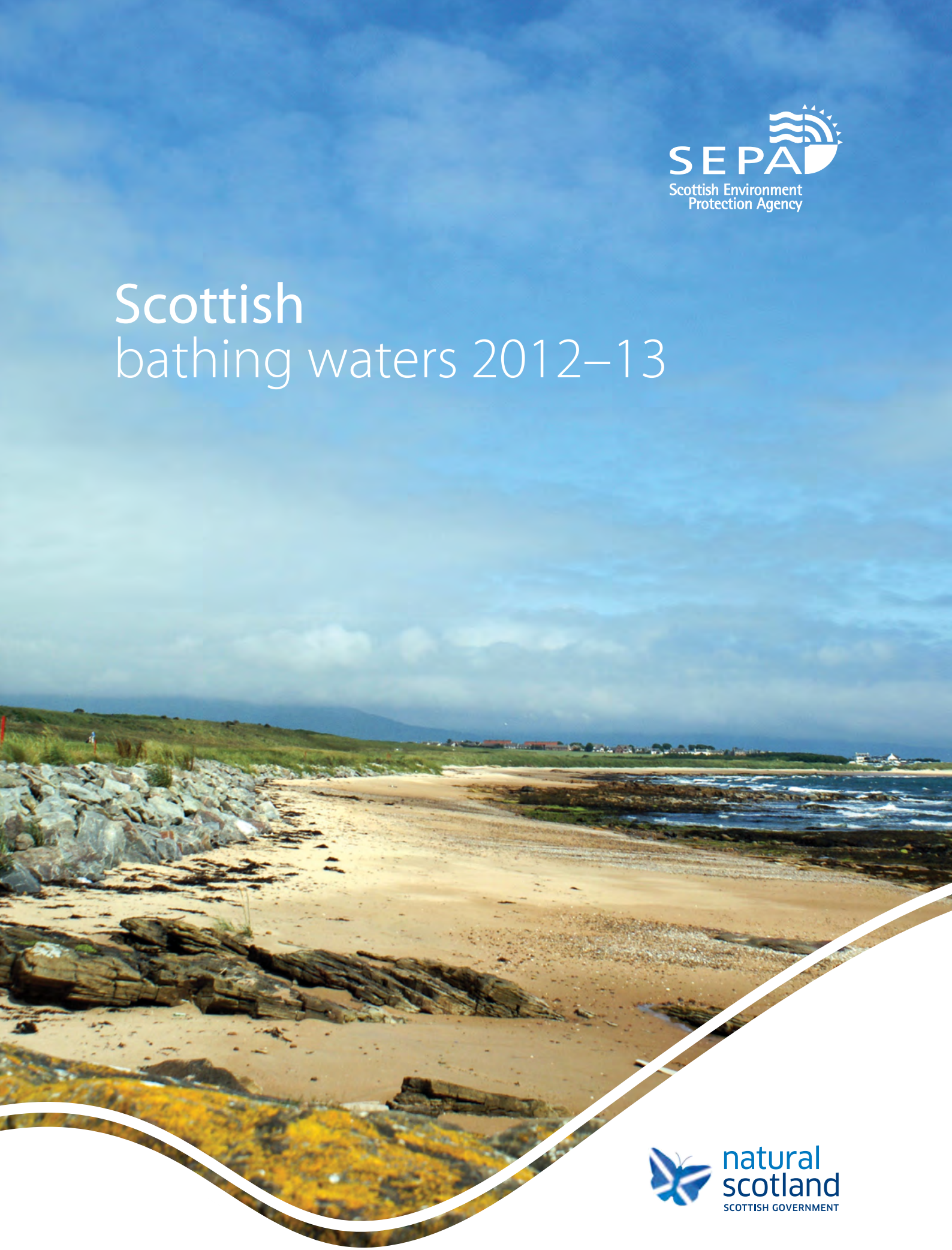
SEPA
Scottish Environment Protection Agency

Scottish bathing waters 2012–13



natural scotland
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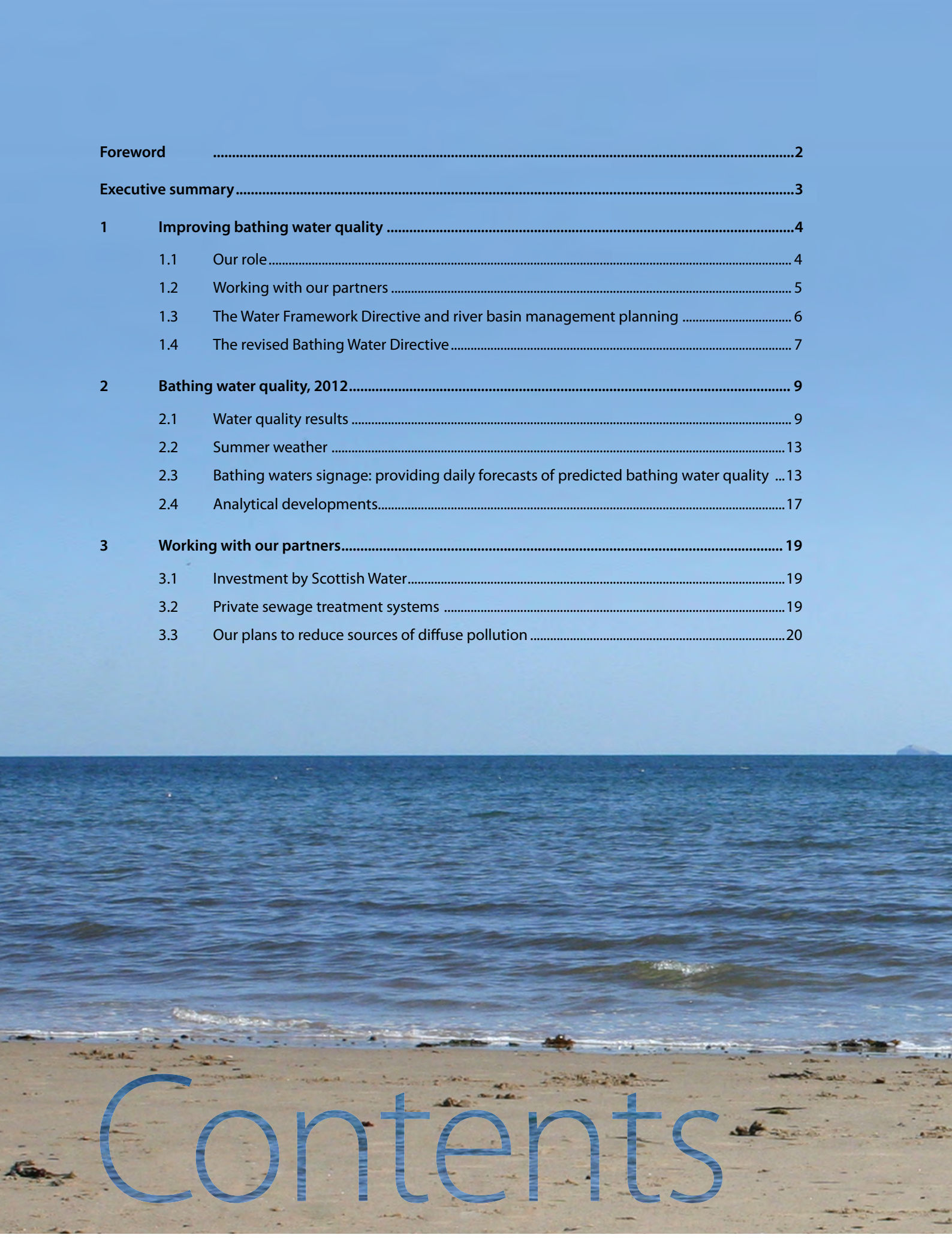

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Foreword

This is an exciting and challenging time for bathing waters in Scotland. We are leading the way in new public information and health protection initiatives and we welcome the drive to improve the quality of our waters for beach users and bathers.

The revised Bathing Water Directive requires higher water quality standards and a greater focus on the provision of information so that people can make informed choices.

This year has been the first season of sampling under the new regulations, with the revised Bathing Waters Directive now partly in force as we move towards full implementation in 2015. This has required new monitoring parameters, more complex sampling procedures and public information duties both for SEPA and other responsible authorities. Results from this season will be included in the initial classification in four years time using data from 2012 to 2015.

In 2012, the mandatory standard for bathing water quality under the current directive was met by 98% of Scotland's 83 bathing waters, which is the best outcome since the long dry summer of 2006. The 2012 results were achieved in spite of the backdrop of an extremely wet summer, with some areas at times recording their highest ever measured rainfall totals, conditions known to contribute a negative impact on water quality.

Our expanded daily prediction and signage system provided daily water quality forecasts at 23 locations across Scotland. We again had a high level of accuracy to our predictions; on 99% of days, the daily advice given to the public was correct or precautionary. Our updated software systems, introduced last season, are now bedded in and our signs were fully functional at all locations.

Whilst being prominent at beach locations, our electronic signs are only one way of accessing water quality information. The daily water quality forecast information and advice was also available on our website, Beachline number and through our mobile phone app.

This real time water quality forecast signage has allowed us to implement the discounting provision of the revised Bathing Water Directive for the first time.

Summary information on display at bathing waters across Scotland was another new development this season. We provided this information to local authorities who are responsible for posting it. The summary includes details of the bathing water season, information on potential pollution sources and risks to water quality and any relevant advice on swimming after storms.

Partnership working with the Scottish Government, Scottish Water, the agricultural community, local authorities and the public is key to driving forward the improvements needed to meet our target of bringing all bathing waters up to the sufficient standard required by the new directive by 2015, to allow the public to continue to enjoy a great day at the beach.

David Pirie
Director of Science and Strategy

Executive summary

In 2012, in spite of one of the wettest summers on record, 81 of Scotland's 83 official bathing waters achieved the mandatory standard for bathing water quality, our best result in six years under the current directive.

Pre-season sampling during a long dry period at the end of May yielded superb results to start the season. The average microbiology count across all beaches in May was less than half the tightest guideline limit, confirming the outstanding water quality we frequently see in dry sunny conditions when our beaches are at their busiest.

Unfortunately, June was a very wet month across Scotland in all but the north-west, mainly due to the unusual southerly track of the jet stream. The south of Scotland recorded rainfall over two and a half times above the normal monthly average. The weather pattern that dominated June also lasted well into July, with unsettled weather and intense downpours commonplace.

This exceptional weather was the cause of a smaller number of Scotland's bathing waters (32 in total) meeting the more stringent 'guideline' standard for water quality than in previous years. Whilst this is disappointing it is balanced by the encouraging overall improvement in the mandatory conditions as this is where pollution improvement and public information efforts are focused.

Only two locations (Stonehaven and Heads of Ayr) failed overall season compliance under the current EU Bathing Waters Directive.

This year the public had more ways than ever to get up to date details on water quality with SEPA providing live information via electronic beach signage, the internet, Beachline, mobile phone apps, and also data for local authority signs at all beaches. Our electronic bathing water signs at 23 bathing waters display predicted water quality information and public messages. This has been a successful year for the signs with the daily water quality information and public messages fully operational at every site on almost every day.

Whilst the overall results this season are positive, there are clearly areas where we need to improve – particularly in managing the impacts caused by the intense rainfall that has been a huge factor this year. The Scottish Government and SEPA will continue to work closely with key stakeholders including Scottish Water, local authorities and farmers to reduce these impacts on our bathing waters and ensure the public is well informed.

Accelerated investment made by Scottish Water under its Quality and Standards programmes has resulted in significant upgrades in Scotland's sewerage and drainage infrastructure, much of it aimed at improving bathing waters compliance. The current investment programme, running from 2010 to 2015, includes 39 bathing water studies.

Reducing diffuse pollution remains a key component in improving water quality in Scotland and we are currently working together with our stakeholders to implement a rural diffuse pollution plan for Scotland. A catchment approach is being taken, with work up to 2015 focusing on 14 priority catchments across Scotland.

The revised Bathing Water Directive changes the monitoring parameters and standards used to assess bathing water quality, classifying waters as 'excellent', 'good', 'sufficient' or 'poor'. The standards are significantly more stringent than those of the current directive and all bathing waters are required to be 'sufficient', or better, by 2015. The data used for the annual classification of a bathing water will change from a single, one year period to a rolling, four year period, therefore data from this season will count towards our first classifications to be reported in 2015.

