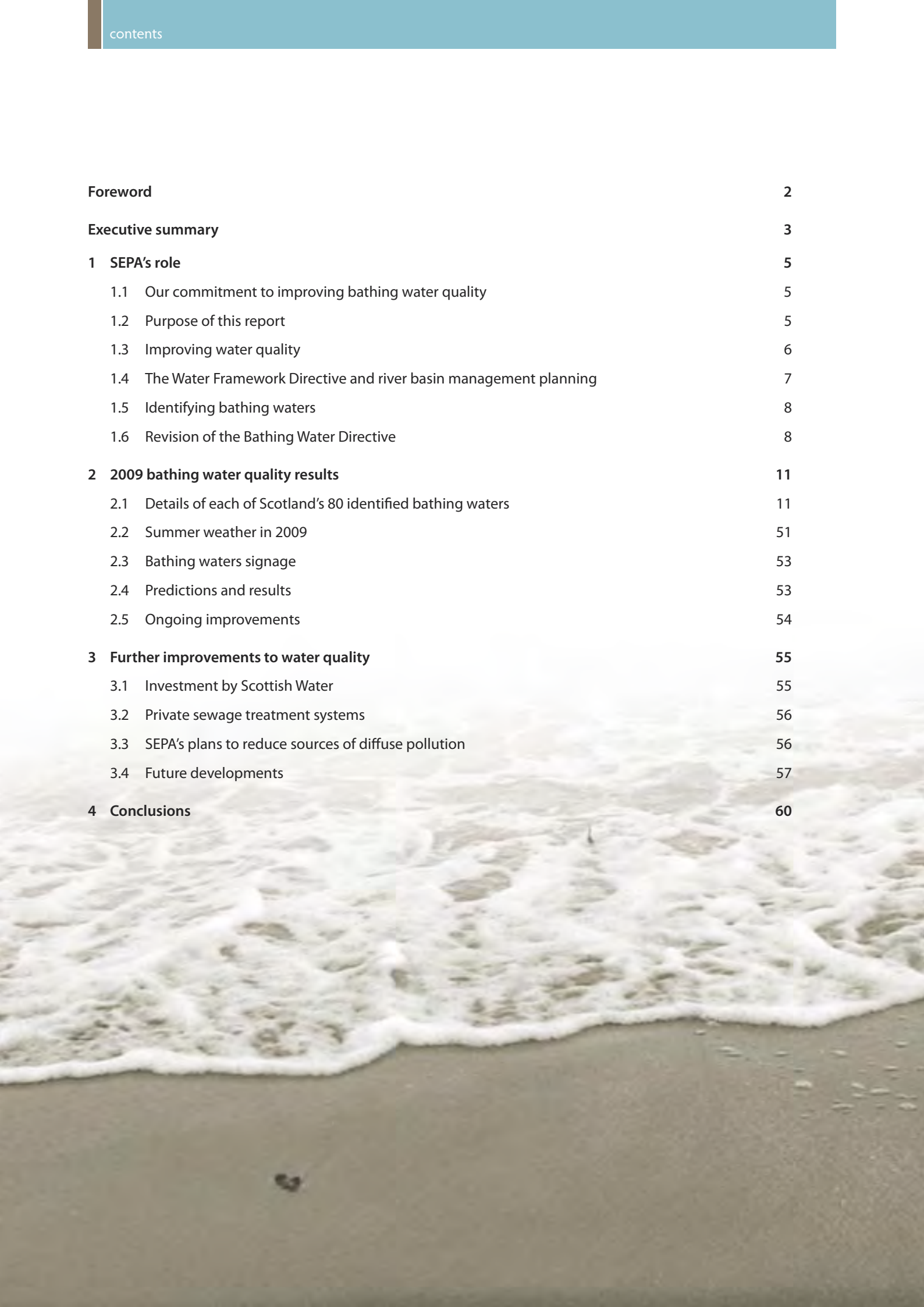
Scottish bathing waters
2009

natural scotland
SCOTTISH GOVERNMENT

SEPA
Scottish Environment Protection Agency



Foreword

2009 saw a welcome start to the bathing season. The dry weather in June and July was encouraging, with monitoring results holding up better than in the two previous seasons. We appeared to be on target for a return to good quality bathing water across Scotland.

Unfortunately the abnormally heavy rain in late summer halted the run of good water quality. As in 2007 and 2008 the wet weather conditions were a big contributing factor in the failure of some of our bathing waters to meet the mandatory standard.

Despite the wet August and September, 94% of bathing waters achieved the EU mandatory standard and more than half of Scotland's bathing waters managed to achieve the more stringent guideline standard. This is a 3% increase in the number of beaches achieving mandatory compliance compared to the previous year, which is encouraging in view of the high summer rainfall in 2009.

The final outcome of the 2009 season is testimony to the joint efforts of the Scottish Government, Scottish Water, the farming community and SEPA to lessen the impact on nearby water systems and to provide the public with good information.

The loss of the blue flag at the Elie (Harbour) and Earlsferry bathing water was a bad blow for the 2009 season. Investigations quickly identified the problem and work was carried out to improve water quality. On a positive note Elie (Harbour) and Earlsferry finished the season complying with the overall mandatory standard. We are hopeful that the blue flag status will be restored at this beach next year.

SEPA's electronic signs displaying daily water quality status forecasts at 11 beaches across Scotland performed well again. Not only were the signs fully operational throughout the bathing season but the predictive accuracy remained extremely high, with 98% of the daily messages being accurate or precautionary. Preparations are underway to extend the beach sign network to another 10 to 15 beaches for 2011.

SEPA is committed to working with others to identify the risks associated with potential sources of pollution to our bathing waters and initiate appropriate improvement measures. This will be achieved through the river basin planning process which has now been agreed for Scotland by the Scottish Government. During 2010, SEPA will be preparing and consulting on drafts of new bathing water profiles which are required to be available on the Internet and with summary information posted at bathing waters by March 2011.

Engaging and working with our partners is essential to enable us to manage risks, initiate improvements, apply pollution regulations and support good practices. Together we will be in a better position to control pollution, be it from diffuse sources such as run-off from agricultural land or point sources such as from pipe discharges.

The imminent application of the revised Bathing Water Directive means that we still require further improvement in the levels of bacterial pollution at our bathing waters over the next few years. We will intensify our efforts to maintain progress and rise to the challenges posed by the stricter microbiological standards and, if climate trends continue, learn to cope with summer intense rainfall events.

James C. Curran.

Prof James Curran
Director of Environmental Science
Scottish Environment Protection Agency

Executive summary

The number of designated bathing waters remained at 80 for the second year running, with no changes made to the site list for 2009.

Despite the abnormally heavy rain throughout Scotland in the late summer 75 bathing waters achieved the mandatory standard and 45 the highest guideline standard during the 2009 season. Initial monitoring results in June and July were encouraging, though unfortunately the exceptionally wet weather and gales during August and September resulted in diffuse pollution entering the water in some areas. Of the 1,522 samples analysed, 1,495 (98.2%) achieved mandatory or guideline standards and only 27 (1.8%) failed to meet the mandatory requirements.

Data provided by the Centre for Ecology and Hydrology indicate that Scotland as a whole had its third wettest summer since 1869. Following the disappointing summer weather of 2008 most people were probably hoping for better things in 2009. In some ways they were not to be disappointed for the summer months June to August of 2009 proved to be both warmer and sunnier than normal. However, by the end of the summer rainfall across Scotland as a whole had reached 419mm, exceeding that of 2008 when 383mm was recorded.

In total, five bathing water beaches failed to achieve the mandatory standard this season. SEPA officers responded swiftly to investigate the reasons behind all failures. The poor results registered this year were generally recorded after heavy rainfall. Heavy rainfall can cause drainage overflows and produce high levels of polluted run-off from land upstream, which washes into the sea and reduces bathing water quality. Not all of the failures were caused by diffuse pollution issues though. There were some sewer network problems that contributed to failures too. Where sewage was the cause, SEPA took swift enforcement action and Scottish Water took prompt corrective measures.

Following each investigation a summary of the findings was published on our website along with the monitoring results. Results from investigations at individual sites are included under the details for each of Scotland's 80 beaches in the main text of this report.

SEPA has some samples, taken from failed waters, which will be sent for microbial source tracking (MST) analysis. These samples will be analysed over the course of the winter. MST can provide indication as to whether the pollution in a particular sample is potentially due to human or animal sources, aiding investigations aimed at addressing future pollution risks and improvement strategies.

It was another successful summer for SEPAs predictive signage system. The electronic signs providing real-time daily forecasts of predicted water quality at 11 beaches were fully operational throughout the bathing waters season. During 2009, the prediction and signage system was correct or precautionary 98% of the time. Preparations are underway to expand the predictive signage system for 2011.

SEPA is continuing to review and expand its work on bathing waters to help implement the new Bathing Water Regulations which came into force in Scotland in May 2008. This work includes extending the use of microbial source tracking, developing new predictive models, on-going investigations into the use of rain radar data for predictive modelling and continued support for the rapid methods testing project. Work has also started on the production of bathing water profiles required for 2011.

SEPA and its stakeholders – including Scottish Water, local authorities and farmers – are continuing to increase their efforts to improve Scotland's bathing waters and meet the tougher challenges required by the revised Bathing Water Directive.

Photo: St Andrews, Fife

1 SEPA's role

The Scottish Environment Protection Agency (SEPA) is Scotland's environment watchdog. We are a non-departmental public body, accountable through Scottish Ministers to the Scottish Parliament.

As Scotland's environmental regulator, our main role is to protect and improve the environment and human health. We do this through regulating activities that can cause pollution, helping business and industry to understand their environmental responsibilities, enabling customers to comply with legislation and good practice and to realise the many economic benefits of good environmental practice and by monitoring the quality of Scotland's air, land and water.

We monitor and report on the state of Scotland's environment, using sound scientific understanding to inform our independent regulation of activities that may affect its quality.

In addition to publishing this report, we place the monitoring results of its bathing waters on our website within a few days of sample collection. Monitoring is carried out throughout the bathing season from 1 June to 15 September, along with a pre-season sample taken in late May.

1.1 Our commitment to improving bathing water quality

Scotland boasts some beautiful beaches, a resource which we should be proud of and strive to protect, enhance and manage. High-quality bathing waters are an important asset. They enable people to enjoy Scotland's water environment safely, helping to promote our important and valuable tourism industry. All possible sources of pollution must be recognised and controlled in order to protect and, where necessary, improve water quality.

Bathing waters feature in two of the seven key outcomes that SEPA wants to achieve for Scotland, namely 'protected human health and communities', and 'improved water environments'. These outcomes are detailed in *SEPA's Corporate plan 2008–2011*[1]. Under these two themes SEPA will strive to achieve high quality designated bathing waters and improve dissemination of information, e.g. through the Bathing Waters Signage network, as we prepare to implement the revised bathing water standards and duties as per the timeline in the 2008 regulations.

SEPA maintains a policy on microbiological standards for relevant discharges; all new or modified discharges to identified bathing waters must be designed to ensure that the Bathing Water Directive's[2] guideline standards are met. This policy also requires that the microbiological quality of other coastal waters is adequately protected and improved as necessary.

SEPA will continue working with all other relevant authorities to improve compliance with European bathing water standards. Further details for individual waters are given in the pollution reduction plans available on SEPA's bathing waters website[3].

1.2 Purpose of this report

This report contributes to SEPA's aim of providing useful information on Scotland's environment. It presents the results of water quality monitoring at Scotland's bathing waters, describes the factors underlying the results and outlines site-specific plans for improvement.

The results of SEPA's routine monitoring at Scotland's 80 identified bathing waters during the 2009 bathing season are presented in Section 2.

Section 3 provides more information about our on-going work and future plans to ensure further water quality improvements.

As required by the Bathing Water Directive, the water quality results for the 80 identified bathing waters have been reported to the European Commission. The commission will 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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[1] *SEPA's Corporate Plan for 2008–2011*: www.sepa.org.uk/about_us/publications.aspx#corporate

[2] Council Directive of 8 December 1975 concerning the quality of bathing water (76/160/EEC): http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1976/L/01976L0160-20030605-en.pdf

[3] SEPA's bathing waters website: www.sepa.org.uk/water/bathing_waters.aspx

1.3 Improving water quality

SEPA's aim is to continue to make progress towards total compliance with the Bathing Water Directive's mandatory standards. This compliance is not something that SEPA can achieve on its own and it will continue to work with all relevant organisations, the agricultural community and the public to attain this goal. Only by working in partnership can SEPA give Scotland and its visitors the high quality of bathing water they are entitled to expect in the 21st century.

SEPA works to preserve and improve 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 plans (see Section 1.4).

The importance of factors outside SEPA's statutory control has become increasingly apparent. The Scottish Government recognised this in its first strategy document published in March 2002, Strategy for Improving Scotland's Bathing Waters, followed by its Four Point Plan for Reduction of Agricultural Pollution Sources published in December 2002. The strategy was further updated in 2006 by Better Bathing Waters: Meeting the Challenges of the Revised Bathing Water Directive in Scotland. These publications (all available on the Scottish Government website[4]) are proving very helpful in enabling problem sources to be tackled.

Although all large continuous sewage discharges to Scottish waters are now essentially subject to at least full secondary treatment, sewage remains a significant cause of pollution in coastal waters. Storm overflows to rivers and directly to sea remain 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:

- 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.

Investment is required not only in sewage treatment but also in sewerage infrastructure, particularly in storm water overflows. At times of heavy rainfall, combined sewer overflows (CSOs) are necessary to prevent flooding. To achieve this, CSOs have to discharge diluted but minimally treated sewage to watercourses and coastal waters. To minimise their impact on water quality, SEPA imposes conditions requiring solids removal and on the location and frequency of operation of CSOs.

[4]Scottish Government publications: http://www.scotland.gov.uk/Publications/Recent
[5]Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment. http://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

In urban areas, greater use of sustainable urban drainage systems (SUDS) is increasingly limiting urban diffuse pollution from new developments. However, there remains a large problem of contaminated surface water run-off from existing urban areas. The results of an evaluation of retrofitting SUDS to urban areas near to bathing waters by the Scottish Government were published in 2004[6]. Information on SUDS and the latest developments are given on the SEPA website[7].

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 to give a variety of information including the water quality data supplied by SEPA.

1.4 The Water Framework Directive and river basin management planning

The condition of any bathing water is linked to the condition of the other waters in its catchment and to how we manage the land and pollution source pathway risks within that catchment. Taking a source-to-sea approach and integrating land and water management are essential for the effective protection and improvement of the water environment. This is because what impacts on one part of a catchment can also have effects elsewhere within the catchment and the nearby coastal zone.

The Water Framework Directive[8] (transposed to Scottish Law under the Water Environment and Water Services (Scotland) Act 2003[9]) established a new, integrated approach to the protection, improvement and sustainable use of Europe's water environment. The key mechanism for ensuring integrated management is the river basin management planning system[10] which represents a huge step forward in the way in which we safeguard and improve the quality of our water environment.

The Scotland and Solway/Tweed river basin management plans were published in December 2009. These plans cover all types of water body (rivers, lochs, estuaries, coastal waters and groundwaters). They:

- describe the current condition of our 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 (eg 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 over the next six years, and beyond that to 2027, whilst trying to achieve a balance between the 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.

The river basin management plans for river basins within Scotland can be found on the SEPA website[10].

River basin management planning is a cyclical process and updated plans will be published in 2015, 2021 and 2027.

The river basin management plans will ensure that statutory agencies, businesses, public sector bodies and individuals work together to protect the water environment and address significant impacts by co-ordinating all aspects of water management. Similar plans will be put in place across the European Union.

