

# Water UK

## Towards Sustainability – Moving Ahead Sustainability Indicators 2001/2002

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# **Water UK**

## **Towards Sustainability – Moving Ahead Sustainability Indicators 2001/2002**

### **Foreword**

This is Water UK's fourth annual report on environmental sustainability. Water UK and its members are committed to monitoring the progress of the water industry towards sustainable development.

This report covers a set of twenty indicators with one new indicator dealing with the recovery and reuse of excavated and construction materials. The industry is tackling the many environmental issues facing it in a variety of ways. Some of them are illustrated in the company specific examples that are listed with every indicator.

As an industry there are many challenges in our quest to become sustainable. Our best endeavours can be thwarted by regulatory drivers, which certainly in the short-term can lead to a greater use of scarce resources as we seek to raise standards. At the same time we are encouraged by the Water Framework Directive which promotes a sustainable approach to water management and by Defra's own water strategy document "Directing the Flow". The 2003 Water Bill places a new duty on our economic regulator Ofwat to have regard to sustainable development. We hope that this will become manifest both in the way that the 2004 periodic review programme is considered in England & Wales and the Quality & Standards 3 programme in Scotland.

Over the past year we have been working with our stakeholders to improve the environmental indicators and also to develop a set of economic and social indicators. In future, these will provide an even more comprehensive picture of how the UK water industry is moving steadily but surely towards sustainability.

*Pamela Taylor*

## Introduction

This is the fourth set of national indicators recording the UK water industry's pursuit of environmental sustainability in the many activities in which it is engaged and covers the reporting year March – April 2001-2002.

The UK water industry is made up of 14 water and sewerage service providers and 13 water suppliers. It is an environmental industry. It collects, treats and then supplies about 18 billion litres per day of high quality water to domestic and commercial customers for a variety of purposes and then collects and treats over 10 million tonnes of the resulting wastewaters, returning them safely to the environment. To do this, the industry:

- Abstracts from approximately 1,585 boreholes, 666 reservoirs and at 600 river abstraction points taking two thirds of its water from surface sources and a third from groundwater
- Operates some 2,500 water treatment works
- Has over 350,000 km of water mains
- Has a further 350,000 km of sewers to collect sewerage
- Operates 9,000 sewage treatment works and discharges the treated effluent back to the environment
- Has over 25,000 intermittent discharges.

Every year the water industry invests around £ 3 billion to improve its water supply and sewerage services.

The industry operates throughout the UK and there are many geographical, geological, climatic and other environmental variations that affect its operations. Regional and structural differences can be very significant although they are not obvious from the national indicators.

The weather continues to be highly variable across the country, without any prolonged dry, hot or cold spells. The summer had average temperatures and rainfalls, though some storms were notably heavy. The winter was very mild but with above average rainfall in some regions.

The period of the report saw restrictions on access to land progressively lifted as the foot and mouth epidemic came to a close.

It would be unrealistic to expect to see substantial improvements in national sustainability indicators every 12 months when the baseline for quality in the products and services that the industry provides is already very high. Indeed the major achievement will often be to maintain the standards already achieved, in the water that is supplied, the wastewater services that are provided and the environment that the water industry helps to protect and conserve. Even so, the industry is committed to chart its progress, setbacks and its achievements too which is, for 2001/2002, the purpose of the report.

Water UK itself has taken several initiatives to promote sustainability over the year. For example it ran, with the Environment Agency, the Water Efficiency Awards 2001 to reward good practice in water conservation and efficiency in agriculture, industry, business, local communities and the public sector. It is seeking to tackle issues like

diffuse pollution by working in partnership with others such as farmers and pesticide manufacturers to encourage best practice.

How the water industry became a pioneer amongst business sectors in measuring its movement towards sustainability, and information on the indicators for 1998/1999, are contained in the report “Towards Environmental Sustainability” which was published by Water UK in May 2000. Further progress reports were given on the Water UK website [www.water.org.uk](http://www.water.org.uk) in June 2001 and March 2002.

## UK Water Industry Environmental Indicators 2001/2002

Subject	Indicator	Result 1998/1999	Result 1999/2000	Result 2000/2001	Result 2001/2002	Towards sustainability? 2001/2002
<b>Water Services</b>						
A1 Water demand and availability	Population with sufficient resources (%)	100	100	100	<b>100</b>	↔
	UK population growth possible with current resources (%)	3.5	3.7	0.9	<b>4.7</b>	↑
A2 Household water demand	Per capita water consumption (litres per head per day)	148.8	148.9	147.4	<b>149.4</b>	↓
A3 Non-household water use	Water efficiency (litres per £GDP)	2.16	1.95	2.0	<b>1.71</b>	↑
A4 Leakage	Total leakage from the network (Megalitres per day)	4275	4420	4,410	<b>4725</b>	↓
A5 Drinking water quality	Tests complying with standards (%)	99.63	99.64	99.72	<b>99.78</b>	↑
A6 Sewer flooding	Properties flooded (%)	0.022	0.029	0.015	<b>0.0185</b>	↓
A7 Intermittent discharges	Discharges in satisfactory condition (%)	78	76	78	<b>81.15</b>	↑
A8 Wastewater treatment works	Population served by works meeting numerical standards (%)	93	96.3	96.3	<b>92.8</b>	↓
<b>Good Environmental Management</b>						
B1 Environmental engagement	BiE Sectoral ranking (%)	88.8	90	90	<b>91</b>	↑
B2 Convictions for public health and environmental offences	Number of category 1 convictions	67	51	62	<b>63</b>	↓
<b>Biodiversity and the Environment</b>						
C1 Species	Priority species with action plans (%)	55	75	52	<b>70</b>	↑
C2 Habitats	Priority habitats with action plans (%)	43	59	59.5	<b>83</b>	↑
C3 River water quality	Rivers in classes A-D (%)	90	90	96.5	<b>95</b>	↔
C4 Bathing water quality	Designated waters achieving mandatory standards (%)	89.1	93.7	94.9	<b>95.4</b>	↑
	Designated waters achieving guideline values (%)	42.8	49.7	49.3	<b>65.5</b>	↑
<b>Energy and Materials</b>						
D1 Energy use at fixed sites	Energy use per Ml water supplied (kWh)	468	553	538	<b>600.5</b>	↓
	Energy used per Ml wastewater treated (kWh)	437	445	454	<b>598.2</b>	↓
D2 Renewable energy at fixed sites	Renewable energy as percentage of total energy used (%)	6.3	5	3.9	<b>4.4</b>	↑
D3 CO <sub>2</sub> emissions at fixed sites	Emissions per head population (tonnes/year)	0.04	0.042	0.0445	<b>0.049</b>	↓
D4 CO <sub>2</sub> emissions from road transport	Emissions per head population (tonnes/year)	0.00175	0.0017	0.00178	<b>0.00173</b>	↔
D5 Sludge management	Sludge recycled/reused (%)	56	55	71	<b>66</b>	↓
D6 Excavated materials	Materials recycled (%)				<b>34</b>	

