

RICS Practice Standards, UK

Valuation of water as a separate resource

Information paper



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Valuation of water as a separate resource

RICS information paper

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Surveyor Court
Westwood Business Park
Coventry CV4 8JE
UK

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Contents

Acknowledgments	iv
RICS information papers	1
Introduction	2
The valuation challenge	2
Classification	2
Assumptions	3
Basis of value	3
Physical inspections	3
Statutory and regulatory environment	4
Valuation reports	4
Appendices	
1 Water classification	5
2 Relevant UK legislation	6
Section 1 European Union Directives	6
Section 2 Legislation for Scotland	8
Section 3 Legislation for England and Wales	10
Section 4 Legislation for Northern Ireland	12
3 Briefing note on River Basin Management Plans (RBMP) and Catchment Abstraction Management Strategies (CAMS)	14
4 Example scenarios	16
5 Relevant factors	17
6 Assumptions and special assumptions	22
7 Inspections	23
8 Desktop review approach for the valuation of water	24

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Primary Author

Hugh Fell – George F. White

Steering Group

Holly Armstrong – George F. White

Jenny Bashford – NFU (National Farmers Union)

Henning Bjornlund – University of Lethbridge

Hugh Fell – George F. White

Dimitri Harrison – Harrison Rural Consultancy

Gordon King – DMH Baird Lumsden

Fiona Mannix – RICS

Robert Paul – Strutt and Parker

Justin Taberham – CIWEM (Chartered Institution of Water and Environmental Management)

William Wilson – Burges Salmon

Legislation

Catherine Davey – Stevens & Bolton LLP

Claire Duffy – Arthur Cox

Valerie Fogleman – Stevens & Bolton LLP

William Wilson – Burges Salmon

Consultees

Junier Browne – EA (The Environment Agency)

Martin Cave – Warwick Business School

Ronan Palmer – EA (The Environment Agency)

David Pearson – Ofwat

RICS Information Papers

This is an information paper. Information papers are intended to provide information and explanations to RICS members on specific topics of relevance to their practice. The function of this paper is not to recommend or advise on professional procedures to be followed by surveyors.

It is, however, relevant to professional competence to the extent that surveyors should be up-to-date and should have informed themselves of information papers within a reasonable time of their promulgation.

Members should note that when an allegation of professional negligence is made against a surveyor, the Court is likely to take account of the contents of any relevant information papers published by RICS in deciding whether or not the surveyor has acted with reasonable competence. Also, in any case of disciplinary action the panel or board is likely to take this into account.



1 Introduction

1.1 There is currently much discussion surrounding the valuation of ecosystem services. The Economics of Ecosystems and Biodiversity (TEEB) study has done much to bring this subject to the fore. The intention behind TEEB is that it will act as a catalyst to assist in accelerating the development of a new economy – one which recognises the value of natural capital. Before we can recognise the value of natural capital we must first endeavour to place a value on it. This paper is the first step in developing an approach in the UK that can assist in placing a value on one of the most essential elements of all, water. It is anticipated that this will evolve over time. As part of the process, it is hoped that stakeholders will contribute and feedback to RICS with a view to developing this.

The initial phase of this lead to the production of a Desktop Review which reviewed existing approaches to the valuation of water and focused in on some particular countries. For those who wish to read wider on this subject it is recommended that this paper is read in conjunction with the full Desktop Review which will be published as a separate document. (The more relevant extracts of the Desktop Review are included in this paper.)

1.2 The approach outlined in this information paper applies only to non marine water resources, e.g. lakes, rivers, reservoirs, boreholes, aquifers, etc.

1.3 The perceived need for a robust approach arises from a variety of factors, for example:

- increasing demand arising from population growth and higher household demand
- increasing demand for food production
- potential impact of climate change
- the need for sustainable water management
- anticipated regulatory pressure; and
- increasing value: shortage leads to higher value.

1.4 The approach to valuation of water is upon the basis that:

- it is a separately identifiable asset; and
- it does have an intrinsic financial value.

1.5 It is anticipated that the approach will be applied primarily within the context of:

- secured lending
- resource appraisal

- project appraisal
- strategic planning and
- cost benefit analysis.

1.6 The concept of valuation of water as a separate resource can be difficult to grasp. Some example scenarios are provided in Appendix 4.

1.7 The *Red Book* (RICS Valuation Standards) applies to the valuation of water and, to avoid repetition, this paper makes the assumption that the valuer will comply with the relevant valuation standards.

2 The valuation challenge

2.1 While the valuation of water as a separate asset is a fairly recent concept, it is important to note that the basic principles of valuation still apply:

- understand the nature and extent of the resource
- understand the factors that impact upon it
- identify a basis of value
- clearly identify any assumptions or special assumptions; and
- transparently set out the methodology that gives rise to value.

2.2 Because the formal valuation of water is a somewhat recent concept, there is currently no comparable evidence, transactions or appraisals from which to draw assistance in arriving at value.

However, as the practice of valuation of water resources becomes more common, the process will become more easily comprehensible and widely accepted.

3 Classification

3.1 Water resource, available as a separate entity, derives from either:

- a 'natural' source; or
- a statutory provider (see Appendix 1).

3.2 The 'natural' source may be in the form of:

- a river
- a lake
- groundwater (conventional, coastal and karst)
- a reservoir; or

- harvested rainwater.

3.3 Water from a statutory provider will be subject to the legislative framework applicable to location, e.g. for human consumption in the UK, there is a legal requirement for the regional water suppliers to deliver water when formally demanded. In other countries, this legal obligation may not exist or if it does may not be enforceable.

3.4 Use and demand need to be clearly identified and assessed. This has been subdivided into:

- **Utility**
 - Domestic use
 - Human consumption
 - Agricultural
 - Industrial
- **Environmental**
 - Biodiversity
 - Landscape; and
 - Amenity.

4 Assumptions

4.1 It is important that assumptions and special assumptions are agreed with the client at the outset when agreeing the terms of engagement.

Examples are listed in Appendix 6.

5 Basis of value

5.1 Choosing a basis of value to ascribe a value is not always an easy task.

A full discussion on the valuation challenge is set out in Appendix 8: an extract from the desktop review, Section 5 and Attachment 1.

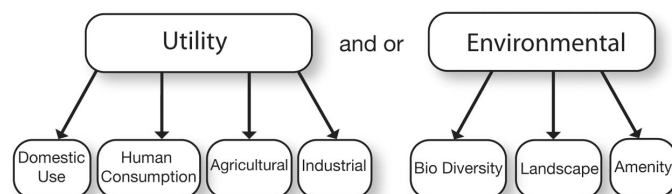
5.2 In settling the terms of engagement (see PS 2.1 in the Red Book), the Valuer should review and agree with the client, the basis and the options available to be adopted.

5.3 Which ever basis is adopted, it is essential that the Valuer obtains a comprehensive view on all relevant factors that impact on value. The nature and extent of those relevant factors may impact on the basis of value selected.

6 Physical inspections

6.1 The purpose of the inspection is to:

- identify the nature of the resource: natural or statutory provider?
- identify its current and potential use



- identify the extent of the resource, i.e. area, volume and
- identify physical relevant factors that will impact on value.

6.2 Understanding the physical relevant factors that impact upon the subject water resource is critically important. The Valuer will comprehensively understand the precise ‘nature of the beast’ that is being appraised.

6.3 Appendix 5 contains a list of some physical relevant factors which may be applicable.

6.4 Attention is drawn to the need to take reasonable steps to verify information provided. If there is any doubt as to the reliability of information, then an appropriate assumption will need to be agreed with the client and set out in the report.

7 Statutory and regulatory environment

7.1 The legislation and regulatory framework surrounding the ownership, use and ‘consumption’ of water will have a fundamental impact on value. The Valuer will need to understand them as a separate, additional set of relevant factors to be taken into account.

7.2 Within the UK, the Valuer will need to consider:

- regional legislation and regulations of:
 - England and Wales
 - Scotland
 - Northern Ireland

- (b) Overarching EU legislation and directives (in particular the Water Framework Directive (WFD)).

