www.environment-agency.gov.uk/cams

The Neath, Afan and Ogmore Catchment Abstraction Management Strategy

October 2005

Asiantaeth yr Amgylchedd Cymru
Environment Agency Wales

www.environment-agency.gov.uk/cams

The Environment Agency is the leading public body protecting and improving the environment in England and Wales.

It's our job to make sure that air, land and water are looked after by everyone in today's society, so that tomorrow's generations inherit a cleaner, healthier world.

Our work includes tackling flooding and pollution incidents, reducing industry's impacts on the environment, cleaning up rivers, coastal waters and contaminated land, and improving wildlife habitats.

Published by:

Environment Agency Wales
Cambria House
29 Newport Road
Cardiff, CF24 0TP
Tel: 08708 506 506

IC code: GEWA 1005BJNM-B-P

This report is printed using water based inks on Revive, a recycled paper combining at least 75% de-inked post consumer waste and 25% mill broke.

Front cover photograph by David Dennis, Environmental Images.

Foreword

Water is so often taken for granted, especially in Wales. After all, it seems to be raining rather often, so surely there has to be a plentiful supply for all our needs! And our needs are many and varied. All our houses need water; hospitals need water; industries need water; breweries need water; some recreational activities need water, this list is endless, and at the same time we need to ensure that we keep enough water in the rivers to protect the environment. It follows that this precious resource has to be carefully managed if all interests, often conflicting, can be properly served.

That is where the Catchment Abstraction Management Strategy (CAMS) comes in. A team of specialists from the Environment Agency have undertaken a detailed study of the Neath, Afan, Ogmore, Kenfig and Ewenny rivers to determine the amount of water that could be available for abstraction under different river flow conditions and different licensing options. They then completed an assessment of the possible impacts on industry, the environment, angling and many other factors for each of these options to determine the most sustainable approach to managing the water resources in these catchments.

Throughout the process they have consulted with a group of key stakeholders, who have represented the key water interests in these catchments, including representatives from industry, navigation, Dŵr Cymru Welsh Water, angling and environmental bodies. This was an exacting task and was undertaken with considerable commitment by the group members to ensure that the CAMS report properly took account of both the present and future different water needs within the catchment communities. The issues that were considered are complex and the demand made for water in the different catchments varies considerably.

The study showed that there is considerable pressure between the environment and the demands and historic licences of the key industries, particularly on the Afan, Kenfig and the Neath. On the Ewenny and Ogmore there is generally more water available to support further development, but this should only be licensed with appropriate conditions to protect the environment.

The study also highlighted areas where future work and investigation need to be undertaken to help plan the Environment Agency's work over the next six year period before this CAMS is next reviewed.

This report has had to deal with some very complex issues so we have tried to present it in a non-technical way. However, using some technical terms has been unavoidable so please use the glossary to help you through, and if you have any queries, Officers at the Environment Agency will be more than willing to help.

I would like to record my sincere thanks to the stakeholder group members for their unstinting commitment over many months to complete the task and to those who responded to the public consultation. I would also like to thank the Environment Agency staff whose professionalism made the task that much easier. But remember this is not just something that the Environment Agency and the industries can do something about; it is something that everyone can support. We can all use our water wisely and ensure that we do not waste this precious resource. Following the extensive consultation process, the judgements on whether the amount of water actually abstracted is too little or too much and how the water might best be used in the future were reviewed and finalised. Those judgements are presented in this final strategy document.

Dr John Elfed Jones CBE DL
Chairman, Neath, Afan and Ogmore
CAMS Stakeholder Group.

Roy Fowles
South West Area Manager

Contents

1. Introduction 3

2. Consultation on the Neath, Afan and Ogmore CAMS 4

3. The CAMS Area 5

3.1 Surface water features 5

3.2 Geology and hydrogeology 8

3.3 Hydrological and hydrogeological monitoring .8

3.4 Major abstractions and discharges 8

3.5 Industry 14

3.6 Ecology and conservation 15

3.7 Fisheries and angling 15

3.8 Water quality 17

3.9 Stakeholder concerns 18

4. Resource Assessment and Resource Availability Status 19

4.1 Introduction 19

4.2 Resource assessment of groundwater management units 22

4.3 Resource assessment of river assessment points 22

4.4 Integration of the surface water and groundwater resource assessments 23

4.5 Summary of resource assessment for the Water Resource Management Units 27

4.6 Areas not included in the Water Resource Management Units 33

5. Licensing strategy 34

5.1 Sustainability appraisal 34

5.2 Catchment overview of licensing strategy . . .34

5.3 WRMUs 1 & 5 (Clydach & Ogmore) 36

5.4 WRMU2 (Neath) 36

5.5 WRMU3 (Afan) 37

5.6 WRMU10 (Ffrwd Wyllt) 38

5.7 WRMU4 (Kenfig) 38

5.8 WRMU6 (Ewenny) 39

5.9 WRMUs 7, 8 & 9 (Neath & Afan Coastal Blocks, Kenfig & Ogmore Coastal Block and Schwyll) 40

5.10 Opportunities for licence trading in the Neath, Afan and Ogmore CAMS area 41

5.11 The Water Act 2003 41

6. Future developments in the CAMS area 42

7. Post-CAMS appraisal 43

Annexe 1.

Agency staff involved in the Neath, Afan and Ogmore CAMS 44

Annexe 2.

Glossary 45

Annexe 3.

List of Abbreviations 50

Introduction

Vision for the Neath, Afan and Ogmore CAMS area

The Vision for the Neath, Afan and Ogmore CAMS is a managed water resource, which will support sustainable development and safeguard the local economy, whilst seeking to maximise potential for protection of the environment.

Catchment Abstraction Management Strategies (CAMS) are strategies for management of water resources at a local level. They will make more information on water resources and licensing practice publicly available and allow the balance between the needs of abstractors, other water users and the aquatic environment to be considered in consultation with the local community and interested parties.

CAMS are also the mechanism for managing time-limited licences by determining whether they should be renewed and, if so, on what terms.

Managing Water Abstraction: The Catchment Abstraction Management Strategy Process is the national document that supports the development of CAMS at a local level. It sets out the national policy and the regulatory framework within which CAMS operate, describes the process of developing CAMS and provides information on the structure and content of CAMS documents. This Catchment Abstraction Management Strategy should be read in conjunction with *Managing Water Abstraction.*

This document is the Catchment Abstraction Management Strategy for the Neath, Afan, Ogmore and Kenfig catchments.

A technical document for the Neath, Afan and Ogmore CAMS has been produced which provides the detailed technical information on which the development of the strategy has been based. If you wish to receive this document on CD-ROM, please contact us at:

Environment Agency Wales
Llys Afon
Hawthorn Rise
Haverfordwest
SA61 2BQ

Tel: 01437 783039
Fax: 01437 760881

Email: cams.walessouthwest@environment-agency.gov.uk

A hard-copy version of the document is also available for viewing at the same office.

2

Consultation on the Neath, Afan & Ogmore CAMS

Consultation is an integral part of the CAMS process. It is important because it ensures that the CAMS process is as transparent as possible and gives everyone the opportunity to get involved. For the Environment Agency to manage water resources in the catchment effectively and sustainably, it is important that as much information as possible is collated on water needs and uses. Comments and suggestions have been gathered during the early stages of development of this strategy through pre-consultation activities. These were:

- Awareness-raising leaflet
- CAMS Stakeholder Group
- Targeted information request

The leaflet was distributed in October 2002. Its aim was to raise awareness of the development of the CAMS in the local area and it also invited anyone with an interest to send in written comments, providing information, views and suggestions.

A stakeholder group was set up for the Neath, Afan and Ogmore CAMS. The role of the stakeholder group was to represent the key interests in the catchment and to help identify issues of local significance, provide views on proposals and to consider the likely implications of different strategy options. The members of the Neath, Afan and Ogmore CAMS Stakeholder Group and the interests they represented are as follows:

- **Mr John Elfed Jones** - Chairperson
- **Mr Richard Leonard** *(Corus)* - Industrial and other abstractors *(Afan, Kenfig, Ogmore & Ewenny catchments)*
- **Mr Alun Short/ Mr David Davies** *(BP Chemicals)* - Industrial and other abstractors *(Neath catchment)*
- **Ms Rebecca Sharp** *(Neath, Port Talbot CBC)* - Local Authority
- **Mr Steve Moon** *(Bridgend CBC)* - Local Authority
- **Mr Dyfrig Jones** *(Wildlife Trust South & West Wales)* - Conservation and recreation
- **Mr Alun Hughes** *(Dŵr Cymru Welsh Water)* - Water Company
- **Mr John Phillips** *(Afan Anglers)* - Angling and fisheries
- **Mr Colin Sheppard/ Mr Kevin Francis** *(Associated British Ports)* - Industry and shipping
- **Mr Howard Evans** *(Welsh Development Agency)* - New development

There was also a formal consultation on the Neath, Afan and Ogmore CAMS through a consultation document, distributed in March 2005. A total of 21 responses were received. These were from a variety of respondents representing a range of interests including conservation, angling, local communities, future developments, private abstractors and business licence holders. The responses received were analysed and taken into account as the strategy was finalised.

A number of the responses raised concerns with the availability of water for licensing within WRMU 2 (Neath). As a result the resource assessment was reconsidered and the subsequent changes to the licensing strategy are detailed in sections 4.5. and 5.4. This CAMS document now sets out the final strategy that has been determined for the Neath, Afan and Ogmore CAMS area.

The CAMS Area

3.1 Surface Water Features

The Neath, Afan and Ogmore CAMS is a surface water dominated catchment that covers the whole length of the rivers Neath, Afan, Ogmore and Kenfig. The CAMS area ranges from Crymlyn Bog in the west, to east of Bridgend, and up to the Brecon Beacons in the north, refer to Map 1.

The headwaters of the river catchments comprise steep upland areas, with some of the highest level of forestry cover in the UK. The streams tend to be steep and fast flowing and react rapidly to changes in rainfall. Ystradfellte reservoir is situated in the headwaters of the River Neath and is used to supply public water to the upper parts of the Neath and Afan valleys.

The lower parts of the river catchments are naturally much flatter, but all of the rivers still have a reasonable gradient and are quite fast flowing until the very lowest reaches and the tidal limits. There is a concentration of industry and urbanisation along the coastal strip at Neath and Port Talbot and also along the river corridors around Bridgend.

The River Neath is the largest river in this CAMS area. Its sources lie high in the centre of the Brecon Beacons and these upper reaches attract many walkers and cavers to the waterfalls and caves. The catchment is still dominated by its industrial past, which was heavily based on coal mining and metal manufacturing. As part of this coal mining heritage the catchment hosts two canal networks, namely the Neath Canal and the Tennant Canal. The Neath Canal runs from Glyn

Afan at Pontrhydyfen

Map 1. Neath, Afan and Ogmore CAMS area overview.

Neath down to Briton Ferry, with the lower section supplied by abstractions from the river at Abergarwed and Tonna. The Tennant canal commences with its abstraction at Aberdulais and concludes at Swansea Docks. Part way along the canal it runs along the south side of Crymlyn Bog which is a designated Special Area of Conservation (SAC), with a short canal spur extending into the Bog itself. There is an historic aquaduct at Aberdulais which links the two canals, although this has not been used for many years.

The River Afan is located in a particularly steep and narrow valley, dominated by forested slopes. It too has a heavily industrial past, but with the main industry located on the narrow coastal strip alongside its lower reaches.

Both the rivers Neath and Afan are high gradient catchments, being steep and stony in the upper reaches, with boulders or bedrock being the predominant substrate. Both experience rapid fluctuations in flow depending on level of rainfall and levels tend to rise and drop very quickly. Towards the lower end of the catchments the gradient lessens, but the rivers become much wider and remain relatively shallow and stony as far as the tidal limit.

The Ffrwd Wyllt, known locally as the Nant Cwm Farteg, is a small river running from its source west of Maesteg, and discharges into Port Talbot Docks.

The River Kenfig is steep, bouldery and shallow in its upper reaches, but soon moves out of the steep sided valleys and becomes more deep, sluggish and has a much lower gradient at the extreme lower end of the catchment. It is joined by its three main tributaries at Pyle, then turns west to reach the sea at Kenfig Sands.

The Ogmore catchment is made up of two main rivers, the Ogmore and the Ewenny. The River Ogmore itself and its two main tributaries, the Llynfi and Garw, are also steep and rocky for most of their length. The gradient of the River Ogmore reduces towards the tidal limit and it becomes a little deeper and slower flowing. The River Ewenny, which joins the River Ogmore below the tidal limit, has an even lower gradient and greater depth in its lower reaches, but again is steep and stony towards the top of the catchment.

Recreation on the Neath Canal

3.2 Geology and Hydrogeology

Map 2 shows that the area is underlain by solid rocks that range from Devonian to Jurassic in age. The oldest rocks, Devonian, are cemented sandstones and mudstones. These are overlain by the Carboniferous Limestone, Millstone Grit and Coal Measures. A period of folding and faulting caused uplift of the area, which was followed by extensive erosion leading to the deposition of the younger sedimentary rocks of Triassic and Jurassic age, which include limestones and mudstones.

This solid geology of the catchment is overlain by an irregular layer of drift deposits that were deposited during, and immediately after, the last ice age. These glacial deposits are dominated by till, which was deposited by the ice as a veneer across the uplands between the Neath, Afan and Ogmore valleys and as a blanket across the lowlands west of Bridgend. High terraces and broad sheets of sand and gravel were also deposited by meltwater.

Following retreat of the ice, the modern Neath, Afan and Ogmore river systems re-established themselves in their respective valleys, largely exploiting the glacially formed landscape, with alluvium, river terraces and fluvial deposits, comprising clay, silt, sand and gravel, accumulating in the river valleys. In the uplands, peat formed in poorly drained areas, whilst under the influence of rising sea levels, sand dunes and muddy coastal flats were developed along the coastline between the mouths of the Neath and Ogmore rivers.

For this CAMS area the aquifer has mainly been considered to be the bedrock, apart from some of the coastal areas between the River Neath and River Afan and the Kenfig sub-catchment, which are dominated by drift deposits. The Carboniferous Limestone is designated as a major aquifer, whilst the Coal Measures form a minor aquifer. The aquifer conditions across the catchment are likely to vary, depending on the type and extent of drift coverage and permeability of the solid geology.

The groundwater catchment for the Neath, Afan and Kenfig catchments is assumed to be the same as the surface water catchment. The groundwater flows in the Ogmore catchment are assumed to be both towards the River Ogmore and parallel to it, in the direction of the spring at Schwyll. There are sinks or swallow holes located in the some of the rivers at the bottom of the Ogmore and Ewenny catchments where the rivers are losing flow to the groundwater through these karstic features.

3.3 Hydrological & Hydrogeological Monitoring

There are eight river gauging stations in the CAMS area.

Table 1 | Gauging stations in the CAMS area

Gauging Station	River
Cilfrew	Dulais
Resolven	Neath
Pont-Nedd-Fechan	Mellte
Marcroft	Afan
Bridgend	Ogmore
Brynmenyn	Ogwr Fach
Coytrahen	Llynfi
Keeper's Lodge	Ewenny

These gauging stations have been recording flows since at least 1971 until present, with the exception of Marcroft, which commenced recording in 1978. Each of these gauging stations has a water level sensor and logger that records river levels every 15 minutes.

The spring outflow at Schwyll is also monitored and additional data is collected from a level logger on the Tennant Canal in the Neath catchment.

Within the CAMS area there also exists a network of rain gauges. These are situated at Resolven and Ystradfellte in the Neath catchment, Blaen Pelenna in the Afan catchment, Cefn Cribwr in the Kenfig catchment, Lletty Brongu and Werfa in the Ogmore catchment and also at Schwyll, Pencoed and Coychurch in the Ewenny catchment. There are also three water level recorders used for flood warning purposes at Ogmore Vale, Maesteg and Taibach on the Ffrwd Wyllt.

Groundwater monitoring information within the CAMS area is very sparse. For example, there is one observation borehole within the Kenfig and Ogmore Coastal Block for which the accumulation of longer time-series data is necessary.

3.4 Major Abstractions and Discharges

Within the CAMS area there are 28 licensed surface water abstractions and 20 licensed groundwater abstractions. There are also two abstractions for navigation purposes, which are exempt from licensing, namely the supply of water to Neath Canal and Port Talbot Docks.