**Key:** ↑ positive movement, ↔ no discernible change, ↓ negative movement relative to 2000/2001.

## A. Water Services

These indicators show the progress the water industry is making to provide now and for the future water and sanitation services to satisfy customer needs, within standards that protect public health and the environment. The industry needs access to adequate quantities of raw water that it will then treat and deliver to customers efficiently and to a consistently good quality. It collects and treats the used wastewaters to ensure that the environment is properly protected.

Most of the data on water services are collected for regulatory purposes and confidence in them is high.

### Indicator A1: Water demand and availability

*Percentage of population with sufficient resources = 100%*

*Level of population growth across the UK that could be satisfied = 4.7% (at peak demands), 21% (average demands).*

#### Aim

This indicator is designed to show whether water suppliers have access to sufficient water resources to satisfy expected demands in their areas.

#### Results

For the fourth successive year, the water industry was able to fully satisfy customers' demand for water in 2001/2002.

The year was unremarkable in terms of average weather conditions, without prolonged periods of sustained high temperatures, and hence with only weak peaks of supply and demand. Both water availability for water suppliers and customer demand were up over the previous year (3.2% and 3.8% respectively). The overall result is that the level of population growth that could have been accommodated in 2001/2002 was better (4.7% growth potential) at times of peak demand, but slightly down (21% growth potential) under normal demand conditions.

This national statistic hides serious regional and local discrepancies. Some companies in the South and East already have water resource deficits. Indeed, one company was just 76% self-sufficient and others were heading in the same direction. Here, further investment to address water deficiencies and secure adequate resources for current needs and future growth is becoming more urgent. In contrast, in the far North, potential supply was nearly twice demand.

The Office of Water Services (OFWAT) has introduced a security of supply indicator (SoSI) to measure at company level the size of any deficit in headroom in a water resource zone and the proportion of customers exposed to that deficit. Thus a company with no water would have an index of 0 whilst one with sufficient to meet all demands in all zones would rate 100. Companies with less than 100 need to take measures to improve supplies. The SoSI enables water availability and leakage issues to be considered within a security of supply context, providing a more reliable picture of regional variations. Results for 2001/2002 show about half of all companies achieving the maximum, 100, but two companies in the South East have indices of 64 and 65.

The data set applies to over 58 million customers. Confidence, especially for population and total demand figures, is very high.

### **Action**

- In line with other water suppliers, Southern Water updates its Water Resources Plan annually and submits it to the Environment Agency. The plan sets out a strategy for meeting demands for the next 25 years. In the short term, it has identified that investment is needed in Sussex North and Sussex Hastings zones. Investment will also be needed to meet future demands in other zones, and potential schemes have been proposed.
- Implementing options identified for reducing the supply deficit in West Cumbria, United Utilities has revised its operation of Ennerdale Water, increasing the amount of water available for use, and also reinforced the integration of water resources in the supply zone.
- Bournemouth and West Hampshire Water are constructing two new lakes at Longham. These will serve as an emergency source of water in the event of the rivers Stour or Avon becoming contaminated and will provide water at times of summer peak demand. When complete the lakes will also be used for recreational purposes.

## **Indicator A2: Household water use**

*Per capita water consumption = 149.4 litres per head day*

### **Aim**

This is a measure of how successful the water industry is being in encouraging wise use of water by its domestic customers.

### **Results**

The results show a slight increase in per capita consumption over the previous year (147.4 litres/head/day). Unmeasured customers used more water (generally in the range 135 to 181 with an average of 151.9 litres/head/day) than their metered counterparts (in the range 121 to 177, average 135.5 litres/head/day). In some areas the difference between measured and unmeasured was as high as 35 litres/head/day. Savings from conservation measures - such as the use of water butts - range from 0 to 0.48 litres/head/day.

The data set applies to over 58 million customers. Confidence in the consumption figures, particularly for measured customers that make up 15% of the total, is very high – but moderate for savings from conservation measures.

### **Actions**

- Bristol Water distributed its ‘Watertalk’ magazine to all customers, with strong promotion for water efficiency
- Domestic consumption monitors used by Portsmouth Water confirm that the rising trend for home occupancy by single householders leads to a rise in per capita consumption. This is a social trend likely only to be influenced by smaller or more efficient washing machines and dishwashers and low-volume toilets.
- Yorkshire Water has established successful partnerships with 2 Councils to deliver economic water audits of council estates; plus partnerships with companies providing service contract support to councils.
- Wokingham District Council has joined forces with South East Water, encouraging residents to go green with free home composters and water butt kits available on a 60-day trial basis.
- Three Valleys Water have a range of information and advice programmes, such as using low water-using appliances and planting gardens with drought tolerant species. In its education centre it has fitted dual low flush toilets and is monitoring water consumption so it can show the difference in use between these and the toilets in other offices. It has taken a ‘gardens’ roadshow out and about, demonstrating patio planters that only need watering once a week.
- South Staffordshire Water promotes water efficiency in a number of ways including
  - Making leaflets available to provide advice on water efficiency in the home, garden and business
  - Making tailored water self-audits available for home and business customers.

## **Indicator A3: Non-household water use**

*Water used per £ of GDP = 1.71 litres*

### **Aim**

Water suppliers have a duty to promote the efficient use of water with all its customers. This indicator is a measure of the progress being made by the trade and industry sector.

### **Results**

Overall water supply to non-domestic customers, at 468 MI/day, was about the same as in the previous year, although there were regional variations and earlier data were less reliable. The increase in the GDP without a commensurate increase in water supply reflects the further water saving measures that trade and industry introduced.

