 wks | Tue 16/04/24 | Wed 12/06/24 | 34 |
| 39 | | Undertake Site Investigation(s) | 2 wks | Thu 13/06/24 | Wed 26/06/24 | 38 |
| 40 | | Prepare Report(s) | 2 wks | Thu 27/06/24 | Wed 10/07/24 | 39 |
| 41 | | Complete Outline Design | 4 mons | Thu 11/07/24 | Thu 31/10/24 | 40 |
| 42 | | 3.3 Review Level B Cost Estimate | 2 wks | Fri 01/11/24 | Thu 14/11/24 | 41 |
| 43 | | 3.6 Complete Detailed Design | 65 days | Fri 15/11/24 | Fri 21/02/25 | |
| 44 | | Review Outline Design | 2 wks | Fri 15/11/24 | Thu 28/11/24 | 41,42 |
| 45 | | Detailed Design | 10 wks | Fri 29/11/24 | Fri 14/02/25 | 44 |
| 46 | | Final Design Review | 1 wk | Mon 17/02/25 | Fri 21/02/25 | 45 |
| 47 | | 3.7 Pre-construction Information (PCI) & H&S Info | 25 days | Mon 24/02/25 | Fri 28/03/25 | 43 |
| 48 | | CDM Appointments | 1 wk | Mon 24/02/25 | Fri 28/02/25 | |
| 49 | | Complete Design Risk Assessment / Register (CDM 2.3 | 2 wks | Mon 03/03/25 | Fri 14/03/25 | 48,41 |
| 50 | | Update CDM1.1 Pre-construction H&S Information | 2 wks | Mon 17/03/25 | Fri 28/03/25 | 49 |
| 51 | | 3.8 Complete Environmental Action Plan & Stakehol | 320 days | Fri 01/11/24 | Fri 30/01/26 | |
| 52 | | Environmental Appraisal and Validation | 4 wks | Fri 01/11/24 | Thu 28/11/24 | 41 |
| 53 | | Environmental / Heritage / (Planning Applications poss | 25 wks | Mon 24/02/25 | Fri 15/08/25 | 52,46 |
| 54 | | Consent Approval Period including FRAP | 24 wks | Mon 18/08/25 | Fri 30/01/26 | 53 |
| 55 | | **Land negotiation, electricity supply, agreement with sewage works** | **40 wks** | **Fri 01/11/24** | **Fri 15/08/25** | **41** |
| 56 | | 3.9 Scope Document for Pricing | 65 days | Mon 02/02/26 | Fri 01/05/26 | |
| 57 | | Draft WIP Preparation | 6 wks | Mon 02/02/26 | Fri 13/03/26 | 46,51 |
| 58 | | Review Draft WIP | 4 wks | Mon 16/03/26 | Fri 10/04/26 | 57 |
| 59 | | WIP Review Meeting | 1 wk | Mon 13/04/26 | Fri 17/04/26 | 58 |
| 60 | | Revise (if needed) and Issue WIP | 2 wks | Mon 20/04/26 | Fri 01/05/26 | 59 |
| 61 | | 3.10 Develop Price & Schedule | 40 days | Mon 04/05/26 | Fri 26/06/26 | |
| 62 | | Review Level B Cost Estimate | 2 wks | Mon 04/05/26 | Fri 15/05/26 | 60 |
| 63 | | Produce Contract Price | 6 wks | Mon 04/05/26 | Fri 12/06/26 | 60 |
| 64 | | Review Contract Price / Trust to provide Comments | 2 wks | Mon 15/06/26 | Fri 26/06/26 | 63 |
| 65 | | 3.11 Budget Holder Approval | 8 wks | Mon 29/06/26 | Fri 21/08/26 | 61 |
| 66 | | GW3 Approvals Complete | 2 wks | Mon 24/08/26 | Fri 04/09/26 | 65 |
| 67 | | Implementation Phase | 365 days | Mon 07/09/26 | Fri 28/01/28 | |
| 68 | | Stage 4: Delivery Execution | 365 days | Mon 07/09/26 | Fri 28/01/28 | |
| 69 | | 4.1 Issue Scope Documents For Construction | 15 days | Mon 07/09/26 | Fri 25/09/26 | |
| 70 | | Issue WIP for Construction | 3 wks | Mon 07/09/26 | Fri 25/09/26 | 66 |
| 71 | | 4.2 Execute Contract | 4 wks | Mon 28/09/26 | Fri 23/10/26 | 70,54 |
| 72 | | 4.3 Construction Mobilisation & Construction Phase | 8 wks | Mon 26/10/26 | Fri 18/12/26 | 71 |
| 73 | | 4.4 Access, FRAP, land negotiation, electricity suppl | 26 wks | Mon 26/10/26 | Fri 23/04/27 | 71 |
| 74 | | Construction Start | 0 days | Fri 23/04/27 | Fri 23/04/27 | 72,73 |
| 75 | | 4.5 Manage Delivery (inc Construction) | 95 days | Mon 26/04/27 | Fri 03/09/27 | |
| 76 | | Construction Phase | 16 wks | Mon 26/04/27 | Fri 13/08/27 | 73 |
| 77 | | Trust-owned Time Risk Allowance | 3 wks | Mon 16/08/27 | Fri 03/09/27 | 76 |
| 78 | | Ready for Completion Certification | 0 days | Fri 03/09/27 | Fri 03/09/27 | 77 |
| 79 | | 4.6 Completion Inspections | 2 wks | Mon 06/09/27 | Fri 17/09/27 | 77 |
| 80 | | 4.7 Compile H&S Handover Files | 4 wks | Mon 06/09/27 | Fri 01/10/27 | 77 |
| 81 | | 4.8 Forecast Final Account | 60 days | Mon 04/10/27 | Fri 24/12/27 | |
| 82 | | Final Account Information Gathering | 3 mons | Mon 04/10/27 | Fri 24/12/27 | 80 |
| 83 | | Contract Completion | 0 days | Fri 24/12/27 | Fri 24/12/27 | 79,80,8 |
| 84 | | Site Handover | 0 days | Fri 31/12/27 | Fri 31/12/27 | 83FS+5 |
| 85 | | 4.9 Sponsor Acceptance | 10 days | Mon 03/01/28 | Fri 14/01/28 | 84 |
| 86 | | GW4 Approvals Complete | 10 days | Mon 17/01/28 | Fri 28/01/28 | 85 |
| 87 | | Handover & Closure | 100 days | Mon 27/12/27 | Fri 12/05/28 | |
| 88 | | Stage 5: Project Close | 65 days | Mon 27/12/27 | Fri 24/03/28 | |
| 89 | | 5.1 Complete Post Project Appraisal | 8 wks | Mon 31/01/28 | Fri 24/03/28 | 86 |
| 90 | | 5.2 Complete Health & Safety File | 13 wks | Mon 27/12/27 | Fri 24/03/28 | 83,74,7 |
| 91 | | 5.3 Close Defect Inspection Checklist | 28 days | Mon 27/12/27 | Wed 02/02/28 | 83,74,7 |
| 92 | | 5.4 Final Account | 20 days | Mon 27/12/27 | Fri 21/01/28 | |
| 93 | | Complete Final Account | 1 wk | Mon 27/12/27 | Fri 31/12/27 | 82 |
| 94 | | Submit Final Account | 1 wk | Mon 03/01/28 | Fri 07/01/28 | 93 |
| 95 | | Approve Final Account | 2 wks | Mon 10/01/28 | Fri 21/01/28 | 94 |
| 96 | | 5.5 Capture Cost per Output | 2 wks | Mon 24/01/28 | Fri 04/02/28 | 95 |
| 97 | | 5.7 GW5 Approval Project Closure | 2 wks | Mon 07/02/28 | Fri 18/02/28 | 96 |
| 98 | | Project Completion | 0 days | Fri 18/02/28 | Fri 18/02/28 | 97 |
| 99 | | Stage 6: Benefits Realisation | 60 days | Mon 21/02/28 | Fri 12/05/28 | |
| 100 | | Monitor Benefits Realisation | 3 mons | Mon 21/02/28 | Fri 12/05/28 | 97 |