Our increased focus on all aspects of bathing waters compliance must continue to help bring all our bathing waters up to the 'sufficient' or better standard by 2015.

Fraserburgh Beach

1 Improving bathing water quality

Good water quality is important for our bathing waters. Clean, safe beaches are essential to tourism and the leisure pursuits of the people of Scotland, which provide valuable income to many seaside communities.

It is vital that the environment is protected and improved by firm, but fair, environmental regulation, both to encourage economic development and to protect communities and human health.

1.1 Our role

Our role is to make sure that the environment and human health are protected by regulating activities that can cause harmful pollution and encouraging good environmental practice. A clean and healthy environment is essential to our health and well-being, as well as to sustainable economic growth and provides a variety of opportunities for recreation.

As a non-departmental public body, accountable through Scottish Ministers to the Scottish Parliament, we implement Scottish, UK and European legislation.

Bathing waters feature in our key environmental outcome 'Scotland's environment is protected and improving', detailed in both our Corporate Plan 2012-2017[1] and our Annual Operating Plan 2012–2013[2]. In the period up to 2015 we will work to ensure the delivery of the environmental objectives of the revised Bathing Water Directive[3]. We have a specific target of all bathing waters to be classified at least sufficient quality by 2015. In June 2012 the provision of bathing water signage become a statutory duty

This report presents the overall results of water quality monitoring at Scotland's bathing waters, describes the factors underlying the results and outlines site-specific plans for improvement. Individual bathing waters monitoring results are placed on our bathing waters web pages, within a few days of sample collection and analysis, throughout the bathing season.

[1] www.sepa.org.uk/about_us/publications/corporate_plan.aspx

[2] www.sepa.org.uk/about_us/publications/annual_operating_plans.aspx

[3] www.scotland.gov.uk/Topics/Environment/Water/15561/bathingwaters/BWD2

1.2 Working with our partners

We continue our progress towards achieving high quality bathing waters at the 83 designated sites across Scotland, with the goal of total compliance with the current Bathing Water Directive's mandatory standards whilst also working towards making progress towards the tighter parameter standards of the revised directive. We cannot achieve current compliance or the revised classifications on our own and we will continue to work with all relevant organisations, the agricultural community and the public to achieve this objective. We recognise that partnership working is essential if we are to reduce the risk of urban and rural pollution in our coastal and inland bathing waters, to give Scotland and its visitors the high quality of water and information which they are entitled to expect.

We will continue protecting and improving the quality of Scotland's lochs, rivers, estuaries, wetlands, groundwater and coastal waters so that they are sustainable for the future. We are responsible for co-ordinating the management of the water environment through the production of river basin management and area management plans (see Section 1.4).

The importance of factors outside our statutory control has become increasingly apparent. The Scottish Government's strategy document Better bathing waters: meeting the challenges of the revised Bathing Water Directive in Scotland[4] is the most recent in a series of publications which are very helpful in enabling problem sources to be tackled.

Sewage remains a significant cause of pollution in coastal waters despite all large continuous sewage discharges to Scottish waters being subject to at least full secondary treatment. Storm overflows to freshwaters and directly to sea continue to be a pollution problem in numerous catchments. Measures to reduce sewage related problems are, in most cases, the responsibility of Scottish Water. SEPA and the Scottish Government work with Scottish Water and the Water Industry Commissioner to ensure:

- that planned capital investment programmes aimed at upgrading sewerage infrastructure throughout the country are prioritised to maximise environmental benefits;
- compliance with regulations implementing the European Urban Waste Water Treatment Directive (UWWTD)[5] and all relevant quality standards.

Continued investment is required in both sewage treatment and in the sewerage infrastructure, particularly storm water overflows. During heavy rainfall, combined sewer overflows which discharge diluted, but minimally treated, sewage to watercourses and coastal waters, are essential to prevent flooding. To minimise the impact of combined sewer overflows on water quality, we impose conditions requiring solids removal and on the location and frequency of their operation.

In urban areas, sustainable urban drainage systems (SUDS) are being increasingly used to drain new developments. They are designed to avoid pollution of the water environment and include permeable surfaces that allow infiltration of rainwater into the ground, slowing the rate at which it drains to the water environment and trapping and breaking down pollutants in artificial ponds or wetlands that provide the final stage of treatment. Information on SUDS and the latest developments is available on our website[6].

Diffuse pollution from agricultural and rural sources also poses a significant risk to bathing water quality. Tackling these sources requires concerted action across catchments draining to the bathing waters. We will ensure this by working with farmers and others to raise awareness about the requirement for preventing and reducing pollution and to help them identify appropriate actions for doing so (see Section 3.3).

Under the Environmental Protection Act 1990, local authorities are responsible for keeping 'amenity beaches' free from litter. Amenity beaches are those areas of beach adjoining an identified bathing water. Local authorities are obliged to display notice boards at these waters giving a variety of information, including the water quality data supplied by SEPA.

Water quality results for the 83 identified bathing waters are reported annually to the European Commission. The commission publish the results as part of its annual report on the overall quality of bathing waters throughout the member states of the European Union.

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[4] www.scotland.gov.uk/Publications/2006/03/23151924/0

[5] http://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

[6] www.sepa.org.uk/water/water_regulation/regimes/pollution_control/suds.aspx

1.3 The Water Framework Directive and river basin management planning

The condition of bathing waters is linked to the quality of other water bodies in its catchment as well as how land and pollution source pathways are managed. Consequently, integrating land and water management is essential for the effective protection and improvement of the water environment.

The Water Framework Directive[7] (transposed to Scottish Law under the Water Environment and Water Services (Scotland] Act 2003)[8] established a new, integrated approach to the protection, improvement and sustainable use of Europe's water environment. The river basin management planning[9] (RBMP) system is the key mechanism for ensuring integrated management. It represents a huge step forward in safeguarding and improving the quality of our water environment.

The first river basin management plans were published in December 2009. For river basins in Scotland, these plans can be found on our website[10]. The plans cover all types of water body (rivers, lochs, estuaries, coastal waters and groundwaters) and:

- describe the current condition of the water environment;
- identify where current or historic activities are adversely affecting the quality of the water environment and the biodiversity it supports;
- detail the actions required to ensure our waters of special value (e.g. protected for drinking, biodiversity, shellfish growing or bathing) are up to standard, and to maintain quality where they already meet those standards;
- set out the actions needed to deliver environmental improvements whilst trying to achieve a balance between protection of Scotland's water environment, sustainable economic development and the protection of the interests of those who depend on our water environment for their quality of life.

For the purposes of river basin management planning, Scotland has been divided into 10 areas. Detailed supplementary area management plans[11] can be found on our website. The area management plans focus on local actions and highlight the opportunities for partnership working to ensure that we all benefit from improvements to the water environment. Similar plans have been put in place across Europe.

River basin management planning is a cyclical process and updated plans will be published every six years. The next river basin management plan will be available in 2015. Bathing waters are classed as protected areas under Annex IV of the Water Framework Directive (WFD). Protected areas are areas that have been identified as requiring special protection because of their sensitivity to pollution or their economic, social or environmental importance. There is a register of protected areas and maps of their locations[12] on our website.

Protected areas must comply with the standards and objectives specified by the directive under which they were established. Unless otherwise stated in the EU legislation under which they were designated, these standards and objectives should be met by 2015. Bathing waters will continue to be protected under the current Bathing Water Directive and, by the end of the first river basin planning cycle, the revised Bathing Water Directive, which states that all waters must achieve a 'sufficient' or better classification by 2015. Bathing waters improvement will be implemented through the river basin management plans.

The Scottish river basin management plans (for the Scotland and Solway Tweed river basin districts) include chapters on protected areas, which describe:

- the links between the WFD and protected areas;
- the current and future state of protected areas;
- actions for protected areas;
- details of specific protected areas.

Actions carried out under river management basin planning to protect and improve water quality will have a positive effect on Scotland's bathing waters.

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[7] www.scotland.gov.uk/Topics/Environment/Water/15561/WFD

[8] www.legislation.gov.uk/asp/2003/3/contents

[9] www.sepa.org.uk/water/river_basin_planning.aspx

[10] www.sepa.org.uk/water/river_basin_planning.aspx

[11] www.sepa.org.uk/water/river_basin_planning/area_advisory_groups.aspx

[12] www.sepa.org.uk/water/protected_areas.aspx

1.4 The revised Bathing Water Directive

The revised Bathing Water Directive (2006/7/EC) came into force on 24 March 2006 and was translated into Scottish law by The Bathing Waters (Scotland) Regulations 2008. The directive introduces a new classification system with more stringent water quality standards and puts an emphasis on providing information to the public. Whilst we will first report water quality under the revised directive in 2015, other parts of the directive must be implemented earlier and are already in place.

2011	2012	2015
Publication of bathing water profiles Publication of monitoring calendar Action, where required, on cyanobacterial (blue-green algae) blooms, macroalgae (seaweed), marine phytoplankton and other waste	Switch to new parameters Summary information to be posted at beach locations Implementation of signage and discounting New abnormal situation rules to apply	Report water quality standards against the revised Bathing Water Directive

New classifications and objectives

The revised directive classifies bathing waters according to four quality categories: 'excellent', 'good', 'sufficient' and 'poor'. The new 'good' standard is broadly equivalent to the existing 'guideline' standards. Under the new system, quality classifications are to be made using data covering four years, with the first classification in 2015 using samples from 2012 to 2015.

By 2015, member states across the EU have to ensure that all bathing waters are of 'sufficient' quality or better. The revised directive requires that measures are put in place to increase the number of 'good' or 'excellent' bathing waters. If a bathing water is classified as 'poor' for five consecutive years, even if improvement measures have been introduced, permanent advice against bathing must be introduced. Action is also required, where necessary, to tackle cyanobacterial (blue-green algae) blooms, macroalgae (seaweed), marine phytoplankton and other waste which took effect from 2011.

What we measure

Changes have now been made to the bacterial entities monitored. These arise from recommendations from the World Health Organization (WHO). In place of the current coliform and faecal streptococci standards, the revised directive sets standards for *Escherichia coli* and intestinal enterococci. While slightly altering the microbiological analytical techniques necessary, the differences in the values obtained are considered to be minimal. During the period 2012 to 2014 we report against the standards prescribed in Directive 76/160/EEC using these new parameters.

Public information

The revised directive emphasises providing information to the public, particularly on the risks that bathers may face from pollution.

From 2011, a bathing water profile has been produced and posted on our website for each of Scotland's designated bathing waters. These are intended to provide useful information to the public and are written in accordance with the requirements of the revised Bathing Water Directive. Each profile includes:

- a description, map and photograph of the bathing water;
- information on potential pollution sources and risks to water quality;
- descriptions of measures being taken to improve water quality;
- information on reporting and responding to any pollution incidents;
- local contact details for sources of further information.

In 2012, summary information was provided to local authorities to post at bathing water locations via mandatory beach signs. A summary of the bathing water profile it includes details of the bathing water season, information on potential pollution sources and risks to water quality and any relevant advice on swimming after storms.

Our electronic signage network at 23 sites across Scotland (Section 2.3) provides real-time predictions of bathing water quality. These electronic signs have enabled us to remove (from the overall classification dataset) samples collected during short-term pollution events, when there is a public warning system in place to inform prospective bathers of potentially poorer water quality. A separate closure sample must have been taken to demonstrate that the event has ended and management measures must be in place to prevent, reduce or eliminate the causes of the pollution.

The directive says that a maximum of 15% of the samples used to assess the classification of a bathing water can be disregarded from the assessment and, if necessary, replaced. 12 samples were discounted using this provision in 2012.

Sampling program

The required sampling frequency under the revised directive is lower than under the current directive. Sampling schedules (the monitoring calendar) are now set in advance of the bathing season, but there is now a five day window following the date in the monitoring calendar when a sample can be taken. At some sites, where a warning against swimming during or after heavy rainfall has been posted at the beach location as part of the summary information we have used this window to avoid the need to sample during very wet weather when bathers would not be expected.

Abnormal situations

An abnormal situation is defined by the revised Bathing Water Directive as an event or combination of events impacting on bathing water quality at the location concerned and not expected to occur on average more than once every four years. During an abnormal situation the monitoring calendar can be suspended so that samples which assess compliance of the bathing water are not taken. This is because they are unrepresentative of the water quality of a bathing water. When an abnormal situation is in force, signs must be put up by the beach controller warning the public of the nature and expected duration of the pollution. No abnormal situations were declared in Scotland in 2012.