Improvements to the amount of data collected and their accuracy over the 4 years that they have been requested have enabled the results for earlier years to be revisited and more reliable indicator values to be established. These are included in the summary tables.

The GDP for the UK for 2001/2002 was £997, 654 million.

GDP is only a partial measure of industrial production (process industry contributes about a quarter of GDP) and varies regionally.

There was a complete and more accurate set of data on water supply than in previous years. The national GDP is an HM Treasury figure. Confidence in the indicator is now high.

### **Action**

- The water industry has developed a website for schools to promote water conservation measures [www.waterintheschool.co.uk](http://www.waterintheschool.co.uk)
- East of Scotland Water has a framework agreement with BAA to identify environmental impacts and where efficiencies can be made for both water and wastewater activities within Edinburgh, Glasgow and Aberdeen airports. This has already brought considerable savings.
- Bristol Water runs water regulations awareness seminars as well as a water audit and leak detection service offered free of charge
- Portsmouth Water's office water efficiency study has shown that the Government target of 7.7M<sup>3</sup>/person/year is achievable in a conventional office building. Passive infra red urinal controllers offer the greatest savings and have a pay back period of only four months. Save-a-Flush bags in toilet cisterns are also effective and have a pay back period of about three months.
- Working together with Kodak Polychrome Graphics, Yorkshire Water achieved significant water and effluent savings at their Morley site – and savings of over 30% on the annual water and wastewater bill. The joint project team closely examined all aspects of the production processes and made a full review of water consumption and effluent disposal routes on site. A wide range of opportunities for water reduction, re-circulation and general water management improvements were identified.

- Three Valleys' schools water audit programme takes a whole school approach to managing water so that head teachers can identify priorities for investment and children can learn how to be water wise. Once a school has indicated it would like help, a profile of its water use is produced from previous meter readings, and audited. A day of special activities is arranged, and the children then recommend to the head teacher steps the school can take to use water wisely. Savings of 5 – 30% on the water bill have been achieved.
- Tendring Hundred gives all commercial customers an annual customer booklet with details on how to conduct a self-audit and keeps a close relationship with large users. During the year a total of 161 visits were made to commercial premises to inspect water byelaw/regulation compliance. At each visit water efficiency was discussed. If water consumption unexpectedly increases, users are told and advice is offered, free of charge. If appropriate, leakage detection work is carried out. The company has installed loggers on the ten largest users, which provide daily information on consumption patterns. This provides early indication of suspected leakage.
- Thames Water has continued to develop its programme to promote water efficiency to its non-domestic customers. Activities this year included water efficiency audits at several key sites, including Claridges Hotel and city finance houses.

## **Indicator A4: Leakage**

*Total leakage from the water network = 4,725 MI/day*

### **Aim**

This indicator will show the progress water suppliers are making to address leakage from their distribution networks

### **Results**

Over 18,400 MI/day were put into supply in the United Kingdom during 2001/2002, with unaccountable water attributed to leakage at 4,725 MI/day. This is an increase nationally in leakage from previous years.

In some regions exceptional cycles of dry and wet weather in the winter, followed by cycles of freezing and thaw led to a four-fold increase in burst mains during January and caused leakage levels to hit an annual peak.

A few companies have changed their reporting methodologies to bring them into line with industry best practice. These adjustments have resulted in increasing their leakage results.

However, the overall increase in leakage has been limited, reflecting the considerable effort made by the water industry over the last 4 years in leakage control.

Where OFWAT has set a mandatory target for leakage, all but 2 companies achieved it – but the success margin was without exception very small, perhaps showing that the economic level of leakage is now being reached.

The figures to make up the indicator are provided to the Economic Regulator in England and Wales. They are also reliable for the rest of the UK. Confidence in the indicator, which relates to over 58 million customers in the UK, is high.

### **Action**

- Yorkshire Water's ongoing leakage control activities include:
  - Night monitoring and analysis to identify hidden leaks
  - Identifying and designing further pressure reduction and/or mains replacement schemes
  - Continuing a programme of tests to assess leakage at service reservoirs
  - Regular management reporting of service reservoir overflow alarms to assess losses.
  - Installations of bulk flow meters to assist in trunk main leakage assessment.
- Bristol Water offers a free 'leakstop' service for first time leak repair for domestic customers
- Investment in state of the art acoustic leakage detection technology and manpower, helped South East Water reduce its leakage by 10 million litres of water per day

## **Indicator A5: Drinking Water Quality**

*Water tests complying with Drinking Water standards = 99.78 %*

### **Aim**

Regulations require that drinking water supplied must be wholesome and comply with standards for more than 50 parameters that ensure the water is safe to drink and aesthetically acceptable. This indicator shows how successful water suppliers are in meeting the required standards and maintaining high levels of quality for its customers.

### **Results**

Water suppliers continue to supply very high quality water to all its customers, with even better performance during 2001.

Over 3 million drinking water tests were taken at water treatment works, service reservoirs and customer taps. Very few failed and none of these failures posed a risk to public health.

Results are well recorded and reported for all UK customers so confidence in the indicator is very high.

### **Action**

- Thames Water has continued its campaign to control pesticides at source through positive dialogue with pesticide users within the Thames catchment. As a result many users have modified their practices to protect water resources.
- East of Scotland Water and West Lothian Council have worked together to cut the level of lead in council tenants' drinking water to ensure it complies with the 2013 standard, 10 years ahead of time. A strategic, systematic lead pipe replacement programme was undertaken, which saw 1000 lead pipes replaced at the end of 2002.
- South East Water typifies all water suppliers by making significant investment in improving its water mains distribution system to ensure that the highest standards are maintained. Water quality is monitored at every stage of the treatment process, right from the raw water, through to the water at the tap 365 days a year.
- Dwr Cymru Welsh Water completed £400,000 of investment work at Elan water treatment works. The project, involved the upgrading and refurbishment of several areas of the works to ensure the continuity of supply and continued excellent water quality to customers in Rhayader and Builth Wells as well as part of the Wye Valley.