Project: Penarth Feeder
Date: Fri 02/12/22

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | Summary | Inactive Milestone | Duration-only | Start-only | External Milestone | Path Driven Successor Milestone Task | Critical | Manual Progress |
| Split | Project Summary | Inactive Summary | Manual Summary Rollup | Finish-only | Deadline | Path Driven Successor Summary Task | Critical Split | Slack |
| Milestone | Inactive Task | Manual Task | Manual Summary | External Tasks | Late | Path Driven Successor Normal Task | Progress |

**CRT MEETING 13/7/2022**

**Attendees:**
**NRW (WR Permitting): Mary Beckett (MB) + Ashley Lansdowne (AL)**
**CRT: Adam Comerford (AC); Kathryn Maye (KM); Nicholas Saiz (NS)**

1. **Purpose of meeting / further meetings**

- NRW advised initial / one-off meeting to provide a general update is considered useful, but feel any meetings going forward should be application specific and on an as-needed basis.
- CRT originally requested regular meetings to be pencilled in to ensure availability for when issues / queries arise.
- Agreed no need for further general meetings to be arranged for time being, but will consider need for application specific meetings as determination progresses.
- MB (NRW) advised that POs are all within one team and are catching up regularly to discuss CRT NA apps so this will help ensure consistency.
- ACTION: NS (CRT) to send 'place holder' to Emma Allcorn (NRW) for mid-Aug to catch up on Mon+Brec applications.