Map 2. Geology of the CAMS area

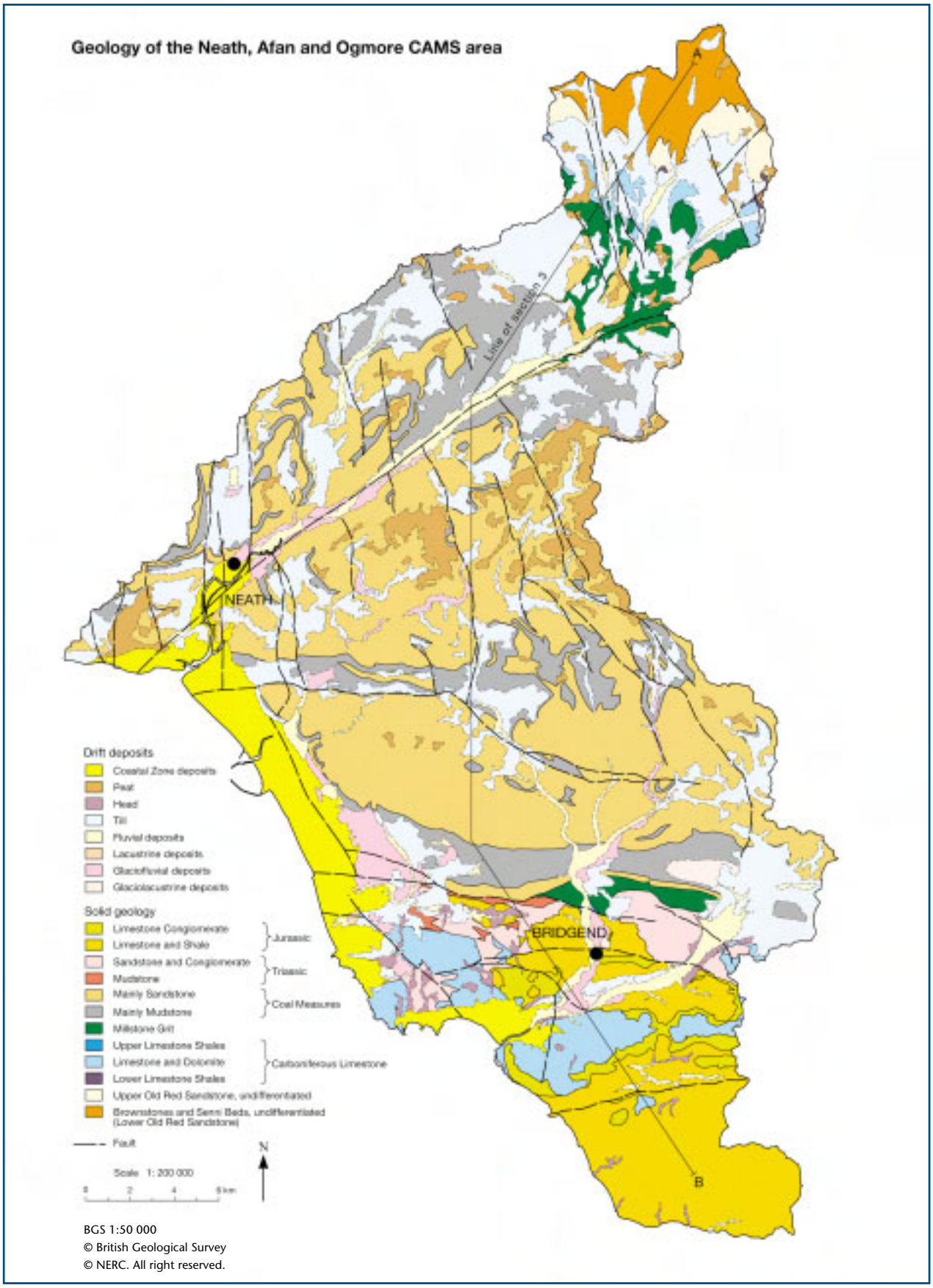


Figure 1 | Cross section showing geology of the CAMS area.

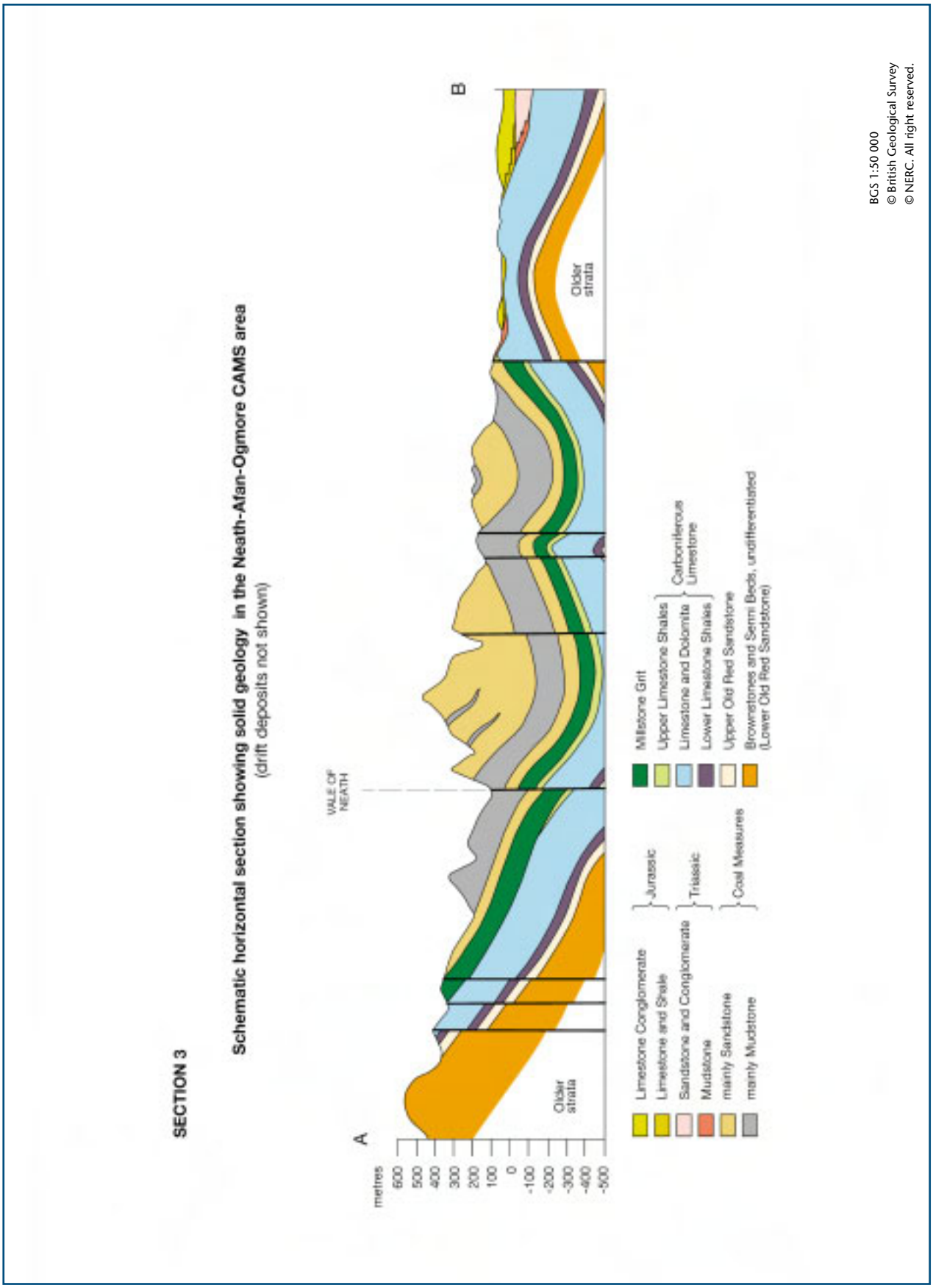
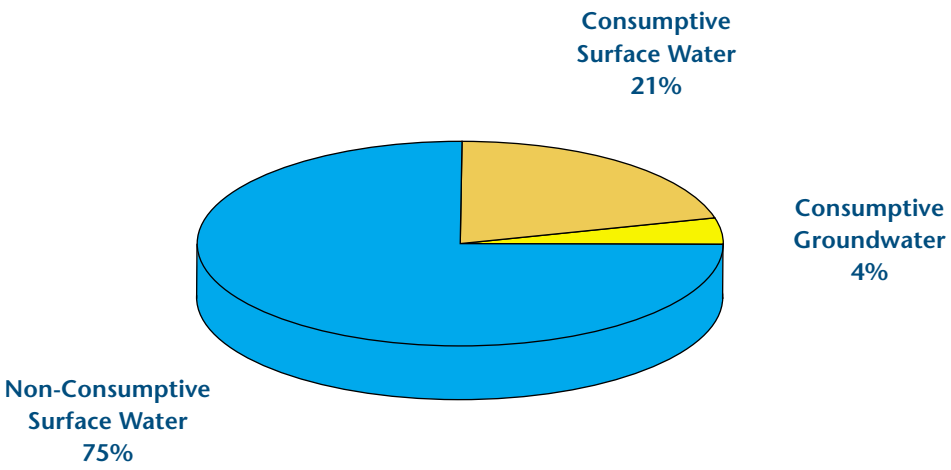


Figure 2 | Licensed surface water and groundwater abstractions in the CAMS area.



Map 3 shows the location and size of licensed abstractions within the Neath, Afan and Ogmore CAMS area.

Most of the water abstracted is from surface water sources, much of this is taken for non-consumptive uses. This means it is returned to the river a short distance away. The largest abstraction in the CAMS area is Corus' abstraction for non-evaporative cooling at Port Talbot Docks, the majority of which is recirculated back to the docks close to the point of abstraction. The other main non-consumptive abstraction is the National Trust's hydropower scheme at Aberdulais. Other such abstractions include amenity ponds and fish farms.

Of the consumptive licensed abstractions, 87% comes from surface water sources and the rest from groundwater sources - these consumptive abstractions are generally the water company and industrial abstractions.

Some of these licences are restricted by hands-off flow conditions that prevent abstraction during low flows to protect the environment and other abstractors. However others, most of which were issued when the control of abstraction was first introduced back in 1963, are not.

The water company has surface water and groundwater abstractions that are utilised for both public water supplies and their industrial customers. However much of the public water supply to this area is drawn from the Afon Tywi in Carmarthenshire, as part of the Tywi Conjunctive Use Zone.

Figure 3 | Licensed use of consumptive licences

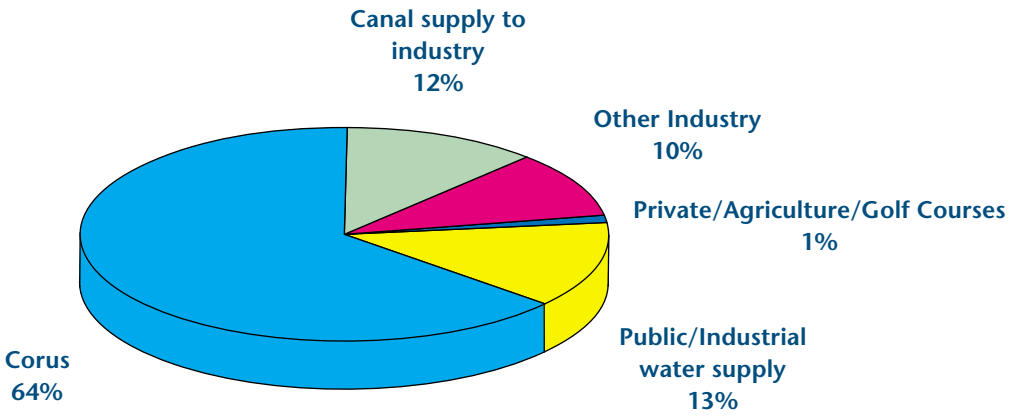
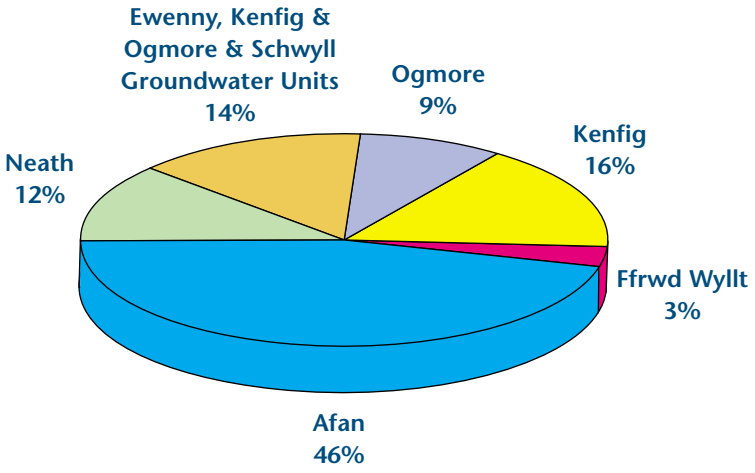


Figure 4 | Distribution of consumptive licences by water resourse management unit



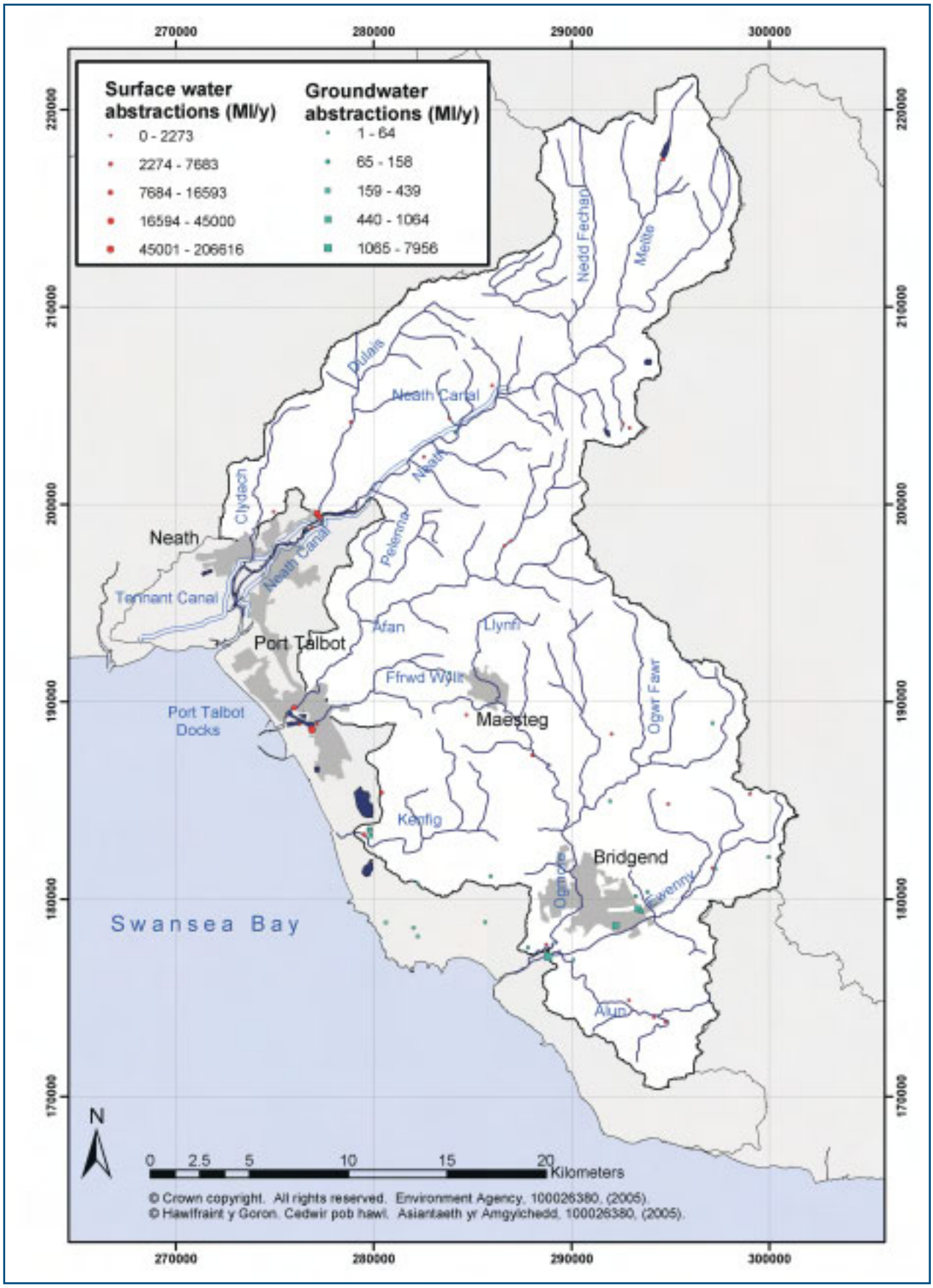
There are a few licensed abstractions for agricultural purposes and many other agricultural abstractions that are exempt due to the small volumes abstracted. The impact of these abstractions on water resources within this CAMS is negligible.

There are also numerous small private domestic water supply abstractions that do not require licensing. Again the estimated collective abstraction volume of these has a negligible impact upon water resources within the CAMS area.

Since undertaking the technical assessment for this CAMS, some elements of the Water Act 2003 have come into effect, including the deregulation of abstractions of less than 20m^3 per day (see section 5.11). Of the 48 licenced abstractions used in the technical assessment approximately 60% have been deregulated from the 1st April 2005 and are no longer required to hold an abstraction licence.

River Afan at Green Park Weir

Map 3: Licensed abstractions in the Neath, Afan and Ogmore catchments.



The technical assessment for this CAMS was completed prior to deregulation and this CAMS and the information contained within this document is based on licensed abstractions prior to April 2005. Although these abstractions no longer require a licence the abstraction may still continue therefore the information used in the resource assessment reflects the current situation.

Consented discharges within the CAMS area are mainly treated sewage effluent with a small proportion of effluent discharged by industry.

3.5 Industry

Within this CAMS area the landscape, society and economy have been shaped by its industrial heritage, particularly in the Neath and Afan Valleys which have a long history of coal mining and metal manufacturing.