Appendix 2 provides a current schedule relevant for the UK regions. Valuers will note that legislation and regulations are constantly being revised, amended and introduced.

7.3 The Valuer in the UK will, in particular, have a good understanding of River Basin Management Plans (RBMP) and Catchment Abstraction Management Strategies (CAMS).

Both RBMP and CAMS are administered by the Environment Agency (EA).

A more detailed briefing note on RBMP and CAMS is provided in Appendix 3.

7.4 The UK has a considerable amount of regulation in place regarding water and is considered one of the most heavily regulated countries in the world as far as water is concerned. The value of water will clearly be different in another country where the regulatory 'touch' is much lighter.

7.5 Outside the UK, each country and/or administrative region will have its own statutory regulatory framework. Therefore the Valuer should be conversant with the framework, its implications and its impact on the water resource.

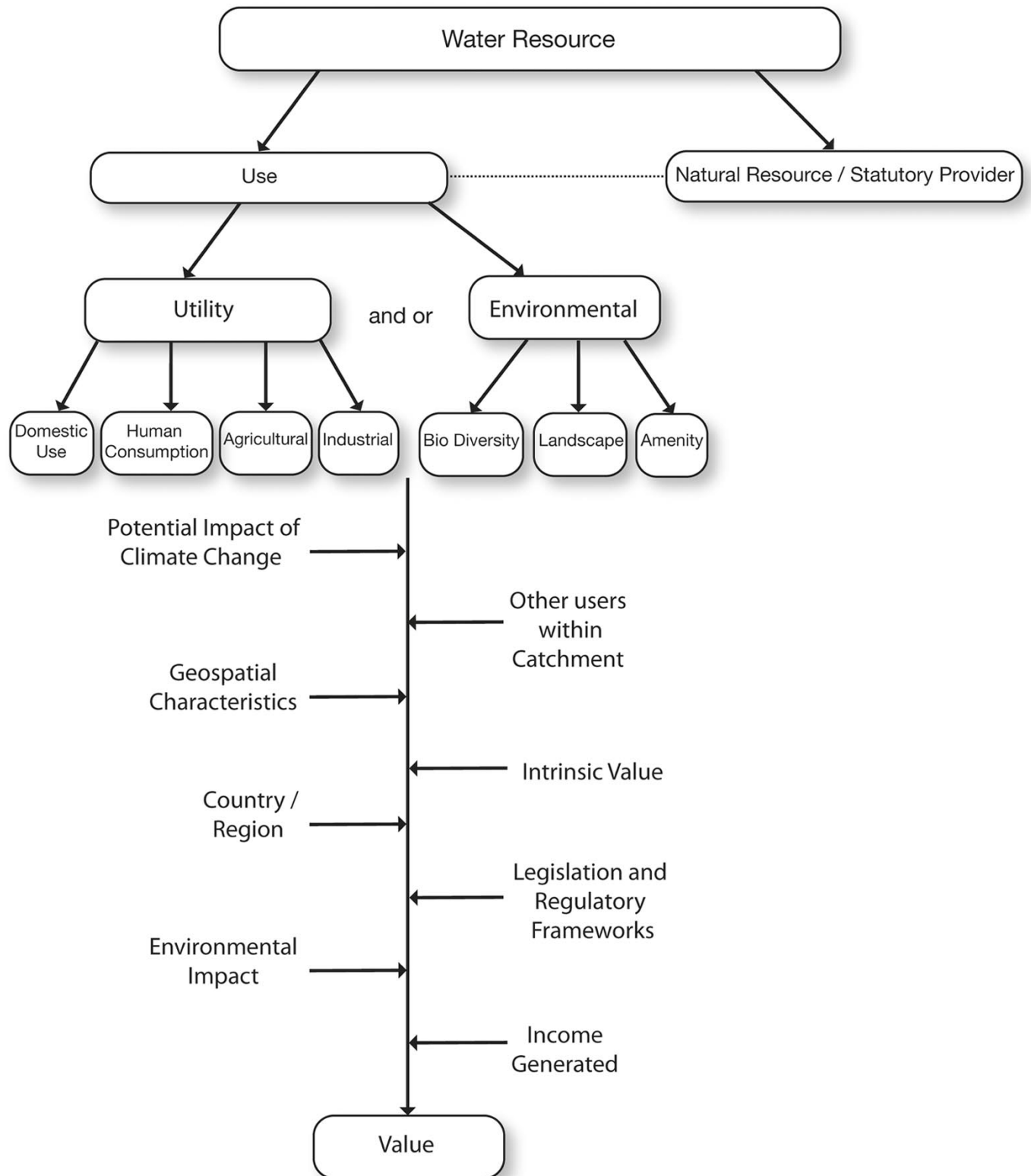
8 Valuation reports

8.1 The primary requirement on the Valuer is that the report will be comprehensive, transparent and not ambiguous, misleading or create a false impression.

8.2 Due to the complexity of the subject, it is strongly recommended that the body of the report is brief with necessary detail provided in appendices.

Appendix 1

Water classification



Appendix 2

Relevant UK legislation (as at November 2010)

Section 1 European Union Directives (subject to continual amendment)

1. Legislative context

- Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy. OJ L 327/1 (22 December 2000)) NB: Several water-related Directives in this list will be repealed by the Water Framework Directive in 2013.

2. Drinking water

- Drinking Water Directive (Council Directive 98/83/EC on the quality of water intended for human consumption. OJ L 330/32 (5 December 1998)) NB: The European Commission is currently preparing a revision of this Directive.

3. Flooding

- Floods Directive (Directive 2007/60/EC of the European Parliament and of the Council on the assessment and management of flood risks. OJ L 288/27 (6 November 2007)).

4. Environmental liability

- Environmental Liability Directive (Directive 2004/35/CE of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage. OJ L 143/56 (30 April 2004)).
- Marine Strategy Framework Directive (Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy. OJ L 164/19 (25 June 2008)).
- Priority Substances Directive (Directive 2008/105/EC of the European Parliament and of the Council on environmental quality standards in the field of water policy amending and subsequently repealing Council Directives 82/

176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council. OJ L 348/84 (24 December 2008)).

- Nitrates Directive (Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources. OJ L 375/1 (31 December 1991)).
- Floods Directive (Directive 2007/60/EC of the European Parliament and of the Council on the assessment and management of flood risks. OJ L 288/27 (6 November 2007)).
- Integrated Pollution Prevention and Control Directive (Directive 2008/1/EC of the European Parliament and of the Council concerning integrated pollution prevention and control (codified version). OJ L 24/8 (29 January 2008)). NB: The Industrial Emissions Directive, which will replace the IPPC Directive and various other Directives, has been agreed by the Council and the European Parliament; a final version will be published in the Official Journal, probably by the end of 2010.
- Freshwater Fish Directive (Directive 2006/44/EC of the European Parliament and of the Council on the quality of fresh waters needing protection or improvement in order to support fish life (codified version). OJ L 264/20 (25 September 2006)).
- Groundwater Directive (Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration. OJ L 372/19 (27 December 2006)).

5. Groundwater

- Groundwater Directive (Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration. OJ L 372/19 (27 December 2006)).

6. Rights of way

- Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for community action in the field of water policy. OJ L 327/1 (22 December 2000)).
- Habitats Directive (Council Directive 92/32/EEC on the conservation of natural habitats and of wild fauna and flora. OJ L 206/7 (22 July 1992)). NB: A consolidated version was issued on 1 January 2007, see http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm
- Drinking Water Directive (Council Directive 98/83/EC on the quality of water intended for human consumption. OJ L 330/32 (5 December 1998). NB: The European Commission is currently preparing a revision of this Directive.