2. **Progress update from NRW**

- MB (NRW) advised that all CRT's NA applications have now been allocated and are currently under determination.
- MB (NRW) provided a brief overview of progress / potential issues with each application:
  - 7 x Mon + Brec – Emma Allcorn lead officer; CRT aware of progress through separate Env + Regulation meetings; agreed application specific meeting required (see action under agenda item 1).
  - 1 x Swansea + Neath – Alex Cowell lead officer; screening / consultation has not highlighted any designations therefore determination likely to be more straightforward than other apps.
  - 2 x Montgomery (Penarth + Tanat) – Charlotte Lilly-White lead officer; HRA requirement due to d/s Severn Estuary SAC designation – issues being assessed include fish screening and flow impacts; KM (CRT) suggested flow impacts on Severn Estuary likely to be insignificant due to distance upstream abstractions are from designation. ; AC (CRT) also flagged SC / SSSI status of Montgom canal – MB (NRW) advised this was already being considered as part of determination and flow impact assessments etc.
  - 1 x Llangollen Canal – MB (NRW) lead officer; email update sent 27/6 – KM (CRT) is collating a response; potential need to set up meeting to discuss once response received by NRW.
- AC (CRT) advised that EA are dealing with approx. 140 NA licences applications, of which only 61 have been issued.
- KM (CRT) asked if it was possible for NRW to share draft licences ahead of issue; MB (NRW) confirmed this was possible but flagged concern around potential delays to determination – agreed NRW will share draft licences ahead of issue and that CRT would aim to review / respond within 10 working days.

3. **Purpose condition wording**

- MB (NRW) advised that permitting officers are aware of proposed purpose condition wording (*Transfer for the purpose of operations in the course of carrying out functions as a navigation authority)* and will be determining whether it can be included on licences as part of determination.
- MB (NRW) advised that determination considers what was previously authorised under Enabling Acts (i.e. whether CRT were authorised to abstract just for navigation for purposes or for other purposes too such as onward supply) and that main concern re. purpose condition wording was to ensure it won't allow CRT to increase abstraction for onward supply in future;

- NS (CRT) pointed out that abstraction controlled through means of abstraction condition so this shouldn't be an issue anyway.
- AC (CRT) advised that when British Waterways (public body) transferred to CRT (charity / trust) certain powers were removed, including (possibly) the power to sell water for onward supply.
- NS (CRT) also advised that EA have used this wording on all licences that have been issued to them so far.

**4. Quantities / potential recording + reporting requirements**

- MB (NRW) advised that although all CRT's NA apps are for transfer licences, there are certain cases where quantities will need to be conditioned and in these cases there is also a potential requirement to include recording and reporting conditions.
- NS (CRT) flagged this may not be required if flows / restrictions etc can be secured through intake structure; MB (NRW) agreed and advised that this would be case specific and considered as part of determination.

**5. Means of abstraction condition – potential drawing requirements**

- MB (NRW) advised that where quantities are not included on licences, then abstraction will be controlled through means of abstraction condition, which will likely include a reference to existing intake structures, meaning drawings will be required for inclusion on any licences issued.
- AC (CRT) advised that CRT are able to provide detailed drawings, but need to NRW to confirm what sites they are needed for; it was anticipated that drawings would be needed for Swansea + Neath canal and 2 x Montgom canal intakes; drawings may also be required for some Mon + Brec intakes.
- NS (CRT) advised CRT's preference for drawings to refer to height above local datum (as opposed to Metres Above Ordnance Datum) as this is considered clearer, more cost-effective and quicker to provide; MB (NRW) advised this would be something the permitting officer would need to check through internal consultation.
- Action: MB (NRW) to confirm in writing to CRT which sites drawings are required for and confirm how levels should be specified.
- Action: NS (CRT) to provide examples of licences already issued by EA in interests of consistency. [action complete – see email dated 13/7/2022]
- AC (CRT) advised that Mon + Brec sites have already been surveyed, however acknowledged that any survey info may not be relevant to these licences if structures need to be altered to comply with flow conditions.

**6. Potential fish screening requirements**

- MB (NRW) advised that fish screening conditions are being considered for all CRT NA apps where Habs Requirements apply (i.e. all except Swansea + Neath Canal abstraction); as per previous advice NRW's current position is for these conditions to be effective from date of issue and acknowledged potential compliance issue.
- AC (CRT) referred to a similar steer they had received from the EA regarding fish screening requirements; AC (CRT) advised that CRT had "pushed back" to EA arguing it would not be possible to comply with these conditions straight away due to need for design, survey, funding work etc to be undertaken beforehand.
- AC (CRT) advised that because of the resource needed to install fish screens etc., CRT would need assurances that HRA process had been properly followed to ensure suitable audit trail; MB advised that NRW would be able to provide regular updates on HRA process as necessary.
- AC (CRT) also advised on EA position wrt fish screening: recognised that there are two regulatory routes that fish screening is required under (Habs Regs + Eel Regs) and that WA 2003 changes was historically seen as mechanism for securing these requirements; CRT aware that compliance

with Eel Regs is an existing requirement but also noted that EA had not pursued this requirement by serving notice (in most cases); CRT understand that EA will not pursue fish screening under NA licences if only required under Eel Regs, however fish screening conditions will be included where required under Habs Regs; MB (NRW) confirmed this is reflective of NRW's position.