Bathing waters are classed as protected areas under the Water Framework Directive (WFD) (see Annex IV of the directive). Protected areas are areas which are considered to require special protection because of their sensitivity to pollution or their economic, social or environmental importance. The WFD requires that the protected areas are listed on a register[11].

Under the WFD protected areas must achieve compliance with the standards and objectives specified in the European Directive under which they were established. These standards and objectives should be met by 2015 unless otherwise stated in the community legislation under which they were designated. Consequently, under the WFD, bathing waters

[6] www.scotland.gov.uk/Topics/Environment/Water/bathingwaters/RetrofittingSUDS
[7] www.sepa.org.uk/water/water_regulation/regimes/pollution_control/suds.aspx
[8] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. http://ec.europa.eu/environment/water/water-framework/index_en.html
[9] Water Environment and Water Services (Scotland) Act 2003 www.opsi.gov.uk/legislation/scotland/acts2003/asp_20030003_en_1
[10] For more information on river basin planning: www.sepa.org.uk/water/river_basin_planning.aspx
[11] Scotland's protected area register: www.sepa.org.uk/water/protected_areas.aspx.

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' classification by 2015. The improvement of bathing waters by SEPA and its partners will be identified and implemented through the WFD and river basin management plans.

The relevant Scottish river basin management plans (Scotland and Solway Tweed river basin districts) include chapters on protected areas, explaining the links between the WFD and protected areas, the current and future state of protected areas, actions for protected areas and details of specific protected areas.

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

1.5 Identifying bathing waters

The Bathing Water (Scotland) Regulations 2008[12] require that Scottish Ministers keep under annual review the list of designated bathing waters for Scotland. These regulations transpose the requirements of Article 3 of the revised Bathing Water Directive (2006/7/EC) concerning the management of bathing water quality. Directive 2006/7/EC states that 'Member States shall annually identify all bathing waters and define the length of the bathing season. They shall do so for the first time before the start of the first bathing season after 24 March 2008'.

Ministers are also required to designate sites as bathing waters where they expect a large number of people to bathe, taking account of past trends, infrastructure or facilities provided, and other measures to promote bathing.

To meet this obligation, Scottish Ministers designated 20 additional bathing waters in 2008 and de-listed one in light of recommendations provided by the then Bathing Water Review Panel. These changes increased the number of official bathing water sites in 2008 by a third.

To assist Scottish Ministers in the required annual review process from 2009 onwards and to ensure that there is appropriate public participation, the Scottish Government asked SEPA to form and chair a new multi-stakeholder group to review future designations.

In light of the extensive review exercise undertaken in 2008, the large number of new sites designated and the time needed to implement the new designation process, SEPA recommended and it was agreed that no additional sites be designated or de-designated in 2009. The new Bathing Waters Designation Panel and designation process has been operational for consideration of sites for the 2010 season and will continue as an annual process. Further information on the designation process is available on the Scottish Government, SEPA and Keep Scotland Beautiful websites.

Official bathing water designation provides for 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 the owners of non-recognised sites to apply for designation where they meet the appropriate criteria. The new panel will continue to actively promote this.

1.6 Revision of the Bathing Water Directive

The revised Bathing Water Directive (2006/7/EC), which came into force on 24 March 2006, introduces water quality standards that are substantially more stringent than those of the current directive. The text of the revised directive can be found on the EU's website[13].

The revised directive has four quality classification categories – excellent, good, sufficient and poor. The new 'good' standard is broadly equivalent to the existing guideline standards. By 2015, the date by which many other EU WFD quality objectives also have to be met, Member States have to ensure that all bathing waters are of 'sufficient' quality or better. Quality classifications are to be made using four years of monitoring data. Therefore for the first compliance period of the revised Bathing Water Directive samples will be collected from 2012 to 2015. Hence, the new standards will need to be achieved in Scottish bathing waters from 2012.

In addition, 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 after improvement measures have been introduced, permanent advice against bathing must be introduced.

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[12] The Bathing Waters (Scotland) Regulations 2008: www.opsi.gov.uk/legislation/scotland/ssi2008/ssi_20080170_en_1

[13] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EC: http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=Directive&an_doc=2006&nu_doc=7


Kingsbarns, Fife

Action is also required, where necessary, to tackle cyanobacterial blooms, macro algae, marine phytoplankton and other waste from 2011.

Changes have been made to the bacterial entities that must be monitored. These arise from recommendations of the World Health Organization. In place of the current coliform and faecal streptococci standards, the revised directive sets standards for Escherichia coli and intestinal enterococci. While slightly complicating the microbiological analytical techniques necessary, the differences in the values obtained are anticipated to be minimal. Different numerical quality limits are also set between coastal (marine) and inland (freshwater) bathing waters.

The required sampling frequency under the revised directive is lower. Sampling schedules (the monitoring calendar) will be set in advance of the bathing season, but there will be several days' flexibility. This could avoid the need to sample during very wet weather when bathers would not be expected; SEPA has undertaken a trial to determine how this might work in practice.

The revised directive seeks greater public participation in its implementation. It puts more emphasis on providing information to bathers, including via the internet, and particularly on the risks bathers might face from pollution. It also allows up to 15% of sample results to be discounted during short-term pollution events, provided there is a public warning system in place to inform prospective bathers of potentially less good quality. The SEPA internet information and its electronic signage scheme already in place at a limited number of sites in Scotland (see Section 2.3) go towards meeting these requirements. The abnormal events provisions of the current directive is also maintained.

During 2010, SEPA will be preparing and consulting on drafts of new bathing water profiles which are required under the regulations by March 2011. These profiles will be developed from our existing pollution reduction plans but will also contain important additional information aimed at meeting all the requirements set out in the revised directive and enforced by our regulations.

Throughout, SEPA has been and will continue working closely with the Environment Agency and the Northern Ireland Environment Agency on agreed templates and format for the profiles. SEPA has also been participating in an EU workshop and helped prepare EU guidelines which will soon be published.

The Scottish Government recognised that significant changes will be required to meet the conditions of the new directive. In 2006 it published a strategy, Better Bathing Waters: Meeting the Challenges of the Revised Bathing Water Directive in Scotland, which outlined how those challenges would be met. This strategy document sets out how the Scottish Government proposes to implement and meet the microbiological requirements of the revised Bathing Water Directive in Scotland by the 2015 deadline. The strategy assesses past work towards complying with the requirements of the existing directive and how this will progress under the revised directive. It also identifies the important role SEPA will play.

Photo: Crail, Fife

2 2009 bathing water quality results

In 2009, 75 of the 80 (94%) identified bathing waters in Scotland met the EU mandatory standards. Of these, 45 waters (56%) also met the more stringent guideline standards.

These compliance results are higher than in 2008 but lower than in 2006 when 100% of bathing waters achieved the mandatory standards. The results should be considered in the context of summer weather conditions. Unfortunately an excellent start to the 2009 bathing season was halted by abnormally heavy rain throughout Scotland during August and September. More details of this summer's weather are given in Section 2.2.

The 'reduced sampling' provision of the Bathing Waters Directive (Annex 3.4) was continued at two sites (Dornoch and Gullane) in 2009. SEPA's policy for reduced sampling is very stringent, with the provision only applied to sites where there have been no guideline standard exceedances of any determinand during the previous bathing season.

Five sites (Achmelvich, Loch Morlich, Lunan Bay, Machrihanish, Trentsmuir Sands) were only sampled 10 times (rather than the usual 20) due to their geographical remoteness. All five of these sites met the guideline standards for microbiological determinands.

The microbiological monitoring data from the 80 identified bathing waters in Scotland can be found in Annex 1. The results are summarised below (see also Figure 1 and Map 1):

Of the 80 identified bathing waters:

- 45 (56%) met the guideline quality standards of the directive;
- 30 (38%) met the mandatory quality standards of the directive;
- Five (6%) failed to achieve the mandatory quality standards of the directive. To put this into context, this was due to 27 poor samples out of around 1,522 samples in total.

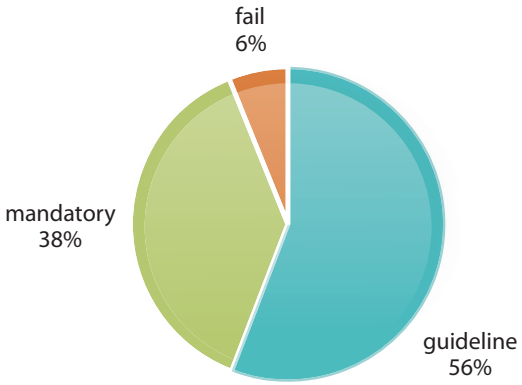


Figure 1: Scotland's 2009 bathing water results

2.1 Details for each of Scotland's 80 identified bathing waters

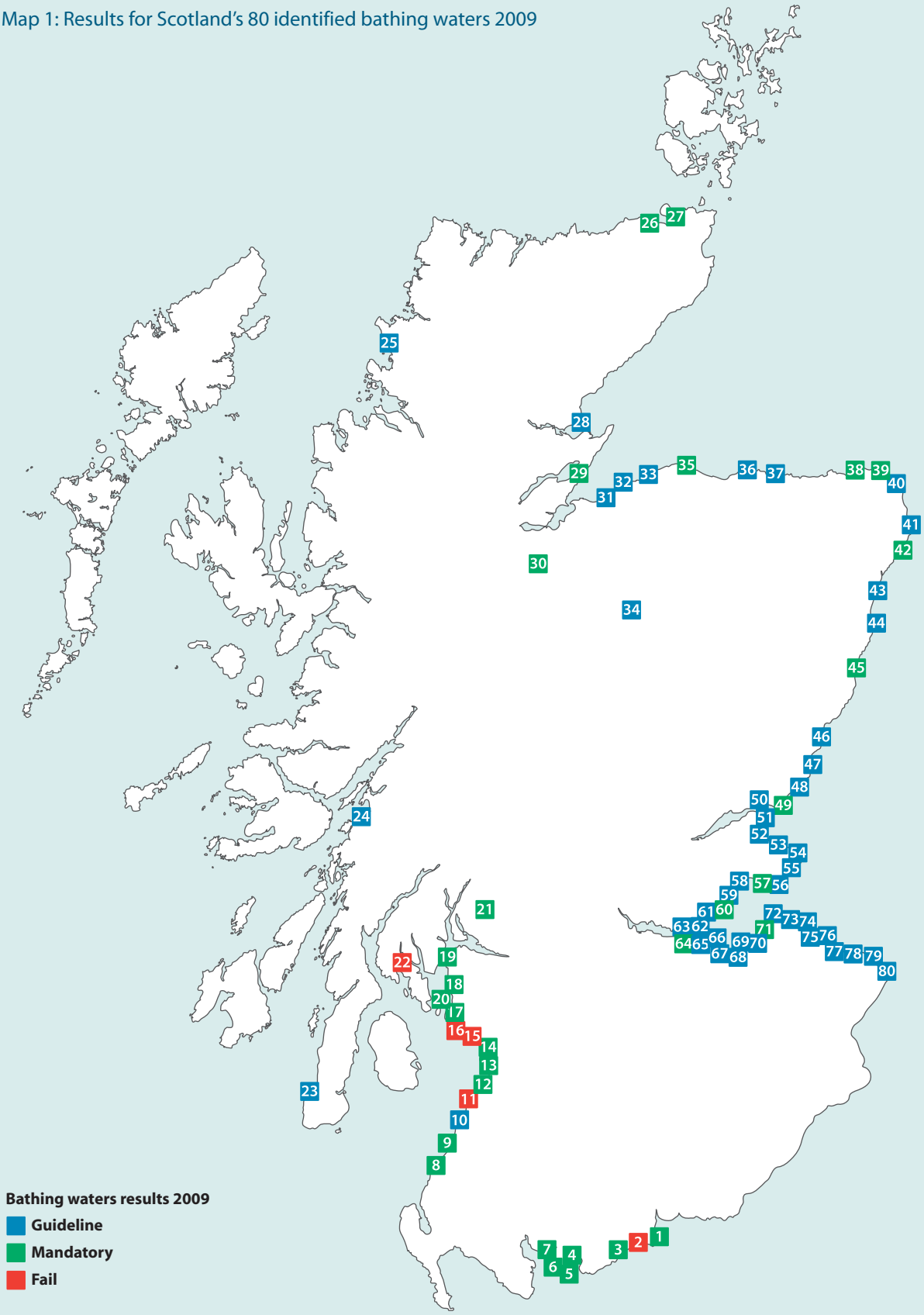
This section contains specific information for each of Scotland's 80 identified waters. It also focuses on the underlying factors behind bathing water quality at each site and outlines the plans for improvements. Waters are described in clockwise order around Scotland, starting in the south west.

In the following paragraphs and tables:

- 'n/s' indicates not sampled;
- 'mandatory' indicates a pass of the current directive's mandatory standards;
- 'guideline' indicates a pass of the current directive's more stringent guideline standards;
- 'fail' indicates a failure to comply with the current Directive's mandatory standards.

An asterisk (*) has been used to identify the years where monitoring, and as such an overall assessment, has been carried out at a bathing water prior to designation. In this case the overall assessment is indicative of whether the bathing water would or would not have achieved the EU standards had it been designated that year.

Map 1: Results for Scotland's 80 identified bathing waters 2009



Map ref.	Bathing water	Result
1	Southerness	Mandatory
2	Sandyhills	Fail
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	Fail
16	Saltcoats/Ardrossan	Fail
17	Seamill	Mandatory
18	Largs (Pencil Beach)	Mandatory
19	Lunderston	Mandatory
20	Millport Bay	Mandatory
21	Luss Bay	Mandatory
22	Ettrick Bay	Fail
23	Machrihanish	Guideline
24	Ganavan	Guideline
25	Achmelvich	Guideline
26	Thurso	Mandatory
27	Dunnet	Mandatory
28	Dornoch	Guideline
29	Rosemarkie	Mandatory
30	Dores	Mandatory
31	Nairn (Central)	Guideline
32	Nairn (East)	Guideline
33	Findhorn	Guideline
34	Loch Morlich	Guideline
35	Lossiemouth (East)	Mandatory
36	Cullen Bay	Guideline
37	Inverboyndie	Guideline
38	Rosehearty	Mandatory
39	Fraserburgh (Tiger Hill)	Mandatory
40	Fraserburgh (Philorth)	Guideline

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


Southerness

Southerness

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Fail	Mandatory	Mandatory	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Southerness was designated as an EU bathing water in 1999. In 2009 the good weather through June and early July was reflected in all but one of the bathing water samples which complied with the guideline standards. However, the poor weather throughout the rest of the bathing season resulted in higher bacterial levels (although the samples were within the mandatory values). One abnormal weather waiver was applied to a sample in August.

The main threat to water quality is from sewage inputs, especially from the town of Dumfries. In addition to the sources of sewage from Dumfries (Troqueer, Dalscone and Lincluden sewage treatment works), there are a number of Scottish Water discharges from small communities along the Nith Estuary.

The combined sewer overflows in the Troqueer catchment of Dumfries were upgraded in 2005 to provide better screening and to reduce the frequency of overflows. However, there are still issues with overflow frequency at two outfalls on the Troqueer network and premature overflows of settled sewage at Troqueer sewage treatmeant works which need to be addressed. The work at Troqueer treatment works is scheduled to be completed in late 2009. The only private wastewater treatment plant is at Southerness, where it serves the caravan park and village. This treatment works has been upgraded to secondary treatment and this year ultraviolet (UV) disinfection was provided during the bathing season.

Sandyhills

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Fail	Fail

Sandyhills bathing water has a varied history of compliance and unfortunately failed to achieve the mandatory standard again in 2009.