7. Protected habitats

- Habitats Directive (Council Directive 92/32/EEC on the conservation of natural habitats and of wild fauna and flora. OJ L 206/7 (22 July 1992)). NB: A consolidated version was issued on 1 January 2007, see http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

8. Sewage treatment works

- Urban Waste Water Treatment Directive (Council Directive 91/271/EEC concerning urban wastewater treatment. OJ L 135/40 (30 May 1991)).
- Shellfish Waters Directive (Directive 2006/113/EC of the European Parliament and of the Council on the quality required of shellfish waters (codified version). OJ L 376/14 (27 December 2006)).
- Bathing Waters Directive 1976 (Council Directive 76/160/EEC concerning the quality of bathing water. OJ L 31/1 (5 February 1976)).
- Bathing Waters Directive 2006 (Directive 2006/7/EC of the European Parliament and of the Council concerning the management of bathing water quality and repealing Directive 76/160 EEC. OJ L 64/37 (4 March 2006)). NB: The 2006 Directive directed Member States to transpose it into national law by 24 March 2008; the 1976 Directive is being gradually replaced by the 2006 Directive and will be repealed in 2014.

Section 2 Legislation for Scotland (subject to continual amendment)

1. Legislative context

- Water Services etc. (Scotland) Act 2005
- Water Act 2003 (extends to Scotland in part)
- Water Environment and Water Services (Scotland) Act 2003
- Water Resources Act 1991 (extends to Scotland in part)
- Marine and Coastal Access Act 2009 (extends to Scotland in part)
- The Water (Scotland) Act 1980
- Coast Protection Act 1949

2. Drinking water

- Water Industry (Scotland) Act 2002
- Water Industry (Scotland) Act 2002
- Water Act 2003 (extends to Scotland in part)
- Water Environment and Water Services (Scotland) Act 2003
- Natural Mineral Water, Spring Water and Bottled Drinking Water (Scotland) Regulations, SSI 2007/435
- The Water Environment (Drinking Water Protected Areas) (Scotland) Orders, SSI 2007/529 and SSI 2005/88
- The Private Water Supplies (Scotland) Regulations 2006, SSI 2006/209
- The Cryptosporidium (Scottish Water) Directions 2003
- The Water Supply (Water Quality) (Scotland) Regulations 2001, SSI 2001/207
- The Water Supply (Water Quality) (Scotland) Amendment Regulations 2001, SSI 2001/238

3. Flooding

- Flood Risk (Cross Border Areas) Regulations 2010, SI 2010/1102
- Flood Risk Management (Scotland) Act 2009
- The Flood Prevention (Scotland) Act 1961
- The Flood Prevention and Land Drainage (Scotland) Act 1997

- Water Environment and Water Services (Scotland) Act 2003

4. Environmental liability

- Environmental Liability (Scotland) Regulations 2009, SSI 2009/266
- Water Environment (Diffuse Pollution) (Scotland) Regulations 2008, SSI 2008/54
- The Anti-Pollution Works (Scotland) Regulations 2003 SSI 2003/168
- Drought Plan Regulations 2005, SI 2005/1905
- Water Act 2003 (extends to Scotland in part)

5. Groundwater

- Groundwater Regulations 1998 SI 2746
- Water Environment (Groundwater and Priority Substances) (Scotland) Regulations 2009 SSI 2009/420
- Water Industry (Scotland) Act 2002

6. Rights of way

- Countryside and Rights of Way Act 2000 (extends to Scotland in part)
- Environment Act 1995 (extends to Scotland in part)

7. Protected habitats

- Environmental Liability (Scotland) Regulations 2009, SSI 2009/266
- The Water Environment (Register of Protected Areas) (Scotland) Regulations 2004, SSI 2004/516
- The Water Environment (Drinking Water Protected Areas) (Scotland) Orders 2007, SSI 2007/529 and SSI 2005/88
- Conservation (Natural Habitats, etc.) Regulations 1994 (SI 1994/2716) and amendments
- Water Resources Act 1991
- Conservation (Natural Habitats, etc.) Amendment (Scotland) Regulations 2007, SSI 2007/80
- Offshore Marine Conservation (Natural Habitats, etc.) Regulations 2007, SI 2007/1842

8. Sewage treatment works

- Sewerage (Scotland) Act 1968 c.47
- Waste Management Licensing (Water Environment) (Scotland) Regulations 2006 SSI 2006/128
- The Water Services and Sewerage Services Licences (Scotland) Order 2006, SSI 2006/464
- The Anti-Pollution Works (Scotland) Regulations 2003, SSI 203/168
- Reservoirs Act 1975

9. Other

- Control of Pollution Act 1974 40 Part III
- Environmental Protection (Restriction on Use of Lead Shot) (Scotland) (No.2) Regulations 2004, SSI 2004/358
- Protection of Water Against Agricultural Nitrate Pollution (Scotland) Amendment Regulations 2005, SSI 2005/ 593
- Water Environment (Oil Storage) (Scotland) Regulations 2006, SSI 2006/133
- Water (Prevention of Pollution) (Code of Practice) (Scotland) Order 2005, SSI 2005/63
- Water Environment and Water Services (Scotland) Act 2003
- Water Environment (Controlled Activities) (Scotland) Regulations 2005 SSI 2005/348
- Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2008 SSI 2008/298 and amendments SSI 2008/394 and SSI 2009/447
- Surface Waters (Shellfish) (Classification) (Scotland) Regulations 1997/2470
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 and associated protection orders affecting the following prescribed areas:
 - Rivers Tweed and Eye Protection Order 1980 (SSI 1980/400) as renewed by the River Tweed and Eye Protection (Renewal) Order 1991 Variation Order 1994 (SSI 1994/2621).
 - Upper Spey and Associated Waters Protection Order 1982 (SSI 1982/377) as renewed by the Upper Spey and Associated Waters Protection (Renewal) Order 1993 Variation Order 1996 (SSI 1996/57).
 - River Tummel Catchment Area Protection Order 1983 (SSI 1983/390) as renewed by the River Tummel Catchment Area Protection (Renewal) Order 1991 Variation Order 1994 (SSI 1994/2623).
 - River Lunan Catchment Area Protection Order 1983 (SSI 1983/391) as renewed by the River Lunan Catchment Area Protection (Renewal) Order 1991 Variation Order 1994 (SSI 1994/2622).
 - River Tay Catchment Area Protection Order 1986 (SSI 1986/1590) as renewed by the River Tay Catchment Area Protection (Renewal) Order 1993 Variation Order 1996 (SSI 1996/58).
 - West Strathclyde Protection Order 1988 (SSI 1988/1516).
 - River Don Catchment Area (Part) Protection Order 1990 (SSI 1990/1971).
 - Loch Awe and Associated Waters Protection Order 1992 (SSI 1992/771).
 - Earn Catchment Area Protection Order 1990 (SSI 1990/50).
 - Loch Morar and River Morar Protection Order 1992 (SSI 1992/2316).
 - River Clyde Catchment Area (Part) Protection Order 1994 (SSI 1994/1949).
 - North West Sutherland Protection Order 1994 (SSI 1994/3302).
 - River Arkaig, Loch Arkaig and Associated Waters Protection Order 1995 (SSI 1995/2683).
 - The Assynt – Coigach Area Protection Order 2004 (SSI 2004/260) varied by the Assynt-Coigach Area Protection Variation Order 2006 (SSI 2006/488)

Note: in this list, SSI refers to a Statutory Instrument issued by the Scottish government – normally prefixed SI refers to a Statutory Instrument of the UK government.