## **Indicator A6: Sewer Flooding**

*Percentage of properties flooded from sewer incidents = 0.0185*

### **Aim**

Although it is a relatively rare occurrence, during heavy rain the sewerage network can be overloaded and flooding of properties sometimes occurs. Construction work may also result in flooding of properties. This indicator shows the effort the water industry is making to reduce flooding from the sewerage network as far as reasonably practicable.

### **Results**

There are some 26 million properties connected to the sewerage network in the UK. Less than 5,000 properties suffered internal flooding from the network in 2001/2002, slightly more than in the previous year. There was also an increase in the number of properties at risk of flooding more than twice in 10 years, to just over 13,000. Overall the risk of flooding from sewers remains very small and, where it does exist, work is continually undertaken to reduce the risk.

Confidence in the indicator is high with data from all of the UK.

### **Action**

- United Utilities has undertaken the following initiatives in 2001-02:
  - CCTV surveys after every internal flooding incident to establish the cause of the blockage or collapse responsible for the flooding;
  - A major regional cleaning and root cutting programme;
  - Proactive repairs to non-critical sewers throughout the region's 'hot spot' areas to prevent future collapses and remove the defects that cause blockages;
  - Introduction of a code of practice procedure to ensure consistency across all Network Operators in the categorisation of flooding incidents and their assignment to the flooding register; and
  - Collection of information on the locations of cellars to assist in targeting future investment.
- East of Scotland Water is a key partner in the South East Wedge Project. The group was developed to ensure that the environmental potential of this major housing development is maximised through integrating urban drainage, natural habitat, amenity and access considerations. This unique partnership, taking a holistic approach to creating new settlements, will set standards for future developments of this kind.
- Severn Trent Water is improving its drainage and sewer systems in parts of Nottingham, tackling the sewer flooding problems the area has experienced at times of storms and heavy downpours. The work includes installing a storage tank and upgrading existing sewers.

## **Indicator A7: Intermittent Discharges**

*Percentage of intermittent discharges in satisfactory condition = 81.15*

### **Aim**

This indicator marks the progress the water industry is making to bring intermittent discharges from the sewerage system, notably combined sewer overflows, up to a consistently high standard and to maintain them properly.

### **Results**

The percentage of intermittent discharges in satisfactory condition continues to improve, to 81% in 2001/2002 compared with 78% the previous year. This reflects the considerable investment programme that the industry is putting in place.

The number of intermittent discharge units, totalling over 26,000, is well established. The Environment Agencies determine which intermittent discharge units are unsatisfactory and information about their number is readily available in the industry. Confidence in the indicator is therefore high.

### **Action**

- The aim of the Figgate Burn Project is to improve the bacterial water quality of the burn and ensure that the bathing waters achieve guideline quality. It is a partnership between East of Scotland Water and the Scottish Environment Protection Agency identifying sources of contamination and resolving them, for example by reducing flows from combined sewer overflows (CSOs) and removing cross connections. One CSO was upgraded to reduce spilling frequency from 70 to fewer than 3 spills per bathing season.
- Northumbrian Water completed capital schemes to improve 45 unsatisfactory CSOs during 2001/2002, in advance of the programme that the Environment Agency set out.

## **Indicator A8: Wastewater treatment works**

*UK population served by a wastewater treatment works compliant with numerical quality standards = 92.8 %*

### **Aim**

This indicator is intended to show how successful the water industry is in meeting the standards that the Environment Agencies set for effluents discharged from wastewater treatment works to the environment.

### **Results**

Wastewater treatment works that fully comply with stringent numerical discharge conditions served 92.8 % of the UK population in 2001/2002. This is lower than last year (96.3%) but is still a high percentage of customers that benefit from water industry's substantial capital investment and operating programme.

The indicator is heavily affected if any one large wastewater treatment plant deviates from compliance standards even for a short period. For example, one operator reported a compliance rate of less than 50% and two others 81% and 86%. This reduced the national average which would otherwise have been comparable with last year's figure. The operators concerned have taken management and operational steps to reduce the risk of future non-compliance.

Population figures served by treatment works and compliance statistics are reasonably accurate and confidence in the result is high.

### **Action**

- East of Scotland's Minor Works programme has delivered 112 individual packages of work, reducing the risk of failure at 51 treatment plants serving 300,000. A further 125,000 are benefiting from improved odour control.
- Yorkshire Water has won the Yorkshire Association of the Institute of Civil Engineers' top award for a new £32 million waste water treatment works constructed in Whitby, North Yorkshire. The new works includes ultra violet disinfection and enables performance far beyond the requirements of EU and UK legislation.
- Thames Water is investing £80m to build a new sewage treatment works in Reading, designed to achieve high effluent standards and minimise odour generation. As part of the development process, assessments undertaken include impacts arising from remediation of historic contamination at the new site, decommissioning of the existing sewage treatment works, and preparation of the old site for future use.

## **B. Good Environmental Management**

All the industry's core businesses affect the environment, from abstracting water for drinking water supply to discharging treated waste waters to the environment; from siting of works to the disposal of wastes. The industry recognises that it must take environmental factors into consideration in all its decisions and actions, that it must seek to manage the environment in a sustainable way and that it must inform and promote amongst its many stakeholders the concept of environmental care. This group of indicators is intended to demonstrate over time the industry's corporate environmental commitment.

### **Indicator B1: Environmental Engagement**

*Water industry ranking for Business in the Environment Survey = 91%*

#### **Aim**

This indicator shows how the water industry scores in good environmental management in comparison with other major businesses.

#### **Results**

The water industry has maintained its position as a leading sector in responsible environmental management.

The Business in the Environment survey covers companies in the FTSE 350, including large single-function and multi-utility companies. The indicator is not sufficiently robust to provide a reliable numeric value specifically for the UK water industry with its many different operational structures and sizes. It is an average ranking for the relatively few water companies included in the FTSE 350 and needs further development.

#### **Action**

- For the second year running Severn Trent has been named as the top utility worldwide in the Dow Jones Sustainability Index. It has established an environmental and corporate social responsibility advisory committee, integrating environmental concerns at a strategic level.
- South East Water has been awarded ISO 14001 for a large water treatment works in Sussex. To achieve this, it needed to demonstrate to external auditors that it has a comprehensive environmental management system in place, together with strategies for continuous environmental improvement.
- Thames Water has ISO 14001 in place at a water treatment works, a waste water treatment works, its two sludge-powered generators, its Engineering department and also its Reading sewage treatment works construction project. It is working to achieve ISO 14001 across Operations.