The main threat to bathing water quality is from agricultural run-off. Work funded through a biogas, composting and farm measures project by the Scottish Government, together with an associated farm inspection programme carried out by SEPA, now appears to be reducing agricultural diffuse pollution. Composting facilities and biogas plants have been installed to treat slurries and manures. These have received welcome positive feedback from the farming communities involved and the project itself gained positive media coverage.

This bathing beach is part of SEPA's electronic beach signage network which provides daily predicted water quality information to bathers (see Section 2.3).


Rockcliffe

Rockcliffe

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Mandatory	Fail	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Before its identification in 1999, the bathing water at Rockcliffe was not of consistently satisfactory quality. Since the local sewage treatment upgrading completed by Scottish Water before the 2004 bathing season, it has consistently complied with EU mandatory requirements.

The continued mandatory water quality this year is encouraging. It suggests that the improvements made to local sewage treatment, involving the addition of UV disinfection and a storm storage tank, have contributed to bathing water quality improvement. In particular, the new storm sewage tank significantly reduces overflows of diluted and screened sewage during very wet weather.

Dhoon Bay

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Mandatory	Mandatory

Dhoon Bay was newly designated as an EU bathing water in 2008. It has complied with mandatory water quality standards since its designation.

The small coastal burns, Mill Hall and Corraford Burns, drain into Dhoon Bay and could be potential sources of microbial pollution. However, the main contributory source is judged to be the River Dee with its extensive catchment. The presence of numerous farms (sheep, beef and dairy) in this catchment means that diffuse pollution will always pose a risk. The western flanks are intensively afforested, especially around the Black Water of Dee/Clatteringshaws area. The catchment around Loch Ken is a major wildlife area and birdlife may contribute to coliform sources. In addition, the River Dee catchment has many small private septic tanks.

Sewage discharges from Carsphairn, St Johns Town of Dalry, Balmaclellan, New Galloway, Castle Douglas, Twynholm, Ringford, Laurieston, Twynholm, Bridge of Dee, Rhonehouse and Kirkcudbright are potential microbial sources. Work under Scottish Water's Quality and Standards II programme at New Galloway, Castle Douglas and Kirkcudbright has improved discharge quality. All other sites currently meet licence conditions.

The storm overflows serving the town of Kirkcudbright and its sewage works may pose a risk to Dhoon Bay due to their geographical proximity; this issue is being studied by Scottish Water. Although Kirkcudbright Creamery discharges effluent on the ebb tide and is close to the bathing water at Dhoon Bay, it should not be a source of microbial pollution of the bathing water.

* explained on page 11

Brighouse Bay

Brighouse Bay

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Brighouse Bay is a small sheltered sandy beach between rocky outcrops. Since 2004 it has consistently achieved mandatory standards.

There are no significant sewage discharges into this catchment, so there is little doubt that the occasional high bacterial counts in samples from this site are due to agricultural run-off both from farm steadings and diffuse pollution.

A project funded by the Scottish Government, which was completed in 2005, involved extensive fencing of watercourses and provision of alternative livestock watering points. Two farm wetlands were also introduced. This work sought to reduce poaching (trampling) of riverbanks and livestock excreta entering the Brighouse Burn. It is not yet clear if the mandatory water quality achieved again this year in Brighouse Bay was due to these extensive efforts to reduce agricultural sources of pollution. A Scottish Government evaluation study is investigating the level of improvement achieved from these field-based measures and is available on the Scottish Government website.

In the past this bathing water has been most contaminated immediately following heavy rainfall events. The results are encouraging but we cannot assume that its problems have all been fixed.

This bathing beach is part of SEPA's electronic beach signage network.

Carrick

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Guideline	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Carrick has had rather a variable quality record since its identification as a bathing water in 1999. This year it complied with mandatory standards for the fifth consecutive year.

Following the failure in 2004 (the first in this water's history), a programme of farm inspections was instituted. It was concluded that agricultural run-off from the catchment was unlikely to have been the cause of the failure.

As there are no major sewage inputs nearby, SEPA is considering further possible sources which may pose a risk to this bathing water. These include input from nearby islands which are heavily populated with sea birds, or tidal influences carrying diffuse pollutants along the coast from the Cree Estuary.


Girvan

Mossyard

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Mandatory	Mandatory	Fail	Mandatory	Fail	Mandatory	Fail	Guideline	Guideline	Mandatory

Mossyard was newly identified as an EU bathing water in 2008. Because of its general recreational use, SEPA has monitored the water quality since 1999. Water quality dropped from guideline in 2008 to mandatory this year.

The area is rich in wildlife, with flocks of geese and other bird species occupying Fleet and Wigtown bays throughout the year. In addition, the area has a good reputation for producing salt marsh lamb and flocks graze the Wigtown Bay salt marshes, especially near Creetown. Sheep faecal pellets are a known potential source of coliforms, which could affect the Mossyard bathing water.

In terms of risk, the main source of likely failures is the River Fleet catchment which drains a large area of land. The upper catchment is intensively afforested and the lower area consists of arable and dairy farms. Gatehouse of Fleet sewage treatment works applies secondary treatment and discharges into the Fleet Estuary.

The small coastal burn that flows through Mossyard Farm (beef and sheep) could pose a small risk to water quality. Sewage from the caravan site at the farm is treated via a septic tank and soakaway system. The nearby Auchenlarie Holiday Park has implemented the first phase of a new sewage treatment facility to improve discharges into Wigtown Bay.

There have been occasional reports of algal blooms along this coastline during exceptionally sunny and calm weather conditions. Although such blooms can be a contributory factor in harbouring microbial pollution, the Mossyard coastline has good exposure to tidal conditions and is generally devoid of calm areas where algal blooms could accumulate.

Girvan

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Mandatory	Mandatory

The Girvan bathing water enjoyed eight years of mandatory compliance following completion of a major sewerage scheme. In 2007 however, the water failed to achieve the mandatory standard as a consequence of the wet summer and frequent high river flows; conditions recognised as a threat to the bathing water quality. It is pleasing to report that the water quality in 2008 and 2009 reverted to mandatory despite the generally wet late summers. This change did not result from any significant improvements but was a consequence of less frequent high river flows and the statistical variability inherent in any sampling regime. There is an underlying trend of gradual improvement.

Maidens

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Fail	Fail	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Maidens was newly identified as an EU bathing water in 2008 and has complied with mandatory standards for the past two seasons. Due to its general recreational use SEPA has monitored the water quality since 1998.

Maidens beach borders the enclosed bay between Maidens harbour to the south and the rocky outcrop of Barwhin Point to the north. The beach is adjacent to caravan parks and the village of Maidens, in an area very popular with holidaymakers (especially in the summer months).

Historically the bay suffered from pollution by poor quality sewage effluent discharged from the village's septic tank. In 2003 this system was abandoned and the drainage from the village is now pumped to the treatment works at Girvan. The storm overflow at the pumping station is designed to meet bathing water criteria and the only other remaining potential pollution sources are diffuse run-off from land draining into the bay.

Culzean

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Mandatory	Guideline	Mandatory	Guideline	Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline

Culzean was newly identified as an EU bathing water in 2008. Again in 2009 it achieved the stringent guideline standards, as it has done consistently since 2005. Due to its general recreational use SEPA has monitored the water quality since 1998.

Culzean is a very small attractive beach at the south-west edge of Culzean Country Park. To the south is the village of Maidens and to the north-east are the dramatic cliffs and rocky shore of the Country Park, noted for their wildlife. The bathing water is very popular with visitors to Culzean Country Park and Maidens village. Water quality is usually expected to meet the mandatory or guideline standards.

Heads of Ayr

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Mandatory	Fail	Fail	Mandatory	Mandatory	Guideline	Mandatory	Guideline	Mandatory	Fail

Heads of Ayr was newly identified as an EU bathing water in 2008, when it complied with the mandatory thresholds. Unfortunately in 2009 the bathing water failed to achieve the required standards. Due to its general recreational use SEPA has monitored the water quality since 2000.

The bathing water is located between the Heads of Ayr cliffs and the rocky outcrops at Greenan Castle, to the south-west of Ayr's main beach front. The beach is very popular with visitors from the nearby holiday parks.

There is potential for bacterial pollution from private sewage treatment facilities and from diffuse run-off from urban and agricultural land following rainfall. Two samples failed to meet the mandatory standard during 2009, in both cases following heavy rain. All sewage treatment plants were found to be operating correctly and it is likely that the failures were a result of diffuse run-off.

Troon (South Beach)

Ayr (South Beach)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Mandatory	Mandatory

Ayr (South Beach) bathing water maintained compliance with the mandatory standards for five years until 2007 when, as a consequence of the wet summer and frequent high river flows, the beach failed to achieve the required standards. Water quality in 2008 and 2009 reverted to mandatory despite the generally wet late summers.

Diffuse urban pollution remains a concern and weekly checks on key points such as sewer overflows and surface water outfalls were carried out throughout the bathing season.

Diffuse pollution via the two main rivers (Doon and Ayr) that flow into Ayr Bay on the Firth of Clyde continues to have the potential to impact on water quality. The bathing water is therefore part of SEPA's electronic signage network.

Prestwick

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Mandatory	Mandatory

Prestwick bathing water enjoyed eight years of mandatory compliance until 2007 when it failed to meet achieve the required standards as a consequence of the wet summer and frequent high river flows; conditions recognised as a threat to Ayrshire's coastal water quality. The bathing water achieved mandatory compliance again in 2008 despite the generally wet late summer; this quality was maintained in 2009.

Diffuse urban drainage remains a potential threat to water quality and weekly checks on key points such as sewer overflows and surface water outfalls were carried out throughout the bathing season. A greater risk is from diffuse run-off via rivers and burns, and the bathing water remains part of SEPA's signage network.

One sample failed to meet the mandatory standard in September 2009, during a time of high river flows. The electronic signs were predicting poor water quality under these conditions.

Troon (South Beach)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Mandatory	Mandatory	Guideline	Mandatory	Guideline	Mandatory	Guideline	Mandatory	Mandatory

This is the ninth successive year that Troon (South Beach) bathing water has complied with either the mandatory or the more stringent guideline standards. It is a little disappointing that 2007's guideline compliance has not been repeated this year, but perhaps not too surprising in another wet summer. This change is not as a result of any deterioration but is a consequence of wet weather over the summer and the statistical variability inherent in any sampling regime.

Troon beach is part of SEPA's electronic signage network.


Irvine

Irvine

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Fail	Mandatory	Mandatory	Fail	Mandatory	Fail

Irvine bathing water failed to comply with the mandatory bathing water standard in 2009.

The waters remain at risk from diffuse pollution via the rivers Garnock and Irvine. During September 2009 a sample failed to meet the mandatory standard during a time of high river flows following heavy rainfall. This bathing water is part of SEPA's electronic beach signage network and the signs were predicting poor water quality under these conditions.

Another sample also failed to achieve the mandatory standard in June 2009. This occurred during a time of calm sunny weather when quality was expected to be high. This failure was believed to be caused by an overflow from the sewer network as a result of a mechanical and electrical failure at a pumping station.

Scottish Water has continued to investigate and model improvement measures to reduce intermittent storm overflow discharges into the Irvine catchment. Diffuse urban pollution remains a concern and weekly checks on key points such as sewer overflows and surface water outfalls were carried out throughout the bathing season.

Saltcoats/Ardrossan

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Fail

After six successive years of achieving mandatory compliance, it is disappointing to report that Saltcoats/Ardrossan bathing water failed to meet the required standards during 2009 for the second year running. All the samples from the start of the bathing season until late summer met either the mandatory or guideline standard, but three samples failed to achieve the mandatory standard between 19 August and the end of the season. In each case the sample was taken following heavy rain and during high river flows. Investigations found no specific sources of pollution and it is believed that the high levels were caused by general diffuse urban and rural drainage.

As elsewhere in Ayrshire, weekly checks on key points such as sewer overflows and surface water outfalls were carried out throughout the bathing season. This bathing water is part of SEPA's electronic beach signage network.


Ardrossan

Seamill

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Fail	Mandatory	Fail	Mandatory	Mandatory	Fail	Guideline	Mandatory	Mandatory	Mandatory

Seamill was newly identified as an EU bathing water in 2008 and has met mandatory standards for the last three years. Due to its general recreational use SEPA has monitored water quality at this beach since 1998.

Seamill bathing water is situated next to the small town of West Kilbride. The sandy beach is popular with both locals and summer visitors. The main risk to water quality is diffuse run-off via local burns and some urban drainage.

As elsewhere in Ayrshire, weekly checks on key points such as sewer overflows and surface water outfalls were carried out throughout the bathing season. Water quality is expected to achieve mandatory standards and it is pleasing to report that the overall quality remained at this level in 2009. One sample collected during May 2009 failed to meet the mandatory standards. Despite a prompt investigation SEPA could not determine a specific cause.

Largs (Pencil Beach)

2000*	2001*	2002*	2003*	2004*	2005*	2006	2007	2008	2009
Mandatory	Mandatory	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Largs (Pencil Beach) was identified as an EU bathing water in 2006. The waters have consistently achieved mandatory compliance since 2003. Due to its general recreational use SEPA has monitored the water quality since 2000.

The designated bathing water area consists of a number of sandy beach areas with a mix of grass and pebble shore strips interspersed by rocky outcrops. Two small coastal burns enter the sea at the beach, draining a relatively small catchment consisting mostly of hill, moorland and a golf course. The main farming activity is sheep grazing, and studies elsewhere in the UK have shown this could introduce diffuse sources of faecal indicator bacteria.

Gogo Water, some 1.2km north of the designated bathing water area, may have some influence on bathing water quality under certain tidal states and at times of high river flow. The most likely risk of failure is diffuse run-off during the wet weather and SEPA considers that this water, like the others in Ayrshire, remains vulnerable to pollution caused by storm events. This was borne out in August 2009 when one sample taken at a time of high river flows following heavy rainfall failed to meet the mandatory standards.

Ettrick Bay

Lunderston

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Mandatory	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Guideline	Guideline	Mandatory

Lunderston was newly identified as an EU bathing water in 2008. Although the water achieved the stringent guideline standard in 2008, it only complied with the mandatory standard in 2009. Due to its general recreational use SEPA has monitored the water quality since 1998.

This compact sandy beach is a popular recreation and picnic area adjacent to a local garden centre and is located approximately five miles from Greenock and 30 miles from Glasgow. Lunderston Bay is Clyde Muirshiel Regional Park's only seaside attraction with free parking, ranger service, environmental education events and various seaside activities.

SEPA is currently in discussions with Inverclyde Council regarding the proposed location of public toilets and offices, which are to be used by Clyde Muirshiel Regional Park, at Lunderston Bay. The Council is currently pursuing connection to the public sewerage system; however, technical difficulties and excessive costs may necessitate the use of a dedicated sewage treatment plant which will require prior approval by SEPA.

There are no significant discharges into the bay that cause concern to SEPA. Inverclyde sewage treatment works, which provides full biological treatment, discharges to Firth of Clyde approximately 1km north-west of the bay.

Millport Bay

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Guideline	Mandatory	Mandatory

Millport Bay on the Isle of Cumbrae was first identified as an EU bathing water in 1999. Although it met the guideline standard in 2007, it only achieved the less stringent mandatory standard in 2008 and 2009.

The new sewage treatment system serving Millport has resulted in improved quality and more reliable compliance with EU mandatory standards. All the samples from the start of the 2009 bathing season until late summer met the guideline standard. The four remaining samples, taken between 19 August 2009 and the end of the season were collected during wetter weather but still achieved the mandatory standard. This bathing water has a smaller catchment area than others in Ayrshire but is still affected to some extent by diffuse run-off in wet weather.