Designation of bathing waters

The Bathing Water (Scotland) Regulations 2008 require Scottish Ministers to annually review the list of designated bathing waters for Scotland.

The directive states that a bathing water is one where a large number of people are expected to bathe and a permanent bathing prohibition, or permanent advice against bathing, has not been issued. Generally, a 'large' number of bathers (approximately 150 people) will be found at popular, well-used beaches and lakes where bathing is encouraged and facilities for bathers may have been provided.

Any organisation or individual can put forward a bathing water to be considered for designation. Once the application and supporting evidence has been received, it will be considered by a multisector panel, chaired by SEPA, who will make recommendations to the Scottish Government's Minister for Environment and Climate Change. The minister will then decide which beaches are designated before the next bathing water season.

Further information on the designation process is available on the Scottish Government, SEPA and Keep Scotland Beautiful websites (see Annex 3).

Official bathing water designation enables action to be taken to ensure the bathing water meets the directive's standards to protect public health. It is therefore in the interest of owners of non-recognised sites to apply for designation if they meet the appropriate criteria.

2 Bathing water quality 2012

2.1 Water quality results

In 2012 98% of Scotland's 83 bathing waters achieved the mandatory standard for bathing water quality and almost two fifths also met the more stringent guideline standard. Two waters failed to achieve mandatory quality compliance and, although disappointing, this should be considered in the context of the overall number of poor samples across Scotland: just 15 samples out of a total of 1,564.

The 2012 result was against a backdrop an extremely wet summer, with some areas at times recording their highest ever measured rainfall totals, conditions known to have a negative impact on water quality (Section 2.3). 12 samples had been taken on dates under predicted short term pollution (with appropriate public signage and information). These 12 samples were discounted and where necessary replaced as required by EU rules and the 2008 Bathing Water (Scotland) Regulations.

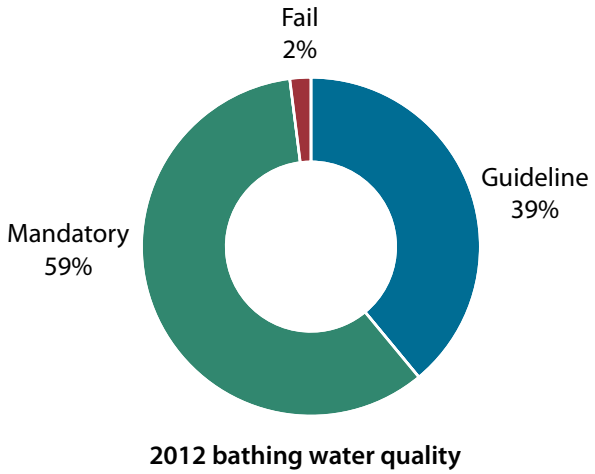
The 'reduced sampling' provision (five samples per season) of the Bathing Waters Directive was applied at Dornoch, Gullane and Achmelvich in 2011, in keeping with our stringent policy of no guideline standard exceedance of any determinant during the previous bathing season. Additionally, some sites were sampled 10 times (rather than the usual 20) because of their geographical remoteness (Annex 2).

In summary, of the 83 identified bathing waters:

- 32 (39%) were classified as being of guideline quality for EU compliance
- 49 (59%) were classified as being of mandatory quality for EU compliance;
- 2 (2%) were classified as being of failing quality for EU compliance.

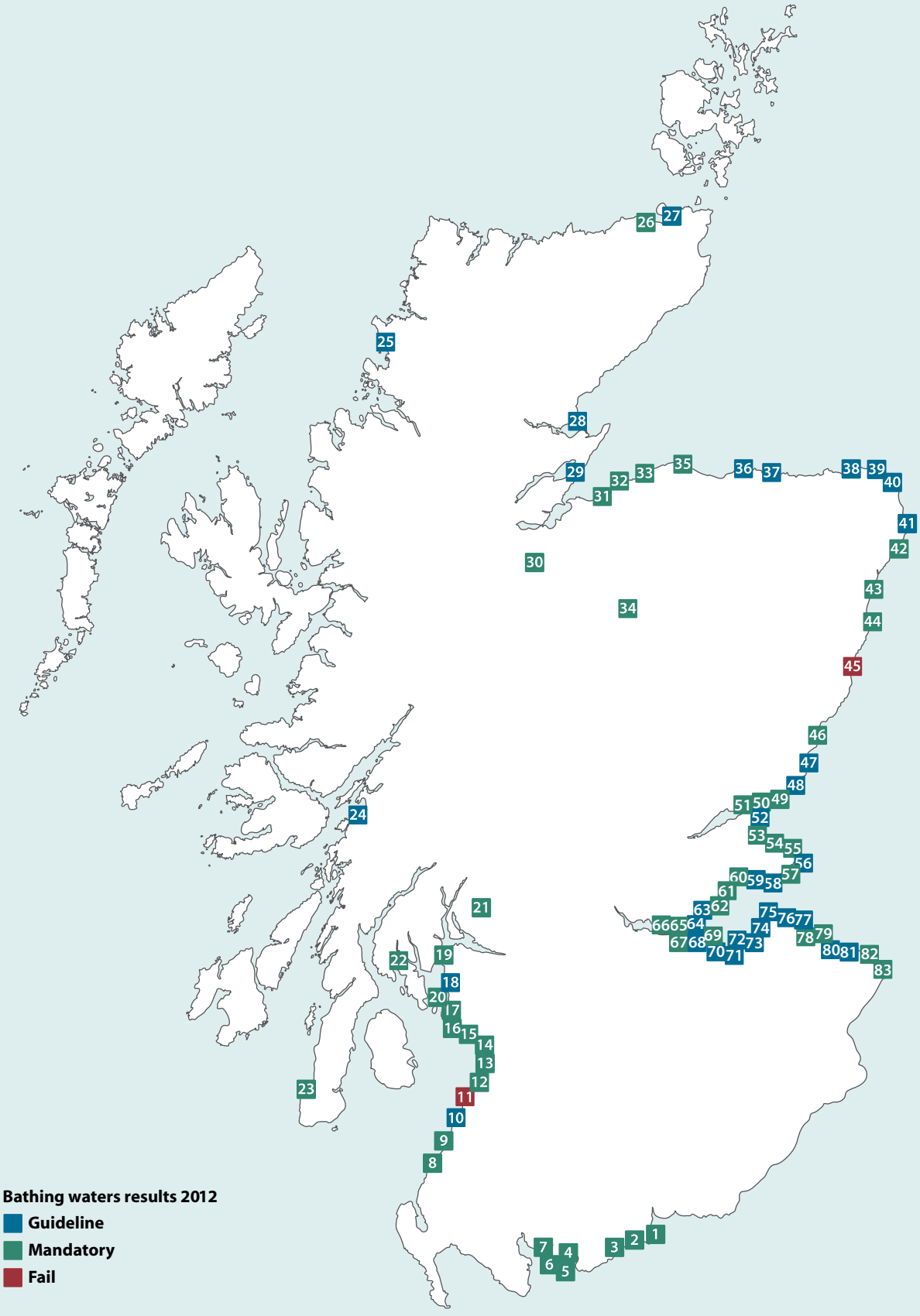
A further breakdown of the microbiological monitoring data from the 83 identified bathing waters in Scotland can be found in Annex 1.

Figure 1: Scotland's 2012 bathing water classification



To fit in with SEPA's minimal printing policy, designed to reduce costs and environmental impact, individual details of Scotland's 83 bathing waters are available in a separate online annex.

Map 1: Individual sample results 2012



Map ref.	Bathing water	Result
1	Southerness	Mandatory
2	Sandyhills	Mandatory
3	Rockcliffe	Mandatory
4	Dhoon Bay	Mandatory
5	Brighouse Bay	Mandatory
6	Carrick	Mandatory
7	Mossyard	Mandatory
8	Girvan	Mandatory
9	Maidens	Mandatory
10	Culzean	Guideline
11	Heads of Ayr	Fail
12	Ayr (South Beach)	Mandatory
13	Prestwick	Mandatory
14	Troon (South Beach)	Mandatory
15	Irvine	Mandatory
16	Saltcoats/Ardrossan	Mandatory
17	Seamill	Mandatory
18	Largs (Pencil Beach)	Guideline
19	Lunderston Bay	Mandatory
20	Millport Bay	Mandatory
21	Luss Bay	Mandatory
22	Ettrick Bay	Mandatory
23	Machrihanish	Mandatory
24	Ganavan	Guideline
25	Achmelvich	Guideline
26	Thurso	Mandatory
27	Dunnet	Guideline
28	Dornoch	Guideline
29	Rosemarkie	Guideline
30	Dores	Mandatory
31	Nairn (Central)	Mandatory
32	Nairn (East)	Mandatory
33	Findhorn	Mandatory
34	Loch Morlich	Mandatory
35	Lossiemouth (East)	Mandatory
36	Cullen Bay	Guideline
37	Inverboyndie	Guideline
38	Rosehearty	Guideline
39	Fraserburgh (Tiger Hill)	Guideline
40	Fraserburgh (Philorth)	Guideline
41	Peterhead (Lido)	Guideline

Map ref.	Bathing water	Result
42	Cruden Bay	Mandatory
43	Balmedie	Mandatory
44	Aberdeen	Mandatory
45	Stonehaven	Fail
46	Montrose	Mandatory
47	Lunan Bay	Guideline
48	Arbroath (West Links)	Guideline
49	Carnoustie	Mandatory
50	Monifieth	Mandatory
51	Broughty Ferry	Mandatory
52	Tentsmuir Sands	Guideline
53	St Andrews (West Sands)	Mandatory
54	St Andrews (East Sands)	Mandatory
55	Kingsbarns	Mandatory
56	Crail (Roome Bay)	Guideline
57	Anstruther (Billow Ness)	Mandatory
58	Elie (Ruby Bay)	Guideline
59	Elie (Harbour) and Earlsferry	Guideline
60	Leven	Mandatory
61	Kirkcaldy (Seafield)	Mandatory
62	Kinghorn (Harbour Beach)	Mandatory
63	Kinghorn (Pettycur)	Guideline
64	Burntisland	Guideline
65	Aberdour (Silversands)	Mandatory
66	Aberdour Harbour (Black Sands)	Mandatory
67	Portobello (West)	Mandatory
68	Portobello (Central)	Guideline
69	Seton Sands	Mandatory
70	Longniddry	Guideline
71	Gullane	Guideline
72	Yellow Craig	Guideline
73	Broad Sands	Guideline
74	North Berwick (West)	Guideline
75	North Berwick (Milsey Bay)	Guideline
76	Seacliff	Guideline
77	Dunbar (Belhaven)	Guideline
78	Dunbar (East)	Mandatory
79	Whitesands	Mandatory
80	Thorntonloch	Guideline
81	Pease Bay	Guideline
82	Coldingham	Mandatory
83	Eyemouth	Mandatory

How we analyse bathing water samples

By the end of the 2012 season, SEPA microbiology staff had analysed over 1500 compliance samples from the 83 bathing waters across Scotland. In addition, over 1200 investigational samples were analysed and used to provide supporting spatial information and for pollution source monitoring.

The monitoring calendar is set in advance of the season, and the water samples can be collected within a five day window. Many samples are analysed each day by the laboratories in Aberdeen, East Kilbride and Edinburgh.

Once the samples have been collected by the dedicated team of samplers, they are swiftly returned to the laboratories, where analysis begins the same day, and ideally within 6 hours of collection.

Volumes of water from each sample are filtered through a porous filter membrane. This membrane retains any bacteria contained within the sample, whilst still allowing the free flow of water. The membrane is then transferred to a culture medium and incubated. The medium specifically encourages the growth of *E. coli* and Intestinal enterococci bacteria. After incubation, colonies of *E. coli* and Intestinal enterococci are recognised by specific growth characteristics, dependant on the media employed. From the volume of sample filtered and the number of bacterial colonies counted, the concentration of *E. coli* and Intestinal enterococci bacteria in the original sample can be determined.

Dunbar (Belhaven)

2.2 Summer weather

Overall the summer of 2012 was very wet and, with the exception of the north-west, much of Scotland received over twice the long term average rainfall.