## **Indicator B2: Convictions for public health and environmental offences**

*Total number of convictions in the regulated businesses = 63*

### **Aim**

This indicator charts the water industry's record on convictions for offences under the extensive range of public health and environmental legislation that regulates its many activities. The regulators always bring prosecutions for the most serious Category 1 pollution incidents and often for breaches of the conditions and quality standards set out in various licences.

### **Results**

The number of convictions for serious incidents or breaches of legal standards and conditions has remained low, 63 during 2001, for a large nation-wide industry most of whose activities are environmentally related. Over 85% of convictions were sewage-related with the average fine per incident around £6,000.

Data are public and confidence in them is high.

### **Action**

Regulatory bodies enforce strict liability on the UK water industry for incidents with potential to pollute, irrespective of whether third-party actions cause an event. It is not always possible to predict events that operators may be held liable for, only to respond rapidly and learn as much as possible from investigations. However, the industry is continually improving its system of reporting, responding to and investigating incidents and events.

- As part of the delivery of effective risk management, Southern Water has established field event co-ordinators, on-call 24 hours a day for attendance at all operational incidents, including potential pollution incident events. These field event co-ordinators are supported by on-call environmental specialists ensuring appropriate advice is on-site rapidly in the event of an incident with potential to impact upon environmental resources. Combined with its incidents and events reporting system, publishing mapped data monthly via the company intranet, evaluation of information gathered through this response service feeds back into Southern Water's management control mechanisms.
- United Utilities has introduced a new programme "Compliance Bluelight" to reduce the risk of compliance failure. It provides a 24-hour hot line to a team who co-ordinate fast track responses to urgent problems. Callers receive the highest priority, immediate support and back-up to solve their problems or implement a temporary solution

## C. Biodiversity and the Environment

The industry operates throughout the UK at many different locations, some urban, others rural. It owns land and accesses water resources. Its operations affect land and water owned or managed by others. This group of indicators looks at how the water industry is contributing to efforts to protect and enhance the local environment and its potential for supporting a diverse range of habitats and species.

For several of these indicators, the water industry makes a contribution but is not the only (and sometimes not the major) contributor.

### Indicator C1: Species

*Priority species identified on water operators' properties with biodiversity action plans (BAPs) = 70 %*

#### Aim

The indicator shows the commitment of the water industry to play a full part in the protection and promotion of species that are considered nationally to require protection as a priority.

Several of the same types of species may be found on different water operators' properties; species of the same type are counted separately to produce the national indicator.

#### Results

There is a further increase from last year (52 to 70 %) in the percentage of priority species that are found on water industry land or associated with its activities and which are being carefully managed through BAPs. Some 40% of these BAPs are established by the water companies, in partnership with conservation bodies.

The indicator is derived from a 70% response. Confidence is medium.

#### Action

- Although Cambridge Water draws its water from boreholes, it owns small parcels of open land. The Fowlmere site (3 hectares) is a Site of Special Scientific Interest that the Royal Society for the Protection of Birds manages under an agreement with, and some funding support from, the company. Turtledove, bullfinch, corn bunting, water vole and freshwater white-clawed crayfish are found on the company's land.
- In the wake of the foot and mouth crisis, United Utilities is helping to develop a model of sustainable upland farming on its catchments, to protect water quality and local wildlife. As part of this model, the company has drawn up a management plan with the Royal Society for the Protection of Birds and the tenant for its demonstration farm at Haweswater.
- Three Valleys Water has identified some non-operational land as providing excellent habitats for barn owls that are considered to be very rare, especially inside the M25 area. Work with the Hawk and Owl Trust has resulted in a

number of owl boxes being added to sites. This year the breeding has been particularly successful with approximately 20 young reared.

## **Indicator C2: Habitats**

*Priority habitats identified on water operators' holdings with biodiversity action plans (BAPs) = 83 %*

### **Aim**

The indicator shows the commitment of the water industry to play a full part in the protection and promotion of habitats that are considered nationally to require protection as a priority.

Several of the same types of habitat may be found on different water operators' properties; habitats of the same type are counted separately to produce the national indicator

### **Results**

There is a further increase from last year (59.5 to 83%) in the percentage of priority habitats that are found on water industry land or affected by its activities and which are being carefully managed through BAPs. Some 30% of the BAPs are company established, in partnership with conservation bodies.

The response rate was about 85%. Confidence is medium/high.

### **Action**

- As part of its native woodlands project, West of Scotland Water has planted 70,000 broadleaved trees at Loch Katrine. The seeds were collected in the autumn and grown in a nursery to ensure a genetically pure base of saplings.
- Mid Kent Water owns approximately 100 acres of land surrounding its pumping station at Thurnham, 80 acres of which is woodland. There are many rare species found within these Longham Woods, including dormice, heath spotted orchids, lady orchids, wild strawberries, as well as heath and brown fritillary butterflies. The company is working with the Forestry Commission and Kent Trust for Nature Conservation, to manage the woods for conservation. This includes re-coppicing to provide a varied age structure and the conditions for the rare hazel dormouse and heath fritillary butterfly to multiply.
- 20% of Folkestone and Dover Water's daily water supply comes from the unique Dungeness shingle headland. Dungeness has the largest mixed sea bird colony in Southern England and provides habitat for, amongst others, great crested newts and medicinal leeches. The company helps to promote the importance and fragility of the Dungeness environment in many ways, including use of a customised vehicle to prevent damage when collecting raw water samples.
- Tendring Hundred helped construct a new Millennium Green and environmental pond at Little Clacton. It supplied the machinery and manpower to dig the 6-metre diameter pond and connect it to the mains water network (for topping-up as appropriate). The company is stocking the pond with plants and creatures taken from its own environmental centre in Manningtree. The earth extracted when digging the pond will be used to create

an insect/reptile mound to encourage animals such as lizards, bumble bees and slow worms.

## **Indicator C3: River Water Quality**

*Rivers in classes A-D = 95 %*

### **Aim**

This indicator provides a guide to how effectively the water industry manages and treats wastewaters and storm waters to ensure the receiving river water quality is protected and improved. The water industry is a major discharger, but by no means the only one, to inland waters.