Luss Bay

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Luss Bay on Loch Lomond continues to meet the mandatory bathing water standards.

Scottish Water's UV treatment unit at Luss sewage treatment works improved the effectiveness of disinfection of the discharge. Diffuse sources of bacterial contamination will be investigated in the Luss catchment area and contact made with relevant persons to attempt to reduce any potential contribution to diffuse pollution in the catchment.

Machrihanish

Ettrick Bay

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Fail	Fail	Fail	Fail	Mandatory	Mandatory	Fail	Fail	Fail

Ettrick Bay on Bute was designated a bathing water in 1999 and for six years failed to meet the directive's quality standards. After two years of complying with the mandatory standards in 2005 and 2006, the bathing water again failed to attain the required standards in 2007, 2008 and 2009. Three exceedances of the mandatory standards were recorded on 10 and 20 August and 8 September 2009. On each occasion, significant rainfall recorded during the 48 hours preceding sampling is likely to have washed large amounts of bacteria from the surrounding land into the receiving watercourses.

Problems were experienced in mid-2009 with a small private sewage discharge from the cafeteria at the northern end of the beach, resulting in localised deposits of sewage debris. Work is ongoing to resolve these problems. Despite this, the recorded failures to meet mandatory standards have been mainly attributed to agricultural pollution, which reaches the bathing water via local streams that flow across the beach. The surrounding area is intensively farmed and high levels of bacteria have been found in the streams after heavy rainfall.

SEPA has encouraged all farms in the area to adopt practices that will reduce bacterial inputs to local watercourses. We are continuing to work with the agricultural sector to promote best practice which should lead to further improvements in the water quality at Ettrick Bay.

The beach will continue to be at risk of failure should rainfall in future years repeat this season's pattern of short high rainfall periods. This bathing water therefore remains part of SEPA's electronic signage project.

Machrihanish

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Machrihanish was identified as an EU bathing water in 1999. The bay is a 5km long, quiet, rural sandy beach located on the Mull of Kintyre peninsular. It is favoured by locals, surfers and other water sports enthusiasts. The bathing water achieved the mandatory standard between 1999 and 2002, before improving to meet the more stringent guideline standards in 2003. Macrihanish has met guideline standards for seven successive years.

The step change in 2003 followed the diversion of sewage from the small communities of Machrihanish, Stewarton and Drumlemble across to Campbeltown sewage treatment works for full treatment. Provided potential agricultural pollution sources in the area are kept under control, the current quality should be maintained and, as a result, this bathing water is at low risk of failing to comply with EU standards.


Achmelvich

Ganavan

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Guideline	Mandatory	Mandatory	Mandatory	Guideline	Guideline

Ganavan was identified as an EU bathing water in 1999. It has achieved guideline compliance for the last two years.

The bathing water consists of two sandy beaches a few miles north of Oban. The beaches are secluded and provide excellent views for visitors to enjoy. A Scottish Water pumping station pumps sewage from the Ganavan public system to Oban for treatment at the sewage treatment works prior to discharge into the Sound of Kerrera. These works serve the resident population of Oban (9,000 rising to 20,000 in summer). A local caravan site has been required by SEPA to upgrade its sewage treatment facility. The bathing water is now believed to be at low risk of failing mandatory standards.

Achmelvich

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Guideline	Guideline

Achmelvich was designated a bathing water and sampled for the first time in 2008.

The bathing water lies three miles north-west of Lochinver and 40 miles north of Ullapool. It is adjacent to a small but popular campsite and caravan park which overlooks the beach. Apart from the caravan park, no public sewerage system operates within this water.

Despite difficult road access, the area is popular with tourists, especially during the summer months. The white sandy beach and clean water quality attract those interested in the outdoors and water sports with water-skiing, windsurfing and coasteering being popular on the beach. The implementation of a local beach management guide in 2004 led to dogs being banned from the beach during the peak tourist season.

Compliance with guideline standards in 2008 and 2009 can be attributed to the absence of any major discharge into the bathing water. The bathing water is considered to be at low risk of failing mandatory standards.


Dornoch

Thurso

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Mandatory	Mandatory	Mandatory	Guideline	Mandatory	Mandatory	Guideline	Mandatory	Guideline	Mandatory

Thurso was designated a bathing water in 2008, although it has been sampled for a number of years.

The bathing water is less than 1km long and extends from Rockwell Point to Little Ebb. The bay receives freshwater input from the River Thurso. The river mouth is at the most southerly reach of the bay and at least 2km from the more northerly and more open waters of the Atlantic.

During 2009 SEPA began investigating an intermittent discharge of farm and sewage effluent from a farm and cottages east of the town, within 500m of the bathing water. Some problems have been addressed but regulation is ongoing. Despite this, the bathing water achieved the mandatory standards for the second successive season.

Dunnet

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Guideline	Mandatory	Guideline	Guideline	Mandatory	Mandatory	Guideline	Guideline	Mandatory

Dunnet, in Caithness, was identified as an EU bathing water in 1999 although it has been monitored as a non-designated beach since 1996. Since 1998 the water has achieved the mandatory or more stringent guideline standard.

The input of sewage from Castletown previously affected the quality of the bathing water in Dunnet Bay. As part of ongoing investment to improve water quality in the area, Scottish Water installed a sewage treatment works on a new site further from the bathing water in 2006.

Health and safety issues regarding the use of peracetic acid as a disinfectant at the Dunnet septic tank has prevented its use for most of the 2009 bathing season. In the late summer of 2009 Scottish Water began modification work to the plant which should provide flow proportional peracetic dosing at Dunnet in time for the 2010 bathing season.

Dornoch

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Dornoch was identified a bathing water in 1999. Local sewage and agricultural sources of pollution have been progressively reduced and, in 2009, it met the guideline standards for the twelfth consecutive year.

The beach continues to be a popular destination for locals and visitors who value the high quality of the bathing water. The only river feeding directly into the bathing water is the Dornoch Burn, which has a relatively small catchment area and does not pose a significant risk to bathing water quality.


Dores

Rosemarkie

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Mandatory	Mandatory

Rosemarkie was designated a bathing water and sampled for the first time in 2008, when it met mandatory EU standards.

The bathing water fronts a wide, picturesque bay which looks out on Fort George and the Moray coastline across the Moray Firth.

Mandatory standards were again achieved in 2009. SEPA continues to work with Scottish Water to ensure that their assets meet the necessary bacteriological standards to achieve compliance.

Dores

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

An area of Loch Ness next to the village of Dores was identified a bathing water in 1999. It is one of three identified freshwater bathing waters in Scotland. Dores met the mandatory standard for the eleventh successive year.

This relatively small bay, around 0.6km long, is popular with tourists particularly in the summer season. In June, an annual concert event, the Rock Ness Festival, attracts thousands of visitors to the area.

In 2004 Scottish Water extended the public sewerage system in Dores village to pick up numerous septic tanks previously identified as a potential risk to water quality and which discharged to either the Minister Burn or Loch Ness. SEPA continues to monitor the Minister Burn and is seeking to find and eliminate remaining pollution sources. This bathing water is expected to continue to meet mandatory standards in the future.

Nairn (Central)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Mandatory	Guideline	Mandatory	Guideline	Mandatory	Mandatory	Guideline	Guideline

Nairn (Central) was identified as a bathing water in 1999. It is one of two designated bathing waters in Nairn which are separated from each other by the piers either side of where the River Nairn flows into the sea. The beach area to the western side of the piers, bordering the town's leisure area, is known as Nairn (Central). The beach area to the eastern side is known as Nairn (East) (see below).

Water quality benefited greatly from the upgrading of the Nairn sewage treatment works in 2000 but the disinfection system required by SEPA to ensure adequate protection proved unreliable and a completely new disinfection system was installed in 2004. The bathing waters record of achieving the mandatory or guideline compliance since 1996 was maintained in 2009 when the water met the guideline standards.

The pollution threats to Nairn (Central) are the same as those for Nairn (East) and are outlined below.


Nairn (Central)

Nairn (East)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Mandatory	Mandatory	Guideline	Guideline	Fail	Mandatory	Mandatory	Mandatory	Guideline

Nairn (East) is a pleasant and popular sandy beach. The underlying water quality has remained very good for the past three years but may be temporarily influenced by unauthorised discharges and weather-related events. In 2009 the bathing water met the EU guideline standards for the first time since 2004.

Bacterial loadings from the River Nairn are considered to pose a sufficient risk to the bathing beaches at Nairn. Consequently SEPA issued Scottish Water with revised discharge licence consents that require disinfection of effluents at Sunnyside, Croy and Cawdor sewage treatment works prior to discharge. SEPA is continuing to work with Scottish Water to improve discharge quality at these works. The continuous discharge from Brackla septic tank has been removed and the remaining few properties that feed intermittently into the tank pose a low risk of contamination.

Scottish Water reported that the operation of Nairn sewage treatment works was disrupted from 6th July 2009 due to a discharge of fat, oil or grease into the sewer network. Despite this disruption the works remained compliant with the terms of its licence. There were no significant spills of sewage or malfunctions reported from the sewer network within the town of Nairn itself, and no reports of problems from any of the inland sewage works discharging to the River Nairn. On the 8th July 2009 there had been substantial rainfall prior to a poor quality bathing water sample being taken, and relatively high levels of bacteria were recorded in the river. At the time the sample was taken there was a moderate northerly wind and an incoming tide. Salinity of the sample was low, so it is possible that the high levels of bacteria in the river contributed to the poor result obtained on this occasion.

Issues remain with the performance of some sewage treatment works (public and private) in the Nairn area, with bacteriological standards being breached in the 2009 season. In addition, the collection system in Nairn itself has suffered some major problems. Discussions are being held to prevent these issues being carried over into the 2010 season, including a joint campaign highlighting that the disposal of fats and grease to the sewer system is illegal.

Findhorn

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Guideline	Guideline

Findhorn was designated as an EU bathing water at the start of the 2008 season. The beach, which is located within the Moray Firth at the mouth of Findhorn Bay, receives the River Findhorn as well as several burns. The area is an important habitat for birds. The designated area sits at the end of a sweeping sandy bay and is backed by dunes and a caravan site.

In 2008, all samples collected during the bathing season complied with guideline standards. This guideline compliance was maintained during the 2009 bathing season.

There are two sewage treatment works (Kinloss and Forres) that discharge into Findhorn Bay. When completed, plans to consolidate these discharges and upgrade the treatment works should help to maintain the water quality in the Findhorn bathing water.


Loch Morlich

Loch Morlich

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Guideline	Guideline

Loch Morlich was designated a bathing water at the start of the 2008 bathing season and is one of only three inland bathing waters in Scotland. It is situated in the Cairngorms National Park and falls within the River Spey Special Area of Conservation. Loch Morlich is a shallow loch surrounded by forest, sitting close to the foot of Cairngorm mountain. It is approximately six miles from Aviemore and is a popular location for bathing and other water sports activities, as well as walking and mountain biking.

Loch Morlich qualifies for reduced sampling due to its remote location and low risk status. The water achieved guideline compliance in 2008 and 2009.

Lossiemouth (East)

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Mandatory	Mandatory

Lossiemouth (East) was designated as an EU bathing water in 2008, although it has been monitored since the 1980s. The designated bathing beach is a long, sandy stretch situated to the east of the town of Lossiemouth on the Moray coast near Elgin. The bathing water achieved mandatory compliance during both the 2008 and 2009 bathing seasons.

The River Lossie and the Spynie Canal flow across the back of the beach and into the sea at one end of the bathing water. Further work is needed to determine whether water quality issues in these watercourses could be affecting bathing water quality.

Cullen Bay

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Mandatory	Guideline	Guideline	Mandatory	Guideline	Guideline	Mandatory	Guideline	Guideline

The attractive sandy beach at Cullen is a popular destination for visitors and locals, who value the high standard of the bathing water which has consistently met the mandatory or more stringent guideline standard since 1997. Cullen achieved guideline compliance in both 2008 and 2009.

Cullen has benefited from substantial improvements to the surrounding sewerage system in recent years. Pumping stations were commissioned early in 2003 to transfer sewage from Cullen to the sewage treatment works at Buckie.


Inverboyndie

Inverboyndie

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Mandatory	Mandatory	Guideline	Guideline	Mandatory	Guideline	Mandatory	Mandatory	Guideline

Inverboyndie was designated a bathing water in 1999. It is a popular tourist area that is adjacent to a large caravan site. The bathing water achieved guideline quality in 2009.

Inverboyndie has benefited from substantial improvements to the surrounding sewerage system in recent years. A continuous discharge of untreated sewage at one end of the beach has been eliminated and the sewage is now pumped to Macduff sewage treatment works, where it undergoes full biological treatment followed by UV disinfection. The Inverboyndie outfall has been retained only as a storm and emergency overflow for the pumping station.

Several large septic tanks serving the Inverboyndie caravan site were identified as impacting on water quality at the mouth of Boyndie Burn. Following action by SEPA and discussions with Aberdeenshire Council these septic tanks have been removed and the site connected to the public sewer. The upgrade has benefited water quality since its completion before the 2008 bathing season.

Rosehearty

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Guideline	Mandatory	Mandatory	Guideline	Mandatory	Fail	Mandatory

Rosehearty was identified a bathing water in 1999. Adjacent to the town of Rosehearty, this beach is becoming more popular with wildlife enthusiasts after recent sightings of basking sharks and whales off the coast. It is also frequently used by scuba divers. The bathing water complied with the mandatory standard in 2009.

In 2001 sewage from the town was diverted to the new sewage treatment works at Fraserburgh, which has UV disinfection designed to protect bathing water quality. The pumping station remains at Rosehearty, but is only authorised to discharge screened sewage under certain storm and emergency conditions.

Failure of the bathing water to achieve mandatory standards in 2008 prompted investigative sampling. The investigation found levels of bacteria to be higher at the designated bathing water sample point than elsewhere at the bathing water. It appears that there is little circulation in the area of sampling and the large amounts of seaweed present can harbour bacteria, prolonging their survival.


Fraserburgh

Fraserburgh (Tiger Hill)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Fail	Mandatory	Guideline	Mandatory	Guideline	Guideline	Mandatory	Guideline	Mandatory

This sandy beach next to the town of Fraserburgh is a popular location for surfing as well as for walking and family outings. Significant upgrading of the local sewerage infrastructure was completed in 2001, with 12 previously untreated sewage outfalls being replaced by a full biological treatment plant with UV disinfection and a single outfall 3km to the west of the bathing water.

Overall the bathing water met the mandatory standards in 2009. The majority of samples collected during the 2009 bathing season complied with guideline standards, however one sample failed one of the mandatory standards in July. Local SEPA staff carried out an extensive investigation into the operation of the sewerage infrastructure immediately after this poor result. This study concluded that the failure to meet mandatory standards could not be attributed to any specific overflow of sewage or malfunctioning of the system. There were very heavy and localised downpours in the days prior to the sample being taken, and whilst recorded rainfall totals were not sufficiently high to invoke an abnormal weather waiver it is possible that the heavy rain caused an increase in the amount of bacteria being transported to the bathing water via local watercourses.

The local Kessock Burn drains to the beach to the west of the monitoring point and remains a potential source of bacterial contamination. Surface water outfalls to the burn, together with farms in the catchment, are inspected regularly to ensure that potential sources of bacterial contamination are monitored.

Fraserburgh (Philorth)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline	Mandatory	Guideline

Located at one end of the sandy bay that links Fraserburgh and Philorth, this beach is a popular recreational and windsurfing area.

Fraserburgh (Philorth) achieved guideline compliance in 2009, with 95% of samples meeting the guideline standards.

There are no sewage discharges in the immediate vicinity of the bathing water. The Water of Philorth discharges some distance to the east of the monitoring point.