Section 3 Legislation for England & Wales (subject to continual amendment)

1. Legislative context

- Water Environment (Water Framework Directive) (England and Wales) Regulations 2003, SI 2003/3242
- Marine and Coastal Access Act 2009
- Water Resources Act 1991
- Environmental Permitting (England and Wales) Regulations 2010, SI 2010/675
- Nitrate Pollution Prevention (Wales) Regulations 2008, SI 2008/3143
- Private Water Supplies (Wales) Regulations 2010, SI 2010/66 (W.16)
- Control of Pollution (Applications, Appeals and Registers) Regulations 1996, SI 1996/2971
- Water Resources (Abstraction and Impounding) Regulations 2006, SI 2006/641

2. Drinking water

- Water Supply (Water Quality) Regulations 2010, SI 2010/994 (W.99)
- Water Supply (Water Quality) Regulations 2001, SI 2001/3911 (W.323)
- Water Act 2003
- Drinking Water (Undertakings) (England and Wales) Regulations 2000, SI 2000/1297
- Private Water Supplies (Wales) Regulations 2010, SI 2010/66 (W.16)
- Water Industry Act 1991

3. Flooding

- Flood and Water Management Act 2010
- Flood Risk Regulations 2009, SI 2009/3042
- Flood Risk (Cross Border Areas) Regulations 2010, SI 2010/1102

4. Environmental liability

- Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009, SI 2009/995 (W.81)
- Nitrate Pollution Prevention (Wales) Regulations 2008, SI 2008/3143
- Environmental Permitting (England and Wales) Regulations 2010, SI 2010/675

- Drought Plan Regulations 2005, SI 2005/1905
- Water Act 2003

5. Groundwater

- Water Resources (Environmental Impact Assessment) (England and Wales) Regulations 2003, SI 2003/164
- Anti-Pollution Works Regulations 1999, SI 1999/1006
- Water Industry Act 1999
- Countryside and Rights of Way Act 2000

6. Rights of way

- Water Resources (Environmental Impact Assessment) (England and Wales) Regulations 2003, SI 2003/164
- Groundwater Regulations 1998, SI 1998/2746
- Control of Pollution (Applications, Appeals and Registers) Regulations 1996, SI 1996/2971
- Environment Act 1995

7. Protected habitats

- Water Industry Act 1991
- Water Resources Act 1991
- Land Drainage Act 1991
- Conservation (Natural Habitats, etc.) Regulations 1994, SI 1994/2716
- Conservation (Natural Habitats, etc.) (Amendment) Regulations 2007, SI 2007/1843
- Offshore Marine Conservation (Natural Habitats, etc.) Regulations 2007, SI 2007/1842
- Water Resources (Environmental Impact Assessment) (England and Wales) Regulations 2003, SI 2003/164

8. Sewage treatment works

- Reservoirs Act 1975
- Trade Effluent (Prescribed Processes and Substances) Regulations 1989, SI 1989/1156
- Trade Effluents (Prescribed Processes and Substances) Regulations 1992, SI 1992/339

9. Other

- Water Resources (Control of Pollution) (Silage, Slurry and Agriculture Fuel Oil) (Wales) Regulations 2010, SI 2010/1493 (W.136)

- Surface Waters (Fishlife) (Classification) Regulations 1997, SI 1997/1331
- Sea Fisheries (Shellfish) Act 1967
- Surface Waters (Shellfish) (Classification) Regulations 1997, SI 1997/1332

One of Defra's current top three priorities is supporting a strong and sustainable green economy, resilient to the effects of climate change. A key commitment under this priority is the publication of a Water White Paper by June 2011.

Section 4 Legislation for Northern Ireland (subject to continual amendment)

1. Legislative Context

- Water Framework Directive
- Marine and Coastal Access Act 2009
- Water (Northern Ireland) Order 1999
- Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003
- Anti Pollution Works Regulations (Northern Ireland) 2003
- Control of Pollution (Applications and Registers) Regulations (Northern Ireland) 2001

2. Drinking water

- Drinking Water Directive 98/83/EC
- Water and Sewage Services (Northern Ireland) Order 2006
- Water Supply (Water Quality) Regulations (Northern Ireland) 2007
- Water Supply (Water Quality) (Amendment) Regulations (Northern Ireland) 2009
- Water Supply (Water Quality) (Amendment) Regulations (Northern Ireland) 2010
- Water Supply (Domestic Distribution Systems) Regulations (NI) 2010
- Private Water Supplies Regulations (Northern Ireland) 2009 as amended by the Private Water Supplies (Amendment) Regulations (Northern Ireland) 2010
- Natural Mineral Water, Spring Water and Bottled Water Regulations 2007

3. Flooding

- EU Floods Directive 2007/60/EC
- Water Environment (Floods Directive) Regulations (Northern Ireland) 2009

4. Environmental liability

- Environmental Liability Directive 2004/35/EC
- Environmental Liability (Prevention and Remediation) Regulations (Northern Ireland) 2009
- Environmental Liability (Prevention and Remediation) (Amendment) Regulations (Northern Ireland) 2009

- Marine Strategy Framework Directive 2008/56/EC
- Priority Substances Directive 2008/105/EC
- Nitrates Directive 91/676/EEC
- Protection of Water Against Agricultural Nitrate Pollution Regulations (Northern Ireland) 2004
- Nitrates Action Programme Regulations (Northern Ireland) 2006
- Nitrates Action Programme (Amendment) Regulations (Northern Ireland) 2008
- EU Floods Directive 2007/60/EC
- Integrated Pollution Prevention and Control Directive 2008/1/EC
- Pollution Prevention and Control Regulations (Northern Ireland) 2003
- Pollution Prevention and Control (Amendment) Regulations (Northern Ireland) 2007
- Control of Pollution (Applications and Registers) Regulations (Northern Ireland) 2001

5. Groundwater

- Groundwater Directive 2006/118/EC
- Groundwater Regulations (Northern Ireland) 2009
- Groundwater (Amendment) Regulations (Northern Ireland) 2009
- Environmental Liability Directive 2004/35/EC

6. Rights of way

- Water Resources (Environmental Impact Assessment) Regulations (Northern Ireland) 2003
- Water Resources (Environmental Impact Assessment) (Amendment) Regulations (Northern Ireland) 2006
- Water Framework Directive 2000/60/EC

7. Protected habitats

- Habitats Directive 92/43/EC
- Conservation (Nature Habitats, etc.) Regulations (Northern Ireland) 1995

8. Sewage treatment works

- Urban Waste Water Treatment Directive 91/271/EC

- Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006
- Water and Sewerage Services (Miscellaneous Provisions) (Northern Ireland) Order 2006
- Water and Sewerage Services (Northern Ireland) Order 2006
- Urban Waste Water Treatment Regulations (Northern Ireland) 1995

9. Other

- Shellfish Waters Directive 79/923/EC
- Bathing Waters Directive 2006/7/EC (which effectively replaced Directive 76/160/EEC)
- Quality of Bathing Water (Northern Ireland) Regulations 2008

Appendix 3

Briefing note on River Basin Management Plans (RBMP) and Catchment Abstraction Management Licences (CAMS)

The Water Framework Directive (WFD)

The Water Framework Directive (WFD) introduced the concept of River Basin Management Plans (RBMP).

In the UK the relevant agencies with responsibility for the environment are the competent authorities and are charged with delivering the objectives of the WFD and must produce and manage a strategic RBMP for each district, known as River Basin Districts (RBD).

The WFD is concerned with the classification of water and divides water into four groups:

- Coastal Waters
- Inland waters – such as lakes and rivers
- Estuaries
- Groundwater.

Why do we have RBMP?

RBMP deliver a number of key objectives, they are set on RBD and allow for the sustainable and strategic management of UK water resources. This includes working with a number of key stakeholders and organisations to drill down the detail of each RBD, and provide effective transparent management.

The key to RBMP is recognising and monitoring the impact and effects one RBD can have on another.

Administration of RBMP

River Basin Management is a six year cycle of planning and monitoring. The first set of RBMP will be reviewed in 2015, when the EA will assess each RBD and will review the water environment and outline their objectives for future management. It is evident that abstraction licences are a key relevant factor which the EA considers when assessing

each RBD. Due to the scale of RBD, Catchment Abstraction Management Strategies are important to support and supplement the management of each RBD.

Catchment Abstraction Management Strategies (CAMS)

CAMS manage the abstraction of water. In particular they are responsible for time limited licences. CAMS will contribute to the decision as to whether the EA can grant the renewal of time limited licences. CAMS allow for an understanding as to the availability of water resources and aid the production of licensing strategies which are effective at a catchment scale.

Due to the scale of CAMS they provide greater clarity as to the availability of water within any given area. They will indicate areas where over abstraction of water resources is an issue and this is then fed back in for future investigation. By addressing the availability of water resources within CAMS it allows for the sustainable management of RBD and provides clarity as to water stressed or over abstracted catchments.

The EA must balance the need of abstractors with that of the environment. At the commencement of any CAMS the EA identifies and sets minimum requirement levels of flow and groundwater and the volume abstraction within the catchment.