Although the collieries and metal works have declined significantly over the last 50 years, industry still plays a major role in the local economy, with the majority of the larger industries bordering the M4 corridor at Neath, Port Talbot and Bridgend. Corus is the largest industry in the area and is also the largest abstractor, with abstractions from the Afan, Ffrwd Wyllt and Kenfig. It is a major direct and indirect local employer and supports a large part of the local economy. Port Talbot Docks, which is managed by Associated British Ports, support the operations at Corus and as such is a busy centre for seaborne cargo and shipping, the main trades being slag cement and sand/gravel. Throughout the valleys there are small pockets of industry, which are significant in terms of social and economic importance. Tower Colliery in the Neath Valley is run by a co-operative and is of cultural importance, being one of the few remaining working deep mines.

The Tennant and Neath Canals have provided water to support the BP oil refinery and chemical works at Llandarcy and Baglan. Over recent years this demand has reduced, although redevelopment at the Baglan site will boost demands for water, and this will increase with further development of that site.

The Bridgend and Maesteg areas also have a mining history, particularly around the Ogmore and Garw Valleys where a number of coal mines and washeries were located. Over the last 30 years a number of large manufacturing companies have set up in the Bridgend area. There is a paper mill near Maesteg, which is an important employer in the area and important to the local economy. There are also a large number of industries, which collectively provide significant employment and support for the local economy. These are located on industrial estates at Maesteg, Waterton, Pencoed and Brynmenyn. Most of the industry within the Bridgend, Maesteg and Ogmore area is supplied by the water company.

Throughout this CAMS process, a number of abstraction issues have been highlighted, predominantly in the bottom reaches of the catchments. Some of these are recognised local issues, which need to be investigated outside of the CAMS process.

Port Talbot Docks

3.6 Ecology & Conservation

The catchments of the rivers Neath, Afan, Ogmore and Kenfig support a diverse flora and fauna. The ecological value is reflected in the various conservation designations of local and national importance (refer to Map 4). Many of these designations are based on river types and associated riverside habitats and species, some of which have also been identified in the United Kingdom and Local Biodiversity Action Plans (BAPs). BAP species included in this CAMS area are otters, water voles, kingfishers, harbour porpoise, reed buntings, great crested newt, white clawed crayfish and a variety of plants. Of these species, otters are recognised as a European protected species together with lamprey and bullhead.

There are 23 Sites of Special Scientific Interest (SSSIs) that are water related. The catchments host various habitats, including fenland, peatland, sand dunes, coastal and flood plain grazing marsh, wet woodlands, coastal saltmarsh, grasslands and reed bed habitats.

Four designated sites are situated in the steep sided, wooded valleys of the upper River Neath. Coedydd Nedd a Mellte is designated a Special Area of Conservation (SAC). The overall botanical diversity of the narrow valley gorges of the rivers Nedd Fechan, Mellte, Hepste and Pyrddin are outstanding, with more than 600 species of plant recorded from these sites, including a very large proportion of the bryophyte flora of mid and south Wales. There is also a raised mire, at Gors Llwyn, of which there are very few examples in mid and south Wales.

Crymlyn Bog SSSI is the most extensive area of lowland fen in South Wales and is part of the Crymlyn Bog SAC. Crymlyn Bog SAC includes the adjacent Pant y Sais Fen and is of special interest for its fen and swamp communities and associated invertebrates. The site is part of a larger inter-estuarine complex, which includes the Neath flood plain. Crymlyn Burrows SSSI is one of the last remaining sections of the Swansea Bay Coastline that has remained substantially unmodified by industrial development. Sand dune ridges have developed over the past 150 years and are continuing to accumulate.

Margam Moors SSSI is the last remaining example of the once extensive coastal levels in West Glamorgan. Bounded to the seaward by dunes and to landward by high ground, the meadows provide a freshwater habitat that hosts many species of plant and nationally important invertebrates. Eglwys Nunydd Reservoir SSSI, which is sited adjacent to Margam Moors, attracts large numbers of wintering waterfowl and migrating birds.

The majority of Kenfig SSSI lies within the Kenfig National Nature Reserve (NNR) and is part of the Kenfig SAC. It is of special interest for its extensive sand dune habitats and standing waters together with a mixture of associated coastal habitats. It is also of special interest for plants, fungi and invertebrates that are associated with these habitats. The exceptional wetness of the Kenfig dune system is of national significance. Kenfig Pool also hosts an abundant and diverse assemblage of aquatic plants and invertebrates.

Merthyr Mawr SSSI is also part of Kenfig SAC and the majority of the site lies within the Merthyr Mawr Warren NNR. Merthyr Mawr is of special interest for its saltmarsh and sand dune habitats and for the assemblages of plants, fungi and invertebrates associated with the dunes. Merthyr Mawr is one of only three Welsh sand dune systems with calcareous grassland, which are extremely species-rich.

3.7 Fisheries and Angling

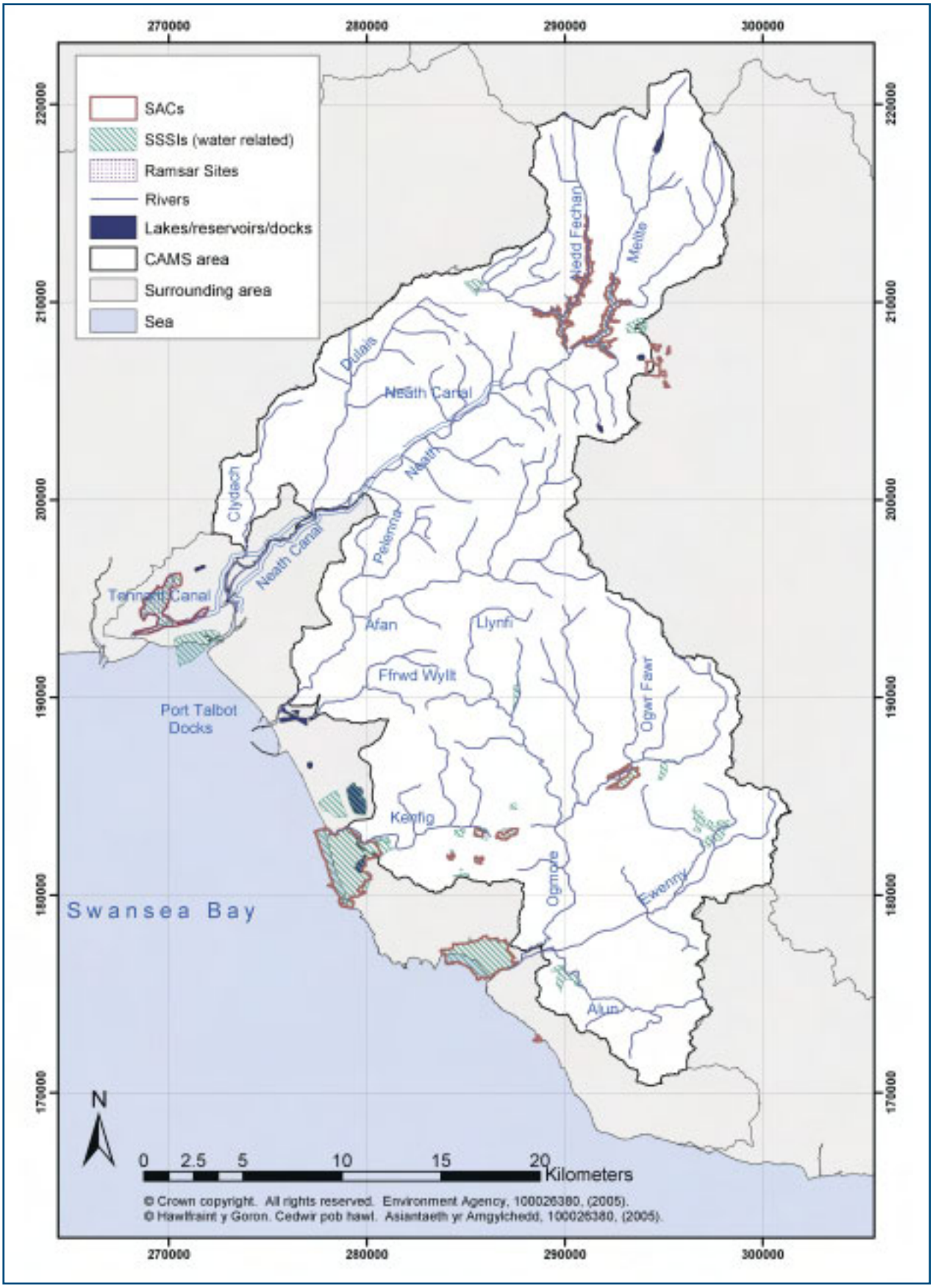
Angling within the Neath, Afan & Ogmore CAMS area is locally important and also attracts anglers from further afield. Angling accessibility throughout the catchments is generally good.

The River Neath is a good salmon and sea trout fishery with important spawning grounds in the upper reaches of the main river. Although mostly inaccessible to migratory fish, the Mellte, Nedd Fechan and Dulais have good brown trout populations, and there is also a brown trout fishery on the Clydach. The lower Neath Canal and Tennant Canal are fished for coarse fish, where angling access is permitted.

The River Afan is extensively fished for salmon, sea trout and brown trout and its tributaries are also major spawning grounds for migratory fish. However, abstraction related low flows at the fish pass at Green Park Weir have impacted upon fish migration. Historically the abstraction at Green Park Weir has also affected smolt migration, though the recently installed smolt screen should reduce this impact. There is also a coarse fishery within Port Talbot Docks.

The River Ogmore is extensively fished for both migratory and non-migratory fish. It is renowned as a sea trout fishery, with spawning grounds in the Garw, Llynfi, Ogwr Fawr and Ogwr Fach. There are also brown trout fisheries on the Ogwr Fawr and parts of the Llynfi. There are recognised abstraction and discharge related problems on the Llynfi with regard to raised water temperatures during lower flows that, together with water quality problems, are thought to impact upon migrating fish and the survival of juvenile salmonids. These issues are being investigated further under the Restoring Sustainable Abstraction (RSA) Programme.

Map 4: Designated sites in the CAMS area.



The River Ewenny is fished for sea trout and the abstraction and discharge related problems on the Llynfi, with regard to occasional salmon and has a growing interest in the area as a grayling fishery. Spawning takes place in both the main river and tributaries. There are good brown trout fisheries on the upper reaches of the Alun.

Apart from the salmon and trout populations, lamprey, bullhead and eels are also present throughout the catchments.

The importance of fisheries in Wales generally is being recognised by the Welsh Assembly Government (WAG) who is providing the Environment Agency with Grant in Aid for fisheries work as part of the Sustainable Fisheries Programme. The Environment Agency has also accessed Objective 1 funding through the 'Fishing Wales' project, the main aim of which is to provide local economic development through attracting angling visitors to Wales. Most of the project funding is targetted towards environmental improvements, such as fish passes and bufferstrip creation, which will produce sustainable increases in fish stocks. The River Neath has also received additional Objective 1 funding through the now completed Neath Habitat Restoration Project. This was a collaboratively funded project to improve the in-river habitat of the Neath catchment, enhance the economic value of the Neath fishery and raise awareness of local biodiversity.

3.8 Water Quality

The Environment Agency undertakes routine monitoring surveys of water quality. Agricultural and industrial discharges together with diffuse run-off from urban areas are all contributory factors to recognised water quality problems within the CAMS area. These will be addressed outside of the CAMS process. However, water quality in many of the river reaches is good and meets the River Quality Objective (RQO) target.

In the Neath catchment, past mining activities have resulted in discharges of poor quality minewater, but significant improvements have been made in recent years to address this. River Quality Objective failures can be attributed to sewage treatment works and agricultural discharges.

River Ogmore at Dipping Bridge

The River Afan and the Ffrwd Wyllt meet the target River Quality Objective throughout. The Kenfig catchment suffers from diffuse pollution problems caused by agricultural and sewer overflow discharges. Some River Quality Objective failures have also occurred in the Ogmore and Ewenny catchments. These are attributable to sewage treatment works, sewerage system failures and agricultural and industrial discharges.

Within the CAMS area there is lack of information with regard to groundwater quality. The areas defined as coastal blocks could show some tidal influence and in certain cases abstractions could draw up saline water.

3.9 Stakeholder concerns

The stakeholder group has been involved in the development of the Neath, Afan and Ogmore CAMS, commenting on the different stages in the process and providing local views and information relevant to the CAMS area. Group members were identified to represent the main areas of interest within the CAMS area. The meetings were a focus for discussion about CAMS related issues and many of these have been taken into account in the development of the Neath, Afan and Ogmore CAMS.

Issues still under consideration are listed below:

- Confusion over the Environment Agency's labelling of the resource availablility status "No Water Available" and that, as a title, this could impact on proposed future development in the catchment.
- Issues have been raised relating to fish migration at the bottom end of the River Neath during prolonged dry periods and mitigation measures, appropriate and proportionate to the frequency and significance of such events, would be considered with regard to any future licences.
- Continued concern about the fish passage issues caused by low flows on the Afan at Green Park Weir. These include general access over the weir and the operation of the fish pass.
- Further consideration needs to be given to the distribution of flows at Green Park Weir, at the bottom of the Afan, as these could cause severe environmental problems.
- The original route of the River Afan prior to the creation of Port Talbots Docks was raised on a number of occasions.

Resource assessment and resource availability status

4.1 Introduction

To manage water resources effectively, we need to understand how much water is available and where it is located. This is achieved by undertaking a resource assessment, covering both surface water and groundwater.

Water is used for a number of different purposes, the principal categories being general industrial use, water supply, power generation and agriculture. For each different use, the amount of water that is returned to the water environment close to where the water was abstracted may vary considerably. Where this loss is high, the Agency considers the abstraction to be consumptive. This may restrict the availability of water for these purposes.

A classification system has been developed to show simply whether or not water is available for consumptive use. This "resource availability status" indicates the relative balance between committed and available resources, showing whether licences are likely to be available and highlighting areas where abstraction needs to be reduced. This does not replace the need for the licence determination process, which is applied to licence applications. More information on the determination process is given in Annexe Two of *Managing Water Abstraction.*

There are four categories of resource availability status, as shown in Table 2. Each category describes the availability of water at the lowest flows.

A framework for resource assessment and management has been developed so that water resources are assessed consistently in similar situations in all CAMS areas.

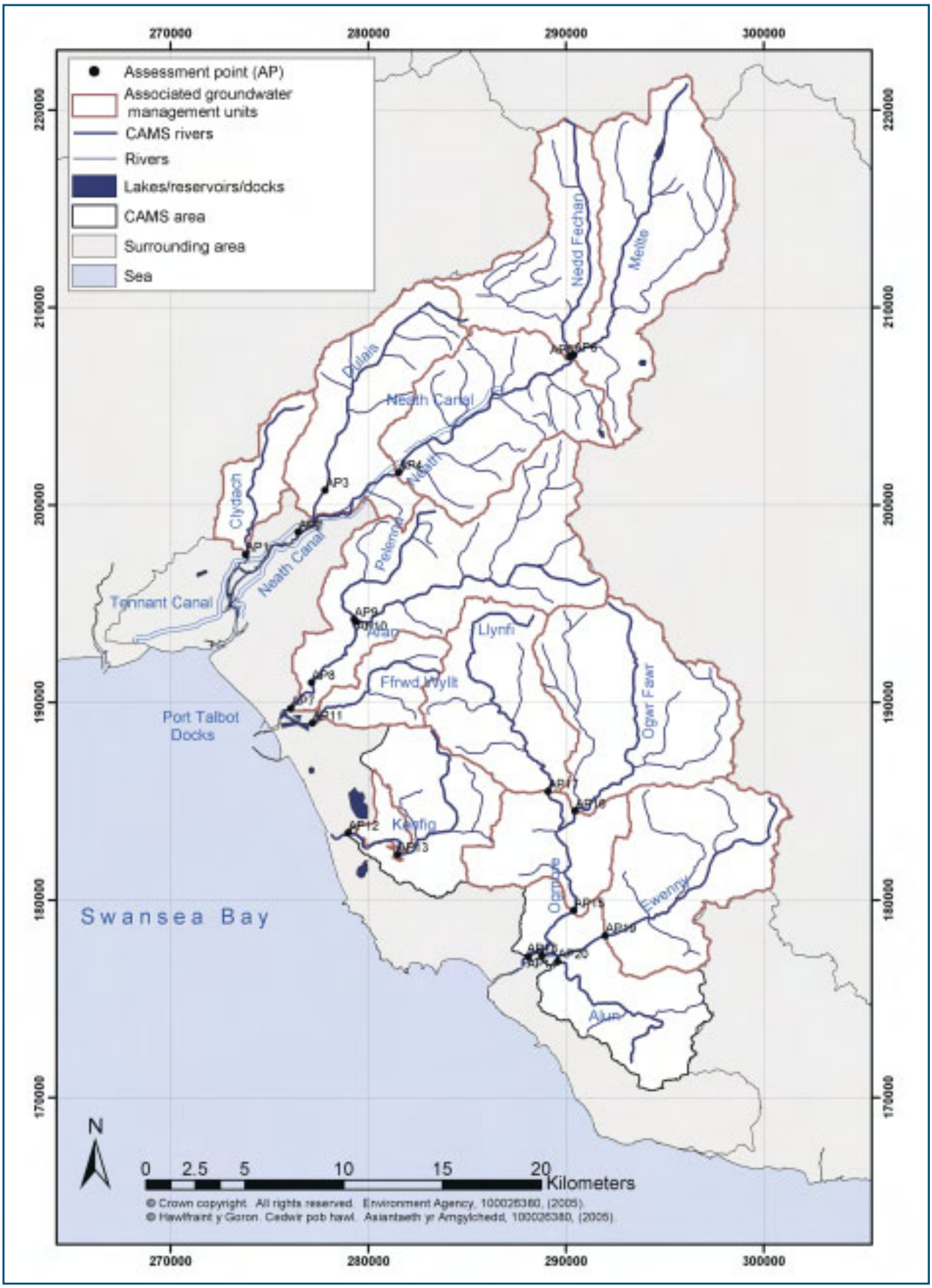
This framework involves developing an understanding of the water resources of the CAMS area, and assessing the surface water and groundwater resource. These results are integrated to define the final resource availability status of different units within the CAMS area.