The Environment Agency classifies stretches of river into 6 bands, A-F, with classes A-D ranging from very good to fair.

### **Results**

Previous years have recorded river quality just in England and Wales. This year the indicator has been extended to all of the UK.

95% of rivers in the UK are of good or fair chemical and biological quality. This is near to the quality reported last time. Rivers and canals affected by the water industry's operations remain of consistent high standard.

Results are based on surveys carried out periodically by the Environment Agencies. Access to river sites was limited during the year due to foot and mouth restrictions so sampling frequency in affected areas was reduced. Further, the classification system adopted in Scotland is different from the rest of the UK so that, though confidence in the data are high, pulling them together for the UK leads to an estimated indicator value.

### **Action**

- The Manchester Ship Canal oxygenation project, supported by United Utilities, was officially launched in June 2001. Up to 30 tonnes of oxygen a day are pumped into the canal in Salford Quays area to provide the conditions for fish to thrive and to remove the possibility of odours.

## **Indicator C4: Bathing water quality**

*Designated bathing waters achieving mandatory standards* = 95.4 %

*Designated bathing waters achieving guideline values* = 65.5 %

### **Aim**

This indicator is a measure of how the investments being made by the industry are helping to improve bathing water quality throughout the UK.

### **Results**

526 of the 552 designated coastal bathing waters and all 11 inland bathing waters in the UK complied with the mandatory standards of the Bathing Waters Directive 76/160/EEC during the 2001 bathing season, giving an overall success rate of 95.4%. This was better than last year (94.9%). The tighter guideline standards were achieved by 65.5 % (369) of bathing waters in the UK, a substantial improvement from previous years.

Designated bathing waters continue to improve in the UK, in large part due to the investments made by the UK water industry whose discharges contribute to water quality. However, further progress will be limited unless efforts are made to tackle other contributors such as private discharges and diffuse pollution.

Data are published by the Environment Agencies and confidence in them is high.

### **Action**

- The water industry continues to support the National Bag It & Bin It Campaign. This aims to prevent sewage related debris from littering British beaches and riverbanks by educating people not to flush disposable products down the toilet - urging them instead to Bag It & Bin It.
- A new pumping station was installed at Cramond, on the Edinburgh coastline resulted in dramatic improvements to the bathing water quality along this beach. East of Scotland Water led a project group to erect signs at specific beaches in order to give visitors a clearer idea of the responsibilities of different organisations involved in the cleaning of beaches. The signs give weekly updates on bathing water quality and information about new and upgraded treatment facilities.
- Wales' largest ongoing civil engineering project, Cardiff's £ 180 million wastewater treatment plant, became fully operational by the spring of 2002. The Dwr Cymru works treat wastewater from homes and industry, serving the equivalent of almost a million people in Cardiff and South East Wales. It is one of the largest treatment works of its kind in Europe, providing full treatment to the sewage before discharging clean effluent into the sea via a five-kilometre outfall. The project is the final stage of Dwr Cymru's South East Wales coastal strategy as part of the Green Seas campaign. The latest technology ensures that wastewater is treated faster and more efficiently than at other such works.

## **D. Energy and Materials**

This group of indicators focuses on the energy and materials that the water industry needs to run its businesses. The indicators seek to measure how efficient the industry is in using energy and materials, thus limiting impacts on the environment from their production, supply and use. They also seek to show the degree to which the industry recycles, recovers or reuses the main by-products of its activities.

### **Indicator D1: Energy use at fixed sites**

*Energy used per Ml of water supplied = 600.5 kWh*

*Energy used per Ml of sewage treated = 598.2 kWh*

#### **Aim**

This indicator attempts to record the efforts the water industry is making to increase efficiency in energy use at fixed installations (treatment works, pumping stations etc) against an increasing demand for higher levels of water and wastewater treatment.

#### **Results**

As further treatment and distribution/collection networks are introduced to meet increasingly more stringent statutory requirements, the use of energy to treat and supply water and to collect and treat sewage increases. This is witnessed in the higher consumption of energy for both services this year. Measures adopted to reduce energy use have not been able to compensate.

Recording and reporting of energy use at fixed sites continues to improve. The indicator covers about 92% of the UK population. Confidence in the results is good.

#### **Action**

- Typical of the water industry's approach to improving energy efficiency, West of Scotland Water energy advisors have carried out energy audits, measured pump efficiency, evaluated pumping regimes, reviewed tariffs and routinely monitored energy consumption at its main operating sites.
- Folkestone and Dover Water has promoted energy reduction within its own offices, for example by using energy-saving computers and new efficient boilers.
- Northumbrian Water has developed an energy strategy with 6 interrelated themes: renewable energy and combined heat and power, operational energy use management, energy efficiency, staff energy awareness, energy generation and trading and financial audits.

## **Indicator D2: Renewable energy at fixed sites**

*Renewable energy used as % of total energy = 4.4 %*

### **Aim**

This indicator is intended to show the extent to which the water industry makes use of renewable sources of energy, including those generated internally.

### **Results**

The water industry continues to look for ways of increasing its use of renewable sources of energy. Its success is shown by the increase in the ratio of renewable energy, up to 4.4% from 3.9% in the previous year.

Information on renewable components of energy use is now reasonably well reported (90% response) across the water industry. Confidence in the indicator is growing to medium/high.

### **Action**

- At present Northern Ireland Water Service produces 5.6 GWh of "Green Electricity" per annum at several locations throughout Northern Ireland using a variety of generation processes. Two combined heat and power (CHP) plants and the Sewage Sludge Incinerator produce a total of 3.75 GWh, the remainder being produced using water turbines. With two new water turbines, commissioned late summer 2001, as well, Water Service is now able to produce 3% of its total electricity demand.
- United Utilities, in partnership with the Northwest Development Agency, has launched "Renewables Northwest" to promote the development and use of renewable energy. This is designed to be a catalyst for green energy interests in response to government targets for renewable generation and to the Kyoto agreement to reduce greenhouse gas emissions.
- A 2-year agreement between Wessex Water and its electricity supplier will mean that over 14% of the electricity - equivalent to the annual electricity consumption of around 7,400 homes - that Wessex Water uses will be from renewable energy sources, mainly hydro and wind power. Wessex Water already generates 15 GWh of electricity from biogas at its sewage treatment works. Overall, 20% of the company's electricity consumption will now come from renewable sources.
- Northumbrian Water is party to the Altner project, a local initiative to ascertain whether all of Teesdale's energy needs can be met from local renewable sources. Its involvement is to explore the potential to adapt its reservoirs to provide hydroelectricity.