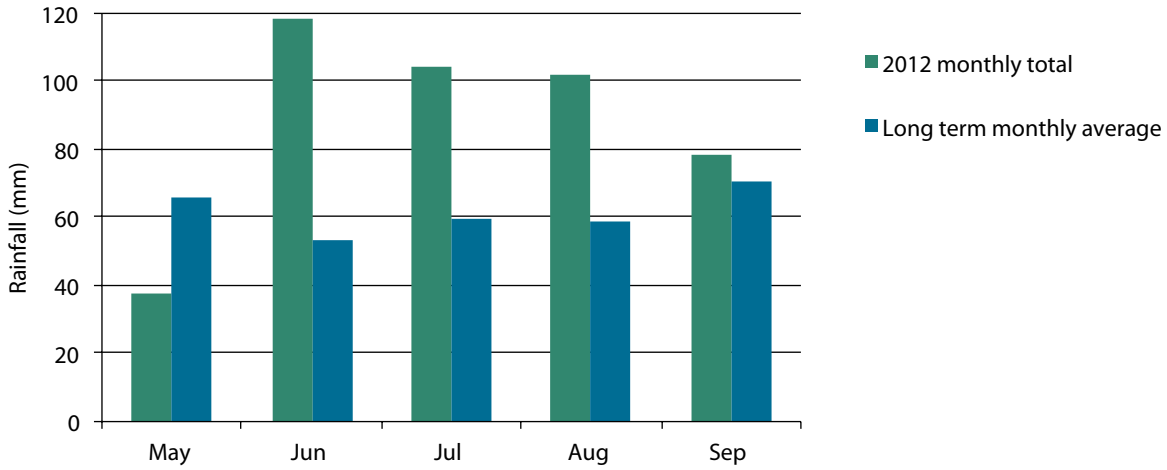
With the exception of the north-west, June was a very wet month across Scotland and, as for the rest of the UK, this was mainly due to the unusual southerly track of the jet stream. The south of Scotland recorded rainfall over 2.5 times above the normal monthly average. For southern and eastern Scotland, it was the wettest June on record. In contrast drier than average conditions were experienced in the north-west and in Shetland.

The weather pattern that dominated June also lasted well into July, with unsettled weather and intense downpours being commonplace. The south was especially wet and the south east recorded over 2.5 times the long term monthly average. Similar to June, the north received less than average rainfall.

Thunder storms on 5 July included an incredible 90 mm of rain recorded in three hours over the Cessnock catchment in Ayrshire which resulted in road flooding and closures. Similar high rainfall totals in central and southern Scotland during that week resulted in some associated flood problems. A northward shift in the jet stream later in July brought relatively more settled conditions to the south.

Southern and eastern Scotland received higher than average rainfall totals in August, where parts of the Borders and Tayside received over 1.5 times the long term monthly average. Again, this was in contrast to the north-west, which was slightly drier than the long term average.

Figure 2: Monthly recorded rainfall in 2012 at Strathkinness, Fife compared with the long term monthly averages (1961-1990)



2.3 Bathing waters signage: providing daily forecasts of predicted bathing water quality

In 2012 we provided live daily water quality forecasts at 23 locations across Scotland during the bathing season via our daily water quality prediction and signage system. Daily water quality information and public messages were fully operational at every site on almost every day, with the teething problems seen last year with some of the new software and mobile phone communication coverage now resolved.

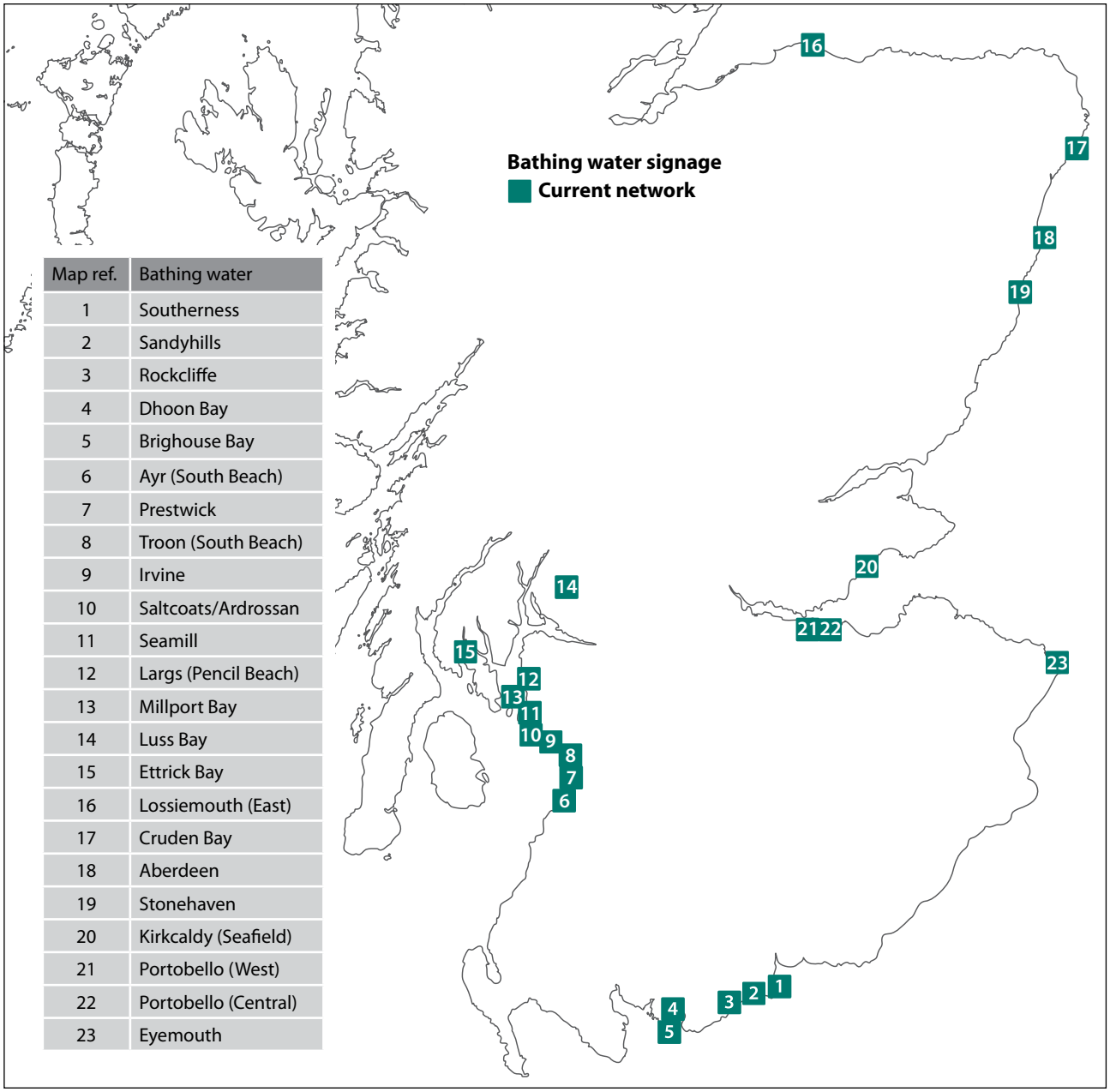
We are fully responsible for the real-time prediction and electronic signage system. We use our in-house scientific information and technical systems to run the daily operation of the sign network. We are assisted by subcontractors for civil engineering consultancy, installation and technical maintenance of the electronic signs.

Although generally of a high quality, these locations were selected for bathing waters signage because they were previously found to be at risk of not meeting European standards during, or after, wet weather. The electronic signs are updated daily with water quality forecasts, indicating either mandatory quality ('good') or risk of water failing to meet the mandatory standard ('poor'), using our extensive rainfall and hydrological information network to inform decisions. Further information on the background to the system and details of the advisory messages are available on our website[13].

[13] www.sepa.org.uk/water/bathing_waters/bathing_water_signage.aspx

The signs are not intended to be an alternative to environmental improvements or action to reduce pollution, but to provide additional public information. Efforts to reduce, or eliminate, potential sources of pollution are continuing and are reducing the frequency with which potential poor quality warnings have to be issued.

Map 2: EU identified bathing waters that are part of SEPA's electronic signage network



Map ref.	Bathing water
1	Southerness
2	Sandyhills
3	Rockcliffe
4	Dhoon Bay
5	Brighouse Bay
6	Ayr (South Beach)
7	Prestwick
8	Troon (South Beach)
9	Irvine
10	Saltcoats/Ardrossan
11	Seamill
12	Largs (Pencil Beach)
13	Millport Bay
14	Luss Bay
15	Ettrick Bay
16	Lossiemouth (East)
17	Cruden Bay
18	Aberdeen
19	Stonehaven
20	Kirkcaldy (Seafield)
21	Portobello (West)
22	Portobello (Central)
23	Eyemouth

Maximising information opportunities

All of our signs have the capacity to alternate between displaying daily water quality status and additional information. Whilst the standard alternative message is a reminder to keep beaches tidy, we are happy to include appropriate bespoke messages. Currently, additional beach specific messages include information about safeguarding dolphins at Aberdeen, a request to not feed gulls at Eyemouth and advice about car park opening and closing hours at Kirkcaldy (Seafield). Please contact us[14] if you have further ideas for useful information that can be displayed using this resource.

This season predictions were available on our new smartphone app, our Beachline telephone service (08452 30 30 98) and our website, in addition to the electronic signs at bathing water locations.

[14] www.sepa.org.uk/about_us/contacting_sepa.aspx

Hydrometry and bathing waters signage

The prediction of water quality at bathing beaches is based on a daily assessment of hydrometric data. Known as hydrometry, this science is concerned with the measurement of the quantity of water in the environment. Measuring rainfall and river flows allows the detection of conditions that are known to increase the risk of pollution entering rivers and coastal waters.

We maintain, and operate, an extensive national hydrological network for Scotland. Rainfall intensity and volume is measured using a tipping bucket rain gauge and river levels are recorded at river gauging stations using a variety of sensors. Hydrometry staff visit each station once a month to check the calibration of equipment and to carry out routine maintenance.

Recorded monitoring data is stored at each station on a data-logger and is then automatically interrogated from our offices using telecommunications systems. The data is reviewed every morning during the bathing water season by hydrometric staff who check for anomalies before producing a prediction for water quality. This prediction is then uploaded onto electronic signs at beach locations, as well as our internet and smartphone systems. In 2012 we switched from having this done at one central location to three regional locations representing the south west, south east and north east of Scotland. This means that the hydrometric staff on duty have increased local knowledge of weather conditions and gauging stations.

Overall, 33 rain gauges and 11 river gauges are used for bathing water quality predictions. The network for four sites in south-west Scotland is shown in Figure 3. The full process from data collection to water quality prediction is shown in Figure 4.

Hydrometric data can also analysed retrospectively to help understand any poor water quality that may be detected from our routine sampling.

Hydrometry support for daily predictions and signage in numbers

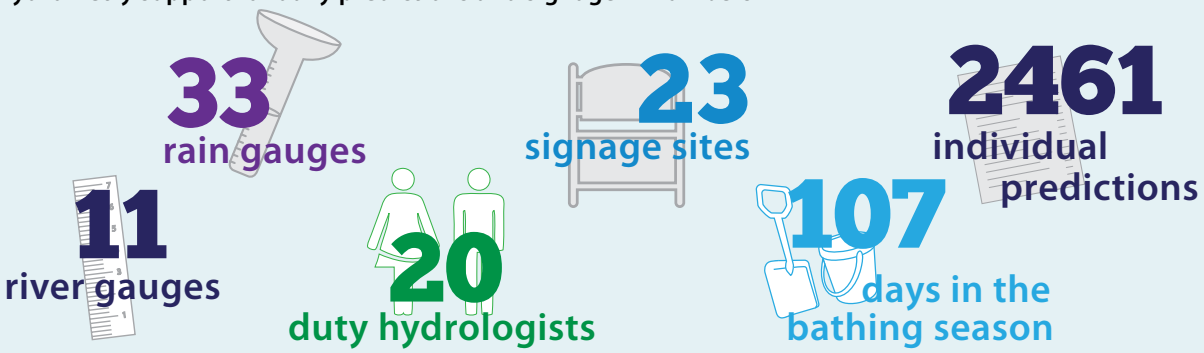


Figure 3: The hydrometry network for water quality predictions at four bathing water sites in south-west Scotland

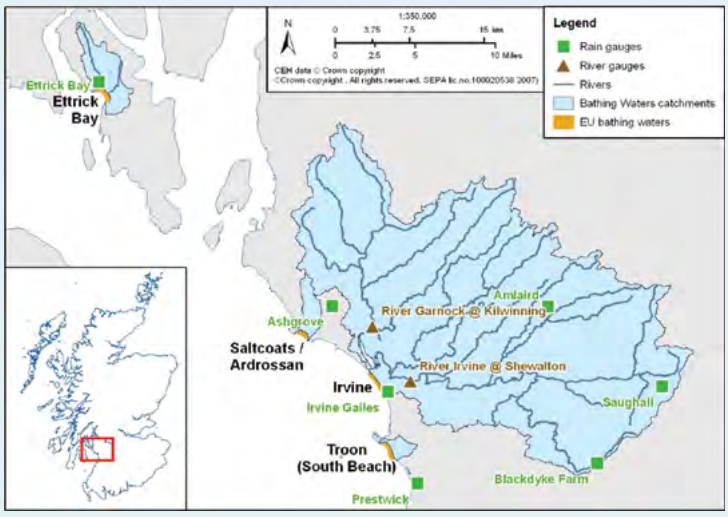


Figure 4: Water quality predictions using data for public information

Signage accuracy and modelling developments

This season the daily advice given to the public was on water quality was correct or precautionary on over 99% of days and we correctly predicted 78% of poor samples at locations with bathing water signs.