Within and between catchments there are variations in characteristics. In order to measure, manage and regulate effectively, we need to break catchments down into smaller areas, recognising similarities in characteristics. In the resource assessment for CAMS, in areas where groundwater resources are significant, groundwater management units (GWMUs) are defined. For surface water, "assessment points" (APs) are located on the river network. These river APs and GWMUs are the focus of resource assessment and abstraction licensing.

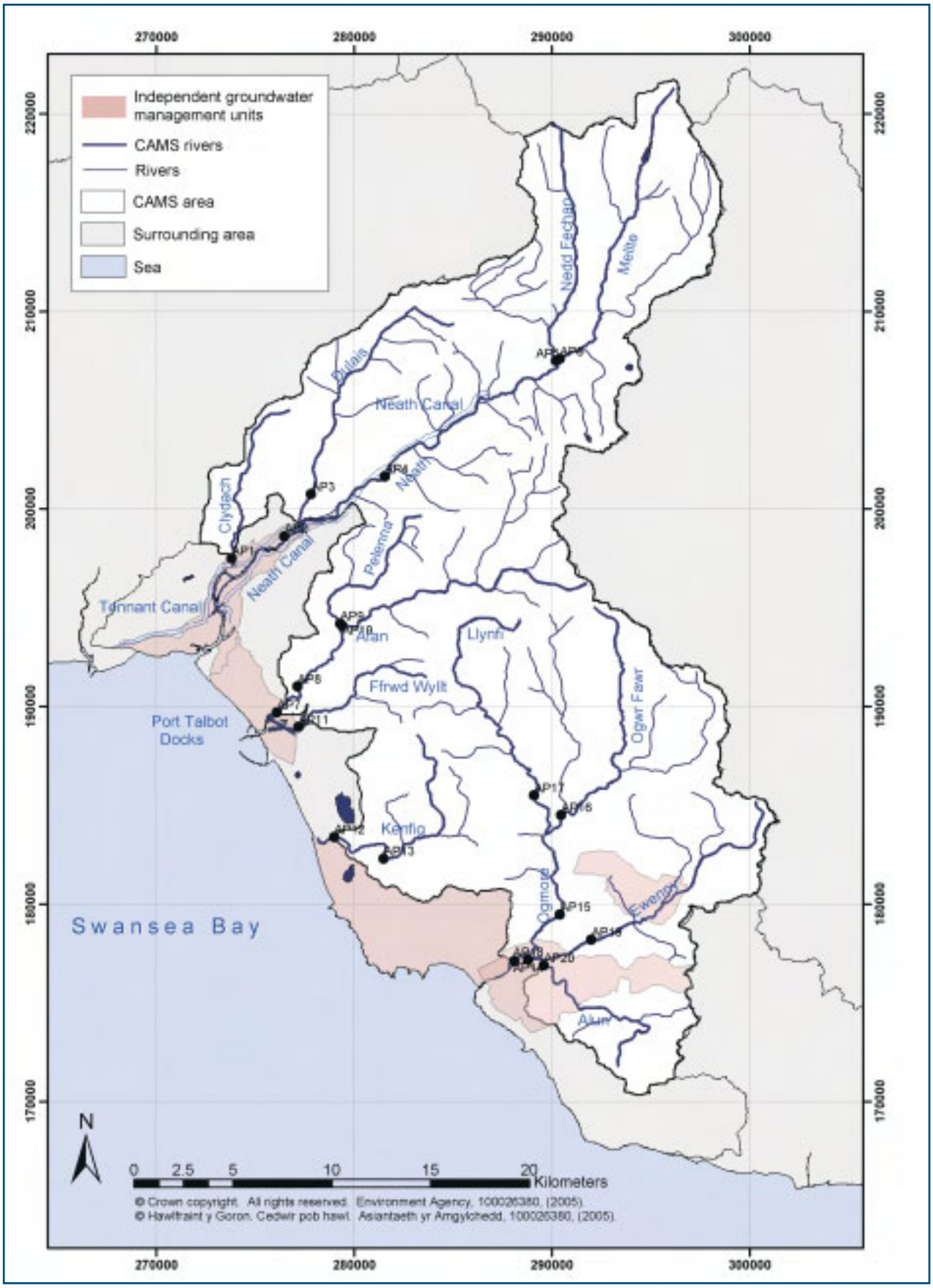
Table 2 | Resource availability status categories

Indicative resource availability status	Definition	Colour coding for illustration on maps
Water available	Water likely to be available at all flows, including a limited amount at the lowest flows. Restrictions may still apply to any new abstractions.	Blue
No water available	No water available for further licensing at the lowest flows.Water is likely to be available at higher flows with appropriate restrictions.	Yellow
Over-licensed	Current actual abstraction is resulting in no water available at low flows. If existing licences were used to their full allocation they would have the potential to cause significant environmental impact at low flows. Water may be available at high flows with appropriate restrictions.	Orange
Over-abstracted	Existing abstraction is causing significant environmental impact at low flows. Water may still be available at high flows with appropriate restrictions.	Red

Map 5. River assessment points and groundwater management units for the CAMS area



Map 6. Independent groundwater management units for the CAMS area.



Maps 5 and 6 show the GWMUs and river APs that have been defined for the Neath, Afan and Ogmore CAMS. Further details on how these were defined are provided in the Technical Document for the Neath, Afan and Ogmore CAMS.

4.2 Resource assessment of groundwater management units

For the groundwater resource assessment, up to 5 tests are applied to each unit to determine the resource availability status. These tests include examining the balance between recharge to the unit and abstraction from it, and the impact of abstraction on summer outflows from the unit.

The availability of groundwater is affected by the geology of the catchment. Due to the complexity of the geology and lack of hydrogeological information, detailed assessment of GWMUs across the whole of the catchment was not possible. Apart from the Schwyll and the Coastal Block GWMUs, all GWMUs were linked with a reach upstream of a river assessment point. The Neath and Afan Coastal Block, Kenfig and Ogmore Coastal Block and Schwyll are independent GWMUs because there is no connectivity between the groundwater and surface water so they cannot be linked with a river reach.

Given the limited information available it was decided that only a very basic water balance calculation would be undertaken to determine the availability of the groundwater resources.

4.3 Resource assessment of river assessment points

The surface water resource assessment requires the definition of "river flow objectives". These are based on the sensitivity of the local ecology to flow variations (i.e. their vulnerability to abstraction impacts). It also takes account of other flow needs. These objectives represent the minimum flow that we are aiming to protect. This then affects the amount of water that is available for abstraction.

These river flow objectives are developed by first giving "environmental weighting" scores to the reaches. These represent the sensitivity of the river reach to abstraction. Reaches are banded according to their sensitivity to abstraction, either Very High (VH), High (H), Medium (M), Low (L) or Very Low (VL).

Map 7 and Table 3 show the environmental weighting scores for each assessment point in the Neath, Afan and Ogmore CAMS area. The review of the resource assessment for AP2 shows the river downstream of Aberdulais to AP2, Neath at tidal limit, has a lower sensitivity to abstraction than the remainder of the reach represented by AP2. Downstream of Aberdulais the environmental weighting (EW) score has been adjusted down to High. This means there is a reduction in the flow required to support the River Flow Objective downstream of Aberdulais, and therefore it may be possible to make more water available for licensing in this section of AP2 (see section 4.5.2).

Table 3 | CAMS assessment points and environmental weighting scores

Assessment Point	Assessment Point Name	Environmental Weighting Score
1	Clydach	VH
2	Neath @ tidal limit	VH (H)*
3	Dulais	VH
4	Neath @ Resolven GS	VH
5	Nedd Fechan	VH
6	Mellte	VH
7	Afan @ Weir	VH
8	Afan @ Marcroft GS	VH
9	Pelenna	VH
10	Afan u/s confuence with Pelenna	VH
11	Frwd Wyllt	VH
12	Kenfig @ tidal limit	M
13	Kenfig u/s confluence with Castle stream	VH
14	Ogmore @ tidal limit	H
15	Ogmore @ Bridgend GS	VH
16	Ogmore @ Brynmenyn GS	VH
17	Llynfi @ Coytrahen GS	VH
18	Ewenny u/s Schwyll	M
19	Ewenny @ Keepers Lodge GS	VH
20	Alun	H

*The general EW score for the reach upstream of AP2 is VH, however it has been recognised that the lower part of this reach, downstream of Aberdulais, would be better represented with an EW of H (see section 4.3).

These river flow objectives are then compared with a scenario flow which assumes that all licences are being fully utilised (i.e. the full licensed quantity is being abstracted). This comparison reveals either a surplus, balance or deficit. The size of the surplus or deficit corresponds to a resource availability status for the unit.

The surface water resource availability classification gives an indication of whether new licences will be available from the river or whether some recovery of resources is required. However, there are significant variations in flow throughout the year. A classification of "over-licensed" or "over-abstracted" generally indicates that no new licences will be granted. However, this applies only at times of low flow. During periods when flows are higher, there may be some water available for abstraction. The classification is therefore really a classification of resource availability at low flow.

Abstraction licences are sometimes managed in order to ensure this flow variability is maintained by the use of "hands-off flow" conditions. These are conditions on licences that require abstraction to cease (or reduce) when the flow in the river falls below a specified level. Therefore, when river flows are above this hands-off flow, abstraction can take place but when flows are below this, no abstraction (or reduced abstraction) can occur. Low flows will occur more frequently during the summer months.

In order to maximise abstraction while maintaining the variability of flow (required for many aquatic species) a tiered system of hands-off flows is applied. Licences are generally granted with the lowest hands-off flow possible on a first-come-first-served basis. As more licences are granted, the hands-off flow must be increased to maintain sustainable flows in the river.

For potential applicants for new abstraction licences, it is therefore important to know not only the likelihood of obtaining a licence, but also the reliability of a licence if granted with a hands-off flow condition. Within the CAMS resource assessment, reliability is expressed as a percentage. This percentage indicates the minimum amount of time over the long term that the scenario flow exceeds the river flow objective, therefore allowing abstraction to take place.

The resource assessments for both surface water and groundwater use a scenario, which assumes that all licences are being fully utilised; that is, the full authorised volume is being abstracted. However, many licences are not used fully and therefore in reality the resource availability can be different. If the result of a resource assessment is "over-licensed", data of actual abstraction is then used to establish whether the status is "over-abstracted" (actual flows are lower than river flow objectives). "Over-abstracted" represents abstraction that is already unsustainable whereas "over-licensed" represents the potential for damage should the full licensed amount be abstracted.

4.4 Integration of the surface water and groundwater resource assessments

The resource availability results for river reach and groundwater management unit assessments are integrated and reviewed.

The preliminary results for a river reach or a groundwater management unit may be overridden in order to protect a downstream river reach or underlying groundwater management unit that has a worse low flow resource availability status than its own (here the downstream reach or unit is known as the critical reach or unit).

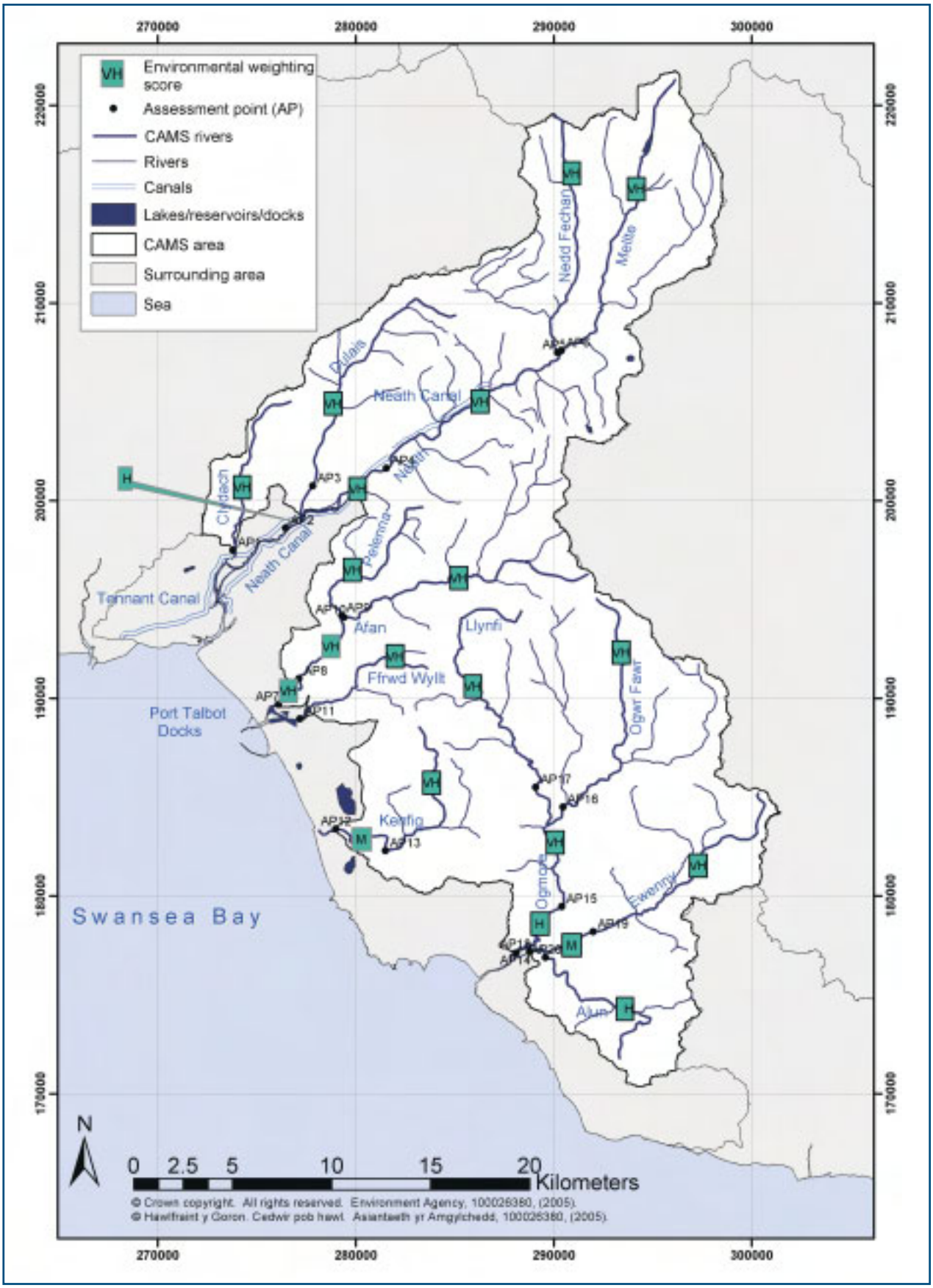
Where the preliminary low flow resource availability status of the river reach or groundwater management unit is "water available" it is overridden to "no water available" in order to indicate that additional abstraction will only be allowed where it does not make the position within the critical unit any worse. Where the river reach or groundwater management unit is "no water available", "over licensed " or "over abstracted" it maintains its own status. The strategy that is developed still takes into account the impact that any additional abstraction from these river reaches or groundwater management units has on the critical reach or unit.

Maps 8 & 9 show the resource availability status of river reaches and groundwater management units in the Neath, Afan and Ogmore CAMS area. This is the classification following integration of the groundwater and surface water assessment results.