### **Indicator D3: Carbon dioxide emissions at fixed sites**

*CO<sub>2</sub> emissions per head of population = 0.049 tonnes/year*

#### **Aim**

This indicator shows how the water industry is progressing in reducing emissions of the greenhouse gas, carbon dioxide (CO<sub>2</sub>), from energy use at its fixed sites.

#### **Results**

The water industry, at about 2.5 million tonnes a year, is a relatively minor emitter of carbon dioxide in terms of total UK emissions of over 550 million tonnes a year. Its contribution to carbon dioxide emissions has increased slightly from last year (0.04 tonnes /year per head of population) from fixed sites involved with water supply and wastewater collection and treatment. This is due to new treatment coming on-line to meet stringent quality requirements. The emissions are almost equally divided between water supply and wastewater services.

There is good recording and reporting of emission figures across the water industry (over 92%), using the DEFRA reporting protocol to calculate emissions. Confidence in the indicator is therefore high.

#### **Action**

- United Utilities' programme to identify energy efficiency savings has resulted in around 130 schemes, saving more than 3,000 tonnes of CO<sub>2</sub>. During 2001/2002 it also planted nearly 288,000 trees on its catchment land. Using a carbon sequestration model, it estimated that the amount of CO<sub>2</sub> offset annually by its tree stock, including this new planting, is 7,580 tonnes.
- Wessex Water has a carbon management plan in place. A renewable energy supply contract has been negotiated with the electricity supplier, contributing about 12% of the total electricity consumption. Biogas engines at Avonmouth have been replaced and now produce 28% more electricity for the same amount of biogas. It is running trials with ultrasonic equipment to maximise the gas produced in digesters at its main sewage treatment works.

## **Indicator D4: Carbon dioxide from road transport**

*CO<sub>2</sub> emissions per head of population = 0.00173 tonnes/year*

### **Aim**

This is a measure of the contribution made by the water industry's extensive fleet of road vehicles to levels of CO<sub>2</sub> in the environment. It does not include train, air, or commuter miles.

### **Results**

The amount of carbon dioxide emitted from road vehicles used by the water industry is around 100,000 tonnes a year, representing about 0.002 tonnes per head of population served. This is about the same as last year (0.00178t/hd)

The data set has improved but a few gaps mean that the confidence level is medium.

### **Action**

- Mid Kent Water has a system of tracking devices, which allow continuous monitoring of vehicle location, to help identify how the number of miles travelled can be reduced. This aidsefficient route planning and allocation of jobs on a location basis.
- Amongst measures initiated by East of Scotland Water:
  - An interactive car sharing scheme, on the company's intranet. Employees log on their details onto the intranet site and search for information on others making similar journeys.
  - Interest free loans for the purchase of bicycles or season tickets.
  - Upgraded showering, changing, and storage facilities for cyclists and walkers at key offices.
  - The number of fleet vehicles was reduced, representing a total reduction of 29% from 1999/2000.
  - Video conferencing facilities introduced at key sites.
  - Flexible working patterns such as hot-desking, home-working, and flexible hours, supported where appropriate.

## **Indicator D5: Sludge Management**

*Sludge recycled or reused = 66 %*

### **Aim**

This indicator is intended to show the extent to which the water industry takes the opportunity to recover and recycle the main by-products of its treatment operations, drinking water residues and sewage sludge.

### **Results**

Some 22% of drinking water residues (175,000 tonnes) and 73% of sewage sludge (1.1 million tonnes) were recycled in 2001/2002, usually to agriculture. This gave an overall recycling rate for sludge of 66%. Overall, this is slightly less than in the previous 12 months, due in part to lack of access to agricultural land at certain times because of the foot and mouth crisis. The results do not include sludge that is incinerated for the recovery of heat energy.

Data on sewage sludge are complete for the UK. Data on residues produced from treating drinking water are less comprehensive, as some is recycled through the sewage system.

Companies/authorities may interpret recycling and reuse in slightly different ways so that the overall confidence in the indicator is medium/high.

### **Action**

- United Utilities completed 60 hectares of remediation work at an opencast site at Workington, recycling 18,000 tonnes of sludge cake.
- Recovery of 2 former colliery sites in Yorkshire was achieved with the help of 10,000 tonnes of sludge.
- Thames Water continues to produce peat-free garden compost from biosolids that is endorsed by the Royal Society for the Protection of Birds and is recognised in helping to prevent the destruction of internationally important wildlife habitats. The compost is sold at over 100 garden centres throughout the UK.

## **Indicator D6: Materials from excavations**

*Excavated materials recycled/re-used = 34%*

### **Aim**

This indicator is intended to provide a measure of how much excavated material is re-used or recycled rather than being disposed of to landfill.

### **Results**

The results indicate that about a third of materials generated during construction or improvements to the water mains and sewerage infrastructure are reused or recycled. The rest go to landfill.

This is the first year for reporting this indicator. Data are only available from half the companies/authorities (serving about 55% of the UK population) and normally related to excavations rather than construction. They still represent about a million tonnes of excavated materials. The indicator should be viewed with caution, with low confidence rating.

### **Action**

- United Utilities used construction waste for landscaping and the creation of pathways on Walney Island, near Barrow-in-Furness.
- Three Valleys Water reuses excavated waste in highway construction. Working in partnership with a specialist waste contractor, Keanes, the company has developed a process for treating clay and other waste material dug up during excavations for repairs, new pipelines and meter installations. The Trenchmod ® process allows all excavated waste to be treated in a controlled way, with sufficient compaction so that it can be reused in local excavations. This is a more sustainable than sending waste to landfill and buying aggregate.

## **E. Indicators under development**

The measures for these indicators are still under development. Companies are working to make progress on these indicators as is illustrated by the following examples.

### **Indicator E1: Wetland bird index**

Because of water industry potential for affecting wetlands, an indicator focussing on wetland birds is a particularly good measure of its performance with regard to avifauna.