Peterhead (Lido)

Peterhead (Lido)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Mandatory	Fail	Guideline	Mandatory	Guideline	Guideline	Guideline	Mandatory	Guideline

Peterhead (Lido) is located within the outer harbour (Bay of Refuge) of the town of Peterhead. This bathing water attracts a diverse range of bathers and water sports enthusiasts, with dinghy sailing in the sheltered waters of the bay being particularly popular. Continuing a good compliance record, Peterhead Lido achieved guideline compliance in 2009, with 100% of samples complying with all standards.

With licence conditions designed to protect the bathing water, discharges from the main pumping station to the bay are now only permitted under emergency or storm conditions. Further improvements to this pumping station, carried out under Scottish Water's Quality & Standards III investment programme, were completed before the start of the 2009 season. These improvements included installation of new pumps, control panels and a new low voltage power supply.

Cruden Bay

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Mandatory	Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Mandatory

This bathing water consists of an extensive sandy beach backed by sand dunes next to the small village of Cruden Bay. Overall, the water achieved mandatory compliance in 2009 although there was one exceedance of mandatory standards following a period of wet weather.

Sewage from Cruden Bay village has been pumped to Peterhead sewage treatment works since 2003, when an unsatisfactory short outfall was removed. The former sea outfall to mean low water springs was retained as a storm and emergency overflow from the pumping station. Cross-connections are thought to be a potential issue in the village.

The Water of Cruden, which drains the majority of the catchment, flows past the village of Cruden Bay and into the sea at one end of the bathing water. With around 60 farms operating in the catchment, diffuse pollution can affect water quality. These farms have been visited and, where necessary, remedial measures implemented.

The Water of Cruden also receives discharge from the sewage treatment works serving the upstream village of Hatton. A sand filter and UV disinfection unit were installed at the Hatton sewage treatment works before the start of the 2006 season to reduce the bacterial loading to the Water of Cruden. Unfortunately the UV disinfection system failed to achieve the required standard and was the subject of an enforcement notice. Scottish Water replaced the UV system prior to the start of the 2009 bathing season. It is now performing satisfactorily and the enforcement notice has been complied with. Scottish Water intends to pump flows from Hatton to Peterhead sewage treatment works for treatment within the next three years.


Aberdeen

Balmedie

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline

This popular expanse of sandy beach is next to Balmedie Country Park about seven miles north of Aberdeen City. It was identified a bathing water in 1999 and has complied with the mandatory or more stringent guideline standards since then. The failure to continue its five year run of guideline compliances in 2008 may have been a result of the wet summer.

In recent years the bathing water has benefited from the installation of a new sewage treatment works at Balmedie, commissioned before the 2004 season. The works also treats sewage pumped from the nearby villages of Newburgh, Potterton and Belhelvie.

Aberdeen

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Guideline	Mandatory	Fail	Guideline

Aberdeen has an extensive sandy beach which is a popular recreation area and attracts many walkers, swimmers, surfers and kite surfers. The bathing water achieved the guideline standards in 2009.

The water failed to achieve the required standards in 2008 as a result of two mandatory exceedances, both following very heavy rainfall. Electronic signage is provided near the Aberdeen Ballroom to advise bathers of predicted water quality.

Improvements to the sewerage network have seen a reduction in combined sewage discharges from the Kings Links overflow and the installation of two mechanical screens, two static screens and seven event recorders. Five other sewer overflows have also been eliminated. UV disinfection of the final effluent is carried out at Persley sewage treatment works to reduce the bacterial loading to the River Don.

Scottish Water is working on a drainage area plan for the city. This will identify further improvements to the drainage network necessary to reduce the operating frequency of combined sewer overflows and effectively lead to improved water quality of the burns and rivers in the catchment for the bathing water.


Stonehaven

Stonehaven

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Stonehaven is an increasingly popular coastal resort which is well used by water sports enthusiasts. It was identified as a bathing water in 1999 but had been monitored since the 1980s. Stonehaven complied with the mandatory water quality standards in 2009.

Sewage effluent from Stonehaven is now connected to the main Aberdeen treatment plant for secondary treatment and disposal via the long sea outfall at Nigg Bay. These facilities have been in place since 14 July 2008.

Despite the completion of this scheme, a single mandatory exceedance occurred following wet weather in late August 2009. On this occasion, levels of bacteria in the nearby River Carron were very high. The extremely low salinity measured at the sample site indicated that the high numbers of bacteria were mainly due to riverine inputs resulting from heavy rainfall.

Agricultural activity within the River Carron catchment is thought to contribute to diffuse pollution during wet weather. A microbiological survey carried out in 2009 suggested there are generally higher bacterial counts in the River Carron in the south compared with the River Cowie in the north. This helps to explain the differences in bathing water quality in the vicinity of the River Carron in the southern part of the bathing water and the River Cowie in the north.

The location of the sampling point for the Stonehaven bathing water has also been questioned. After an investigation by SEPA it was agreed that, for the start of the 2010 bathing season, it will be moved to a point more representative of bathing water usage and closer to the beach amenities. This will also take it further from the mouth of the River Carron.

Montrose

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

The bathing water at Montrose has consistently achieved the stringent guideline standard since 1999. This bathing water holds a Blue Flag quality award.

The commissioning of Montrose sewage treatment works and associated works in January 2002 has ensured that high quality waters are maintained. The treatment plant and few remaining storm overflows (which include storm storage and screening) are designed to be compatible with the attainment of the Bathing Water Directive's guideline standards. Although guideline compliance was achieved in 2009, the influence of rainfall events is reflected in some of the results recorded.


Lunan Bay

Lunan Bay

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline

Lunan Bay was formally identified a bathing water in 2008, although it has been monitored by SEPA for many years. With the exception of 2008, this bathing water has consistently achieved guideline compliance.

In view of the consistent guideline compliance at this bathing water, and as permitted by the Bathing Water Directive, sampling frequency was reduced from 20 to 10 samples in 2008. It was therefore very disappointing that Lunan Bay failed to maintain guideline standards in 2008. It is recognised that the weather conditions last summer were likely to have influenced the results and sampling remained at 10 times per season in 2009.

Arbroath (West Links)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Guideline	Fail	Mandatory	Guideline	Guideline	Guideline	Mandatory	Guideline	Guideline

Overall, the identified bathing water at Arbroath (West Links) achieved guideline compliance again in 2009 despite two samples at the start of the season only meeting mandatory standards. The cause of these mandatory, rather than guideline, quality samples could not be traced.

Substantial improvement in water quality has been seen at this site since the 1990s. This improvement is ascribed to the pumping of local sewage to Hatton sewage treatment works, which was commissioned in 2001. SEPA required Hatton works to be designed to ensure that guideline quality would be achieved at Arbroath (West Links).

The disappointing failure of this bathing water in 2002 was tentatively attributed to unplanned combined sewer overflow discharges. Possible sources were investigated and freshwater inputs close to the bathing water were monitored in conjunction with the bathing water during 2003–2004. However, with better Scottish Water maintenance procedures in place by then, these sources were all clean. In 2005 monitoring effort was directed elsewhere, and mandatory or guideline bathing water quality has been maintained ever since.


Arbroath

Carnoustie

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory

All normal sewage flows from the Carnoustie catchment are pumped to the Hatton sewage treatment works for full treatment. SEPA required this works to be designed to ensure guideline quality standards were met at the bathing water. Since completion of the Hatton sewage treatment scheme, Carnoustie has maintained a good compliance record.

The local Lochty Burn, which outflows into the bathing water, has been identified as an occasional source of pollution. In addition, the complexity and age of the Carnoustie public sewerage system requires continued vigilance and investigative effort to ensure bathing water quality is maintained. Achieving guideline compliance in 2008 – despite the exceptionally wet weather – illustrates the success of this ongoing work.

Weather conditions once again influenced bathing water quality in 2009, with only mandatory compliance being achieved. Problems were again apparent in the Lochty Burn in 2009, with Scottish Water undertaking further work to identify the source of elevated microbial pollution in one of their surface water systems.

The temporary dip in bathing water quality in 2002 was attributed to contamination from local surface water inputs, which were affected by increased rainfall. Continuing investigations led to the identification and remediation of a number of potential problems with surface water drains, sewer overflows and possibly sewer leakage into the Lochty Burn.

Further remedial work was carried out on the sewerage system in 2006 after a failing bathing water sample was traced back to a specific malfunction. A local environmental improvement action plan was implemented by SEPA before the 2007 bathing season to seek out and eliminate remaining potential polluting inputs to the burn and minimise the risk of future poor quality events. With the co-operation of local residents, the direct discharges of septic tank effluent to the Lochty Burn from the Clayholes and Carlogie areas were removed.

Tentsmuir Sands

Broughty Ferry

2000*	2001*	2002*	2003*	2004*	2005*	2006	2007	2008	2009
Mandatory	Fail	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline	Guideline

Broughty Ferry was designated a bathing water in 2006 but has been monitored by SEPA since 1997 due to its recreational use.

Before 2002, water quality at Broughty Ferry was often low. Guideline standards were achieved between 2002 and 2006, but quality dropped to mandatory in 2007, before returning to guideline in 2008. Despite receiving an abnormal weather waiver for a failing sample taken in September 2009 and the replacement sample also failing, the beach achieved overall guideline compliance again in 2009.

The apparent slight drop in bathing water quality in 2007 was probably a result of the higher than average summer rainfall, though the Tay Public Finance Initiative Scheme is not designed to deliver guideline quality at Broughty Ferry. Increased rainfall can lead to greater run-off from urban and arable land, and also increases the likelihood of sewage system overflows.

Since 2002 all normal sewage flows from the Dundee area have been pumped to Hatton sewage treatment works for full treatment. As part of the same project, six crude sewage discharges in the Broughty Ferry area were intercepted and taken to a new pumping station at Broughty Castle, from where flows are passed forward to Hatton sewage treatment works. Storm storage was provided at the pumping station and a new outfall installed to allow the discharge of screened storm sewage.

At the start of the 2007 season Broughty Ferry held a Blue Flag quality award, which recognises both the quality of the bathing water and the facilities provided by the local authority. It lost this status in 2007 because only EU mandatory standards were achieved. The beach regained its Blue Flag award in 2009.

Tentsmuir Sands

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Guideline	Guideline	Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Tentsmuir Sands was identified a bathing water in 2008, although it has been monitored by SEPA for many years. With the exception of 2002 this bathing water has consistently complied with EU guideline standards.

St Andrews (West Sands)

St Andrews (West Sands)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

St Andrews (West Sands) has a good record of compliance with EU standards and has complied with guideline standards for the last 11 years. This bathing water also holds a Blue Flag quality award.

The sewage treatment works at Kinkell Ness, to which all sewage from St Andrews is pumped, was commissioned in 2001. This works has tertiary treatment, including UV disinfection (required for both bathing water and shellfishery protection), and the treated effluent is discharged via a long sea outfall. Storm tanks constructed in the Kinness Burn sewer catchment minimise discharges from storm sewer overflows. The sewage treatment works STW consistently meets its discharge consent conditions, which should ensure continuing guideline bathing water quality.

The Kinkell Ness sewage treatment works reduces the risk of non-compliance with the Bathing Water Directive at both St Andrews bathing waters. In January 2008 work to install new storm screens at the Harbour and Bruce Embankment pumping stations in St Andrews was completed.

St Andrews (East Sands)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Guideline	Guideline	Guideline	Guideline	Mandatory	Mandatory	Guideline

St Andrews (East Sands) was identified a bathing water 1999, although SEPA and its predecessors had monitored it for many years. Between 2003 and 2006 the bathing water complied with guideline standards, however, quality dropped to mandatory in 2007 and 2008. The bathing water returned to guideline compliance this year.

The faecal coliform level at this St Andrews (East Sands) exceeded the mandatory standard on 4th September 2009. However, this sample was granted an abnormal weather waiver and the replacement sample achieved the guideline standard.

The failure of East Sands to meet guideline standards in 2007 and 2008 was believed to be due to the high levels of coliform bacteria in the Kinness Burn especially during wet weather. An action plan has been implemented on this watercourse to try to pinpoint the source(s) of contamination; this work is ongoing.

Kingsbarns

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Fail	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Kingsbarns was designated a bathing water in 1999. The bathing water complied with guideline standard for the eighth year running in 2009.

Since failing to achieve mandatory compliance in 2001 the sea outfall at Kingsbarns has been extended to the low water mark and the Kingsbarns sewage treatment works has been upgraded. The sewage treatment works now comprises of a submerged media aeration system followed by sand filtration and UV disinfection during the bathing season. This tertiary treatment should ensure continuing guideline compliance.


Crail (Roome Bay)

Crail (Roome Bay)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

First identified as a bathing water in 1999, Crail (Roome Bay) has consistently complied with the stringent guideline bathing water standards. All local sewage sources are pumped to a sewage treatment works at Kilminning, which provides adequate protection of these waters.

Elie (Ruby Bay)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Elie (Ruby Bay) was formally identified as a bathing water in 1999, although SEPA began monitoring in 1998. This bathing water has met the guideline standard every year it has been monitored. This bathing water holds a Blue Flag quality award.

Elie (Harbour) and Earlsferry

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory

Elie (Harbour) and Earlsferry was formally identified as a bathing water in 2007, although it had been monitored by SEPA and its predecessors since the early 1980s. This bathing water achieved guideline compliance every year until 2009 when it dropped to mandatory.

In 2008 Scottish Water provided storm storage and 6mm screening on overflows at pumping stations at South Street, Elie, and Cadgers Wynd, Earlsferry. Both pumping stations have storm outfalls to the bathing water. In addition, extensive repairs were made to the outfall pipe from the pumping station at Cadger's Wynd to ensure the discharge is made below the low water mark.

Unfortunately Elie (Harbour) beach area lost its Blue Flag status in 2009 due to repeated guideline failures for faecal coliforms and faecal streptococci. Investigations between SEPA and Scottish Water revealed a problem with site telemetry, thus any discharge of sewage effluent or storm sewage effluent would not have been detected. Any such undetected discharge of effluent may have resulted in the laboratory failure of the samples of bathing water taken by SEPA. However, it should be noted that there can be legitimate discharges of storm sewage effluent as a consequence of rainfall. A comprehensive assessment of Scottish Water assets in the locality was undertaken and the required remedial work was completed.

Leven

Leven

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Mandatory	Guideline	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Guideline	Mandatory	Guideline

Leven was formally designated a bathing water in 2008, although it has been monitored by SEPA for many years. Leven has consistently complied with the mandatory or more stringent guideline standards since 2000. Overall, the bathing water achieved guideline compliance in 2009.

The sample collected on 26 August 2009 exceeded the mandatory standards. This exceedance was most likely due to bacterial loads from the River Leven and the Scoonie Burn into which there are various combined sewer overflows and septic tank discharges, as well as urban and rural run-off.

The sewerage infrastructure in this area is not designed to achieve EU guideline bathing water quality and, as such, guideline status cannot be expected. Levenmouth sewage treatment works does provide tertiary treatment during the bathing season.

Kirkcaldy (Seafield)

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Guideline	Guideline	Mandatory	Guideline

Kirkcaldy (Seafield) was formally identified a bathing water in 2008, although it had been monitored by SEPA for many years. The water has met at least the EU mandatory standard since 2001. The bathing water achieved guideline compliance in 2009.

The sewerage infrastructure in this area is not designed to achieve guideline bathing water quality and, although guideline quality has been achieved in three out of the last four years, mandatory status is all that can be expected of this beach. Scottish Water is carrying out upgrade work on assets, which should help improve water quality.