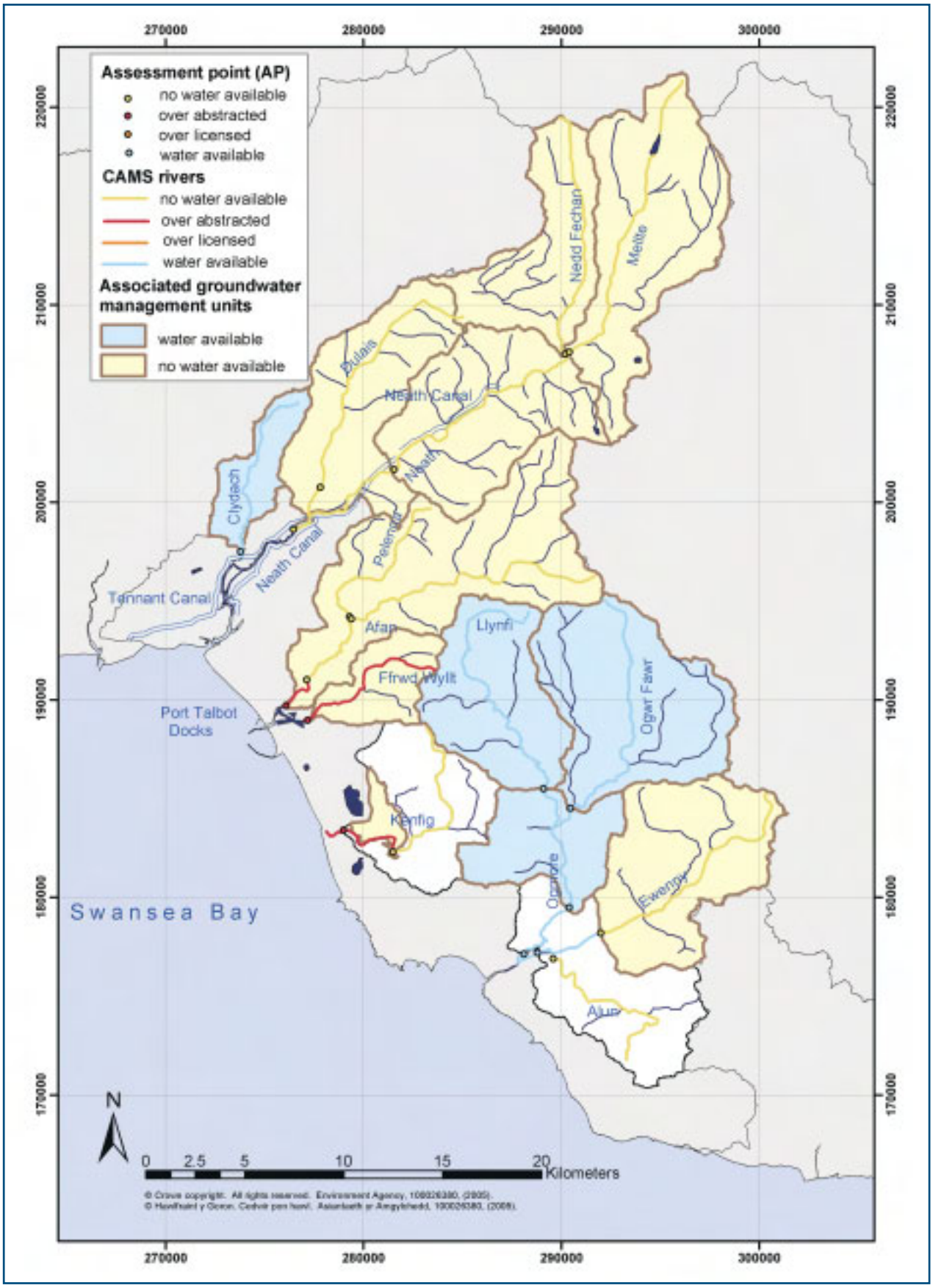
The results of the separate surface water and groundwater assessments are available in the Neath, Afan and Ogmore CAMS Technical Document.

The resource availability status for all the groundwater management units gave the same result of 'water available'. For the independent groundwater management units this was identified as the final resource availability status. For the remaining water resource management units where there was a difference between the groundwater and surface water resource availability status the groundwater results were overridden by the surface water results. This was on the understanding that these catchments

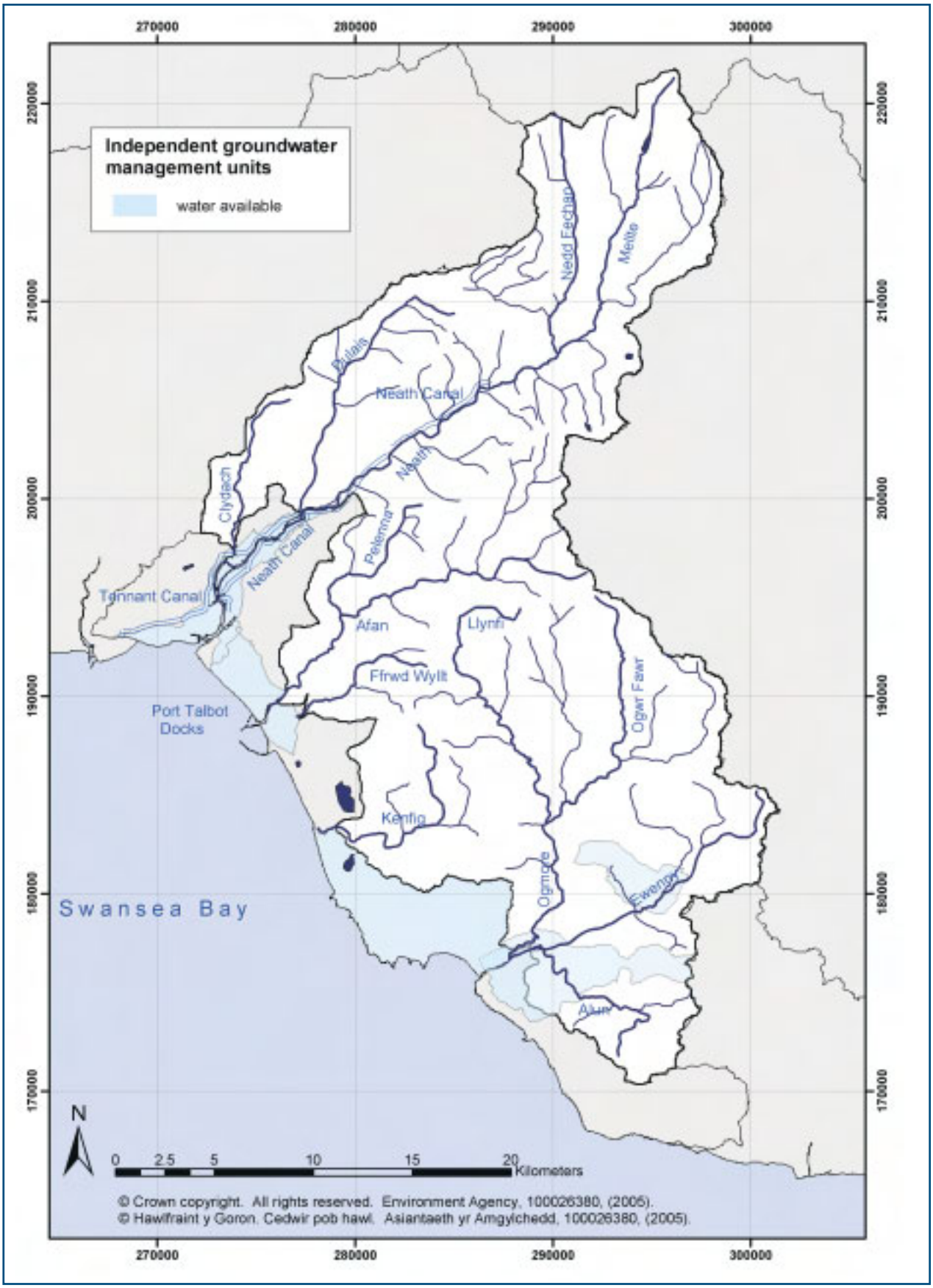
Map 7. Environmental weighting scores for CAMS assessment points.



Map 8. Resource availability status of assessment points and associated groundwater management units.



Map 9. Resource availability status of independent groundwater management units.



are surface water dominated. As surface water is the major influence in these units and there is connectivity between groundwater and surface water, the integrated surface water and groundwater units are referred to as assessment points.

4.5 Summary of resource assessment for the Water Resource Management Units

Once the resource assessment was complete, the assessment points and independent groundwater units were grouped into water resource management units as illustrated in maps 10 & 11. Details of the grouping are given in the following sections.

Although some of the water resource management units in this CAMS currently have a resource availability status of 'over licensed' or 'over abstracted', it should be noted that licensed abstractors are operating within their licensed volumes. Abstractions for navigation by Associated British Ports and Neath Canal Navigation are currently exempt from licensing.

4.5.1 Water Resource Management Unit 1 (Clydach)

WRMU1 consists of the River Clydach, from its source east of Crynant to its confluence with the River Neath below the tidal limit near Neath Abbey, and its associated groundwater management unit. The catchment is long and narrow with a length of 10km and catchment area of 18km^2. The area is underlain by coal measures.

This river has been considered as a separate unit due to its physical characteristics and considerations for licensing purposes.

There is only one licensed abstraction within this unit. There are also a number of small exempt abstractions for private water supply.

This unit has a resource availability status of 'water available', which means there is water available for licensing at all flows, including a limited amount at low flows.

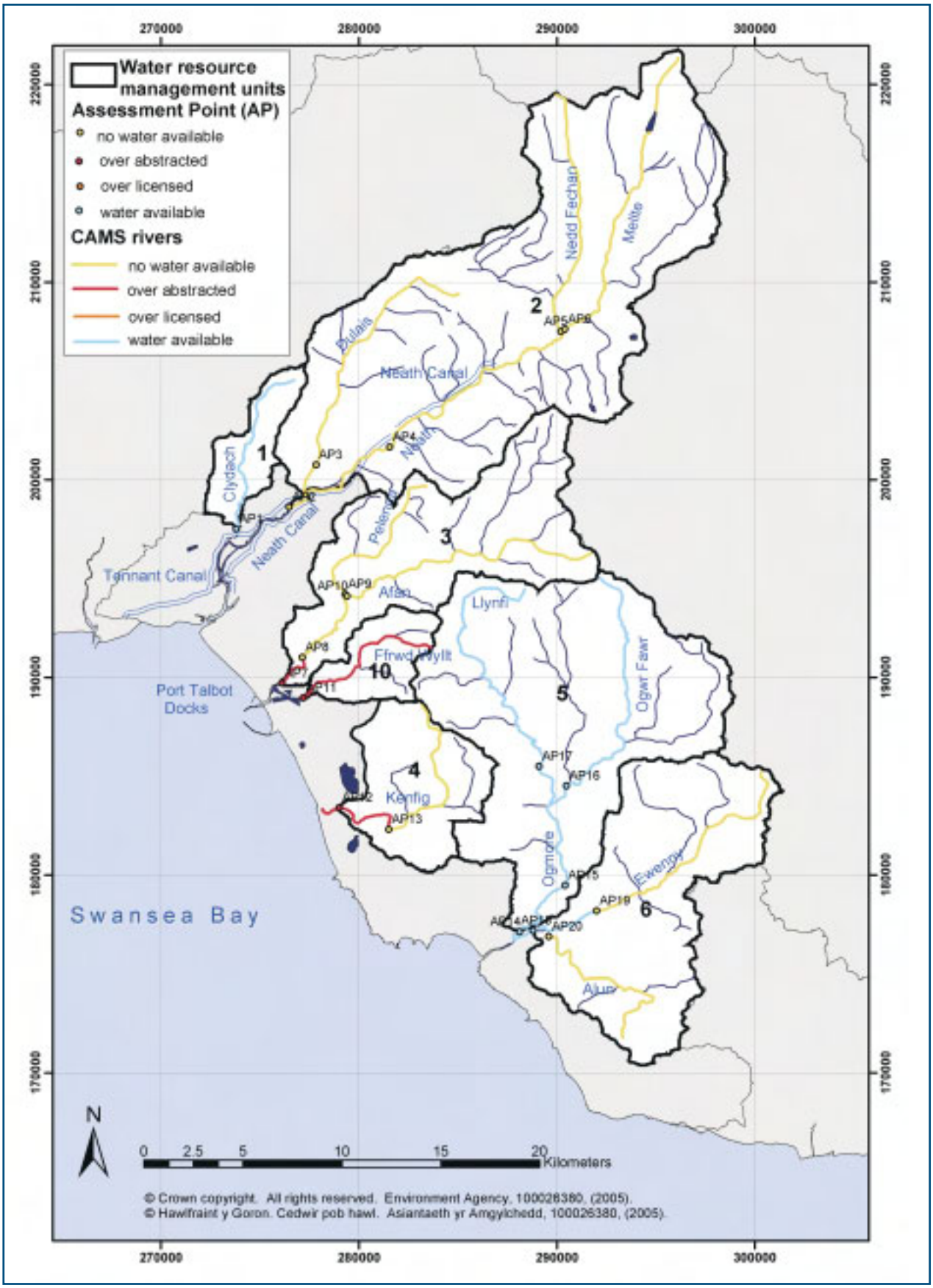
Table 4 | Grouping of assessment points to Water Resource Management Units

Water Resource Management Unit	Integrated Resource Availability Status	AP/ GWMU	Description	Resource Availability Status
1	Water available	1	Clydach	Water available
2	No Water available	2 3 4 5 6	Neath @ tidal limit Dulais Neath @ Resolven GS Nedd Fechan Mellte	No water available** No water available * No water available * No water available * No water available *
3	Over abstracted	7 8 9 10	Afan @ Weir Afan @ Marcroft GS Pelenna Afan u/s confuence with Pelenna	Over abstracted No water available * No water available * No water available *
10	Over abstracted	11	Frwyd Wyllt	Over abstracted
4	Over abstracted	12 13	Kenfig @ tidal limit Kenfig u/s confluence with Castle stream	Over abstracted No water available *
5	Water available	14 15 16 17	Ogmore @ tidal limit Ogmore @ Bridgend GS Ogmore @ Brynmenyn GS Llynfi @ Coytrahen GS	Water available Water available Water available Water available
6	No water available	18 19 20	Ewenny u/s Schwyll Ewenny @ Keepers Lodge GS Alun	Water available No water available No water available
7	Water available	GWMU 1 GWMU 2	Neath Coastal Block Afan Coastal Block	Water available Water available
8	Water available	GWMU 4	Kenfig & OgmoreCoastal Block	Water available
9	Water available	GWMU 3	Schwyll	Water available

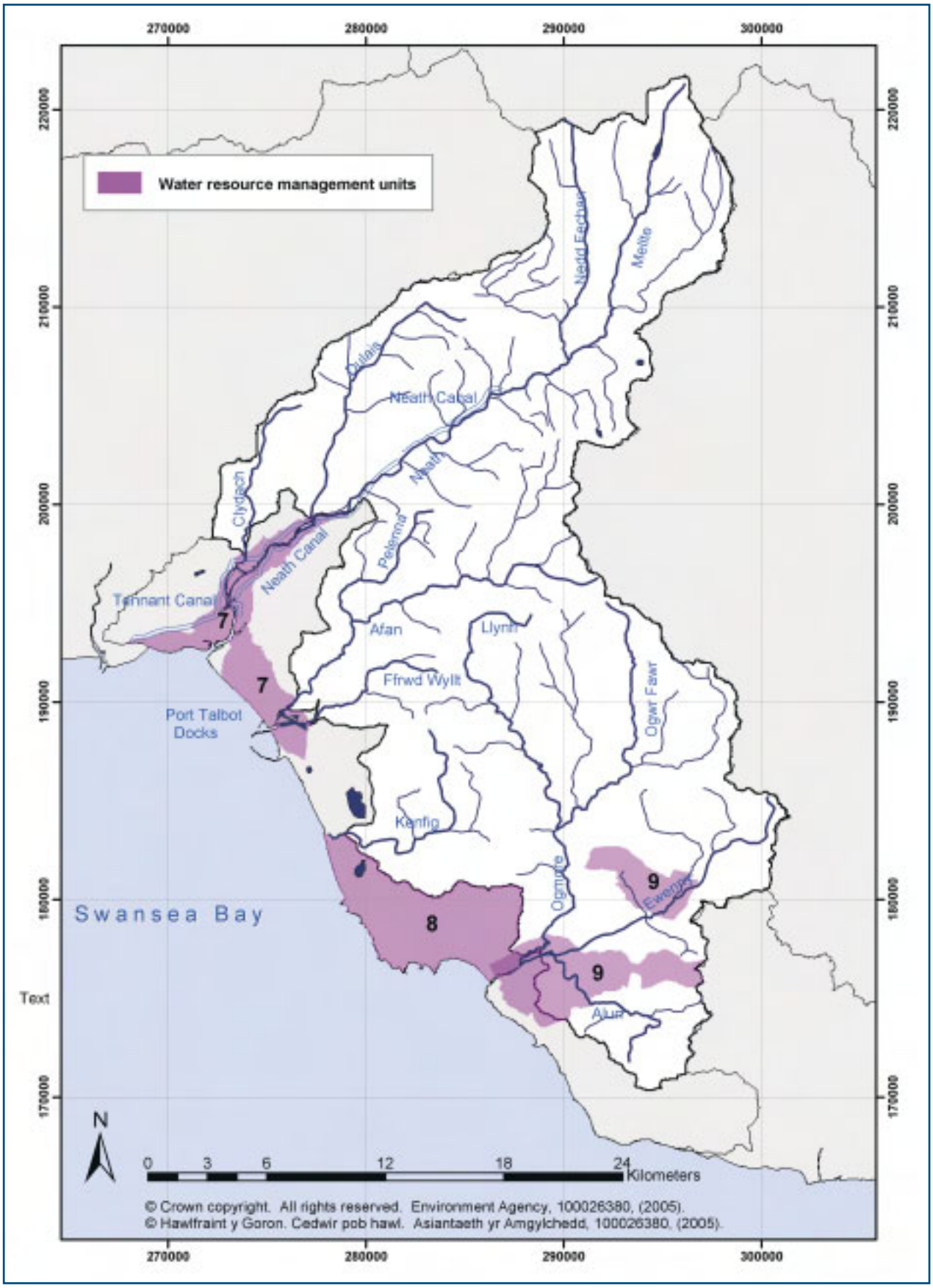
* Resource availability status overridden from 'water available' to 'no water available' to protect flows of critical assessment point downstream.