Overview of the Abstraction Licence System

Licence trading

CAMS are vital in identifying locations in which licence trading could be feasible. As a general rule licence trading is usually only carried out within the same catchment.

Licence trading is a difficult concept to grasp and is rare in the UK as opposed to countries like Australia which use water trading and have developed a specific market. In the UK licence trading is used to trade abstraction rights with an existing licence holder, who is likely to have a secure licence.

Time limiting of licences

The EA brought about the time limiting of all new abstraction licences. In some circumstances this also extends to the variation of licences. Time limiting is managed through the CAMS process, the ultimate aim being that there is a common end date to these types of licences. Although the EA issue time limited licences, there is the presumption of renewal. This means that all time limited licences will then be assessed against the criteria of environmental sustainability, continued justification and efficient use. If these requirements are met there is no other legal obligation to meet.

Appendix 4

Example scenarios

Scenario 1: Reservoir

Two identical 500 acre blocks of free draining, light land. One has a 25,000m³ gallon reservoir; the other has no access to water for irrigation.

- *What is the difference in value?*

Scenario 2: House with river frontage

Two identical six bed manor houses set in 100 acres. One has a one mile stretch of river – the other just plain permanent pasture.

- *What is the difference in value (excluding sporting)?*

Scenario 3: Dairy farm with private borehole

Two identical dairy farms. One has private water via a borehole; the other can only source water from the mains.

- *What is the difference in value?*

Scenario 4: EA revocation of abstraction licence cost of claim

An application has been made by the EA for the revocation of an abstraction licence of right. The licensee is claiming compensation.

- *What is the value of this claim?*

Scenario 5: Industrial use

A power station is actively on the market for sale. They have a valid abstraction licence of right for xm³

- *What is the value of this licence?*

Scenario 6: Recreational lake

A 75,000m³ lake set in an area of high landscape value with strong tourism links.

- *What is the value of this resource?*

Appendix 5

Relevant factors

Scenario 1 – Reservoir		
Relevant factor	Regulatory framework**	Physical breakdown
Containment		Stability of construction
		Quality of containment
		Source
		Contamination
Quality		Potability
		On entry and retention
Quantity		Reliability
		Volume
		Vulnerability to impact of climate
		Extendability
Infrastructure		Type of pipe work
		Quality of pipe work
		Age
		Stop
		Taps/valves
		Plans/records
Security		Contamination
		Vandalism
Health & Safety		Exclusion of third parties
		Prevention of accidents
		Signage
		Means of getting out
		Quality of banks/sides
Legal considerations (relating to ownership and occupation)		Third party users' covenants and obligations
		Who has rights
		Obligations
		How much was paid
		Administration
Licensing		Current type
		Maintained or vulnerable
		Local RBMP and CAMS
		Local/national statutory position
Water trading		Ability to trade
Climate change		Consider what the impact of climate change may be
Energy production/potential		e.g. Hydroelectric schemes

Other use – leisure		Fish
		Motor Sport
		Sail
		Paddle

Scenario 2 – House with river frontage		
Relevant factor	Regulatory framework**	Physical breakdown
Physical		Length
		Width
		Shape
		Depth
Surrounding land		Shelter/tree cover
		Land form
		Ability to control
		Quality of surroundings – marriage value
		Added value
Privacy		Public access
		Now/in the future
Security		Contamination
		Public access
		Vandalism
Health and safety		Exclusion of third parties
		Preventing accidents
		Signage
		Means of getting out
		Quality of banks/sides
Marriage value		Value conferred on adjacent property by the use of the water resource
Climate change		Consider what the impact of climate change may be
Energy production/potential		e.g. hydroelectric schemes
Quality of water		Clear
		dirty
		potable
Landscape appraisal		Understanding relative importance
		Control over management
		Designation
Designations		Need to drill down to detail
Other users within catchment		Impact on quality and quantity
Impact of flood		
Surety of course and supply		

Scenario 3 – Dairy farm with private borehole		
Relevant factor	Regulatory framework**	Physical breakdown
Security		Contamination
		Vandalism
Climate change		Consider what the impact of climate change may be
Quality of water		Hygiene standards
		Treatment of water
		Potability
Security		Impact on quality and quantity
		Nature of licence from EA and likelihood of contamination
		Competition from other users
		Other sources of natural supply
Cost of water		Borehole only
		Mains only
		Combination of the above
		Recycling unit
Revocation of abstraction licence		Understanding of the extent of depreciation
Infrastructure		Type of pipe work
		Quality of pipe work
		Age
		Stop taps/valves
Legal consideration (relating to ownership and occupation)		Third party users covenants and obligations
		Who has rights
		Obligations
		Administration

Scenario 4 – EA revocation of abstraction licence cost of claim		
Relevant factor	Regulatory framework**	Physical breakdown
Security		Impact on quality and quantity
		Nature of licence from EA and likelihood of contamination
		Competition from other users
		Other sources of natural supply
Cost of water		Borehole only
		Mains only
		Combination of the above
		Recycling unit
Revocation of abstraction licence		Understanding of the extent of depreciation
Legal consideration (relating to ownership and occupation)		Third party users covenants and obligations
		Who has rights
		Obligations
		Administration

Scenario 5 – Industrial use		
Relevant factor	Regulatory framework**	Physical breakdown
Security		Impact on quality and quantity
		Nature of licence from EA and likelihood of contamination
		Competition from other users
		Cost of metered supply
		Other sources of natural supply
Climate change		Consider what the impact of climate change may be
Quality of water		Hygiene standards
		Treatment of water
		Potability
Quantity of water		Extendability
		Volume
		Reliability
Revocation of abstraction licence		Understanding the extent of depreciation
Infrastructure		Type of pipe work
		Quality of pipe work
Impact on water course		Catchments area
		Designations

Scenario 6 – Recreational lake		
Relevant factor	Regulatory framework**	Physical breakdown
Physical		Length
		Width
		Shape
		Depth
Surrounding land		Shelter/tree cover
		Land form
		Ability to control
		Quality of surroundings
		added value
Location		Population
		Market demand
		Competition from other sites
Infrastructure		Access to site
		Facilities
		Access to water
Security		Contamination
		Vandalism
Health and safety		Exclusion of third parties
		Preventing accidents
		Signage
		Means of getting out
		Quality of banks/sides

Marriage value		Value conferred on adjacent property by the use of the water
Climate change		Consider what the impact of climate change may be
Energy production/potential		
Planning		
Brand/reputation/goodwill		

**** REGULATORY FRAMEWORK**

Appendix 2 of this paper contains a non exhaustive list of legislation and directives currently in force in the UK. Statutory requirements will form a relevant factor to be considered when reviewing a water resource.

Appendix 6

Assumptions and special assumptions

This Appendix sets out assumptions and special assumptions that may apply to the valuation of water. They are not intended to be exhaustive or exclusive.

Assumptions

‘An assumption is a supposition that is taken to be true. It involves facts, conditions or situations affecting the subject of or approach to, a valuation that it has been agreed and need not be verified by the Valuer as part of the valuation process.’

Examples of categories of assumptions that may be agreed with the clients, dependent upon a particular instruction are:

- title
- licensing
- infrastructure
- quality
- quantity; and
- surety of course and supply.

Special assumptions

An assumption that either:

- requires the valuation to be based on facts that differ materially from those that exist at the date of the valuation; or
- is one that a prospective purchaser (excluding a purchaser with a special interest) could not reasonably be expected to make at the date of valuation, having regard to prevailing market circumstances.

The following examples are of categories of special assumptions, which may be agreed with clients dependent upon a particular instruction:

- future legislation and regulation
- climate change
- the anticipation of a physical change
- security of supply into the future
- future licensing
- charges for regulated water supplies
- brand, reputation and goodwill
- establishment of high volume traded water rights
- future value of energy production
- other use, i.e. leisure
- future marriage value
- future designations
- other users within catchment area; and
- environmental impacts.

Appendix 7

Inspections

This Appendix sets out various factors that may be relevant in an inspection of a water resource and may affect the value of the resource. It is not intended to be exhaustive or exclusive.