Figure 5: Bathing waters signage performance and validation of daily predictions

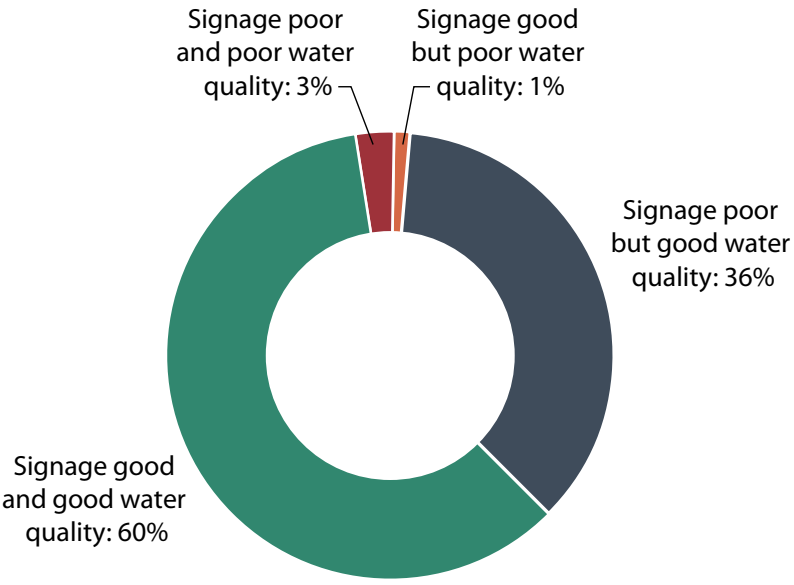
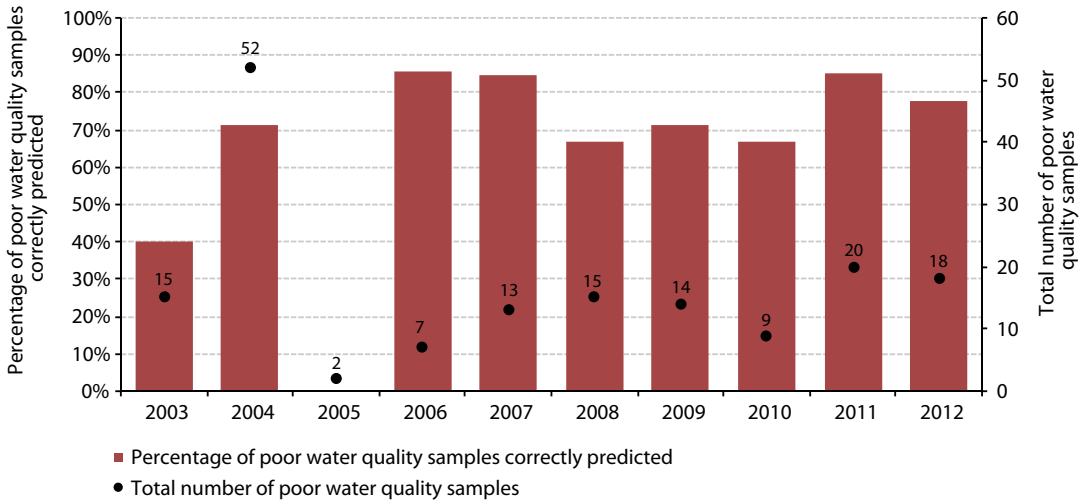


Figure 6: Validation of poor water quality samples



We currently report and predict to the water quality standards in the 1976 Directive where an *E. coli* count of less than or equal to 2000 is considered 'good'. We are now in the transition period between directives and by 2015 we will be making our water quality predictions against the tighter standards of the revised Bathing Water Directive. To bring us towards these standards changes have been made to the models at Ettrick, Millport, Lossiemouth (East) and Sandyhills so that water quality results within the range of 1000 to 2000 *E. coli* are now being predicted as 'poor'. As our models have always been built with a precautionary element results in this range at other sites are already usually being predicted to be of poor water quality.

Work is ongoing on the development and testing of new smarter prediction models using decision-tree systems and on building platforms for their daily implementation. These will enable us to predict more accurately against the standards required by the revised directive.

In 2012 our models which used river flow as a parameter faced a new, previously unseen, challenge. At these sites the model works on the premise that heavy rainfall causes an increase in river flow, which then triggers a poor bathing water prediction. This approach has been operationally effective in previous seasons, with river flow falling below the trigger level when the rainfall, and risk to bathing water quality has receded and the water quality prediction reverting to good. In 2012 due to ongoing rainfall throughout large parts of the season some of the river levels used in the models rose so high that even when they dropped they still remained above the trigger level, causing a higher than acceptable number of false alarms.

Sites affected were Irvine, Portobello (West), Portobello (Central), Saltcoats/Ardrossan and Southerness.

The revised directive allows us to discount samples taken on dates under predicted short term pollution where there has been appropriate public signage and information. Under the phased implementation this is allowed from 2012. As such 12 samples were discounted across 11 sites and where necessary replaced as required by EU rules and the 2008 Bathing Water (Scotland) Regulations.

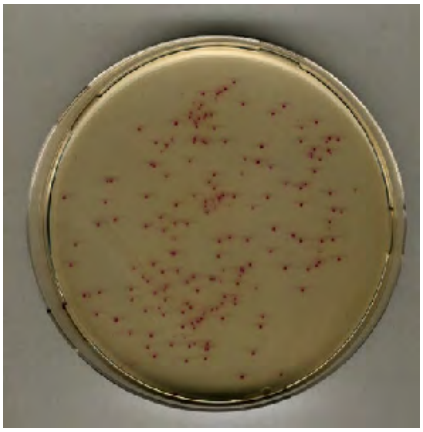
2.4 Analytical developments

New microbiological methods for *E.coli* and Intestinal Enterococci

In 2008 SEPA, the Environment Agency and the Northern Ireland Environment Agency carried out a joint equivalency trial on alternative analytical methods. This trial led to the development of alternative methods for the two indicators that produced confirmed results for *E. coli* and Intestinal Enterococci (the new parameters of the rBWD) within 24 hours – a big saving on the traditional methods used. Following this work, we carried out further validation and commissioning work on these methods for which we received the methods' acceptance by the EC and UKAS accreditation during 2012.

Chromogenic, or colour producing, media are microbiological culture media which contain chromogenic substrates. Certain enzymes, produced by and very specific to the target bacteria, split these substrates, resulting in the different colouration of bacterial colonies of interest.

E. coli on TBX media



Enterococci on CEA media

The new methods were used during the 2012 bathing season, proving popular with the microbiologists. The *E. coli* method in particular worked very well. The enterococci method also worked well, but was found to be more difficult to interpret with a small number of samples, resulting in the addition of some additional tests, which reduced some of the time savings expected for this method. This is being looked into by our microbiology team prior to the 2013 bathing season to see if any method modifications are required.

3 Working with our partners

3.1 Investment by Scottish Water

Previous bathing water reports have highlighted the accelerated investment by Scottish Water in its Quality and Standards (Q&S) programmes since 2000. The Q&S programmes are the means by which the Scottish Water capital investment programme is identified, funded and delivered.

Significant investment in water and drainage infrastructure has been made in previous investment periods—Q&S I (2000–2002), Q&S II (2002–2006) and Q&S IIIa (2006–2010)—with the aim of improving bathing waters compliance.

The main focus of the Q&S IIIa investment programme was to identify and reduce the effects of unsatisfactory intermittent discharges in Ayrshire (Meadowhead and Stevenston sewerage networks) and Edinburgh. Although solutions have been implemented in Edinburgh, not all improvements have been completed in Ayrshire. As such, this work has been carried forward into the current investment period, Q&SIIIb (2010–2015).

In addition, the Q&SIIIb (2010–2015) investment programme includes 39 bathing water studies. These are being undertaken to determine if improvements to Scottish Water assets are required to achieve compliance with the revised Bathing Waters Directive. Any required solutions will also be implemented during this investment period.

A list of the bathing waters being studied by Scottish Water as part of the Q&SIIIb (2010–2015) investment programme is presented in Table 1.

Table 1: Q&SIIIb (2010–2015) Scottish Water bathing water studies

Aberdeen	Kinghorn (Harbour Beach)	North Berwick (West)
Ayr (South Beach)	Kirkcaldy (Seafield)	Portobello (Central)
Broad Sands	Largs (Pencil Beach)	Portobello (West)
Carnoustie	Leven	Prestwick
Cruden Bay	Loch Morlich	Rockcliffe
Dhoon Bay	Lossiemouth (East)	Rosehearty
Eyemouth	Lunderston Bay	Rosemarkie
Findhorn	Luss Bay	Saltcoats/Ardrossan
Ganavan	Maidens	Seamill
Girvan	Millport Bay	Southerness
Heads of Ayr	Nairn (Central)	Stonehaven
Inverboyndie	Nairn (East)	Thurso
Irvine	North Berwick (Milsey Bay)	Troon (South Beach)

3.2 Private sewage treatment systems

As highlighted in the results for individual bathing waters, not all sewage treatment schemes are part of the public network operated by Scottish Water. Improvements often have to be sought from privately run systems treating waste from caravan sites and even individual homes. Very often, the preferred solution is connection to a public system, but it may have to be paid for by a householder or a developer.

3.3 Our plans to reduce sources of diffuse pollution

Diffuse pollution is identified as the largest pollution pressure on the water environment in Scotland, but it can be difficult to identify and control. The potential for pollution via diffuse sources is increased during rainfall because nutrients, soil, chemicals and faecal bacteria can be washed from land into the surrounding water environment. For individual or small areas this might not result in an issue, but combined across whole river catchments these pollutants can significantly affect water quality, including in EU designated bathing waters. Land and run-off management practices play a pivotal role in diffuse pollution mitigation.

The rural diffuse pollution plan for Scotland has successfully been implemented, which has seen SEPA working with other members of the Diffuse Pollution Management Advisory Group (DPMAG)[15]. DPMAG was created as a statutory group under section 17 of the Water Environment and Water Services (Scotland) Act 2003 (WEWS)[16] to ensure input from a cross-section of rural, environmental and biodiversity interests, and to help create robust governance, decision-making and a co-ordinated framework for tackling diffuse pollution.

The rural diffuse pollution plan ensures key stakeholders in Scotland work in a co-ordinated way to reduce diffuse pollution from rural sources. A two tiered approach has been developed. It includes:

- a national campaign of awareness raising, guidance, training and inspections in relation to the effects of diffuse pollution;
- a targeted catchment approach (the priority catchment approach) with a sequential process of evidence gathering, awareness raising and farm visits to identify hotspots, target measures and provide one to one advice.

Through the national campaign, DPMAG has ensured a co-ordinated approach for the implementation of measures to reduce the impact of diffuse pollution across Scotland. The national awareness raising campaign along with awareness raising work undertaken by The Scottish Government Rural Payment and Inspection Directorate, Scottish Natural Heritage and Forestry Commission Scotland staff will, as part of Scotland's Environmental and Rural Services (SEARS) will help prevent deterioration of the water environment and will enable water quality improvements. Compliance assessment visits on farms and forestry sites have highlighted rural diffuse pollution problems, and through the inspection process land managers are helped to identify and address the risks. Through the findings of these inspections training events and awareness raising can be targeted at a national and catchment basis.