Kinghorn (Harbour Beach)

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Mandatory	Mandatory

Kinghorn (Harbour Beach) was formally identified a bathing water in 2008, although it had been monitored by SEPA for many years.

This bathing water failed to achieve the mandatory standard in 2007 due to a problem with an overflow from one of the pumping stations. Scottish Water has since rectified this problem and the bathing water returned to mandatory compliance in 2008. Mandatory compliance was maintained in 2009.

Scottish Water is targeting assets in the area to identify any improvements required to achieve guideline quality in the future.


Burntisland

Kinghorn (Pettycur)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Mandatory	Mandatory	Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline	Guideline

In 2006 Kinghorn (Pettycur) bathing water achieved guideline compliance for the fourth consecutive year. In 2007 however, this high standard was narrowly missed and only the mandatory requirements met. The decline in quality was ascribed to increased frequency of storm sewage discharge from the local sewage treatment works due to the unusually wet summer. The bathing water returned to the more stringent guideline status in 2008 and 2009.

New treatment facilities and a long sea outfall pipe at Pettycur were commissioned early in 1993. During 2001 the scheme was extended to treat and discharge all of Kinghorn's sewage through this system. This resulted in much improved water quality at Kinghorn's other beach, Kinghorn Harbour (see above), although guideline quality has not yet been attained there. Investigations before the 2006 season to determine the reason for this were inconclusive and will continue.

Burntisland

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Burntisland was identified a bathing water in 1999. Before then untreated sewage was discharged via several short outfalls, causing gross pollution. In 2009 Burntisland maintained its guideline standard for the eleventh consecutive year. The beach is well managed and holds a Blue Flag award.

Scottish Water has since completed a prolonged series of improvements started by the former Fife Regional Council. Flows from several unsatisfactory outfalls have been diverted to a new sewage treatment works and now discharge via a long sea outfall. An unsatisfactory discharge from Lammerlaws was diverted to this works at the end of 1998 and guideline water quality has been achieved ever since. A new Lochies Road pumping station scheme was completed early in 2003, removing a discharge with an immediate threat to the bathing water. The harbour outfall and a few other small outfalls were intercepted and connected to the main sewers prior to the 2004 bathing season. This work should ensure that guideline quality standards continue to be attained.


Aberdour (Silver Sands)

Aberdour (Silver Sands)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

The very popular bathing water at Aberdour (Silver Sands) has complied with the EU guideline standards for the past 12 years and holds a Blue Flag award.

The diversion of Dalgety Bay sewage by means of a pumping station and rising main to Dunfermline sewage treatment works was completed in spring 2003, removing this distant potential risk to bathing water quality.

Portobello (West)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory

Portobello (West) was identified a bathing water in 1999. In 2009 it achieved EU mandatory compliance for the ninth consecutive year.

Bathing water quality at this beach has been successively improved over many years by progressive enhancement of sewage treatment and the sewerage infrastructure. Edinburgh's sewage treatment works has effluent disinfection and does not threaten water quality. The remaining water quality threats are from local sewage pumping stations, the Figgate Burn and potentially contaminated surface water run-off from adjacent urban areas.

A joint SEPA/Scottish Water working group continues to determine the impact of storm overflows and other inputs to the Figgate Burn with a view to reducing these sources. A programme of combined sewer overflows upgrading was carried out to reduce spill frequency. Several other sources of faecal contamination to the burn have been identified and removed. This has resulted in improved sanitary quality in the Figgate Burn, with parallel improvement in bathing water quality at Portobello (West). Other work to identify sources of surface water run-off contamination is on-going.

To further improve this bathing water to guideline standard, a study group was set up to investigate the reasons for the current failure to achieve this quality. All unsatisfactory intermittent discharges in the catchment have been reviewed and a new tidal waters model has been used in conjunction with a freshwater model of the Figgate Burn to identify any improvements required. It was concluded that no further improvements are required at combined sewer overflows in the vicinity of the bathing water and that background bacterial levels in the Figgate Burn are hindering the bathing water from reaching the guideline standard. A sampling programme is continuing for the Figgate Burn to try to trace the source of these elevated bacterial levels.

Portobello (Central)

Portobello (Central)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory	Mandatory	Fail	Guideline

Portobello (Central) was identified as a bathing water in 1999. The bathing water achieved guideline compliance for the first time in 2001, a status which was maintained until 2005. The main reason for the change in status from mandatory in 2000 to guideline in 2001 was improvements by Scottish Water to reduce the occurrence of storm sewage overflows. For example, investigative work on the Joppa sewer by the water authority following a sewer overflow in May 2000 resulted in removal of debris which increased the flow passing on to Seafield and reduced the frequency of overflows at Joppa. Another factor which may have influenced this was the upgrading of Seafield sewage treatment works in 2000 to provide secondary treatment and disinfection of the effluent during the bathing season.

Portobello (Central) met the EU mandatory quality standards in both 2006 and 2007 but failed to achieve this level in 2008. Water quality returned to guideline in 2009.

Investigations into the failures in 2008 showed that intense rainfall caused the flow in the sewer at the Joppa pumping station to exceed the capacity of the duty and assist pumps, causing more frequent spillages of the combined sewer overflow. The standard procedure at the pumping station is to have duty and assist pumps operating, with a standby pump available if one of these should fail. As the capacity of the duty and assist pumps was exceeded, Scottish Water brought the standby pump into operation for the rest of the bathing season.

Problems with the pumps at the Joppa sewage pumping station was also considered the reason for an exceedance of mandatory standards in 2007. The pumps had been required to operate above their designed capacity due to additional flow in the sewer from abandoned mineworkings. To address this issue, Scottish Water installed greater capacity pumps in 2007.

The Coal Authority has also been examining ways to reduce the minewater flow. A preparatory borehole was sunk into the abandoned mineworkings during 2008 and pump tests are due to be carried out in the near future to establish whether it is possible to find ways of reducing this flow.

Although the threat from diffuse pollution is relatively slight, this bathing water is part of the SEPA's electronic signage system.


Seton Sands

Seton Sands

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Mandatory	Mandatory	Guideline	Guideline	Mandatory	Guideline	Guideline	Mandatory	Guideline

Seton Sands/Longniddry was identified a bathing water in 1999. Between 1999 and 2002 it achieved the mandatory standard and in 2003, complied with the guideline standards for the first time. This higher quality was maintained in 2004 but not, disappointingly, in 2005 when the bathing water returned to mandatory. The drop was investigated before and during the 2006 bathing season. Although some elevated contamination levels were found in the Canty Burn, it was not possible to confirm that this was the source of the problem in 2005. The Canty Burn is now sampled at the same time as bathing water samples are collected to provide additional information should any future problems arise. Work to eliminate overflows from dual manholes in the Canty Burn catchment has been completed. Longniddry (see below) became a separate identified bathing water in 2006.

The EU mandatory standard was exceeded at Seton Sands in August 2008. On this occasion rainfall was heavy but not sufficient to trigger an abnormal weather waiver. An investigation showed that the failure had been influenced by a choke in a hydrobreak combined sewer overflow at Seton Sands Caravan Park. Prompt action was taken by Scottish Water to address this problem and the subsequent sample met the required standard. The bathing water achieved an overall mandatory status for the 2008.

Close surveillance was carried out on the combined sewer overflows in this area during the 2009 season. Bathing water quality at Seton Sands returned to guideline standard in 2009.

Longniddry

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Fail	Mandatory	Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Although previously part of the Seton Sands bathing water, Longniddry became a separate identified bathing water in 2006. It has been monitored by SEPA since 1996. Before 2002 water quality at Longniddry was often poor, but mandatory or guideline quality has been achieved continuously since then. In 2009 the bathing water quality met guideline standards for the sixth consecutive year.

In 2002 a new interceptor sewer was laid to convey the sewage from Longniddry to Edinburgh sewage treatment works. The existing works at Longniddry became a storm treatment works with a design overflow spill frequency of only once every five years. The impact of this improvement and work funded partly by residents to convey sewage from Seton Mains to this sewerage system is best measured by the fact that the bathing water at Longniddry achieved mandatory status in 2002 and met the more stringent guideline quality standard for the first time in 2004, despite the wet weather that year. This standard has been maintained since.


Gullane

Gullane

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

The very popular and picturesque bathing water at 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.

The high quality of the bathing water at Gullane is due to the effective local sewage treatment works and the fact that storm overflows are located well away from the bathing water area. Work was completed early in 2004 to build a new long sea outfall and to extend the outfall for the discharge of storm sewage. This provides further protection of the bathing waters in this area.

Yellowcraig

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline	Guideline	Guideline	Guideline

The improvement in quality of the identified bathing water at Yellowcraig in 1999 followed the diversion of sewage from Dirleton to the sewage treatment works and long sea outfall to the east of North Berwick. Prior to this, sewage had discharged at the western end of Broad Sands Bay. Following the diversion, Yellowcraig achieved guideline compliance for six consecutive years up to 2004, and it was disappointing that there was a drop in bathing water quality to the mandatory standard in 2005. One possible cause was a nearby surface water discharge which may have been intermittently contaminated, although SEPA was not able to confirm this.

In 2006 Yellowcraig returned to guideline bathing water quality and has achieved this standard ever since, perhaps suggesting that the 2005 result was atypical. Surface water discharges in the area continue to be monitored to ensure that this quality is maintained.

Broadsands

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Guideline	Guideline

Broadsands was formally identified as an EU bathing water prior to the 2008 bathing season. It is adjacent to Yellowcraig and people frequently walk between the two beaches. The bathing water was not monitored prior to designation. Broadsands complied with the guideline standards in 2008 and 2009.

Broadsands is expected to continue to meet guideline standards, achieving similar water quality to Yellowcraig.


North Berwick (West)

North Berwick (West)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Guideline	Guideline	Guideline	Mandatory	Guideline	Guideline	Mandatory	Guideline	Mandatory

SEPA and its predecessors have sampled North Berwick (West) since the 1970s, though its first year as an identified bathing water was 1999.

Before 1995, when the North Berwick sewage treatment works scheme was completed (see below under North Berwick (Milsey Bay)), North Berwick (West) frequently failed to meet required quality standards. While bathing water quality improved markedly after this date, occasional problems with the sewage collection and treatment infrastructure remained.

In 2005 North Berwick (West) returned to guideline status, which was maintained in 2006. In 2007 it was disappointing that North Berwick (West) met the mandatory standard and not the guideline standard, albeit by the narrowest of margins. This was partly due to a pump failure at North Berwick sewage treatment works on 15 July 2007, which caused backing up in the main sewers and surcharging onto the beach. SEPA served an enforcement notice on Scottish Water, requiring them to investigate the cause of the problem and to take action to resolve it. Scottish Water took very prompt action and has put measures in place to prevent any recurrence.

The bathing water returned to guideline status in 2008, although dropped back to mandatory in 2009 when it narrowly missed achieving the higher standard due to three faecal streptococci guideline standard exceedances.

A considerable amount of investigative work was carried out by Scottish Water and SEPA following an elevated count of 400 faecal coliforms/100ml in an analysed sample prior to the start of the 2009 bathing season (21 May 2009). A close circuit television survey was carried out inside a suspected surface water sewer and a choke in the foul sewer was eventually identified as causing spilling of sewage into this surface water sewer. This choke was cleared and subsequent results improved. Further work will be carried out before the next bathing season to check inputs to the sewer.

Dunbar (Belhaven)

North Berwick (Milsey Bay)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

The identified bathing water at North Berwick (Milsey Bay) has complied with guideline standards since 2000. Bathing water quality improved greatly after the commissioning of the North Berwick sewage treatment works and long sea outfall in 1995, although SEPA was disappointed that guideline quality was not achieved until after 1999.

Investigations by SEPA before the 2000 bathing season identified two significant sewage sources that could affect water quality at Milsey Bay. These were brought to the attention of Scottish Water for remediation. As a consequence, North Berwick (Milsey Bay) achieved guideline quality for the first time in 2000. This high standard has been maintained since.

Small sewage infrastructure leaks and discharges in 2002 and 2004 illustrate the need for ongoing vigilance. This is particularly true with bathing waters that have freshwater inputs and storm sewage infrastructure nearby.

This bathing water again achieved guideline quality in 2009. Following an initial high count (700 faecal coliforms per 100ml) in the pre-season sample taken on 21 May 2009 a considerable amount of investigative work was carried out. A source of contamination was found near the golf course on the Glen Burn, which resulted in Scottish Water rectifying a choke in a sewer there. The spillage caused by the choke reached the burn through a redundant sewer which Scottish Water have investigated closing off. Further elevated results prompted additional investigations in the Glen Burn, but no definitive sources were found. Additional pre-season bathing water inspections in this area are planned for next year.

There were two abnormal weather waivers granted for samples taken on 3 and 7 September 2009; although meeting mandatory standards, they were not of guideline quality. The subsequent replacement samples were both of guideline quality.

Seacliff

2000*	2001*	2002*	2003*	2004*	2005*	2006*	2007*	2008	2009
Guideline	n/s*	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

* Access restrictions due to foot and mouth disease.

Seacliff was identified a bathing water prior to the 2008 bathing season, although it had been monitored by SEPA for many years. The bathing water is popular with surfers and the water quality is consistently guideline standard.


Dunbar (East)

Dunbar (Belhaven)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline	Guideline	Guideline

Dunbar (Belhaven) is a fine sandy beach where, with the exception of 2006, the identified bathing water has achieved guideline compliance every year between 1993 and 2009.

The original West Barns sewage treatment works and long sea outfall were commissioned in 1993. Although the bathing water has generally achieved guideline quality since then, the works and outfall suffered frequent short circuiting and therefore could potentially discharge untreated sewage to the water via the old West Barns outfall and storm overflow. SEPA required Scottish Water to eliminate this source of pollution. The consent issued for a new treatment works required Scottish Water to replace the West Barns sewage treatment works by the end of 2005. However, delays in concluding the terms of the necessary land acquisition meant that the works were not completed until May 2008. The new works has been built inland with a discharge to the Biel Water, utilising the existing long sea outfall as a storm overflow. The use of membrane technology means that the high quality of effluent required for bathing water compliance is achieved without the need for additional disinfection, further safeguarding the quality of this bathing water. Investigations have shown that the new sewage treatment works is performing well and complying with its consent.

Dunbar (East)

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

Dunbar (East) was identified a bathing water in 1999, although it had been monitored by SEPA and its predecessors for many years previously.

In 2009 Dunbar (East) achieved guideline compliance as it has done every year since sewage from the east side of Dunbar was diverted to the main sewer 13 years ago.

Achieving overall guideline water quality in 2009 was due to concentrated efforts to deal with a pollution incident during July. The sample taken on 13th July 2009 showed elevated bacterial concentrations. Prompt investigations by Scottish Water identified and cleared a choked sewer. Subsequent samples achieved guideline quality.


Pease Bay

Whitesands

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Mandatory	Guideline	Guideline	Guideline	Mandatory	Guideline

Whitesands achieved guideline compliance each year from 1988 to 2003, though it was not formally identified as a bathing water until 1999.

Disappointingly, Whitesands failed to meet guideline standards by the narrowest of margins in 2004. This was possibly a result of the wet weather increasing local surface water contamination. This site is remote from any significant sewage inputs.

Guideline status was restored in 2005 and maintained in 2006 and 2007. Unfortunately this bathing water again dropped to mandatory in 2008, once again failing to achieve guideline standard by the narrowest of margins. This drop was probably a result of the unusually wet weather.

Whitesands is a shallow enclosed bay, protected from the effects of strong waves and currents by the rocky outcrops at each end. These outcrops may also restrict the turnover of water when the tide is receding.

Quality at this bathing water returned to guideline this year. Additional work had been carried out to investigate potential sources of contamination and samples were taken of outfalls during the bathing survey. An abnormal weather waiver was granted for the sample taken on 3rd September 2009.