- type of water resource, i.e. statutory or natural supply
- utility or environmental
- current use and relevant consents
- location – within the context of a River Basin District and Catchment Abstraction Management Strategy (CAMS) and demand
- situation – within context of surroundings
- other users within catchment
- extent of resource
- containment of resource
- infrastructure
- licensing provisions
- occupation and use by parties other than the client
- surrounding landscape
- designations
- drainage
- boundaries
- dwellings
- irrigation
- access
- amenity/leisure
- contamination
- third party users, covenants and obligations
- security
- health and safety provisions
- energy production/potential, and
- synergistic value.

Appendix 8

An extract from the desktop review

1 The challenge of valuation

Value:

- relative worth, merit, or importance
- monetary or material worth, as in commerce or trade or
- equivalent worth or return in money, material, services.

Value has a number of connotations; it is something that is recognised globally as being of 'worth' either intrinsically or monetarily. Water, as at 2011, is recognised as having intrinsic value, it is something that every living organism requires.

The questions remain in economic terms.

Does water have monetary value?

Is it possible to ascribe value to water?

If so, how do you do it and why would you want to?

1.1 Valuation methodologies

It is logical that current thinking on property valuation should be considered within the context of water.

The valuation methodologies, a summary of which can be found in Appendix 1, include:

- comparable evidence
- investment
- profit
- discounted cashflow
- depreciated replacement cost
- residual.

Valuations may be required for a number of purposes, for example:

- trading
- secured lending

- valuations for financial statements
- valuations for public sector assets for financial supporting.

1.2 Does water have a value?

Water in the UK is something that is largely taken for granted as a nation; on a day to day basis it is something that is simply there at our disposal.

An issue with water is its multifaceted status. To some, because water is an essential part of life, it forms the basis for a human right; it is an adjunct of property ownership, to be abstracted when needed and repelled when in excess. To others, it is a commercial commodity needing to be efficiently and profitably transported from A to B.¹

The prominent question is how to put an economic value on something that to date has not been assessed in terms of pure monetary worth. Water undoubtedly has value, both intrinsically and economically; this should be established through the process of creating a robust valuation approach, which will assist in making informed decisions.

In the scenarios in 1.4 of this review, water has an impact on property value:

- it is something that can be charged for if delivered to a third party
- it can increase or decrease property prices
- it is valuable to the environment.

What we already know is that as individuals we pay for water resources, so it does have an economic value.

1.3 Is it possible to ascribe value to water?

Apportioning a specific monetary charge to water as a separate asset in £ sterling is difficult. Water is of course a product that is charged for; the global market for water supply, sanitation and efficiency is

said to be worth over US \$250 billion, and is likely to grow to \$660 billion by 2020.²

Water is one of the few natural resources to have a market in amenity, utility and leisure uses, with varying charging methods for each sector.

What is evident is, that if an approach could be adopted to value water, then this would provide a universal base, enabling an acceptance of factors in assessing the resource. An argument would be that it is possible to assign value to any resource, as long as a recognised structure is followed to impart an end result.

1.4 *How do you ascribe value?*

Referring again to the scenarios provided in Appendix 4, the question remains, how is value allocated to water resources? In terms of water trading, the price is allocated on a comparable basis.

The value of trade is negotiated according to individual circumstances and appears to be based on³:

- what would the buyer have to pay to obtain water from another source, with the cost of mains water as a bench mark; and
- what is the cost of the licence as it stands?

Agriculturally, there are other comparative measures, including:

- rental values of land with or without water; and
- the price of water as opposed to the rights for water.

One theory is that the value of water rights in a trading scenario should be approximately ten times the value of the water; ascertaining the value of water is an approximate science.

The various valuation approaches will provide a general overview of principles to be adopted in valuing the resource. At the moment, valuation of water resources is being exercised on an 'if it fits' basis, due to the lack of a definitive structure.

In 1998, the EA sought to vary Thames Water's licence to abstract water from the River Kennet at Oxford. The EA argued that the volume of water

abstracted from the Kennet needed to be reduced, and valued the river at £13m.⁴ This was reached applying a cost benefit assessment, which considered the public's willingness to pay for 'use' and 'non use' benefits.

This is an interesting example of a cost benefit approach to valuing water resources. It highlights the necessity for environmental water factors to be able to be valued alongside a private bore hole and raw water.

1.5 *Why is it necessary?*

The above emphasises the need for an adopted valuation approach to cover the complex scale of water resources. At present, there is no particular adhered to approach, meaning the environment for valuation is currently functioning on an ad hoc basis.

As water becomes scarcer and its value increases, valuation will be required for a range of disciplines including, ratings, insurance, lending, accounting, planning and general supply. Viewed at this level, an adopted valuation approach that fully recognises value is imperative.

In context, compared to other valuable natural resources, such as oil, it is astonishing that in the modern day, water is not largely viewed as having fiscal value, aside from any inherent worth.

A valuation approach is necessary on a number of levels:

- Environmentally: It will highlight how much an ecosystem contributes to economic activity or society, and it will help us to understand the benefits and costs of an intervention that modifies the ecosystem, making them service comparable with other investments.
- Socially: Knowledge is key; a campaign of marketing the valuation process amongst industry specialists will allow for a wider understanding of the diversity of the economic value water can embrace.
- Economically: To be able to ascribe monetary value to water has the potential to engage new markets; support trading, and provide an

investment structure. If an acceptable approach could be produced then lenders and banks could start lending against water resources.

The above examples are currently being exercised in 'developed' water resource countries. The UK now needs to be counted alongside the likes of Australia and the US in providing a lead on water valuation.

2 Conclusion

The heading of the Phase 1 desktop review was 'a review of the current approach to value water.' As part of this process, UK initiatives on water resources; the Australian approach to water management, how this is being adapted, and the concept of value have all been reviewed.

(See full Desktop Review which is a separate document).

What is apparent is that there is no one universal approach to water management and value. Water value is accepted as a topic which is difficult to comprehend. The question remains, how do you apportion value to something that to date has not been viewed as having monetary worth?

The solution to this is that all aspects of the desktop review must be analysed with expert input on the UK legal framework for abstraction. Through this process, we will be able to produce and adopt a valuation methodology that has the ability to value water at various levels for differing concepts.

A process of fact gathering on agreed relevant factors, and then applying a universal valuation approach, would be logical. Before a decision is made on relative contributory elements to be considered as part of the valuation process, and this is applied in a structured format, it will be difficult to ascribe value.

In practice, once a recognised approach is adopted it has the potential to revolutionise the way water is perceived globally. The value of water is only going to increase. Uncertainty as to future supply and environmental issues means that water will become an expensive necessity.

The past two years have seen a surge of reviews and appraisals of the current water resource framework in England and Wales. All regulatory authorities have had involvement at some level;

either in consultation as part of PR09 or in preparation of their own reports on the outlook for water.

There is acceptance that the current infrastructure in place in England and Wales is not flexible enough to adapt to impending changes in supply. Change is needed to enter into a new era of water management and supply; the valuation of water could be critical in creating a transparent system.

The approach taken by water scarce nations is something that had to be reviewed as part of the Phase 1 approach. It is apparent that Australia particularly has advanced systems in place to trade and allocate water resources. The UK undoubtedly has lessons to learn from their experiences of addressing water shortages and creating a workable solution.

Until foundations are set which support the key issues facing water resources, and there is a recognised valuation approach to provide an economic structure and stability, water will not be fully recognised by the public or collectively acknowledged by all industry regulators as something of fiscal worth.

In conclusion, there is an interesting point to consider:

What is economic value?

A commodity has an economic value when people are willing to pay for it, rather than go without it. Water is an essential commodity, so the value of a small or basic amount for survival is infinite; people would pay any price. This does not, however, make it an easy process for policymakers.⁵

After basic needs are met, people buy water based on its price compared to other goods they might buy. Water's value is the willingness to pay for water; it is observed when people make a choice between different products, i.e.⁶

- How much will a household pay for drinking water?
- How much will a farmer pay for irrigation?
- How much will a factory pay for clean water?