The catchment approach has been on going in fourteen diffuse pollution priority catchments (Box 1) since 2010.

Box 1. Diffuse pollution priority catchments in the first river basin cycle

Buchan Coastal	**River Doon**
Eye Water	**River Garnock**
Galloway Coastal	**River Irvine**
River Ayr	River South Esk
River Dee (Grampian)	River Tay
River Deveron	River Ugie
North Ayrshire Coastal	**Stewartry Coastal**

Priority catchments associated with bathing water catchments are shown **in bold**

Further information on individual catchments can be accessed via the SEPA website under diffuse pollution[17].

In these catchments we are working with land managers (farmers, foresters, golf course and sports field managers as well as others who work the rural land) and other stakeholders (positive partnerships have been developed between SEPA and members of the local branches of National Farmers Union of Scotland and Scottish Water). This partnership working has allowed knowledge transfer and developing methods to achieve compliance in all sectors with the diffuse pollution General Binding Rules (GBRs).

[15] www.sepa.org.uk/water/river_basin_planning/diffuse_pollution_mag.aspx

[16] www.scotland.gov.uk/Topics/Environment/Water/15561/WFD/WEWSAct

[17] www.sepa.org.uk/water/river_basin_planning/dp_priority_catchments.aspx

A three staged approach has been employed in all 14 catchments and has been achieved as being very successful in identifying issues and mitigation measures that will work on the ground to minimise diffuse pollution.

Stage one

All 14 catchments have been walked by our staff with help from Scottish Water and local fishery bailiffs. A total of 5600 km of named watercourses have been walked in these 14 catchments. Evidence of good practice, such as riparian buffer strips and provision of fencing and water troughs, have been identified, however a significant number of non compliance with the diffuse pollution GBRs have also been found, averaging out at approximately one non compliance per kilometre. These non compliances relate to inappropriate storage and application of fertiliser, issues relating to the keeping of livestock, cultivation of land and the application or agro chemicals (both pesticides and herbicides).

Stage two: awareness raising

Each catchment, guided by the information collected through the catchment walks and available science has undertaken a targeted awareness campaign ranging from on-farm events to press articles. In catchments that impact bathing waters, the impacts of the catchment activities on these areas have been highlighted. Over 150 awareness raising events have taken place in Scotland's 14 priority catchments.

Stage three: engagement (one to one farm inspections)

We have been progressing with one to one farm visits in Scotland's priority catchments. To date, one to one visits have been completed in six of the 14 catchments and are on going in another four catchments. Over 1,100 one to one farm visits have been completed by our staff, the findings of which were discussed with the land manager identifying possible methods of mitigation and funding for these. We have also undertaken a number of revisits to land managers in four of the six priority catchments in which one to one visits have already been completed. These visits have demonstrated that the majority of farmers have either completed remediation measure on the ground or are in the process of starting work.

Annex one: 2012 Monitoring data from Scotland's 83 identified bathing waters

Bathing water	Local Authority	No of sample results	Overall quality
Southerness	D&G	20	Mandatory
Sandyhills	D&G	20 (+1 disc)	Mandatory
Rockcliffe	D&G	19 (+1 disc)	Mandatory
Dhoon Bay	D&G	19 (+1 disc)	Mandatory
Brighouse Bay	D&G	19 (+1 disc)	Mandatory
Carrick	D&G	20	Mandatory
Mossyard	D&G	20	Mandatory
Girvan	SA	20	Mandatory
Maidens	SA	20	Mandatory
Culzean	SA	20	Guideline
Heads of Ayr	SA	20	Fail
Ayr (South Beach)	SA	19 (+1 disc)	Mandatory
Prestwick	SA	20 (+1 disc)	Mandatory
Troon (South Beach)	SA	20	Mandatory
Irvine	NA	20	Mandatory
Saltcoats/Ardrossan	NA	19 (+1 disc)	Mandatory
Seamill	NA	19 (+1 disc)	Mandatory
Largs (Pencil Beach)	NA	20	Guideline
Lunderston Bay	Inv	20	Mandatory
Millport Bay	NA	20	Mandatory
Luss Bay	A&B	20	Mandatory
Ettrick Bay	A&B	19 (+1 disc)	Mandatory
Machrihanish	A&B	10	Mandatory
Ganavan	A&B	10	Guideline
Achmelvich	H	5	Guideline
Thurso	H	20	Mandatory
Dunnet	H	20	Guideline
Dornoch	H	5	Guideline
Rosemarkie	H	20	Guideline
Dores	H	20	Mandatory
Nairn (Central)	H	20	Mandatory
Nairn (East)	H	20	Mandatory
Findhorn	Moray	20	Mandatory
Loch Morlich	H	10	Mandatory
Lossiemouth (East)	Moray	20	Mandatory

Bathing water	Local Authority	No of sample results	Overall quality
Cullen Bay	Moray	20	Guideline
Inverboyndie	Aber	20	Guideline
Rosehearty	Aber	20	Guideline
Fraserburgh (Tiger Hill)	Aber	20	Guideline
Fraserburgh (Philorth)	Aber	20	Guideline
Peterhead (Lido)	Aber	20	Guideline
Cruden Bay	Aber	20	Mandatory
Balmedie	Aber	20	Mandatory
Aberdeen	ACC	20	Mandatory
Stonehaven	Aber	18 (+2 disc)	Fail
Montrose	Angus	20	Mandatory
Lunan Bay	Angus	10	Guideline
Arbroath (West Links)	Angus	20	Guideline
Carnoustie	Angus	20	Mandatory
Monifieth	Angus	20	Mandatory
Broughty Ferry	DC	20	Mandatory
Tentsmuir Sands	Fife	7	Guideline
St Andrews (West Sands)	Fife	20	Mandatory
St Andrews (East Sands)	Fife	20	Mandatory
Kingsbarns	Fife	20	Mandatory
Crail (Roome Bay)	Fife	20	Guideline
Anstruther (Billow Ness)	Fife	20	Mandatory
Elie (Ruby Bay)	Fife	20	Guideline
Elie (Harbour) and Earlsferry	Fife	20	Guideline
Leven	Fife	20	Mandatory
Kirkcaldy (Seafield)	Fife	20	Mandatory
Kinghorn (Harbour Beach)	Fife	20	Mandatory
Kinghorn (Pettycur)	Fife	20	Guideline
Burntisland	Fife	20	Guideline
Aberdour (Silversands)	Fife	20	Mandatory
Aberdour Harbour (Black Sands)	Fife	20	Mandatory
Portobello (West)	CofE	20	Mandatory
Portobello (Central)	CofE	20	Guideline
Seton Sands	EL	20	Mandatory
Longniddry	EL	20	Guideline
Gullane	EL	5	Guideline
Yellow Craig	EL	20	Guideline
Broad Sands	EL	20	Guideline

Bathing water	Local Authority	No of sample results	Overall quality
North Berwick (West)	EL	20	Guideline
North Berwick (Milsey Bay)	EL	20	Guideline
Seacliff	EL	20	Guideline
Dunbar (Belhaven)	EL	20	Guideline
Dunbar (East)	EL	20	Mandatory
Whitesands	EL	20	Mandatory
Thorntonloch	EL	20	Guideline
Pease Bay	SB	20	Guideline
Coldingham	SB	20	Mandatory
Eyemouth	SB	19 (+1 disc)	Mandatory

Disc = Discounted

20 (+x Disc) denotes 20 samples used for compliance, plus x discounted

Local Authority abbreviation codes

A&B Argyll and Bute
Aber Aberdeenshire
ACC Aberdeen City Council
CofE City of Edinburgh
D&G Dumfries and Galloway
DC Dundee City
EL East Lothian
H Highland
Inv Inverclyde
NA North Ayrshire
SA South Ayrshire
SB Scottish Borders

Annex two: Current legislation and results assessment

EU Bathing Water Directives 76/160/EEC and 2006/7/EC

Directive 76/160/EEC requires each member state to identify bathing waters and to take all necessary measures to bring these waters up to the quality standards prescribed. A 'bathing water' is defined as "... fresh or sea water where bathing is either explicitly authorised and is traditionally practised by a large number of bathers or is not prohibited".

The environmental quality standards are set to protect the environment and public health, and include safe limits for microbiological measures. The directive lays down requirements for sampling frequency, analysis methods, bathing areas inspection and the interpretation of results.

The Bathing Waters (Scotland) Regulations 2008 introduces the requirements of the revised Bathing Waters Directive (2006/7/EC), and will come into effect in a phased manner over the coming years. The key features of the regulations will be tighter microbiological standards to be met by 2015 with monitoring started by 2012, and an increased provision of public information.

The period 2012 to 2014 is a transition phase where parts of both directives apply.

Related legislation

Under the Water Environment (Controlled Activities) (Scotland) Regulations 2005 as amended, SEPA issues authorisations for discharges of sewage and trade effluent to controlled waters, including all coastal and inland waters. The conditions applied to each consent must be met by the discharger and are designed to enable compliance with relevant water quality objectives. The latest amendment, via The Water Environment (Diffuse Pollution) (Scotland) Regulations 2008, introduces further General Binding Rules (the lowest level of authorised activity), based on widely accepted agricultural and forestry standards of good practice.

The Urban Waste Water Treatment Directive (UWWTD) specifies minimum legal standards for the treatment of municipal waste water. These standards are determined by the size of the community to be served by a sewage treatment works and by the nature of the receiving environment. This directive also requires treatment to ensure compliance with all other relevant EU directives, including the Bathing Water Directive. The Urban Waste Water Treatment (Scotland) Regulations 1994 implement this directive in Scotland.

The Water Framework Directive (WFD) will be the principal driver for water quality improvements in Scotland over the next decade and beyond. This directive requires member states to ensure attainment of good status in coastal waters, estuaries, rivers, lochs and groundwater by 2015 through the implementation of river basin management plans, the first of which was finalised in December 2009. The WFD will replace seven existing directives and will provide the context in which other directives, including the Bathing Water Directive, operate.

Interpretation of results and requirements for monitoring programmes

The requirements of the current Bathing Water Directive have been implemented in Scotland by the Bathing Waters (Classification) (Scotland) Regulations 1991. The directive contains two sets of water quality standards:

- mandatory quality standards which member states must meet;
- more stringent guideline quality standards which member states must endeavour to achieve.

During this transition phase until 2014 we report each year against the standards prescribed in Directive 76/160/EEC, as per previous years. The data will also be used to report in 2015 to the standards prescribed in the revised directive using data from the four year period 2012 to 2015. We now measure using the revised directive parameters of *Escherichia coli (E. coli)* and intestinal enterococci (IE) which are transferable on a near 1:1 basis with the previous parameters faecal coliforms and faecal streptococci.

Mandatory standards (good quality)

Mandatory standards during the period 2012 to 2014 apply to the quality indicator *Escherichia coli*, previously known as faecal coliforms (FC).

For the site to achieve a mandatory level pass, 95% of samples taken during the bathing season must comply with the mandatory coliform quality standards. Waters which do not meet this standard are classified as failing.

Guideline values (excellent quality)

In addition to the mandatory standards, there are guideline values for *Escherichia coli* and intestinal enterococci (previously reported as faecal streptococci) bacterial quality indicators. These guideline values are more stringent than the mandatory standards and, if achieved, indicate very good bathing water quality.

Abnormal situations

An abnormal situation is defined by the revised Bathing Water Directive as an event or combination of events impacting on bathing water quality at the location concerned and not expected to occur on average more than once every four years. During an abnormal situation the monitoring calendar can be suspended so that samples which assess compliance of the bathing water are not taken. This is because they are unrepresentative of the water quality of a bathing water. When an abnormal situation is in force, signs must be put up by the beach controller warning the public of the nature and expected duration of the pollution. No abnormal situations were declared in Scotland in 2012.

Short term pollution

The revised bathing water directive defines short term pollution as "microbiological contamination that has clearly identifiable causes (and) is not normally expected to affect bathing water quality for more than approximately 72 hours". The directive allows us to disregard samples taken during short term pollution if "adequate management measures are being taken, including surveillance, early warning systems and monitoring, with a view to preventing bathers' exposure by means of a warning."

The directive says that up to a maximum of 15% of the samples used to assess the classification of a bathing water can be disregarded from the assessment and, if necessary, replaced. Twelve samples from 11 sites across Scotland were discounted using this provision in 2012.