Thorntonloch

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

The bathing water at Thorntonloch has consistently complied with guideline standards since 1999, although it was only identified a bathing water prior to the 1999 bathing season. The strong tidal currents present (particularly at the west side of the bay) during certain tide and wind combinations can be potentially hazardous for bathers.

In view of its consistent guideline status the frequency of monitoring was reduced in 2004 and 2005 (as permitted by the Bathing Water Directive) from 20 samples a year to five. Unfortunately one of the five samples taken in 2005 exceeded one of the directive's guideline quality standards. Overall excellent status was maintained but, in accordance with SEPA's precautionary procedure, the sampling frequency returned to 20 times in 2006. Guideline bathing water quality was maintained in 2008.

This bathing water achieved guideline compliance again in 2009, despite the sample taken on 17th August 2009 exceeding the mandatory standard. This is most unusual for this bathing water and prompted immediate investigation. Sampling of the Thornton Burn showed slightly elevated bacterial concentrations, although further investigations did not identify any definitive source of pollution. Septic tank effluents from the local caravan site go to soakaways. Weather during the sampling day was wet but not sufficiently intense to trigger an abnormal weather waiver. Further work will be carried out to investigate this exceedance.


Coldingham

Pease Bay

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

The identified bathing water at Pease Bay has met the guideline standards since 1999.

The caravan park at the bay installed a new sewage treatment works before the start of the 2006 bathing season. The plant uses membrane reactor technology which provides bacteriological treatment of the effluent all year around, so that it meets the required standards during the bathing season. The plant discharges to the Pease Burn and is monitored by SEPA during the bathing season. Samples of the effluent collected in 2007 indicated it was of very high quality. Some issues with the plant were experienced during 2008 and, as a result, the operator installed UV treatment prior to the 2009 bathing season. The plant has performed well during the 2009 bathing season.

The sewage from Cockburnspath (1.5km inland) is pumped to a sewage treatment works at Cove Village where, together with the sewage from Cove Village, it receives full treatment prior to discharge to the North Sea, about 1.5km north of the bathing water. During the bathing season the effluent from the works is disinfected prior to discharge. Work was carried out in 2006 to increase the capacity of this sewage treatment to accommodate sewage from a new housing development in Cockburnspath.

Coldingham

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mandatory	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline	Guideline

The very popular bathing and surfing beach at Coldingham was identified a bathing water in 1999, although it had been monitored previously. With the exception of 2000, the bathing water has achieved guideline compliance each year since 1996. In 2000, several samples taken during or after heavy rain reduced the water quality to mandatory standard.

Since 2004 sewage from Coldingham has been collected and pumped to the sewage treatment works at Eyemouth, where it receives full treatment before being discharged to the North Sea.


Eyemouth

Eyemouth

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fail	Mandatory	Mandatory	Mandatory	Mandatory	Fail	Mandatory	Fail	Mandatory	Guideline

Eyemouth was identified a bathing water in 1999. This year Eyemouth met the stringent guideline standards for the first time and had been of mandatory quality in 2008. This shows good progress as it had failed to achieve mandatory standards in 2005 and 2007. The poor water quality samples in 2005 and 2007 were collected during or following heavy rainfall events. This beach is part of SEPA's electronic signage network.

SEPA investigations into times of poor water quality at Eyemouth suggest that this can largely be attributed to high levels of bacteria in the Eye Water, a river that discharges into the North Sea south of the bathing water. A further potential source is the North Burn, a small culverted watercourse that discharges directly into the bay at Eyemouth and which has been found to contain occasional high levels of bacteria.

The Eye Water is sampled regularly by SEPA throughout the bathing season and has been found to contain high levels of bacteria, especially during and following heavy rainfall events. The Eye Water was strongly implicated as the cause of the 2005 and 2007 failures. Storm overflows that discharge from Eyemouth's sewerage network into the Eye Water during wet weather may be a contributory factor. However, the catchment is largely agricultural, and run-off from agricultural grazing land where livestock have direct access to the watercourse is thought to be responsible for the elevated levels of bacteria sometimes occurring in the Eye Water.

All farms in the Eye catchment have been visited by SEPA and meetings have been held with the agricultural community to raise awareness. In June 2008 SEPA officers walked the entire Eye catchment and identified approximately 150 sites at high risk of causing bacteriological contamination of water courses in the catchment. These are sites where livestock have direct access to the watercourse. Water sampling was carried out at a number of these sites to verify the impact.

In spite of 2009 being one of the wettest summers on record, Eyemouth bathing water achieved guideline compliance for the first time. This is thought to be due to the considerable amount of awareness raising carried out by SEPA and other organisations, notably the Tweed Forum, which has resulted in stakeholders and many in the agricultural community taking action to prevent livestock accessing watercourses in the Eye catchment.

Although we have seen these recent improvements in bathing water quality, further work is proposed as part of SEPA's diffuse pollution mitigation strategy (see Section 3.3). In view of the risk that Eyemouth may still occasionally fail Bathing Water Directive standards the Eye Water has been designated as one of the 14 Priority Catchments in Scotland. These catchments must be improved by 2015.

Extensive investigations have been carried out by Scottish Water and SEPA to determine the sources of high bacteria levels in the North Burn. This includes sampling and camera surveys. SEPA determined through microbial source tracking analysis that most of the bacteria present in the North Burn was of human origin. A large number of foul sewerage discharges which were wrongly connected to the North Burn have been removed to the foul sewer. Scottish Water is continuing to investigate one further potential source. Further sampling will be carried out during 2010 to determine whether all the sources have been removed.

2.2 Summer weather in 2009

Following the disappointing summer weather of 2008, most people were probably hoping for better things in 2009. In some ways they were not to be disappointed for the summer months; June to August of 2009 proved to be both warmer and sunnier than normal. Temperatures were similar to or slightly above those of summer 2008, while sunshine values were well above those of 2008. In the summer of 2008 Scotland as a whole recorded only 378 hours of sunshine, but in 2009 Scotland experienced 511 hours of sunshine; 16% above average.

However, as in the previous year, summer 2009 turned out to be very wet. For Scotland as a whole, a total of 419mm of rainfall was recorded in the three summer months. This represents 147% of the long term average and is even wetter than 2008, when 383mm of rainfall was recorded. Figures provided by the Centre for Ecology and Hydrology indicate that in 2009 Scotland had its third wettest summer in a series going back to 1869; only 1985 and 1877 were wetter. Although 2009 was a wet summer more or less everywhere, the north tended to see the best of the weather. As was the case in 2008, the south of the country tended to see the worst of the wet weather.

Although there were similarities between the summers of 2008 and 2009 there were also some differences:

- In 2008 each of the three summer months generally saw rainfall above average, while in 2009 it was only July and August that were wetter than average.
- Overall June 2009 was quite a good month for weather, it was only from the second week of July that the weather became very unsettled with showers or longer spells of rain.
- Thunderstorms were fairly common.
- August 2009 proved to be very wet in the south-west, while July was particularly wet in the south-east of the country.
- Dumfries and Galloway had its wettest August since records began in 1914.

The following three graphs show rainfall recorded in the period January to September 2009, compared with long-term average values. Nairn is representative of the north, while the stations at Ashgrove in North Ayrshire and Kirkcaldy in Fife are typical stations in the south-west and south-east respectively. The dry June is clearly shown in comparison to the very wet August in the south-west.

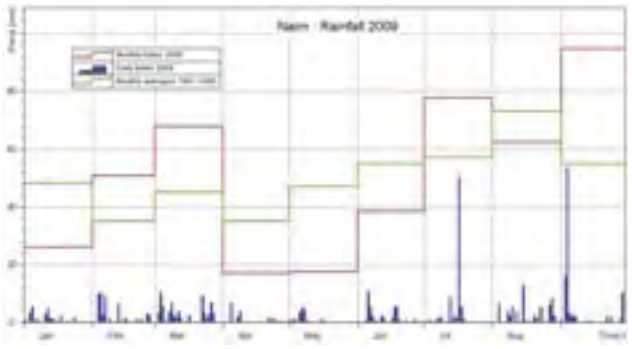


Figure 2: Daily and monthly rainfall recorded in 2009 compared with the 1961-1990 long-term monthly averages for the SEPA rainfall station at Nairn (Highland)

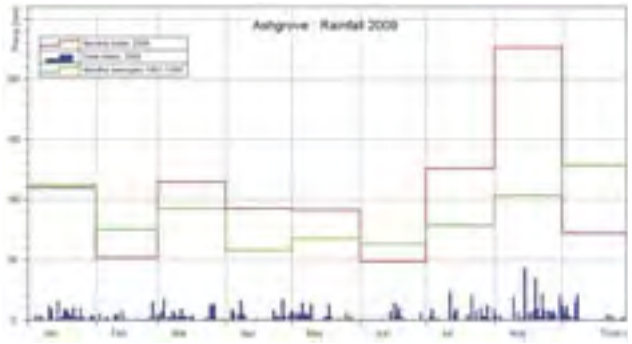


Figure 3: Daily and monthly rainfall recorded in 2009 compared with the 1961-1990 long-term monthly averages for the SEPA rainfall station at Ashgrove (North Ayrshire)

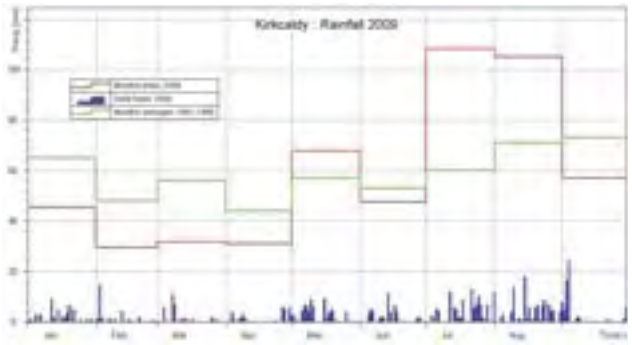


Figure 4: Daily and monthly rainfall recorded in 2009 compared with the 1961-1990 long-term monthly averages for the SEPA rainfall station at Kirkcaldy (Fife)

June

June saw some very warm weather at the beginning and the end of the month (the weather station at Kinlochewe recorded a temperature of 26.9°C on the 24th June). It was quite a sunny month, with at least 200 hours of sunshine; over a third more than the long-term average. The north and west of the country tended to be sunnier than the east. The north had a particularly sunny June, with over 226 hours of sunshine, equal to 156% of the average. June also turned out to be slightly drier than average. The gauge at Ashgrove on the North Ayrshire Coast recorded a total of 48.2mm for the month, equivalent to 77% of the long-term average. On the other side of the country in Fife, Kirkcaldy recorded 47.6mm. This represents 90% of the long-term average for this station.

July

July started off with some very warm and sunny weather (the station at the Royal Botanic Gardens in Edinburgh recorded 29.9°C on the 2nd July). Temperatures for the month as a whole were slightly above average and the north and west experienced above average sunshine hours. However, it turned out to be a wet month, particularly in the south and in the east. The Tweed catchment was particularly wet, recording well over 200% of what is normal for July. The gauge at Ayton Castle recorded 155mm for the month, equivalent to 270% of long-term average. The gauging station at Eyemouth recorded a mean flow of 1.82m^3/s, more than three times the long-term average for July. Localised flooding was reported in the south west on 3 July, on 6 July in Perthshire and Fife, and on 17 and 18 July in the Kelso area.

August

August saw a contrast between the north-east and the south-west. While in the north rain-gauges at Nairn and Cullen recorded below average rainfall for the month, stations in the south-west saw monthly totals well in excess of the long-term average. Nairn recorded 62mm, or 85% of the long-term average for the month. This contrasts with the gauge at Ashgrove, which recorded 226mm for August, equal to 219% of long-term average for this station. The gauge at Low Creoch on the Galloway Coast recorded 311mm for the month, equivalent to 288% of the long-term average.

River flows followed a similar pattern. The Rivers Lossie and Nairn recorded below average mean flows for the month, in stark contrast to rivers in the south-west of the country. Friars Carse on the Nith recorded a mean flow for August of 64.85m^3/s, almost three times the average for the month at this location, and the highest mean for August since records began more than 50 years ago. This followed on from July, which saw a monthly mean of 60.34m3/s recorded at Friars Carse, 370% of the July average and again the highest value on record for this month.

The two graphs below show flows recorded in 2009 compared with long-term averages for the gauging stations at East Linton on the Tyne and Shewalton on the River Irvine. East Linton in the east of the country clearly shows higher flows in July, while Shewalton in the west recorded very high flows in August. Both stations recorded below average flows for June.

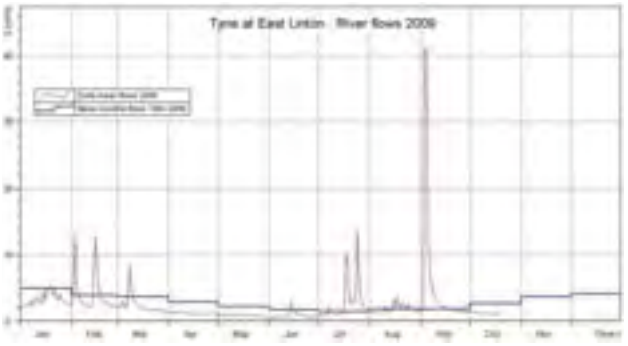


Figure 5: Daily mean flows for 2009 compared with long-term monthly averages for the period of record for the SEPA gauging station at East Linton on the River Tyne

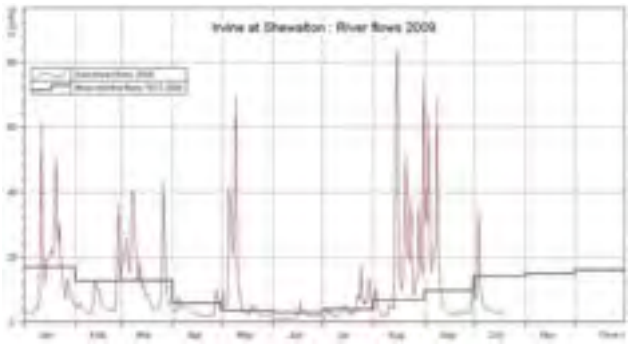


Figure 6: Daily mean flows for 2009 compared with long-term monthly averages for the period of record for the SEPA gauging station at Shewalton on the River Irvine

September

The month started with a very wet spell of weather on 4 and 5 September. Just as the bathing beach season was drawing to a close there was widespread flooding along the Moray Firth and down the East Coast. Conditions were severe enough for abnormal weather waivers to be applied to a number of samples taken at this time. Some record peak flows were recorded.

2.3 Bathing waters signage

Providing information on bathing water quality to the public is an important part of the revised Bathing Water Directive. SEPA's real-time electronic signage network is a leading example of how this can be achieved and puts Scotland at the forefront of this public information provision. The current signage network helps to keep bathers up-to-date, providing daily forecasts on predicted water quality at 11 of Scotland's beaches. SEPA intends to undertake work to plan the extension of predictive signage to (around) an additional 10 to 15 bathing waters during next year.

Although generally of a high quality, the 11 bathing waters in the current network were selected because they had previously been found to be at risk of not meeting European standards during or after wet weather. The electronic message signs allow predictions of water quality to be shown, indicating either mandatory quality (good) or risk of water failing to meet the mandatory standard (poor).

The electronic signs were fully operational throughout this year's bathing season and were updated with daily water quality forecasts using SEPA's extensive rainfall and hydrological information network to make decisions. The sign status was then recorded via a computer control station which enabled switching to the relevant version of text message. Further information on the background to the system and details of the text messages are available on SEPA's website[14].