**The low flow resource availability status for this unit has been amended to 'no water available' as a result of reductions in the licensed volumes since the initial resource assessment was made.

Map 10. Water resource management units (integrated assessment point and associated groundwater units)



Map 11. Water resource management units (independent groundwater units)



4.5.2 Water Resource Management Unit 2 (Neath)

WRMU 2 consists of the main River Neath (APs 2 & 4), its major tributaries the Dulais (AP3), Nedd Fechan (AP5), Mellte (AP6), and associated groundwater management units. The catchment is 32km in length with an area of 252km^2

The catchment stretches across a diverse geology from Old Red Sandstone in the north, across Carboniferous limestone and Millstone Grit to the Coal Measures, which reach down to the coast.

These river reaches have been grouped together to protect the flow at the lowest assessment point, AP2 Neath at tidal limit. This is because in the lower reaches there are potentially significant demands on the river, to meet the requirements of the local economy by the abstractions from the Tennant and Neath Canals, in particular for the supply of water to the Baglan Bay development.

Since completion of the initial resource assessment there has been a reduction in the licensed volume within AP2. The Agency has also reviewed how sensitive the lower section of this reach represented by AP2 is to abstraction. This section is less sensitive and as a result water can be made available to support development in the lower catchment, while retaining the resource availability status.

AP2 remains the critical assessment point for the unit as all the remaining assessment points in this unit drain into AP2. There are few demands on the upper assessment points and all are defined as 'water available'. However, the surplus water in these reaches is required to support the flows in AP2 therefore their resource availability status has been overridden to also be 'no water available'.

There are 9 consumptive surface water abstraction licences in this unit. The two largest consumptive abstractions on the Neath are held by the canal companies. The remaining consumptive abstractions are relatively small for a range of industrial purposes.

There is a large non-consumptive abstraction for hydroelectric power generation on the Dulais.

There are 3 groundwater abstraction licences in the unit for industrial and domestic use. There are also a number of small exempt abstractions for private water supply.

The changes in licensed volumes and the environmental sensitivity of the lower part mean that there is water available throughout the whole flow regime for licensing in this unit under this management option.

Given the need to balance the potential social and economic benefits of ensuring that sufficient water is made available to support key development within the catchment, and the needs of the environment and its socio-economic value, the Agency will retain this resource available status of 'no water available'. Any future licensing of resources will ensure that this status is maintained whilst supporting potential development providing there is no unacceptable impact on the environment.

The licensing strategy retains an amount of water for licensing across the catchment throughout the whole flow regime, and will maintain the resource availability status of 'no water available'.

4.5.3 Water Resource Management Unit 3 (Afan)

WRMU 3 consists of the Afan (APs 7, 8 &10), including Port Talbot docks, the Corrwg (upper reaches of AP10), the Pelenna (AP9), and the associated groundwater unit. The catchment covers an area of 91km^2 and is 22km in length, from its source south east of Abergwynfi to the tidal limit at Green Park Weir.

The catchment is predominantly underlain by Coal Measures.

At the downstream end of this unit (AP7), the docks feeder canal takes water from the Afan towards the docks. Some of this water is abstracted by Corus' abstraction from that channel, whilst the rest feeds the docks, providing water for Corus' abstraction from the dock and for the operations of the docks themselves by Associated British Ports. At present this abstraction is primarily controlled by the level of the docks, and has the capacity to draw most of the flow in the Afan towards the docks during medium and low flow conditions, leaving little to flow over the weir or through the fish pass. At higher flows this abstraction is controlled by constraints within the docks feeder channel and the weir affecting flows to the docks. The resource availability status for this point is 'over abstracted'. It should be noted that the impact of these abstractions is at the assessment point and that no length of channel in the CAMS area itself is affected, and that upstream of the abstraction to the docks all reaches would be considered to be in a 'water available' status. However the impact of these abstractions does affect the freshwater input to the tidal section downstream of the assessment point and the fish migration past this point.

As such AP7, Afan at Green Park Weir, is the critical assessment point in this unit and has a low flow resource availability status of 'over abstracted'. The other APs in this unit drain into AP7 and as the surplus

water in these reaches is required to support the flows in AP7, their original resource availability status of 'water available' has been overriden to 'no water available'. Although there are different resource availability statuses within this unit, all the river reaches will be considered in the same way for licensing purposes to protect the flow within AP7.

As described above the main abstractions in this unit are the two licensed abstractions held by Corus and the exempt abstraction for navigation by Associated British Ports. The remaining licences include a small industrial abstraction from the docks and a non-consumptive abstraction for a pond through flow. There are also a number of small exempt abstractions for private water supply.

The resource availability status for this unit is that of the critical AP, 'over abstracted'. In this case it means there is no water available for licensing at medium and low flows. Applications for non-consumptive abstractions would be considered subject to an assessment of local impacts.

It should be noted that the docks also receive flows from the Ffrwd Wyllt. The resources from the Afan and Ffrwd Wyllt were considered together when making the assessment against the demands from Corus and ABP. However, the Afan and the Ffrwd Wyllt were considered under separate WRMUs for the sustainability appraisal, as the final licensing options were different. Please refer to WRMU 10 (4.5.4).

4.5.4 Water Resource Management Unit 10 (Ffrwd Wyllt)

This unit consists of the Afon Ffrwd Wyllt (AP11). The catchment covers an area of 20km^2 and is 9km in length from the source west of Maesteg where it is known as Nant Cwm Farteg. From there it flows in a south-westerly direction before discharging into the Docks at Port Talbot. This unit is underlain by Coal Measures.

This unit has been considered separately because of its requirements for licensing purposes.

There is 1 surface water abstraction licence in this unit, a significant abstraction by Corus at the bottom of the catchment, just above where the river enters a culvert before flowing into the docks. There are also a number of small abstractions for private water supply.

As described above, the flows from the Ffrwd Wyllt support some of the abstraction from the docks and as such the resources from this source were considered alongside the Afan.

The resource availability status for this unit is 'over abstracted', which means there is no water available for licensing at low and medium flows. Applications for non-consumptive abstractions would be considered subject to an assessment of local impacts.

4.5.5 Water Resource Management Unit 4 (Kenfig)

WRMU4 consists of the river Kenfig (APs12 & 13) from its source south-west of Maesteg to its tidal limit, and the associated groundwater unit. The unit is 13km in length and covers an area of 38km^2. The associated groundwater management unit consists of glacial and alluvial deposits.

Again there are high demands on the lower river reach by Corus. The demands result in a resource availability status of 'over abstracted' at the lowest assessment point, AP12 Kenfig at tidal limit. As AP13 drains into AP12 the surplus water in this reach is required to support the flows in AP12. The original resource availability status of 'water available' for AP13 has been overriden to 'no water available'. Although there are different resource availability statuses within this unit, both river reaches will be considered in the same way for licensing purposes to protect the flow within AP12.

Alongside Corus' abstractions from the Afon Kenfig and Castle stream, there are 2 groundwater abstraction licences for industrial supply within this unit. There are a number of small exempt abstractions for private water supply.

The resource availability status for this unit is that of the critical AP, 'over abstracted', which means there is no water available for licensing at low and medium flows. Applications for non-consumptive abstractions would be considered subject to an assessment of local impacts.

4.5.6 Water Resource Management Unit 5 (Ogmore)

This unit consists of the River Ogmore (APs 14 &15), its tributaries (APs 16 &17), and the associated groundwater unit. The Ogmore is 28km in length from the source north of Nantymoel to the tidal limit at Ogmore by Sea. The unit covers an area of 167km^2.

The upper part of this catchment is underlain by Coal Measures changing to Triassic limestone in the lower part of the catchment.

These river reaches have been grouped together because they all have the same resource availability status and they will have similar requirements for licensing purposes.

There are 6 surface water abstraction licences in this unit. The largest abstraction, from the Llynfi, is for industrial purposes. This abstraction is predominantly non-consumptive. The remaining abstractions are all relatively small and include abstractions for a sawmill,

spray irrigation at a golf club, a public water supply, and two for domestic use.

The 3 groundwater abstraction licences, two used for agriculture and one for spray irrigation at a golf club, are also relatively small. There are a number of small exempt abstractions for private water supply.

This unit has a resource availability status of 'water available', which means there is a water available for licensing at all flows, including a limited amount at low flows.

4.5.7 Water Resource Management Unit 6 (Ewenny)

This unit consists of the river Ewenny (APs18 & 19), the Alun (AP20) and the associated groundwater unit. The Ewenny is 17km in length and the unit covers an area of 105km^2.

The source of the Ewenny is north-west of Pencoed where it is known as Nant Crymlyn. It flows south to the confluence with the Ewenny Fach, then south-west to the confluence with the Alun. Some of the flow in the Ewenny and Alun is lost to groundwater via 'sink holes' within the river. This has caused the Alun to dry up completely for some of the summer. A short distance further downstream is the large spring outflow, which enters the Ewenny at Schwyll, and just below that, the confluence with the Ogmore. These river reaches have been grouped together because they will have similar requirements for licensing purposes.

There are 6 surface water abstractions in this unit. These include 3 non-consumptive abstractions for pond through flows on the Alun. The remaining abstractions are relatively small and include top up water for a pond, spray irrigation and domestic use. There are 2 groundwater abstraction licences for industrial purposes. There are also a number of small exempt abstractions for private water supply.

The resource availability status for this unit is generally 'no water available', which means there is no water available for further licensing at the lowest flows, although water is likely to be available at higher flows with appropriate restrictions. However, due to additional flows joining the main river from the tributaries in the lower reaches, the downstream AP at the bottom of the Ewenny is 'water available', which means that some water would be available for licensing under all flow conditions, with appropriate restrictions applied to larger licence applications.

4.5.8 Water Resource Management Unit 7 (Neath & Afan Coastal Blocks)

WRMU7 consists of independent GWMU 1 (Neath Coastal Block) and GWMU2 (Afan Coastal Block). This unit takes into account groundwater present within the superficial deposits of alluvium, marine and blown sand. As there are no licensed groundwater abstractions in this unit a simple water balance was calculated. The amount of water entering the aquifer was estimated from long term average annual rainfall data. Whilst the aquifers are generally of a minor nature they have a resource availability status of 'water available', although site specific investigations to determine sustainable rates of supply would be required.

4.5.9 Water Resource Management Unit 8 (Kenfig & Ogmore Coastal Block)

WRMU8 consists of GWMU4 (Kenfig and Ogmore Coastal Block). This unit assesses the groundwater resource present within the limestone but discharging at the coast rather than via a river assessment point. This coastal block was defined along the stretch between the Ogmore and Kenfig rivers.

There are 5 licensed groundwater abstractions in this unit, for uses including agriculture and spray irrigation of a golf course. The resources within this unit were assessed by comparing the water entering the aquifer with the amount licensed for abstraction.

This unit has a resource availability status of 'water available', although due to the nature of the limestone, yields will vary through the aquifer and will require site specific investigations to determine sustainable rates of supply.

4.5.10 Water Resource Management Unit 9 (Schwyll)

Schwyll spring is the known discharge of the limestone aquifer located in the south of the CAMS area. Previous studies of this area have already identified an area of the aquifer that needs to be protected to protect the source of the Schwyll abstraction. This source protection zone together with interlying areas where the limestone could be recharged through overlying formations were used to define this independent GWMU.

There are 8 licensed abstractions within the Carboniferous limestone. They include 3 abstraction licences held by the water company, two of which, (accounting for the largest proportion of the total volume licensed), are not currently in use. The remaining licences include abstraction for dust suppression, spray irrigation and pond top up.

The resources within this unit were assessed by comparing the water entering the aquifer with the amount licensed for abstraction. This unit has a resource availability status of 'water available', although due to the nature of the limestone, yields will vary through the aquifer and will require site specific investigations to determine sustainable rates of supply.

4.6 Areas not included in the Water Resource Management Units

Most of the CAMS area has been assessed. However the National CAMS Framework does not require resource assessments for tidal waters, minor catchments and aquifers. As a result water resource availability has not been assessed for the following areas.

- The south-west corner of the CAMS area down stream of the tidal limit of the Neath. This area includes Crymlyn Bog SAC.
- The coastal strip between the Afan and the Kenfig. This area includes Eglwys Nunydd and Margam Moors SSSIs.
- The south-east corner of the CAMS area around Llantwit Major.
- The Port Tennant and Neath Canals.

This is because the areas include minor surface water catchments with little demand for abstractions.

However implications of abstraction will be assessed at a local level, in particular impacts on designated sites. Impacts on the SAC will be taken into consideration under the Habitats Directive assessment.

Licensing strategy

5.1 Sustainability appraisal

5.1.1 Introduction

A sustainability appraisal process has been developed to enable the Agency to take account of costs and benefits in the production of CAMS. The process considers the government's four objectives of sustainable development, relating to environment, economics, society and resource use. It uses a largely qualitative, proforma-based approach to consider what the resource availability status for each water resource management unit should or could be after each six-year cycle (Tier 1). This is undertaken for all units in all CAMS areas. It also allows the appraisal of options for recovering water resources, by taking into account the implications of different options on all aspects of sustainability (Tier 2). This is undertaken to determine the most sustainable options for the future management of the catchment including, where necessary options for recovery of resources. More information on the sustainability appraisal process is provided in *Managing Water Abstraction: The Catchment Abstraction Management Strategy Process.*

5.2 Catchment overview of licensing strategy

5.2.1 Licence Determination

The CAMS process does not negate the need for a local impact assessment when considering new licence applications. The licence determination process will follow the procedure laid down in Annexe 2 of *Managing Water Abstraction* July 2002.

5.2.2 Exempt purposes

There are instances, relating to both quantity and purpose, in which a licence is not required. A list of exemptions are given in Annexe 2, section 4.1 of *Managing Water Abstraction*. However, since this document was published in 2002, The Water Act 2003 has changed some of these exemptions, see section 5.11.

5.2.3 Approach to time-limiting

There is a presumption that applications for new or varied licences, received on or after 1 October 2001, will be issued with a time limit. The first common end date for time limited licences in the Neath, Afan and Ogmore CAMS area is 31 March 2017. Licence holders will be notified approximately 12 months in advance that their licence is due to expire and that they need to re-apply.

Licences will normally be renewed, providing the applicant can demonstrate that the three renewal tests can be satisfied, although licence conditions may be reviewed. These three tests are for:

- Environmental sustainability
- Continued justification of need
- Efficient use of water (see *Managing Water Abstraction,* section 5.6)

The Environment Agency will endeavour to give 6 years notice if a licence is not to be renewed, or renewed on more restrictive terms that impact on the use of that licence

5.2.4 Water efficiency

The Environment Agency encourages all current abstractors to employ water efficient methods to reduce the demands for water. The amount of water allocated for a particular purpose can be justified based on the findings of *'Optimum Use of Water in Agriculture and Industry'* [1]. Abstractors are required to assess their abstraction (usually using a meter) and these abstractions will be routinely inspected.

5.2.5 Management of licences

The Environment Agency has a programme of routine inspections of abstraction licences. Through the inspection programme the Environment Agency

promotes water efficiency and improved practice, and discusses future proposals with the licence holder. As part of the inspection programme Environment Agency officers check compliance with licence conditions. Any non-compliance will be investigated and enforced in line with the Environment Agency's Enforcement and Prosecution Policy.

5.2.6 Impoundments

Applications for new impoundments are dealt with on a case-by-case basis.

5.2.7 Exempt areas

At present the only source exempt from licensing is the Tennant Canal, which was granted an exemption from the need for abstraction licensing under two Orders issued in 1965 and 1966. This means that abstractions from the canal are not under regulatory control, however, abstraction of water to supply the canal is authorised under the regulations. This position may change under the Water Act 2003.

5.2.8 Exemption threshold/Register of Protected Rights

Under the Water Act 2003 all abstractions below $20m^3/d$ will be exempt from licensing. The Environment Agency has the power to apply to the National Assembly for Wales for an Order, which designates an area as one of compulsory registration. If a register is set up, those exempt abstractions not recorded on the register will not keep their protected rights status. This would apply to those whose activities are currently exempt and will remain so, as well as to those who currently hold licences that will become exempt under the new legislation. A register is unlikely to be set up in the short term.

5.2.9 Changes to the current licensing system

A list of proposed changes to the current licensing system is given in Annexe 2, section 9 of *Managing Water Abstraction.*

5.2.10 Improvements to resource assessment information

In order to better understand the impacts and any remedial measures that can be put in place at the bottom of the Afan (WRMU3) we will develop a hydraulic model in order to determine flow movement and profiles around the weir, fish pass, dock feeder channel and lock gates.

The Agency will review the environmental weighting scores for both WRMU3 (Afan) and WRMU10 (Ffrwd Wyllt).