Sampling frequency

The minimum frequency of sampling is prescribed in the Annex to the Bathing Water Directive. Normally, checks must be made at least once every two weeks during the bathing season. Additional samples must be taken if there are grounds to suspect that the quality of the waters is deteriorating, or is likely to deteriorate, as the result of any discharge. Given this requirement, and the historically poor compliance record of Scottish bathing waters, additional samples are generally taken from all waters so that they are sampled 20 times during the bathing season.

The Bathing Water Directive also permits sampling frequency to be halved for waters where quality is consistently good. Following the improvements made to Scottish bathing waters, the European Commission indicated a list of Scottish sites where this provision may be applied. As described in earlier reports, SEPA implemented this provision for the first time in 2004. We will only apply the provision to waters that meet a much higher quality hurdle than that required by the EU. This hurdle requires high statistical confidence that the directive's guideline quality standards have been met over the preceding three-year period. Thus, it includes results from years before the most recent quality improvement schemes were completed. Sites selected for reduced sampling are sampled five times during the bathing waters season. Details of sites where the reduced sampling provision was applied in 2011 are identified in Annex 1.

Interpretation of microbiological values

The Bathing Water Directive sets standards for microbiological quality indicator organisms that are all naturally present in the guts of humans and all other warm blooded animals. The presence of these indicators of faecal contamination in excess of the values in the directive indicates that waters may have received discharges of sewage that have not received adequate treatment or dilution. Large concentrations of seabirds or livestock slurries and manure also give rise to these microbiological indicators in bathing waters. The latter must therefore be properly applied to agricultural land in order to avoid pollution. The bacteria and viruses present in sewage and animal excreta may cause illness, especially as a result of ingestion or infection through wounds or cuts.

Table 1: Interpretation of microbiological values for bathing waters in the period 2012 to 2014

	Escherichia coli (previously faecal coliforms)	Intestinal enterococci (previously faecal streptococci)
Mandatory / Imperative pass (M)	95% of samples should not exceed 2,000 *E. coli* per 100 ml If a site is sampled 20 times, at least 19 samples must meet this criteria. If a site is sampled less than 20 times, all samples must meet this criteria	The 1976 directive contains no mandatory standard for this parameter
Guideline pass (G)	80% of samples should not exceed 100 *E. coli* per 100 ml If a site is sampled 20 times, at least 16 samples must meet this criteria Proportional reductions apply at sites with reduced sampling	90% of samples should not exceed 100 intestinal enterococci per 100 ml If a site is sampled 20 times, at least 18 samples must meet this criteria Proportional reductions apply at sites with reduced sampling

Annex three: Sources of additional information on bathing water quality

Our website[18] contains current bathing water profiles and previous Scottish bathing waters reports. The results from the monitoring programme for identified bathing waters are published on our website as they are produced throughout the bathing water season.

Several other organisations complement our role in promoting high standards of bathing water quality. The Scottish Government is responsible for implementing the directive in Scotland and for establishing policy and strategy. It has also funded and co-funded research to help achieve compliance.

The Marine Conservation Society (MCS), the UK charity dedicated to protecting the marine environment and its wildlife, publishes the Good Beach Guide every year. It lists all identified and many non-identified bathing waters around the entire UK coastline. The recommended beaches can be viewed online[19].

In Scotland, the charity Keep Scotland Beautiful (KSB) administers the Seaside Awards for beaches. These awards recognise beaches that are clean, safe and which comply with the Bathing Water Directive's mandatory standards. As well as the Seaside Awards, Keep Scotland Beautiful administers the International Blue Flag Campaign in Scotland on behalf of the Foundation for Environmental Education. The Blue Flag is acknowledged in many countries around the world. The programme is designed to raise environmental awareness and increase good environmental practise amongst tourists, local communities, and beach and marina operators.

The Blue Flag award requires water quality to be guideline standard. At the start of the 2012 bathing water season, eight bathing waters held a Blue Flag in Scotland:

- Aberdour (Sliversands);
- Burntisland;
- Elie (Harbour) and Earlsferry;
- Kinghorn (Pettycur);
- Broughty Ferry;
- Coldingham;
- Elie (Ruby Bay);
- Leven, East Fife

Water Authority	Scottish Government	Keep Scotland Beautiful
Scottish Water, Castle House, 6 Castle Drive, Carnegie Campus, Dunfermline, KY11 8GG 0845 601 8855 www.scottishwater.co.uk	Victoria Quay, Edinburgh, EH6 6QQ 0131 244 0396 eqcat@scotland.gsi.gov.uk www.scotland.gov.uk/Topics/Environment/Water/15561/bathingwaters	Wallace House, 17-21 Maxwell Place, Stirling, FK8 1JU 01786 471333 beach@ksbscotland.org.uk www.keepscotlandbeautiful.org

Information on bathing water quality in England and Wales can be obtained from the Environment Agency and, in Northern Ireland, from the Northern Ireland Environment Agency.

Environment Agency	Northern Ireland Environment Agency	Marine Conservation Society
National Customer Contact Centre PO Box 544 Rotherham, S60 1BY 03708 506 506 enquiries@environment-agency.gov.uk www.environment-agency.gov.uk/bathingwaters	NIEA 17 Antrim Road, Tonagh, Lisburn, Co Antrim, BT28 3AL 0845 302 0008 waterinfo@doeni.gov.uk www.doeni.gov.uk/niea/water-home/quality/bathingqualityni.htm	Wolf Business Park Alton Road, Ross-on-Wye, Herefordshire, HR9 5NB 01989 566017 info@mcsuk.org www.mcsuk.org

[18] www.sepa.org.uk

[19] www.goodbeachguide.co.uk

Annex four: Individual bathing waters information

A dash in the right hand column indicates that there were no significant changes in this catchment that would affect bathing water quality.

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Southerness	This season Southerness met the mandatory standard for its eighth consecutive year.	The catchment associated with this bathing water has been identified as a diffuse pollution priority catchment in the first river basin cycle. Evidence gathering through waterbody walks has been completed; the awareness raising is now on-going and individual farm visits are programmed to start in 2013. Any improvements as a result of this work are likely to be seen in several years time, when the measures identified as necessary are fully in place.
Sandyhills	Sandyhills met the mandatory standard in 2012, after a varied compliance history in previous years. There were two single exceedances of this standard during August. Both exceedances were thought to be due to high localised rainfall resulting in increased run-off from the catchment and were correctly predicted by our bathing water quality sign. The second sample has been removed from our compliance dataset.	The catchment associated with this bathing water has been identified as a diffuse pollution priority catchment in the first river basin cycle. Evidence gathering through waterbody walks has been completed; the awareness raising is now on-going and individual farm visits are programmed to start in 2013. Any improvements as a result of this work are likely to be seen in several years, when the measures identified as necessary are fully in place.
Rockcliffe	Rockcliffe met the mandatory standard this season as it has done since 2004. There was a single sample exceedance in August which was likely to be due to high localised rainfall resulting in increased run-off from the catchment. The poor water quality on this occasion was correctly predicted by our electronic water quality signs and so this result will not count towards bathing water compliance.	The catchment associated with this bathing water has been identified as a diffuse pollution priority catchment in the first river basin cycle. Evidence gathering through waterbody walks has been completed; the awareness raising is now on-going and individual farm visits are programmed to start in 2013. Any improvements as a result of this work are likely to be seen in several years, when the measures identified as necessary are fully in place.
Dhoon Bay	Dhoon Bay has complied with mandatory water quality standards since designation in 2008. There was a single sample exceedance in August, which is possibly due to high localised rainfall resulting in increased run-off from the catchment. Our electronic signs at the beach warned of poor water quality on the day and so this result will not count towards compliance under the revised Bathing Water Directive.	The catchment associated with this bathing water has been identified as a diffuse pollution priority catchment in the first river basin cycle. Evidence gathering through waterbody walks has been completed; the awareness raising is now on-going and individual farm visits are programmed to start in 2013. Any improvements as a result of this work are likely to be seen in several years, when the measures identified as necessary are fully in place.

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Brighouse Bay	Brighouse Bay has consistently achieved mandatory standards since 2004. A period of heavy rainfall leading to run-off from land was the most likely cause of the single sample failure in July. Elevated levels of bacteria were also detected in Brighouse Burn which flows into the bathing water. Our electronic signs at the beach warned of poor water quality on the day and so this result will not count towards compliance under the revised Bathing Water Directive.	The catchment associated with this bathing water has been identified as a diffuse pollution priority catchment in the first river basin cycle. Evidence gathering through waterbody walks has been completed; the awareness raising is now on-going and individual farm visits are programmed to start in 2013. Any improvements as a result of this work are likely to be seen in several years, when the measures identified as necessary are fully in place.
Carrick	Carrick again met the mandatory water quality standard as it has done sine 2005.	The catchment associated with this bathing water has been identified as a diffuse pollution priority catchment in the first river basin cycle. Evidence gathering through waterbody walks has been completed; the awareness raising is now on-going and individual farm visits are programmed to start in 2013. Any improvements as a result of this work are likely to be seen in several years, when the measures identified as necessary are fully in place.
Mossyard	Mosyard met the mandatory quality standard this season. It has met this standard or the higher guideline standard since 2007.	The catchment associated with this bathing water has been identified as a diffuse pollution priority catchment in the first river basin cycle. Evidence gathering through waterbody walks has been completed; the awareness raising is now on-going and individual farm visits are programmed to start in 2013. Any improvements as a result of this work are likely to be seen in several years, when the measures identified as necessary are fully in place.
Girvan	In 2012 this bathing water again complied with the mandatory standard. There was a single sample exceedance in August which was considered to have been caused by rainfall in the lead up to sampling.	-
Maidens	Maidens met the mandatory standard in 2012. It has achieved this standard or better since 2003.	-
Culzean	Culzean once again achieved the stringent guideline standards, as it has done consistently since 2005.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Heads of Ayr	Heads of Ayr failed the mandatory standard of the bathing water Directive in 2012, recording three separate exceedances of the mandatory standard; one in July and two in August. In all cases it is thought that localised rainfall mobilised pollutants from agricultural land and this, possibly in combination with other existing sewage discharges, was the most likely cause of the failures. At the time of the final exceedance elevated bacteria levels were also detected in Carwinshoch Burn which flows into the bay at the southern end of the bathing water.	Works are ongoing at a local farm steading to improve the quality of the surface water run-off from the site.
Ayr (South Beach)	In 2012 Ayr (South Beach) bathing water achieved mandatory compliance. One sample taken in July exceeded the mandatory standard. A specific reason for the exceedance could not be identified though there was some rainfall in the area which may have contributed. The poor water quality on this occasion was correctly predicted by our electronic water quality signs and so this result will not count towards compliance under the revised Bathing Water Directive.	-
Prestwick	Prestwick bathing water again achieved mandatory compliance in 2011, as it has done since 2008. There was a mandatory exceedance in June. Whilst SEPA was unable to identify a specific reason for this exceedance it was likely caused by recent rainfall. The poor water quality on this occasion was correctly predicted by our electronic water quality signs and so this result will not count towards bathing water compliance. There was a further exceedance in July. Again a specific reason for the exceedance could not be identified though there was some rainfall in the area which may have contributed.	-
Troon (South Beach)	Troon (South Beach) met the mandatory standard this season. This bathing water has complied with either the mandatory or the more stringent guideline standards for over ten years.	-
Irvine	Irvine met the overall mandatory standard in 2012 for the first time since 2008. All samples taken this season met this standard or the higher guideline standard.	Scottish Water has carried out improvements to a number of sewer overflows in the catchment to reduce their impacts by the installation of a storm sewage interceptor system. This system is now partly operational.