**AOB Items requested by CRT:**

1. Abstraction conditions triggering works that then trigger impoundment licensing requirements (can we rely on exemptions or low risk impoundment guidance)

- MB (NRW) advised that Emma Allcorn is currently exploring if the exemption for navigation authorities applies in this case and will be providing following discussions with NRW legal;
- AC (CRT) acknowledged Emma had already sent email update on this and advised CRT would be providing comment based on advice from CRT's legal team; AC (CRT) suggested that exemption may not apply as many structures fall outside their authority's boundary;
- AC (CRT) keen to understand if any other options available to negate need to apply for an impoundment licence;
- AC (CRT) also suggested CRT may decide to abandon some intakes if not considered cost-effective to operate once solution in place; this potentially means some applications may be withdrawn although acknowledged it was too soon to make a decision on this.

2. Specific query on a dayjob application we are hoping to submit (Afon Lwyd abstraction to feed Mon&Brec Canal). Emma already replied to me about this, but keen to follow up some general licensing principles.

- MB (NRW) advised that it would be best to arrange a separate meeting with Emma Allcorn on this issue;
- AC (CRT) advised that Jon Goldsworthy had raised concerns regarding regulatory complexities of the proposal at last steering group;
- AL (NRW) advised that permitting would not be able to determine any 'day job' application until NA programme complete due to limited permitting resource.

3. NS (CRT) requested clarification on CEDs; MB advised as follows:
    - Dee: 31/3/2039
    - Usk: 31/3/2038
    - Severn Corridor: 31/3/2034
    - Swansea: 31/3/2029

## Lillywhite, Charlotte

**From:** Lillywhite, Charlotte
**Sent:** 24 November 2022 10:33
**To:** Kathryn Maye; Nicholas Saiz; Adam Comerford
**Cc:** New.Authorisations@canalrivertrust.org.uk; Mary Beckett (Mary.Beckett@cyfoethnaturiolcymru.gov.uk)
**Subject:** PAN-007395 & 7 Penarth and Tanat Feeders: Flow restriction update and final screen size confirmation

Hi All,

At our last meeting you requested the modelling for our initial proposed low flow restrictions, I have been unable to send these, as we have continued our internal discussions around what flow restrictions are necessary to protect migratory fish species of the Severn Estuary SAC and Ramsar, as well as to ensure sufficient water for the canal SAC during periods of low flows. I will receive further modelling by tomorrow and following this I will send an email to get your feedback on our proposed scenarios – i.e., the impact of the flow restriction proposals on how you have historically operated the canal e.g., volumes and depths.

I realise this is unlikely, but would you have any availability for a meeting next week to discuss the above? If not, I will request your feedback by email, and send you draft copies of the licences as soon as possible.

Internal consultees have confirmed the following screening (outlined in my email 18/10/2022) to be acceptable:

- The inclusion of a condition on both licences requiring a screen with spacing no greater than 10mm at the point of abstraction.
- The inclusion of a condition requiring a screen with spacing no greater than 40mm on the overflow weir (at the intake structure) at Penarth.

It would be useful to include the National Grid Reference for the overflow weir within the condition, please can you provide this.

I am sure you aware that the Penarth Feeder is a listed building and a historic monument, and the Tanat Feeder is a historic monument; I wanted to flag that you should engage with Cadw and the Local Authority to discuss the above screening requirements.

Best wishes

Charlotte

Charlotte Lillywhite (They/Them)

Swyddog Trwyddedu Adnoddau Dŵr / Water Resources Permitting Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales Ffôn / Phone: 03000 65 3921

Tŷ Cambria, 29 Heol Casnewydd, Caerdydd, CF24 0TP / Cambria House, 29 Newport Road, Cardiff, CF24 0TP

Mental Health First Aider MHFA Wales

**Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.**

**Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.**

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**Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi. Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.**

Rydym yn adolygu ein ffioedd rheoleiddio, mae rhagor o wybodaeth am ein hymgynghoriad ar gael yma: Ymgynghoriad ar ein ffioedd a thaliadau rheoleiddio ar gyfer 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)

We are reviewing our regulatory fees and charges, please find more information on our consultation here: Consultation on our regulatory fees and charges for 2023/2024 - Natural Resources Wales Citizen Space - Citizen Space (cyfoethnaturiol.cymru)