- Southern Water has created a new wetland at its Millbrook water treatment works. Marginal and aquatic plants already thrive, dragonflies have been seen patrolling and birds such as kingfisher, oyster catcher and greenshank, have been observed using the site.

### **Indicator E2: Otter population index**

Otters provide a good indicator of fresh water quality and hence an indirect measure of the success of the water industry in improving the quality of its discharges.

- Working closely with a Local Conservation Board, Southern Water has built otter holts at appropriate locations where sitings/tracks have been identified. More are planned later in 2002.
- Severn Trent Water has worked in partnership with the National Sea Life Centre in Birmingham to set up an “Otter Academy”, to teach children about otters.
- Yorkshire Water sponsors the Yorkshire Otters and Rivers Project run by the Yorkshire Wildlife Trust. A three-year deal, which began in March 1999 and is worth £180,000, is helping to fund habitat improvements and the building of artificial holts to encourage otters to breed and thrive.

### **Indicator E3: Rivers with low flows**

This indicator is intended to show the success of measures taken by the water industry to help address the local and temporal issue of low flow rivers.

- The Environment Agency identified the upper reaches of the River Worfe as suffering from low flows. Severn Trent Water was obliged to augment flows in the upper Worfe from groundwater abstractions. It constructed a washout from its existing Sheriffhales public water supply borehole in order that discharges could be made into the Ruckley Brook, a tributary of the River Worfe. It is currently carrying out compensation release trials of up to 3Ml/d from Sheriffhales borehole. An operating agreement is being prepared with the Agency that will formalise how the discharges should be made when needed in future.
- One of Bournemouth and West Hampshire Water’s sources near Wimborne, Dorset, has historically been linked with unacceptably low flows in the River Allen, a tributary of the Stour. In a scheme agreed with the regulators, the company is investing £2 million to reduce by half the amount of water it abstracts. The cost relates to providing the infrastructure to obtain the equivalent amount of water elsewhere.
- The Environment Agency, English Nature and Wessex Water have worked to find a solution to low flow rivers in the region. A phased interim solution has

been agreed, with DEFRA and OFWAT support, involving a range of measures such as using existing alternative sources where possible, seeking additional water from Wimbleball reservoir (in Exmoor) and Bristol Water and stream support through pumping water from deep aquifers directly into rivers. Together these actions minimise abstractions from the sources identified as having the greatest effect on low flow rivers.

#### **Indicator E4: Materials and Services covered by environmental initiatives**

This indicator will show the extent to which the water industry promotes and supports environmental good practice amongst the many companies that provide goods and services to it.

- Northumbrian Water sends every major supplier an environmental questionnaire as part of its tender process. Additional modules are also being developed to gain greater insight into the companies' processes and environmental performance. For smaller companies that may not have their own environmental policy we ask that they commit themselves to adhering to the principles laid out in our own environmental policy.

#### **Indicator E5: Global warming index**

Water industry activities generate greenhouse gases that contribute to global warming, for example methane from wastewater treatment processes. This indicator would give a measure of the industry's contribution.

- Severn Trent Water has joined forces with the Midlands Environmental Business Club to identify potential impacts of climate change on the West Midlands. This study is being run under the guidance of the United Kingdom Climate Impacts Program. The scoping study will be followed by a detailed assessment of the impacts and potential adaptation and mitigation responses.
- UKWIR has a project intended to develop measurement and reporting protocols for water industry emissions and to identify reduction potential.

## **Companies contributing to this work**

### **and links to their websites:**

Anglian Water Services Ltd	<a href="http://www.anglianwater.co.uk">www.anglianwater.co.uk</a>
Bournemouth & West Hampshire Water plc	<a href="http://www.bwhwater.co.uk">www.bwhwater.co.uk</a>
Bristol Water plc	<a href="http://www.bristolwater.co.uk">www.bristolwater.co.uk</a>
Cambridge Water plc	<a href="http://www.cambridge-water.co.uk">www.cambridge-water.co.uk</a>
Dee Valley Water plc	No website available
Dwr Cymru	<a href="http://www.dwrcymru.co.uk">www.dwrcymru.co.uk</a>
Essex & Suffolk Water plc (part of Northumbrian Water Ltd)	<a href="http://www.eswater.co.uk">www.eswater.co.uk</a>
Folkestone & Dover Water Services Ltd	<a href="http://www.fdws.co.uk">www.fdws.co.uk</a>
Mid Kent Water plc	<a href="http://www.midkentwater.co.uk">www.midkentwater.co.uk</a>
Northern Ireland Water Service	<a href="http://www.waterni.gov.uk">www.waterni.gov.uk</a>
Northumbrian Water Ltd	<a href="http://www.nwl.co.uk">www.nwl.co.uk</a>
Portsmouth Water plc	<a href="http://www.portsmouthwater.co.uk">www.portsmouthwater.co.uk</a>
Scottish Water	<a href="http://www.scottishwater.co.uk">www.scottishwater.co.uk</a>
Severn Trent plc	<a href="http://www.stwater.com">www.stwater.com</a>
South East Water plc	<a href="http://www.southeastwater.co.uk">www.southeastwater.co.uk</a>
South Staffordshire Water plc	<a href="http://www.south-staffs-water.co.uk">www.south-staffs-water.co.uk</a>
South West Water Ltd	<a href="http://www.swwater.co.uk">www.swwater.co.uk</a>
Southern Water	<a href="http://www.southernwater.co.uk">www.southernwater.co.uk</a>
Sutton & East Surrey Water plc	<a href="http://www.waterplc.com">www.waterplc.com</a>
Tendring Hundred Water Services Ltd	<a href="http://www.thws.co.uk">www.thws.co.uk</a>
Thames Water Utilities Ltd	<a href="http://www.thames-water.com">www.thames-water.com</a>
Three Valleys Water plc	<a href="http://www.3valleys.co.uk">www.3valleys.co.uk</a>
United Utilities Water plc	<a href="http://www.unitedutilities.com">www.unitedutilities.com</a>
Wessex Water Services Ltd	<a href="http://www.wessexwater.co.uk">www.wessexwater.co.uk</a>
Yorkshire Water Services Ltd	<a href="http://www.yorkshirewater.com">www.yorkshirewater.com</a>