The general lack of hydrogeological information throughout the CAMS area has been recognised and as such it has been determined that further monitoring and data collection should take place prior to the next CAMS cycle - dependent on appropriate resources being available.

In particular it would be desirable to set up some observation boreholes within WRMU7 (Neath and Afan Coastal Block), within the alluvial plain above Briton Ferry and in the Aberavon area in order to characterise aquifer properties and establish basic information on water level trends. The monitoring of groundwater quality within this WRMU also needs to be undertaken and could be done in tandem with the water level monitoring using the same boreholes.

Within WRMU8 (Kenfig and Ogmore Coastal Block) there is already one existing observation borehole for which the accumulation of longer time-series data will be helpful for the next review. However the installation of additional boreholes within this WRMU would improve groundwater information.

WRMU9 (Schwyll aquifer) is monitored through the discharge at Schwyll spring, but there is a lack of data on the spring flow rates concurrent with abstraction of groundwater. If the licensed volume is resumed it will be critical to assess whether the spring flow rates respond as predicted.

This additional groundwater information would enable further groundwater tests to be undertaken for the second cycle of CAMS.

5.3 Licensing Strategy for Water resource management units 1 and 5 [Clydach & Ogmore] ("water available")

5.3.1 Resource availability status and results of the sustainability appraisal

From the resource assessment it was determined that these units currently have a resource availability status of 'water available'. Through the sustainability appraisal, options for managing water resources in these units were considered to identify the target resource availability status.

There is little demand for abstraction in WRMU1 while WRMU5 has more development and, potentially, a higher requirement for water resources. However, there is enough water available to meet forecast demands and still meet the river flow objective. This means water is available for licensing and protection of the river environment is ensured.

Following the sustainability appraisal and consultation the Environment Agency will retain the resource availability status of 'water available', allowing licensing of the surplus water down to the river flow objective. In this way the flows required to sustain the river environment will be protected. This means that there will be a presumption for granting new abstraction licences until river flows reach those defined by the river flow objective. At the lowest flows there will be limited scope for further unrestricted abstraction to support new developments.

5.3.2 Guidance on the assessment of new applications

As these units are classed as 'water available', new or increased consumptive surface water licences would be considered at all flows. Consumptive licences would be issued with appropriate restrictions, including hands off flow (HOF) conditions at Q95 as determined in the resource assessment. The reliability of licences within these WRMUs is shown in Table 5 at the end of Section 5.

Application for non-consumptive abstractions would be considered. Although no restrictions would be applied under the catchment wide assessment, local impacts may result in specific conditions being applied.

Groundwater licences would be considered subject to the normal determination criteria.

All new licences would be subject to the standard licence determination procedures and are likely to be issued with an expiry date of 31st March 2017.

5.3.3 Renewals and management of existing licences

There are no time-limited licences in this unit.

5.4 Licensing Strategy for Water Resource Management Unit 2 [Neath] ("no water available")

5.4.1 Resource availability status and the results of the sustainability appraisal

Taking into consideration the changes in licensed volumes and the environmental sensitivity of the lower part of this reach it was determined that WRMU2 has a resource availability status that means there is water available throughout the whole flow regime for licensing in this unit under this management option.

Following the sustainability appraisal and consultation the Agency will retain this resource available status. Future licensing of resources will ensure that this status is maintained, supporting development, with the associated potential social and economic gains, without unacceptable impact on the natural environment.

It is recognised that there will be significant social and economic benefits from the potential development within the lower catchment. Therefore water will be made available to support such development, providing it is in balance with the environment and its socio-economic value. This assessment will be made through the licence determination process. Although water may be available throughout the unit it is likely the primary demand for this resource will be to meet the water requirements from interests in the Baglan Bay development.

5.4.2 Guidance on the Assessment of new Applications

Licence applications for new or additional resources will be considered in this unit. Due to the fine balance between the requirement to support new and prospective developments in the area and the environmental impact including its socio-economic value, the sustainability of proposals will need to be considered in further detail at the time of the determination. Applications for new abstraction

licences will need to be supported by an appropriate business case outlining the social and economic benefits of proposed development, which can then be used to update and refine the findings from the CAMS Sustainability Appraisal. Issues have been raised relating to fish migration at the bottom end of the River Neath during prolonged dry periods and mitigation measures, appropriate and proportionate to the frequency and significance of such events, would be considered with regard to any future licences.

Initially it will be possible to issue some licences without restriction. However in time, licences will generally be subject to hands-off flow conditions to protect the river flow objectives locally and further downstream. These restrictions would have more impact in dry years and drought conditions.

Application for non-consumptive abstractions would be considered. Although no restrictions would be applied under the catchment wide assessment, local impacts may result in specific conditions being applied.

Groundwater licences would not normally be available unless appropriate constraints are included as part of the conditions.

All new licences would be subject to the standard licence determination procedures and are likely to be issued with an expiry date of 31st March 2017.

5.4.3 Renewals and management of existing licences.

In this unit there will be a presumption of renewal of existing licences, subject to renewal criteria as explained more fully in section 5.2.3 and local considerations, although they may be subject to minor changes.

Any licence holders who have licences that are time limited will be required to demonstrate that the renewal criteria can be satisfied, in particular justifying the continued need for the volume abstracted. Most of the licences within this unit are not subject to time limited conditions.

5.5 Licensing Strategy for Water Resource Management Unit 3 [Afan] ("over abstracted")

5.5.1 Resource availability status and results of the sustainability appraisal

From the Resource Assessment it was determined that this unit currently has a resource availability status of 'over abstracted', with depletion of flows over the whole flow regime. Through the sustainability appraisal, options for managing water resources in this unit were considered to identify the target resource availability status.

The need to secure sufficient resources to support current forecast development was considered a priority, whilst at the same time offering an improved level of protection to the environment.

Following the sustainability appraisal and consultation the Environment Agency will retain the resource availability status of 'over abstracted' but with a view to moving towards 'no water available'. This can only be achieved by reducing existing abstracted volumes during the lower part of the flow regime. However reducing abstraction sufficiently to achieve environmental improvement in this WRMU is currently outside the Agency's control. It is dependent on the voluntary installation and management of a control mechanism on the dock feeder canal to control the flow of water to the docks (see section 5.5.4).

5.5.2 Guidance on the assessment of new applications

As this unit is classed as 'over abstracted' new or increased consumptive surface water licences would only be granted at flows of Q30 and above. All new consumptive surface water licences would be subject to a Q30 hands off flow (HOF) condition. This means that for 70% of the year, ie 252 days in an average year, resources would not be available for abstraction making it very unreliable and the take up of new licences is therefore highly unlikely.

Application for non-consumptive abstractions would be considered. Although no restrictions would be applied under the catchment wide assessment, local impacts may result in specific conditions being applied.

Groundwater licences would not normally be available unless appropriate constraints are included as part of the conditions.

All new licences would be subject to the standard licence determination procedures and are likely to be issued with an expiry date of 31st March 2017.

5.5.3 Renewals and management of existing licences

At present there are no time-limited licences in this unit. The Environment Agency will continue to work closely with the key licence holders to promote water efficiency as we move towards a time-limiting regime under the Water Act 2003.

5.5.4 Resource recovery strategy and other changes to existing licences

At present there is no active management of the water taken from the Afan to the docks, via the Docks Feeder Canal. This activity is currently controlled by the level of the docks and under medium and low flow conditions little flow is left in the Afan.

It is proposed that the volume taken will need to be controlled so that only the water required for the future operation of the docks plus the industrial abstraction from the dock and dock feeder is taken, allowing sufficient flow to pass over Green Park Weir to support fish migration. The Environment Agency will work with key organisations in the area to promote improved management of the water taken to the docks. This issue is complex and all possible solutions will have impacts on operation, cost and the environment. These would need to be assessed fully before any solution can be implemented.

The Environment Agency will also work with the key licence holder to seek a voluntary reduction in licensed volumes.

5.6 Licensing Strategy for Water Resource Management Unit 10 [Ffrwd Wyllt] ("over abstracted")

5.6.1 Resource availability status and results of the sustainability appraisal

From the resource assessment it was determined that this unit currently has a resource availability status of 'over abstracted'. Through the sustainability appraisal, options for managing water resources in this unit were considered to identify the target resource availability status.

Safeguarding the economy and industrial operations were considered the priority within this unit.

Following the sustainability appraisal and consultation the Environment Agency will retain the resource availability status of 'over abstracted'. This decision was reached after considering restricting abstraction during low flows in order to improve fish migration. This would result in the need for an alternative water supply, thus increasing pressure on other local sources e.g. the Afan. It was also recognised that migration would still be impeded by the physical obstructions that are present. It was therefore considered that the cost to the economy would outweigh the environmental benefit.

5.6.2 Guidance on the assessment of new applications

As this unit is classed as 'over abstracted' new or increased consumptive surface water licences would only be considered at flows of Q39 and above. All new consumptive surface water licences would be subject to a Q39 hands off flow (HOF) condition. This means that for 61% of the year ie. 223 days in an average year, resources would not be available for abstraction making it very unreliable and the take up of new licences is therefore highly unlikely.

Application for non-consumptive abstractions would be considered. Although no restrictions would be applied under the catchment wide assessment, local impacts may result in specific conditions being applied.

Groundwater licences would not normally be available unless appropriate constraints are included as part of the conditions.

All new licences would be subject to the standard licence determination procedures and are likely to be issued with an expiry date of 31st March 2017.

5.6.3 Renewals and management of existing licences

At present there are no time-limited licences in this unit. The Environment Agency will continue to work closely with the current licence holder to promote water efficiency as we move towards a time-limiting regime under the Water Act 2003.

5.6.4 Resource recovery strategy and other changes to existing licences

As the resource availability status of 'over abstracted' is being retained there are currently no resource recovery proposals for this unit.

5.7 Licensing Strategy for Water Resource Management Unit 4 [Kenfig] ("over abstracted")

5.7.1 Resource availability status and results of the sustainability appraisal

From the resource assessment it was determined that this unit currently has a resource availability status of 'over abstracted'. Through the sustainability appraisal, options for managing water resources in this unit were considered to identify the target resource availability status.

The need to secure sufficient resources to support current forecast growth was considered a priority, whilst offering an improved level of protection to the environment.

Following the sustainability appraisal and consultation the Environment Agency will retain the resource availability status of 'over abstracted' but with a view to moving towards 'no water available'. However this can only be achieved by a voluntary reduction in existing licensed quantities during the lower part of the flow regime. This would result in improved fish migration but may not fully accommodate the planned expansion by local industry under the lowest flow conditions.

5.7.2 Guidance on the assessment of new applications

As this unit is classed as 'over abstracted' new consumptive surface water licences would not be considered at low flows. Abstractions at higher flows, around Q25 ie for around 91 days in an average year, would be considered.

Application for non-consumptive abstractions would be considered. Although no restrictions would be applied under the catchment wide assessment, local impacts may result in specific conditions being applied.

Groundwater licences would not normally be available unless appropriate constraints are included as part of the conditions.

All new licences would be subject to the standard licence determination procedures and are likely to be issued with an expiry date of 31st March 2017

5.7.3 Renewals and management of existing licences

At present there are no time-limited licences in this unit. The Environment Agency will continue to work closely with the licence holders to promote water efficiency as we move towards a time-limiting regime under the Water Act 2003.

5.7.4 Resource recovery strategy and other changes to existing licences

The Environment Agency will work with the key licence holder to seek a voluntary reduction in licensed volumes based on recent actual abstractions, current operations and forecasted growth. However this reduction may not fully accommodate the planned expansion by local industry under the lowest flow conditions.

5.8 Licensing Strategy for Water Resource Management Unit 6 [Ewenny] ("no water available")

5.8.1 Resource availability status and results of the sustainability appraisal

From the resource assessment it was determined that this unit currently has an overall resource availability status of 'no water available', although AP18 (the downstream assessment point) has a low flow resource availability status of 'water available'. The 'no water available' status has been applied to this WRMU because AP19 has deficit for approximately 7% of flows, albeit very small. This deficit is the result of considering the worst case scenario within the resource assessment. Through the sustainability appraisal, options for managing water resources in this unit were considered to identify the target resource availability status.

The need to support forecast growth whilst offering a high level of environmental protection were considered a priority within this unit.

Following the sustainability appraisal and consultation the Environment Agency will retain the resource availability status of ‘no water available’ (for APs 19 and 20). However AP18 will retain a ‘water available’ status. This means that within APs 19 & 20 there generally is no water available for licensing at the lowest flows, but there would be water available for licensing at other times. Within AP18 there will be a presumption for granting new abstraction licences until river flows reach those defined by the river flow objective.

5.8.2 Guidance on the assessment of new applications

This unit has an overall classification of 'no water available'. New abstractions would be restricted at flows below Q93. New consumptive licences would be issued with appropriate restrictions including hands off flow conditions at Q93 as determined by the resource assessment. This means that resources would be available for all but the very lowest flows. The licence holder could expect to be able to abstract water for 340 days in an average year. The reliability of licences is shown in Table 5 at the end of Section 5.

Application for non-consumptive abstractions would be considered. Although no restrictions would be applied under the catchment wide assessment, local impacts may result in specific conditions being applied.

Groundwater licences would not normally be available unless appropriate constraints are included as part of the conditions.

All new licences would be subject to the standard licence determination procedures and are likely to be issued with an expiry date of 31st March 2017.

5.8.3 Renewals and management of existing licences

There are no time-limited licences in this unit.

5.9 Licensing Strategy Water Resource Management Units 7, 8 and 9 [Neath & Afan Coastal Block, Kenfig & Ogmore Coastal Block & Schwyll] ("water available")

5.9.1 Resource availability status and results of the sustainability appraisal

From the resource assessment it was determined that these groundwater management units currently have a resource availability status of 'water available'. Through the sustainability appraisal the management of water resources in these units were considered, in order to identify the target resource availability status.

Due to the lack of groundwater information it was decided to take a precautionary approach so only one option for managing water resources was appraised ie to stay at 'water available'.

Following the sustainability appraisal and consultation the Environment Agency will retain the resource availability status of 'water available', allowing licensing of the available water.

5.9.2 Guidance on the assessment of new applications

As these units are classed as 'water available' there is a presumption of granting new licences until the groundwater level reaches the limit of 'water available'.

All new licences would be subject to the standard licence determination procedures and are likely to be issued with an expiry date of 31st March 2017.

WRMU 7 & 9
Given the nature of the groundwater aquifers new licences would be granted subject to normal determination criteria. This would include investigations such as pump tests to assess yield and localised impacts and would be issued with restrictive conditions where appropriate.

WRMU8.
As this unit contains Kenfig Special Area of Conservation all new licence applications will be subject to assessment under the Habitats Directive. This will involve assessing their potential impact on the designated species and habitats, alone and in combination with other licences. As part of the process the Countryside Council for Wales will be consulted on these assessments.

Table 5 | Examples of impact of hands off flow restrictions

Long term record based on an average year			
	Flow restriction	% time restriction imposed in average year	No. of days restriction imposed
Clydach and Ogmore	Q95	5	18
Ewenny	Q93	7	25
No. of days abstraction would have been allowed (restricted)			
Year	**Clydach / Ogmore***	**Ewenny**	
2003	318 (47)	304 (61)	
2002	344 (21)	329 (36)	
2001	359 (6)	363 (2)	
2000	366 (0)	327 (39)	
1995 (dry year)	288 (77)	247 (118)	

* The figures presented are based on the gauged flow records for the Ogmore

5.9.3 Renewals and management of existing licences

WRMU 7 & 9
There are currently no time-limited licences within these units.

WRMU8
Existing licences have been investigated under The Habitats Directive Review of Consents process to determine their potential impact on the designated sites. This investigation is due to be completed in 2006.

5.10 Opportunities for licence trading in the Neath, Afan and Ogmore CAMS area

One of the objectives of the CAMS process is to facilitate water rights trading. The term water rights trading refers to the transferring of licensable water rights from one party to another, for benefit. It involves a voluntarily movement of a right to abstract water between abstractors, using the abstraction licensing process. More detailed information is available in '*Managing Water Abstraction*'.

A guidance leaflet (Water Rights Trading) was published and sent to Licence Holders towards the end of 2002 explaining the scope for water rights trading within current legislation. Consultation on more detailed proposals followed in 2003. After considering the responses to this consultation exercise, further information will be made available to update Licence Holders on the Agency's conclusions for a detailed framework within which water rights trading will take place. This information and guidance will be timed to coincide with the expected implementation of the sections of the Water Act 2003 that are most relevant to trading. Further information on Water Rights Trading is available on the Environment Agency web site (www.environment-agency.gov.uk/subjects/waterres).

5.11 The Water Act 2003

Following the first major review of the abstraction licensing system since its inception in 1963, the Government set out, in 1999, a new framework for managing water resources. The CAMS process and the move to time limited licences are key elements of the new framework, which is completed by revisions to the statutory framework introduced by the Water Act 2003. The Act updates the Water Resources Act 1991 in several key areas:

- Deregulation of small abstractions
- New controls on previously exempt abstractions for mine and quarry dewatering, trickle and other forms of irrigation, transfers into canals and internal drainage districts
- Stronger powers for water resources planning and management
- Changes to the legal status of abstraction licences
- More flexibility to the licensing regulations to improve its efficiency and to encourage trading
- Stronger powers on water conservation

For more details on the Act and its implementation, see the Agency's web-site, www.environment-agency.gov.uk.