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Saltcoats/ Ardrossan	Saltcoats met the mandatory standard in 2012. There was a single mandatory exceedance in late August. As a result of preceding rainfall our electronic water quality signs correctly predicted poor water quality, and so this result will not count towards bathing water compliance.	-
Seamill	Seamill met the mandatory standard in 2012. It has met this standard or better since 2006. There was a single mandatory exceedance in late August. As a result of preceding rainfall our electronic water quality signs correctly predicted poor water quality, and so this result will not count towards bathing water compliance.	-
Largs (Pencil Beach)	Largs (Pencil Beach) met the guideline standard in 2012. This is the first time this beach has met this higher standard after consistently meeting the mandatory standard since 2003.	-
Lunderston Bay	Lunderston met the mandatory standard in 2012. It has consistently met this standard, or the higher guideline standard for over 10 years.	-
Millport Bay	Millport met the mandatory standard in 2012. It has consistently met this standard or the higher guideline standard for over 10 years. There was a single mandatory exceedance in early July. The most likely cause of the failure was a combination of run off from agricultural land and sewage discharging from a failed sewage pumping station.	Scottish Water has refurbished the sewage pumping stations in Millport to improve their performance.
Luss Bay	In 2012 Luss Bay again met the mandatory standard, continuing an unbroken run of compliance for over ten years.	
Ettrick Bay	In 2012 Ettrick Bay achieved the mandatory standard for a third consecutive year after failing for three years and having a mixed record prior to that. There was a single sample exceedance in late August. As a result of preceeding rainfall our electronic water quality signs correctly predicted poor water quality and so this result will not count towards bathing water compliance.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Machrihanish	Machrihanish met the mandatory standard in 2012. It has consistently met this standard or the higher guideline standard for over ten years.	-
Ganavan	In 2012 Ganavan continued to achieve the guideline water quality standard, as it has done since 2008.	-
Achmelvich	Achmelvich again met the guideline standard as it has done since sampling started in 2008.	-
Thurso	Thurso met the mandatory standard in 2012. The water quality at this site fluctuates between this and guideline status.	-
Dunnet	Dunnet met the guideline standard in 2012. It has met this or the mandatory standard for over 10 years.	-
Dornoch	The guideline standard was again met at Dornoch, as it has been for over 10 years.	-
Rosemarkie	Rosemarkie met the guideline standard in 2012. It has met this or the mandatory standard consistently since monitoring started in 2008.	The Fortrose and Rosemarkie Sewage Treatment Works is being replaced with a new activated sludge plant, which is being built immediately adjacent to the existing site. Completion is expected during summer 2013.
Dores	Dores consistently achieves mandatory compliance, and did so again in 2012.	-
Nairn (Central)	Nairn (Central) met the mandatory standard in 2012. It has met this or the higher guideline standard for over ten years.	-
Nairn (East)	Nairn (East) met the mandatory standard in 2012. It has met this or the higher guideline standard since 2006.	-
Findhorn	Findhorn met the mandatory standard in 2012, narrowly missing the higher guideline standard which it has met since 2008.	-
Loch Morlich	Loch Morlich met the mandatory standard in 2012, narrowly missing the higher guideline standard which it has met since 2008.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Lossiemouth (East)	Lossiemouth met the mandatory standard in 2012. It has met this consistently since 2008 with the exception of last season when it recorded a failure. Investigational sampling is planned for next season at the end of the Spynie canal to determine if this is adversely affecting bathing water quality.	-
Cullen Bay	Cullen met the guideline standard in 2012, as it has done since 2008.	-
Inverboyndie	Inverboyndie met the guideline standard in 2012. It has consistently met this or the mandatory standard for over 10 years.	-
Rosehearty	Rosehearty met the guideline standard in 2012 for the third consecutive year.	The catchment is part of the Buchan coastal priority catchment on which farm visits will be starting shortly to address diffuse pollution issues.
Fraserburgh (Tigerhill)	Fraserburgh (Tigerhill) met the guideline standard in 2012. It has consistently met this or the mandatory standard for over 10 years.	The catchment is part of the Buchan coastal priority catchment on which farm visits will be starting shortly to address diffuse pollution issues.
Fraserburgh (Philorth)	Fraserburgh (Philorth) met the guideline standard in 2012. It has consistently met this or the mandatory standard for over 10 years.	The catchment is part of the Buchan coastal priority catchment on which farm visits will be starting shortly to address diffuse pollution issues.
Peterhead (Lido)	Peterhead (Lido) met the guideline standard in 2012. It has consistently met this or the mandatory standard since 2003.	-
Cruden Bay	This site met the mandatory standard in 2012 for the forth consecutive year.	The catchment is part of the Buchan coastal priority catchment on which farm visits will be starting shortly to address diffuse pollution issues.
Balmedie	Balmedie met the mandatory standard in 2012. It has consistently met this or the higher guideline standard for over 10 years.	-
Aberdeen	Aberdeen met the mandatory standard in 2012. It has met this or the higher guideline standard for over ten years with the exception of 2008 when it recorded a failure.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Stonehaven	Stonehaven bathing water recorded a failure in 2012 after meeting the mandatory standard since 2006. There were four exceedances of the mandatory standard; on three consecutive occasions in late June, early July and once in August. The problems started in late June when a period of persistent and intermittently heavy rainfall coincided with a pollution incident on the Maxie Burn which flows into the Cowie Water. Investigations by SEPA staff found high numbers of bacteria in the Cowie Water indicating that the pollution incident was likely a contributory factor to the failure. A specific reason for the August exceedance could not be identified although there was a period of heavy rainfall leading to run-off from land which was the most likely cause of the failure. Elevated levels of bacteria were also detected in the River Carron which flows into the bathing water. Our electronic signs at the beach warned of poor water quality on the day and so this result will not count towards bathing water compliance.	-
Montrose	Montrose met the mandatory standard in 2012, the first time in over ten years that it has dropped below the guideline standard. This drop from guideline standard is considered to be due to the cumulative impact of rainfall events over what was a very wet summer.	-
Lunan Bay	Lunan Bay has consistently achieved guideline compliance, with the exception of 2008, when the mandatory standard was met.	-
Arbroath (West Links)	Arbroath (West Links) achieved guideline compliance for the fifth successive year.	-
Carnoustie	Carnoustie met the mandatory standard in 2012. It has met this or the higher guideline standard consistently for over ten years.	-
Monifieth	Newly designated in 2011, Monifieth met the mandatory standard this season after meeting the guideline standard last year.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Broughty Ferry	Broughty Ferry met the mandatory standard in 2012. This bathing water has met this, or the higher guideline standard, consistently for over 10 years.	-
Tentsmuir Sands	Tentsmuir Sands again met the guideline standard as it has done since 2003.	-
St Andrews (West Sands)	St Andrews (West Sands) met the mandatory standard, as it did in 2011. This follows a consistent period of guideline water quality. The drop in standards is considered to be due to two consecutive seasons of very wet weather.	-
St Andrews (East Sands)	St Andrews (East Sands) met the mandatory standard in 2012. This site has consistently met the mandatory or higher guideline standard for over 10 years. There was a single sample exceedance in June, most likely due to heavy rainfall and high bacterial counts associated with urban storm water and rural runoff in associated watercourses.	-
Kingsbarns	Kingsbarns met the mandatory standard in 2012. This is only the second time in over 10 years that the higher guideline standard has not been met. There is no specific known reason for this drop in water quality; it is thought to be weather related reflecting the very wet summer experienced in this area.	-
Crail (Roome Bay)	Crail (Roome Bay) again met the highest guideline standard as it has consistently done for over 10 years.	-
Anstruther (Billow Ness)	Anstruther (Billow Ness) met the mandatory standard in 2012. This is a disappointing result as this site had consistently met the guideline standard since 2005. There is no specific known reason for this drop in water quality; it is thought to be weather related reflecting the very wet summer experienced in this area.	-
Elie (Ruby Bay)	Elie (Ruby Bay) again met the highest guideline standard as it has consistently done for over 10 years.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Elie (Harbour) and Easrsferry	Overall Elie (Harbour) and Earlsferry met the guideline standard in 2012 although there was one exceedance of the mandatory standard in early June. This exceedence was most likely caused by debris in the sewerage system which resulted in choked pumps and screen at the Elie South Street pumping station. This caused a discharge from the combined sewer overflow to the bathing water location. Scottish Water undertook suitable and sufficient remedial action to resolve the problem within 24 hours.	-
Leven	Leven met the mandatory standard in 2012, after meeting the guideline standard for three years prior. There was one exceedance of the mandatory standard in July which was most likely due to rainfall associated runoff from urban and rural areas.	-
Kirkcaldy (Seafield)	Kirkcaldy met the mandatory standard in 2012. This site has consistently met this or the higher guideline standard for over 10 years.	-
Kinghorn (Harbour Beach)	Kinghorn (Harbour Beach) met the mandatory standard in 2012 as it has consistently done since 2008. The single sample mandatory exceedance in July was most likely to be associated with rainfall.	-
Kinghorn (Pettycur)	The guideline standard was again met at Kinghorn (Pettycur), as has been the case for over 10 years with the exception of 2007.	-
Burntisland	Water quality at Burntisland continued to meet the guideline standard as it has for over 10 years.	-
Aberdour (Silversands)	Aberdour (Silver Sands) recorded a drop to the mandatory standard after 14 consecutive years of guideline water quality. The water quality at this site remains at a comparatively high standard, with the guideline standard being missed by a very narrow margin. There is no specific known reason for this drop in water quality; it is thought to be weather related reflecting the very wet summer experienced in this area.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Aberdour Harbour (Black Sands)	In 2012 Aberdour Harbour (Black Sands) met the mandatory water quality standard. The single sample exceedance in August is thought to be due to heavy rainfall and the associated runoff from the agricultural fields adjacent to the Dour Burn where it spills into the harbour.	-
Portobello (West)	Portobello (West) met the mandatory standard in 2012 as it has consistently done for over 10 years.	-
Portobello (Central)	Portobello (Central) has achieved guideline compliance for the last four years, following a departure from this standard from 2006 to 2008.	-
Seton Sands	Seton Sands met the mandatory standard in 2012. This beach has met this or the higher guideline standard for over ten years.	-
Longniddry	Longniddry returned to its usual guideline standard in 2012, after a dip to mandatory in the previous season.	-
Gullane	Gullane has complied with the guideline bathing water standards every year since 1995; a consistency of excellence which reflects this bathing water's status as one of the cleanest in the UK.	-
Yellow Craig	Yellow Craig consistently meets guideline or mandatory standard and met the guideline standard this season.	-
Broadsands	This site has complied with the guideline standards each year since 2008 and is expected to continue to do so.	-
North Berwick (West)	North Berwick (West) met the guideline standard in 2012. This beach has met this or mandatory standard for over ten years.	-
North Berwick (Milsey Bay)	The identified bathing water at North Berwick (Milsey Bay) achieved guideline standard in 2012 which, apart from a dip to the mandatory standard in 2010, has been consistently achieved since 2000.	-
Seacliff	The bathing water quality at Seacliff is consistently guideline standard.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Dunbar (Belhaven)	Water quality at Dunbar (Belhaven) has, with the exception of 2006, achieved guideline compliance every year between 1993 and 2012.	-
Dunbar (East)	Dunbar (East) achieved guideline compliance consistently until 2009. It is disappointed that 2012 was the third successive year since that only the mandatory standard was met. In light of this seeming decline in water quality standard, further investigation is planned in 2013 in conjunction with Scottish Water.	-
Whitesands	Whitesands achieved the mandatory standard in 2012, after three consecutive years of meeting the higher guideline standard. SEPA is considering potential sources within the drainage catchment.	-
Thorntonloch	The bathing water at Thorntonloch has consistently complied with guideline standards since 1999. In 2012 there was a single exceedance of the mandatory standard, in July. At Thorntonloch some of the upstream land is used for agriculture, with cattle and sheep grazing on its tributaries. This catchment is considered to be susceptible to diffuse pollution. The Thorntonloch Burn flows into Thorntonloch beach and flows rise quickly due to the step nature of the catchment. Due to this the beach is prone to poor quality when it's been wet and the exceedence is thought to be weather related.	-
Pease Bay	Pease Bay has achieved guideline compliance every year since designation in 1999, reflecting the very high quality of the bathing water.	-
Coldingham	Coldingham only met the mandatory standard in 2012, after consistently meeting guideline compliance each year since 1996. No specific reason was identified for this reduction in water quality, however the wet weather was considered to have been a contributory factor.	-

Bathing water	Compliance 2012	Catchment changes affecting bathing water quality, 2012
Eyemouth	Eyemouth met the mandatory standard in 2012, following a period of mixed compliance. There was a single sample exceedance in July but as a result of preceeding rainfall our electronic water quality signs correctly predicted poor water quality and so this result will not count towards bathing water compliance.	Further work has been undertaken by SEPA as part of its priority catchment work in the Eye catchment. This has included further farm visits in the catchment. A number of farms have already undertaken works to exclude stock from watercourses and a number of other proposals are awaiting approval. SEPA considers it likely that the works already undertaken in the catchment contributed to Eyemouth achieving compliance with the mandatory standard this year.

Annex five: SEPA offices

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