Attachment 1 of desktop review

Current valuation approach

Comparable

This is usually the preferred means of finding value, and is based upon the assumption that if one person is willing to pay a figure for a property, a similar property should logically be worth a similar sum.

This method relies upon there being a stable, active market to provide comparable evidence. The Valuer will take into account the presence of special purchasers, as well as any differences between the comparables and the subject property. Thus, a thorough knowledge of the appropriate market is essential, and indeed a requirement of the RICS Red Book.⁷ Comparable transactions should be of a similar date, relate to the same type of property, and usually be in the same locality as the subject property; thus in a market with limited transactions, this method becomes difficult to rely upon.

Investment

This is also known as the 'All Risks Yield' technique. As one of the approaches based on income capitalisation, this method is used to value the freehold of rented property; it regards the property as an investment, with the rent as interest payable. It may be used in isolation where property is likely to be let far into the future, or alongside a different technique such as the comparable method, used to value the reversionary interest when the freeholder regains vacant possession at a known point in the future.

Like the comparable method, evidence from similar transactions is important in investment valuations. Valuers must establish what proportion of freehold value is represented by the rental payments passing for comparable properties then apply this 'yield' to the rent of the subject property. The valuer's skill is in the selection of comparables, and identification of the most appropriate yield to apply. The lease terms and risk associated with the tenancy should be considered, alongside other matters like location, which are commonly included in the selection of comparables.

One criticism that may be made of this approach is that the selection of the yield and resultant YP⁸ is somewhat subjective, with adjustments made to this figure to reflect likely rental growth; differences between comparables, and the subject property, etc.⁹ Thus, it may sometimes be compared unfavourably with the more sophisticated Discounted Cashflow method.

Income approach

Also based on income capitalisation, this is used where a property's value is entirely attributable to the business carrying on within it. For example, filling stations, pubs and hotels are commonly valued in this way. To gain an accurate impression of the strength of the business, the accounts from at least the last three years should be analysed by the Valuer. The stability, or lack of it, that this suggests, may then be used to indicate the multiplier applied by the valuer to the net profit, with a low risk business being given a higher multiplier than a less secure entity.

Valuers must consider the proportion of the net profit which may be ascribed to 'goodwill', as opposed to the supposedly more secure 'rental' portion. The valuer's view as to the security of these income streams will then determine the YP they apply to the sum. Clearly, the selection of this multiplier is of critical importance to the end value; it is in the choice of this factor that the experience of the valuer comes into play.¹⁰

Valuations using this approach are based on the assumption that the activity carried out on the property will continue. However, this should not cause valuers to disregard possible alternatives where they are appropriate.¹¹

Discounted Cash Flow (DCF)

DCF is used to assess the worth of an asset to a particular investor. The technique is based on the appraisal of a series of projected cashflows over a period of years. Cashflows may be structured to

take account of the most likely market conditions, as well as rent reviews, projected development costs, and sale prices.

A DCF appraisal is capable of indicating three things:

the internal rate of return (IRR) or yield that the owner of the asset could expect to receive on their investment;

the Gross Present Value of the future cashflows that may be expected to arise from the investment; and

the Net Present Value to the investor, which equals the Gross Present Value with the initial purchase price also taken into account.

DCF techniques are often used as a means of assessing the worth to an investor in the context of their required rate of return.¹² Thus, if valuers wish to find Market Value using DCF they must consider the likely market sentiment towards the return that may be required. The advantage of this method is that it avoids some of the subjectivity inherent in the selection of YP in other techniques.

Depreciated Replacement Cost (DRC)

This method may be defined as ‘the current cost of replacing an asset with its modern equivalent asset less deductions for physical deterioration and all relevant forms of obsolescence and optimisation’.¹³

The method is used in the absence of any alternative suitable valuation technique, where the type of property is so rarely traded that there is no market from which to draw comparable evidence. When using the DRC method therefore, the valuer is comparing the subject property with a hypothetical comparable then making an allowance for the relative life expectancies of the two. DRC valuations must be done on the basis that there will be a continued demand for the property in its current use. Furthermore, their use is limited as they are not suitable for valuations for loan security.¹⁴

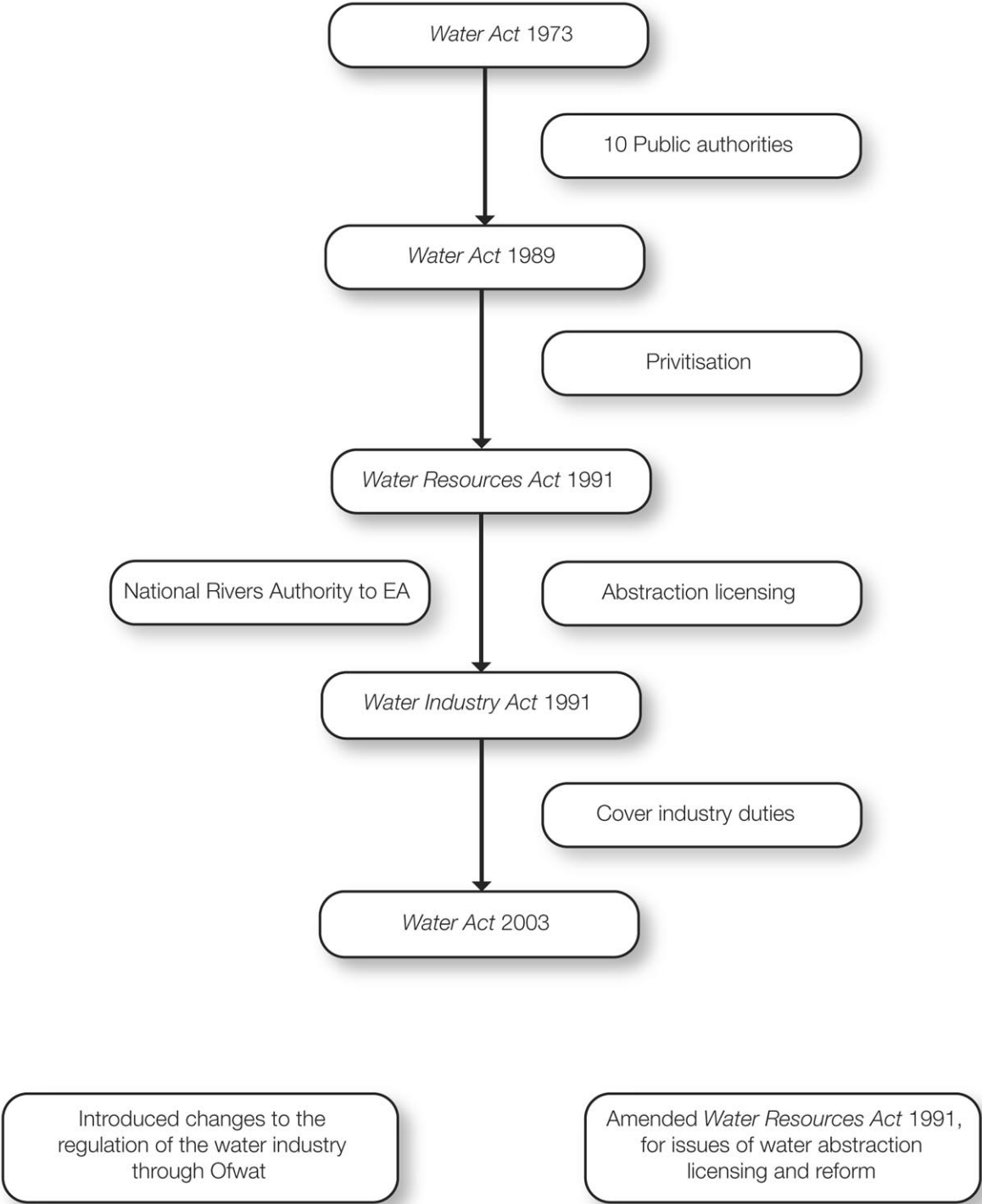
Residual

This technique may be used in the valuation of development sites, though where it is possible to arrive at a value using the comparable method, this means should be used.¹⁵

In this context, the valuer’s knowledge of the market is no less important than in other methods of valuation. Not only must they have a thorough understanding of the likely costs of development, and be able to form an opinion of the profit that will be required by a developer, but they must also keep in mind the site’s potential for alternative uses other than the specific development proposed.