The Agency web site will be updated to provide information as the Water Act is implemented.

6

Future developments in the CAMS area

The Baglan Bay area at the bottom of the Neath catchment (WRMU2) has been identified for future development. The Welsh Assembly Government is promoting the Baglan Energy Park as a key contributor to economic regeneration in the area and as such is reliant on water resource availability. The future viability of the Baglan Power station and their proposed expansion is reliant on industrial developers locating to the Baglan Bay area.

Possible expansion by existing abstractors, at the bottom of the Afan (WRMU3) and the Kenfig (WRMU4) has also been recognised within the licensing strategy.

It is unlikely that additional resources would be available for any other consumptive abstractions in the Afan and Kenfig WRMUs.

We are currently developing a hydraulic model of the lower reaches of the Afan in order to determine flow movement and profiles around the weir, fish pass, dock feeder channel and lock gates. We will also consider the impacts of abstractions on fish migration and development of potential mitigation measures on both the Afan and the Neath.

There are likely to be groundwater resources available, particularly in the coastal blocks, but all applications would be subject to the result of investigations to confirm reliability of the source and any potential local impacts. Under this determination criteria consideration would particularly be given to any potential impacts on local designated sites.

The need for additional hydrogeological information has been highlighted. Appropriate investigations have been identified but will be dependent on resources being available.

Post-CAMS appraisal

The Agency will review the Neath, Afan and Ogmore CAMS in 2008 and publish the updated strategy in 2010. The implementation of this CAMS can be assessed using the following indicators:

- New licences granted, with restrictive conditions where required, if water is available and the application satisfies the statutory determination requirements.
- The resource availability status of each Water Resource Management Unit either remains unchanged or improved.
- Routine ecological and hydrological monitoring, to increase our data sets for the resource assessment and to improve understanding of the catchment and to use this understanding to improve the management of the resources.
- Undertake additional hydrogeological monitoring to increase our data sets for the groundwater resource assessment.
- Regular visits to licence holders to ensure licence conditions are met and comply with legislation; these will also help monitor water efficiency.
- A better understanding of how the bigger licences (both consumptive and non-consumptive) actually impact on surface water flows.

Annexe 1:

Agency staff involved in the Neath, Afan and Ogmore CAMS

Current members of the Neath, Afan and Ogmore CAMS project group

Kathy Banner - Regulatory Officer (Water Resources)

Nicola Broadbridge - Ecological Appraisal Officer (CAMS Biologist)

James Greenhalgh - Team Leader Regulatory (Water Resources)

Elizabeth James - Regulatory Officer (Water Resources)

Andrea Mann - Technical Specialist - Hydrogeology

Hamish Osborn - Senior Environment Officer

Glenda Tudor - Hydrologist

Sonja Watts - Regulatory Officer (Water Resources)

Mary Youell - Environment Manager (East)

Past members of the Neath, Afan and Ogmore CAMS project group:

Steve Bater - Regulatory Officer PIR/RAS

Benedicte Cordier - Technical Specialist - Hydrogeology

Kate Jenkins - Ecological Appraisal Officer (CAMS Biologist)

Niall Reynolds - Corporate Services Manager

Jeremy Stephens - Regulatory Officer PIR/RAS

Ian Wiseman - Biodiversity Officer

The following staff have helped in the development of the Neath, Afan and Ogmore CAMS:

Mike Brett - Environment Officer

Dave Charlesworth - Sustainable Fisheries Project Officer

Karen Dunn - Environment Officer

Sally Evans - Regulatory Officer (Water Resources)

Michelle Walker - Environment Officer

Dave Headworth - Senior Technical Specialist - Hydrogeology

Neil Herbert - Environment Officer

Mike Jenkins - Technical Specialist Biodiversity

Will Jenkins - Regulatory Specialist (Water Resources)

Eiryn Petty - Team Leader Flood Risk

Kay Roberts - Technical Officer (Groundwater)

Graham Rutt - Ecological Appraisal Specialist

Pippa Sabine - Environment Officer

Leila Somers - Ecological Specialist (Fisheries)

Ida Tavner - Fisheries & Recreation Technical Officer

Ben Wilson - Sustainable Fisheries Programme Manager

Annexe 2:

Glossary

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

Abstraction - Actual The volume of water actually abstracted as opposed to the volume of water that may be abstracted under the terms of an abstraction licence. Individual abstraction records are reported to the Environment Agency each year.

Abstraction licence The authorisation granted by the Environment Agency to allow the removal of water from a source.

Alluvial deposit Layers of sediment resulting from the activity of rivers. Usually fine material eroded, carried, and eventually deposited by rivers in flatter areas such as flood plains or lake beds.

Aquifer A geological formation, group of formations or part of a formation that can store and transmit water in significant quantities.

Assessment Point Critical point in catchment at which an assessment of available resources should be made. APs are located at the extremities of identified reaches and water resource management units.

Biodiversity The living component of the natural world. It embraces all plant and animal species and communities associated with terrestrial, aquatic and marine habitats. It also includes genetic variation within species.

Borehole Well sunk into a water bearing rock from which water will be pumped.

Bryophyte Bryophytes are mosses and liverworts. They are non-flowering (spore producing) and non-vascular (can't draw up water from any distance).

Canal An artificial watercourse used for navigation.

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

Confluence The point where two or more streams or rivers meet.

Consumptive use Use of water where a significant proportion of the water is not returned either directly or indirectly to the source of supply after use.

Consumptive-ness Proportion of the water not returned either directly or indirectly to the source of supply after use e.g. water evaporated, transpired or transferred elsewhere.

Discharge The release of substances (i.e. Water, sewage etc.) into surface waters.

Discharge Consent A statutory document issued by the Environment Agency, which defines the legal limits and conditions on the discharge of an effluent into controlled waters.

Drift A loose, deposit of sand, gravel, clay etc.

Drought A general term covering prolonged periods of below average rainfall resulting in low river flows and/or low recharge to groundwater, imposing significant strain on water resources and potentially the environment.

EC Directive Issued by the European Commission to member states with the objective of producing common standards in the European Community - member states are then obliged to introduce appropriate legislation to comply with the Directive.

Environmental impact The total effect of any operation on the environment.

Environmental Weighting An assessment of a river's sensitivity to abstraction based on physical characteristics, fisheries, macrophyte and macro-invertebrates for a catchment/sub-catchment

Fauna Animal population of a particular area or epoch.

Flood plain Land adjacent to a watercourse that is subject to flooding.

Flora Plant population of a particular area or epoch.

Flow regime The statistical pattern of a river's constantly varying (mean daily) flow rates.

Fluvial River associated processes such as flow and erosion.

Gauged flow records Records of flow in river as conventionally measured. They reflect not only natural runoff from the catchment, but also artificial influences (abstraction, discharge etc) that occur upstream of the measurement point.

Gauging station A site where the flow of a river is measured.

Groundwater Water occurring below ground in natural formations (typically rocks, gravels and sands).

Groundwater catchment The area from which recharge to the aquifer would naturally discharge to a defined point of a river, or over a defined discharge boundary.

Groundwater Management Units Administrative sub-divisions of aquifers, defined on geological and hydrogeological criteria, which form the basis for groundwater resource management and licensing policy decisions.

Habitat Place in which a species or community of species live, with characteristic plants and animals.

Habitats Directive EU Wild Birds Directive (1979) and the EU Habitats Directive (1992) implemented in UK law through the Conservation (Natural Habitats) Regulations (1994) are collectively known as the Habitats Directive. A network of sites has been established to protect important species and habitats.

Hands Off Flow A condition attached to the abstraction licence so that if the flow in the river falls below the flow specified on the licence then the abstractor may be required to stop or reduce the abstraction.

Hydrogeology Branch of geology concerned with water within the Earth's crust.

Hydrology The study of water on and below the earth's surface.

Hydrometric network Networks of sites monitoring rainfall; river flow; river, lake, tidal and groundwater levels and some climate parameters. The data is used extensively for water resources management and planning, water quality and ecological protection and improvement, flood defence design, flood forecasting and flood warning.

Hydrometry The measurement of water on or below the earth's surface.

Hydropower Power generated from the natural gravitational fall of water by the installation of turbines, water wheels etc

Irrigation Supply (land) with water by means of artificial canals, ditches etc, especially to promote the growth of food crops.

Karstic Heavily eroded and channelled outcropping limestone rocks.

Local Environment Action Plan (LEAP) Previous process by which the Agency planned to respond to the environmental issues in a catchment.

Licence Formal permit allowing the holder to engage in an activity (in the context of this report, usually abstraction), subject to conditions specified in the licence itself and the legislation under which it was issued.

Licence application Formal request by individual or organisation to the competent authority for a licence. For abstraction licences, the competent authority is the Environment Agency.

Licence determination A decision by the competent authority on whether and on what terms to grant or refuse a licence application, by reference to the authority's regulatory powers and duties.

Licensing methodology Procedure to aid licence determination.

Low flow The flow that is exceeded for a given percentage of the time. For example Q95 is the flow that is exceeded 95% of the time, this means that flow will only fall this low 5% of the time.

Managing water abstraction Document produced in May 2001 on the CAMS Process.

Pool A distinct natural feature of deeper water. In dry-weather conditions, there is no perceptible downstream flow. Back currents may be present.

Precautionary principle Where significant environmental damage may occur, but knowledge on the matter is incomplete, decisions made should err on the side of caution.

Protected right Protected rights include all existing licensed abstractions, and certain exempt abstractions for domestic and agricultural purposes (excluding spray irrigation) not exceeding 20 m^3/d.

Public water supply Term used to describe the supply of water provided by a water undertaker.

Q79 The flow of a river which is exceeded on average for 79% of the time.

Q95 The flow of a river which is exceeded on average for 95% of the time.

RAM framework Resource Assessment and Management Framework - a technical framework for resource assessment (for the definition and reporting of CAMS) and subsequent resource management (including abstraction licensing).

Ramsar site A site of international conservation importance classified at the 'Convention on Wetlands of International Importance' 1971, ratified by the UK Government in 1976.

Reach A length of river

Recharge Water which percolates downward from the surface into groundwater.

Regime (Flow) The statistical pattern of a river's constantly varying (daily) flow rates.

Restoring Sustainable Abstraction Programme (RSAP) The programme for resolving environmental problems caused by over abstraction in certain catchments.

Resource Availability Status (RAS) This indicates the relative balance between committed and available resources, showing whether licences are likely to be available and highlighting areas where abstraction needs to be reduced.

Resource Availability Status Categories There are four categories (see below) of resource availability status, each category describes the water available at the lowest flows.

Water available Water likely to be available at all flows, including a limited amount at the lowest flows. Restrictions may still apply to any new abstractions.

No water available No water available for further licensing at the lowest flows.Water is likely to be available at higher flows with appropriate restrictions.

Over-licensed Current actual abstraction is resulting in no water available at low flows. If existing licences were used to their full allocation they would have the potential to cause significant environmental impact at low flows.Water may be available at high flows with appropriate restrictions.

Over-abstracted Existing abstraction is causing significant environmental impact at low flows. Water may still be available at high flows with appropriate restrictions.

River An open channel in which inland, surface water can flow.

River flow objectives (RFOs) The minimum river outflows from the area required to protect ecological objectives, effluent dilution requirements, navigation and amenity in-river needs.

River quality objective (RQOs) A River Quality Objective is an agreed strategic target, expressed in terms of River Ecosystem standards, which is used as the planning base for all activities affecting the water quality of a stretch of watercourse.

River reach Unit of a river between two assessment points, delineated for the purposes of abstraction licensing and resource management.

Saline Intrusion The ingress of salt water into an aquifer, from the sea or estuary, due to groundwater depression normally caused by excessive groundwater abstraction.

Salmonids Members of the family salmonidae, includes - Salmon, Trout and Char.

Scenario flows The flows, which would leave the assessment point in the specified year, based on the assumed scenario abstractions and discharges.

Source protection zone The zone in which all resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a resource shortfall.

Special area of conservation (SAC) A Special Area of Conservation is one classified under the EC Habitats Directive and agreed with the EC to contribute to biodiversity by maintaining and restoring habitats and species.

Special Protection Area (SPA) A Special Protection Area is one classified as such under the EC Birds Directive to provide protection to birds, their nests, eggs and habitats.

Spray irrigation Abstracted water sprayed onto grassland, fruit, vegetables etc. Can have a high impact on water resources.

Springs These occur where the water table intersects the ground surface.

Site of Special Scientific Interest A Site of Special Scientific Interest is an area given a statutory designation by English Nature or the Countryside Council for Wales because of its nature conservation value.

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

Surface water catchment The area from which runoff would naturally discharge to a defined point of a river, or over a defined boundary.

Surplus or deficit How much more or how much less abstraction impact is acceptable: = Scenario flows - RFOs.

Sustainable development Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This involves meeting four objectives simultaneously:
- social progress which recognises the needs of everyone;
- effective protection of the environment;
- prudent use of natural resources;
- maintenance of high and stable levels of economic growth and employment.

Tidal limit The most upstream point within an estuary or river where water levels are subject to tidal variation.

Time limited licence Licence with specified end date

Trickle irrigation The irrigation of crops by taking water direct to roots of plants, but without spraying or ejecting into the air.

Water Consumption (based on sizes of abstraction licences in this CAMS area)

Industrial Process water	
Large industry	*9Ml/d*
Industrial Process water	
Medium industry	*2Ml/d*
Industrial Process water	
Small industry	*0.9Ml/d*
Quarry	*0.2Ml/d*
Spray irrigation	*0.05Ml/d*

Water Resource The naturally replenished flow or recharge of water in rivers or aquifers

Water Resource Management Unit	An area that has similar groundwater and or surface water characteristics and is managed in a similar way.
Water resources strategy (The)	Strategy for Water Resource planning in England and Wales over the next 25 years to ensure sustainable us and sufficient water for all human uses with an improved water environment. The strategies predict demand using different social and economic scenarios.
Water Rights Trading	The transfer of licensable water rights from one party to another for benefit.
Wetland	An area of low lying land where the water table is at or near the surface for most of the time, leading to characteristic habitats.
Yield	The reliable rate at which water can be drawn from a water resource.

Annexe 3:

List of Abbreviations

AP	Assessment Point.
BAP	Biodiversity Action Plan.
CAMS	Catchment Abstraction Management Strategy.
EW	Environmental Weighting of a river reach based on its physical, macrophyte, fisheries and macroinvertebrate scores.
EU	European Union.
HOF	Hands off flow.
km	Kilometres.
km²	Square kilometres.
LEAP	Local Environment Agency Plan. Previous process by which the Agency planned to respond to the environmental issues in a catchment.
Ml, Ml/d, Ml/day	Ml = megalitres = 1,000,000 litres = 1,000 cubic metres = 1,000 m^3 = 220,000 gallons Ml/d = Ml/day = Ml per day, = tcmd, thousand cubic metres per day.
Ml/a	Ml/a = Ml per year = Megalitres per year.
mm	Millimetres
PWS	Public Water Supply.
Q79	Flow exceeded during 79% of period over which flow data are being considered.
Q95	Flow exceeded during 95% of period over which flow data are being considered.
R & D	Research and development.
RFO	River Flow Objectives.
RQO	River Quality Objective
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	A Site of Special Scientific Interest i.e. an area given a UK statutory designation because of its conservation value.
SW	Surface water.

Footnotes

1.Optimum use of Water in Agriculture and Industry: Environment Agency R&D Technical Report, W6056/TR2

Notes

SWYDDFA CYMRU
Tŷ Cambria
29 Newport Road
Caerdydd
CF24 0TP
Ffôn: 08708 506 506

WALES OFFICE
Cambria House
29 Newport Road
Cardiff
CF24 0TP
Tel: 08708 506 506

SWYDDFA ARDAL Y DE DDWYRAIN
Plas-yr-Afon
Parc Busnes Llaneirwg
Heol Fortran, Llaneirwg
Caerdydd CF3 0EY
Ffôn: 08708 506 506

SOUTH EAST AREA OFFICE
Rivers House
St Mellons Business Park
Fortran Road
St Mellons
Cardiff CF3 0EY
Tel: 08708 506 506

SWYDDFA ARDAL Y DE ORLLEWIN
Maes Newydd, Llandarsi
Nedd Port Talbot
SA10 6JQ
Ffôn: 08708 506 506

SOUTH WEST AREA OFFICE
Maes Newydd
Llandarcy
Neath Port Talbot
SA10 6JQ
Tel: 08708 506 506

SWYDDFA ARDAL Y GOGLEDD
Llwyn Brain, Ffordd Penlan
Parc Menai, Bangor
Gwynedd LL57 4ZZ
Ffôn: 08708 506 506

NORTHERN AREA OFFICE
Llwyn Brain
Ffordd Penlan
Parc Menai, Bangor
Gwynedd LL57 4ZZ
Tel: 08708 506 506

PENCADLYS
Rio House
Waterside Drive
Aztec West
Almondsbury
Bryste BS32 4UD
Ffôn: 08708 506 506

HEAD OFFICE
Rio House
Waterside Drive
Aztec West
Almondsbury
Bristol BS32 4UD
Tel: 08708 506 506