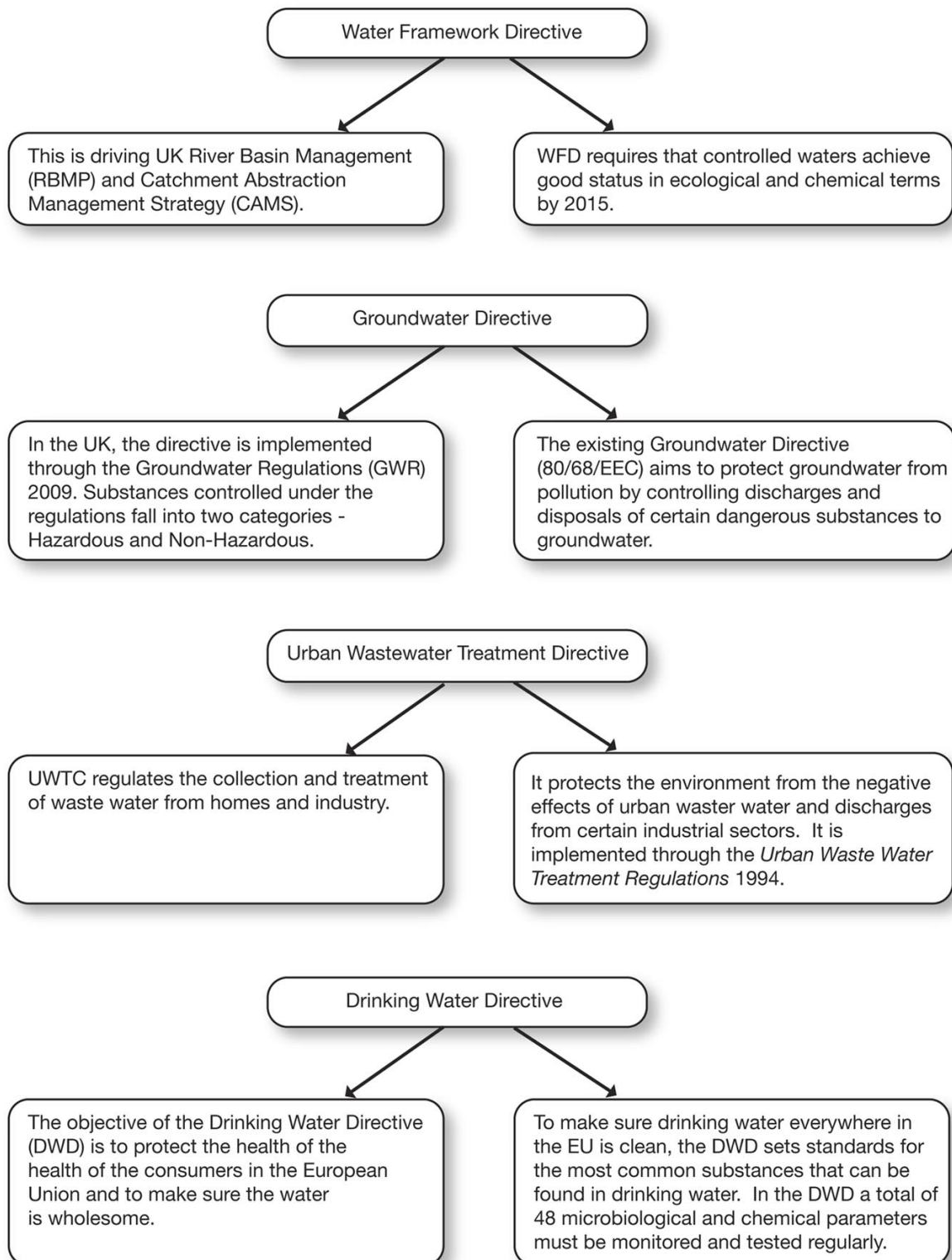
Attachment 2 of desktop review

UK legislation



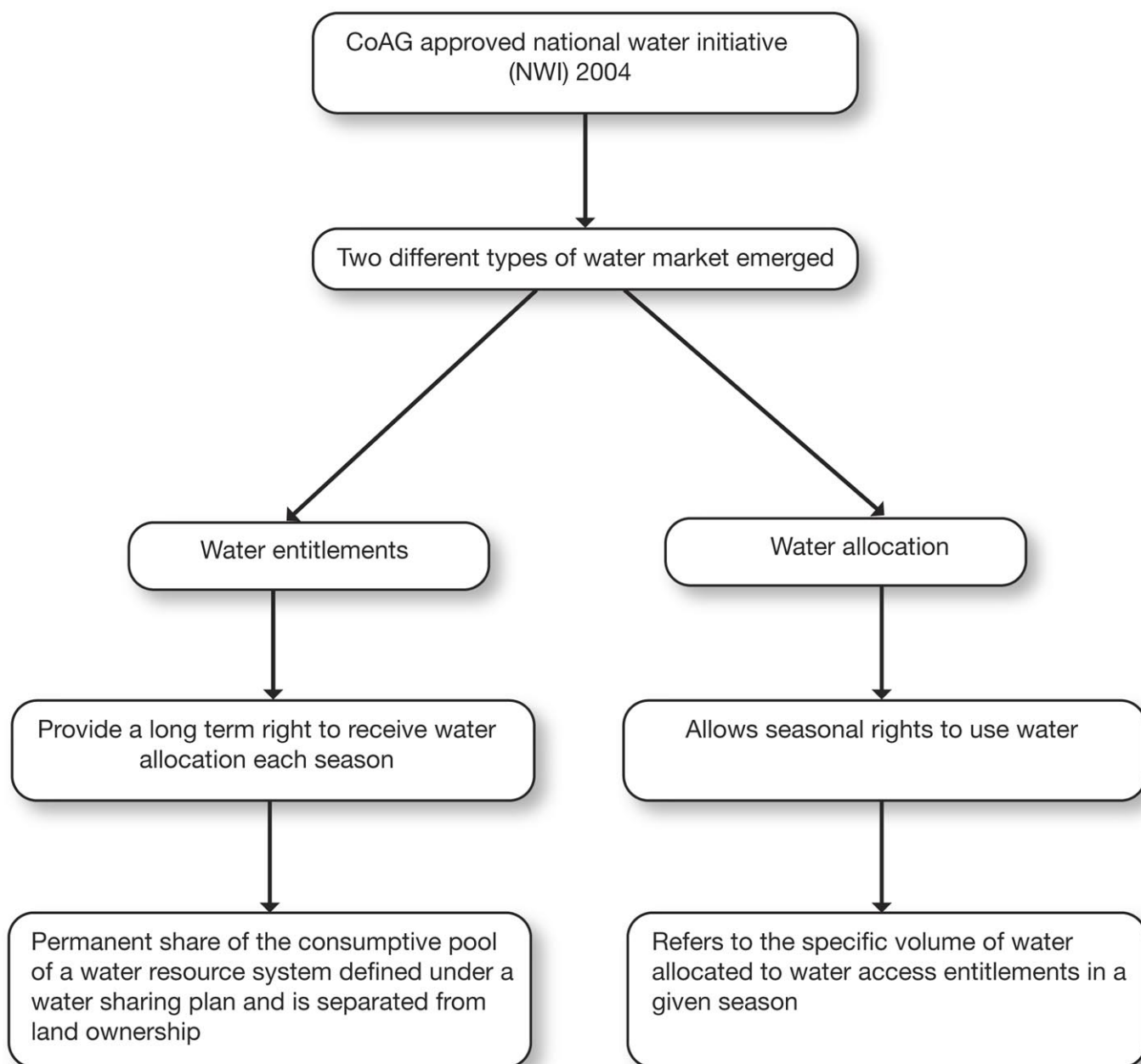
Attachment 3 of desktop review

Key EU Directives



Attachment 4 of desktop review

Australian framework



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