Again this year, the signs displayed additional messages, alternating between displaying daily water quality status and reminders to keep beaches tidy.

2009 was the fifth year in which SEPA was fully responsible for the real-time electronic signage. The work was initially funded by the Scottish Government and piloted jointly in 2003–2004.

SEPA provides scientific advice, technical input and manages the daily operation of the sign network. We have

developed additional systems to provide wider access to the same information through our website, telephone information line and a text messaging service. A firm of consulting engineers has been sub-contracted to manage civil engineering and field work and to provide technical support. In addition, the local authorities and Clean Coast Scotland have also been consulted and provide advice.

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.

2.4 Predictions and results

During the 2009 bathing season 74% of the days, on average, were predicted as having mandatory or better water quality (good or excellent conditions against the current EU standards). This is a slightly lower figure than in 2004 (81%), 2007 (80%) and 2008 (78%), which were also wetter than average summers, and considerably lower than 2005 and 2006 (90% and 87%, respectively). This was an effect of the overall wet conditions seen across Scotland during 2009.

The signage at the 11 locations indicated correct or protective precautionary conditions to the public 98% of the time. Of the 208 compliance samples collected from the sites with signage during the 2009 bathing water season, the prediction models correctly predicted measured water quality on 75% of occasions (Figure 7). This success rate is slightly lower than in the previous four years, largely due to a higher number of precautionary

[14] www.sepa.org.uk/data/bathingwaters/signage/index.asp

forecasts, ie when the sign predicts that water quality is below mandatory standards but the measured water quality is mandatory or better. The main reason for these additional precautionary forecasts was the persistently high river flows observed this season.

In 2009 signage correctly predicted 10 of the 14 measured events when water quality failed the mandatory standard (Figure 8); a similar number of predictions to 2008. A full investigation was undertaken in all cases where an exceedance had not been correctly predicted. Where appropriate, the knowledge gained will be used to make improvements to the prediction models.

Figure 7: Bathing waters signage performance and validation of daily predictions

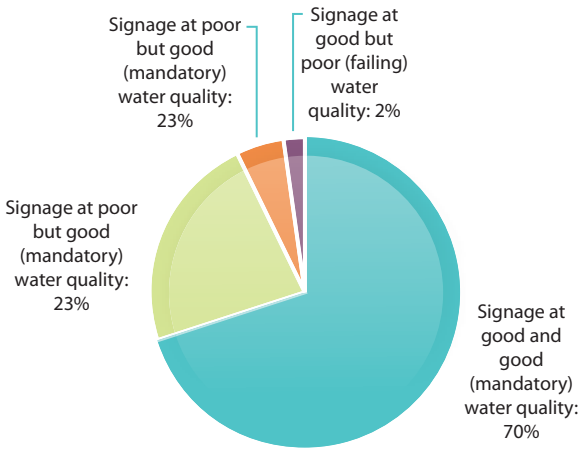
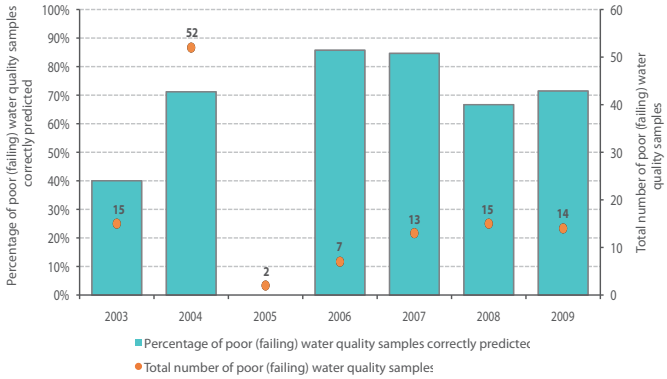


Figure 8: Validation of failed water quality samples, 2003–2009



2.5 Ongoing improvements

SEPA further developed and improved its bathing waters predictive modelling capability during 2009:

- Eyemouth benefited from an extension of the forecast system and a new electronic beach sign was installed and operational at that location for the first time this year. This means that SEPA now provides electronic water quality information signage at 11 locations across Scotland.
- Initial investigations were completed into extending SEPA's prediction systems for possible new locations. To date, six priority sites have already shown promise and it has been agreed that these will go forward to identify the location of possible signs and commission planning and procurement of new signage. A further two to seven locations are also being considered for trialling water quality prediction models, which will need to be successful before new signage is considered.
- Plans are in place to further develop and test new, more complex SEPA prediction models, using decision tree systems. The initial results for the 10 sites tested to date have been very encouraging and further testing is now being commissioned. This will include extending the trials to new bathing water locations and bringing in additional site specific variables such as wind, tide and sunshine.
- The use of rain radar to improve bathing water quality predictions had been investigated previously in a research project called 'Methods of Estimating Impacts of Rainfall on Bathing Beach Quality' funded by the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER). That project reported in August 2008[15] and SEPA has now prepared a plan to make use of recent improvement in access to rain radar data. We have requested an implementation project so that we can make progress during 2010. It is hoped that we may be able to use direct rain radar data in a few years time, which will further enhance our use of hydrological information and improve catchment spatial coverage for prediction models at bathing water catchments.
- SEPA's signage system and general approach to bathing water quality prediction and information systems was presented at meetings and published in case studies at events held by the World Health Organisation in January and October 2009, and also at the US Environmental Protection Agency's National Beaches Conference, held in California in April 2009.

[15] www.sniffer.org.uk

3 Further improvements to water quality

3.1 Investment by Scottish Water

Until fairly recently many decades of under investment in Scotland's water and sewerage infrastructure meant that sewage discharges were the major cause of water pollution. In 2000 many bathing waters were still failing, or at risk of failing to meet the required EU standards, due to unsatisfactory sewage discharges.

Previous bathing waters reports have highlighted the acceleration in investment made by Scottish Water in its Quality and Standards (Q&S) programmes since 2000. Q&S I (2000–2002) and Q&S II (2002–2006) saw significant levels of investment in water and drainage infrastructure, much of it aimed at improving bathing waters compliance. This investment continues in the current period, Q&S IIIa (2006–2010), with the main focus being on identifying and reducing the impacts of unsatisfactory intermittent discharges in Ayrshire (Meadowhead and Stevenston sewerage networks) and in Edinburgh. These required detailed sewer hydraulic models to be constructed to understand where and how any adverse water quality impacts occur and to develop satisfactory solutions. It is only now, towards the end of this investment period, that many of these solutions can be implemented.

Further studies are proposed for the Q&S IIIb period (2010–1015) to understand any possible impacts on newly designated bathing waters with a view to funding any improvements in the following period.

A summary of the major works carried out by Scottish Water in 2009 is presented in Table 1.

Table 1: Summary of major works by Scottish Water

Bathing water	Description
Peterhead Lido	A major refurbishment of the main pumping station at Peterhead was completed prior to the 2009 bathing season. The £4.5 million scheme involved relining several hundred metres of rising main with a continuous medium density polythene pipe. The four existing pumps which pump up to 850 l/s were replaced with new pumps that incorporate non-clog impellors. The existing high voltage power supply has been changed to low voltage, which will allow repairs to be undertaken more quickly. Numerous improvements were also made to the storm tank arrangements, which will reduce both the frequency and volume of spills to the bathing waters.
Irvine, Troon (South Beach) and Saltcoats/Ardrossan	Extensive investigation and modelling work has been carried out on behalf of Scottish Water into the impacts of the combined sewer overflows in the Meadowhead and Stevenston catchments. The work involved updating existing sewer models, construction of a model of the River Irvine and its tributaries and a new marine model of Irvine Bay and the outer Firth of Clyde. The results will be used to inform solutions to the problems associated with the overflows. Scottish Water is developing options for implementation during Q&SIII; some of the work is extensive and requires the provision of new sewers and the Q&SIII period has been extended to allow completion of the work within the programme. Some 15 existing overflows within the Irvine Valley have been upgraded by the provision of screens during 2009. These have resulted in an improved aesthetic quality of the discharges.
Ayr	Refurbishment of the Ayr sewage pumping station has improved its performance and should result in fewer discharges of storm sewage from the station. The work involved difficult civil engineering in a very deep sewerage system.
Southerness	Upgrade work has been proceeding at Troqueer and Dalscone sewage treatment works throughout the year and, when completed, will provide full treatment for greater pass forward flows thus reducing the spill frequencies at storm overflows.

3.2 Private sewage treatment systems

As highlighted in Section 2.1, during the discussion of 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 this may have to be paid for by a householder or a developer.

A further upgrade at Pease Bay Caravan Park was completed prior to the 2009 bathing season to include UV disinfection. The treatment works performed well during the 2009 bathing season.

3.3 SEPA's plans to reduce sources of diffuse pollution

Reducing diffuse pollution remains a key component in improving water quality in Scotland. The challenge is due in part to the nature of the problem as diffuse pollution can be difficult to identify and control. Rainfall increases diffuse pollution risk as it washes a range of contaminants from the land. Individually, inputs may be minor, but often prove to be a significant and cumulative problem for water quality when considered on a catchment scale. How we manage land and run-off from land can help to significantly reduce diffuse pollution risks.

SEPA's approach to mitigating rural diffuse pollution includes:

- A new national strategy to mitigate rural diffuse pollution as part of the river basin planning process. This will be implemented through a two tier approach of;
  - a national campaign of awareness raising, engagement and inspection by Scotland's Environmental and Rural Services (SEARS) partners in areas outwith priority catchments;
  - targeted action to identify and reduce diffuse pollution in priority catchments.
- Formation of the Diffuse Pollution Management and Advisory Group (DPMAG).

Rural Diffuse Pollution Mitigation Strategy

A new national strategic approach has been developed and will be implemented via a two tier approach:

- A national campaign of awareness raising will be used to promote compliance with the requirements of the Water Environment (Controlled Activities) (Scotland) Regulations 2005. The campaign will:
  - involve SEPA staff working with others to promote the diffuse pollution general binding rules (GBRs), together with guidance and training events for land managers on required good environmental practices;
  - include farm inspections by SEARS partners to check good practices are being adopted.
- Additional targeted efforts to improve the management of diffuse pollution within catchments will be identified as 'priority' catchments because:
  - diffuse pollution from land use activities is contributing to bathing water quality problems;
  - the scale of pollution reduction needed will require planned and targeted actions to be identified in discussion with the land managers concerned.

  The additional efforts will include:
  - enhanced awareness-raising of what is required;
  - assistance in identifying pollution hotspots;
  - one-to-one advice on necessary actions.

Both the national campaign and the work in targeted catchments are key to helping to reduce diffuse pollution risks. Work in the Eye Water (see Box 1) demonstrates the partnership approach SEPA is already taking to address rural diffuse pollution.

Box 1: Partnership working in the Eye Water

Work in the Eye Water continued in summer 2008, with SEPA carrying out catchment walking in order to assess areas where livestock had unhindered access to watercourses. Any areas of concern were logged and photographs taken to enable this information to be digitally mapped to highlight areas where livestock access and therefore potential risks were prevalent. Work confirmed that unchecked livestock access was a significant factor impacting on the Eyemouth bathing waters through faecal bacteria contamination. During 2009, a significant amount of work has been undertaken by Tweed Forum's Collaborative Action Project Officer, who carried out one-to-one visits with most farmers in the catchment, providing advice on remedial measures as well as providing assistance with applications for funding to support the introduction of these measures. Despite one of the wettest summers on record, Eyemouth bathing water passed the guideline standard of the Bathing Water Directive this year, the first time the bathing water has achieved this level of compliance.

As a priority catchment SEPA will be involved in awareness-raising, conducting extensive surveys of all watercourses within the Eye catchment and all farms will be inspected to ensure compliance with the Diffuse Pollution (Scotland) Regulations 2008. These regulations, for the first time, give SEPA control over diffuse pollution originating from land use activities. They are in the form of general binding rules, which cover land use matters such as the storage and application of fertiliser (including manures and slurries), the keeping of livestock, cultivation of land, etc. Where issues such as livestock having direct access to watercourses is shown to be a problem, ie by giving rise to soil erosion and bacteriological pollution of the watercourse, measures will be put in place to remediate this, eg by fencing off the watercourse or providing alternative watering points.

Formation of Diffuse Pollution Management and Advisory Group

On the request of Scottish Government, SEPA has established a Diffuse Pollution Management and Advisory Group (DPMAG) to provide governance, decision-making and co-ordination framework for the delivery of rural diffuse pollution actions in Scotland. By working together in partnership, the group can ensure an input from a cross section of rural, environmental and biodiversity interests.

Membership of the group consists of Association of Salmon Fisheries Boards (ASFB), Confederation of Forest Industries UK (ConFor), Forestry Commission Scotland, Loch Lomond & Trossachs National Park (also representing Cairngorms National Park), National Farmers Union Scotland (NFUS), Scottish Crofting Foundation, SEPA, Scottish Government, Scottish Environment Link (RSPB & WWF Scotland), Scottish Natural Heritage (SNH), Scottish Rural Property and Business Association (SRPBA), Scottish Tennant Farmers Association (STFA) and Scottish Water.

Scottish Government and Scottish Natural Heritage (SNH) staff working as part of the SEARS project are continuing to carry out inspections to assess compliance with diffuse pollution GBRs. The inspection process is highlighting the most commonly found rural diffuse pollution problems, helping land managers to identify and address these risks and informing future training and awareness raising approaches to be taken by both the national and the targeted catchment approach.

3.4 Future developments

During 2009 SEPA continued to be involved in two key areas of work focusing on the development of molecular methods and improving the capability of predictive models for signage.

Development of molecular methods

SEPA has worked with the Environment Agency and the Scottish Government on two UK Water Industry Research (UKWIR) research projects on the laboratory development of improved molecular methods (based on DNA analysis and fingerprinting techniques). The two projects are:

- microbial source tracking (MST);
- developing rapid methods for testing.

Microbial source tracking project

The national MST project which started last year was aimed at testing new analytical tools for the identification of sources (quantitative and semi-quantitative) of indicators of faecal contamination at bathing waters.

This project was completed in 2009. The outputs of the project have delivered some success to provide specialist laboratory methods which are analytically robust and reliable and can identify sources of faecal indicators (human, cow, sheep, dog, avian). However it was also clear that MST by DNA fingerprinting/genotyping and interpretation of the results has to be used with caution as the sampling variables and bathing water environments are more complex than first envisaged.

Notwithstanding the limitations of the technique, if used in the correct way MST can:

- enable fuller understanding of sources of potential contamination (arising from diffuse pollution, point source pollution, natural or impact of human activities);
- make it easier to take appropriate remedial actions in a specific bathing water catchment.

The objective of the collaborative UK project was to further improve the sensitivity and reliability of the genotyping technique. Progress has also been made to extend the level of discrimination so that different sources can be isolated. Human (sewage), cattle, dogs and avian (specifically common coastal birds) sources are a priority for reliable identification. The methods will be developed so that they can be transferred or offered as a routine laboratory service to the project partners.

During the 2008 and 2009 bathing water season SEPA collected a series of samples from a few prioritised sites and at times of elevated microbiological pollution for subsequent testing using the MST tools. These preserved samples will be analysed by the specialist MST techniques now available from the Environment Agency and the results will help SEPA plan pollution improvements for the 2010 season and possibly be of use for the new bathing water profiles to be prepared during 2010.

Rapid methods testing project

The rapid methods testing project, facilitated by UKWIR and led by the Environment Agency with a consortium of other organisations including SEPA is now complete. The project was generally successful with methods, which are directly comparable to the longer, culture-based, standard microbiology methods, developed for further testing.

The aim of the project was to develop rapid methods to analyse water samples for Escherichia coli and intestinal enterococci. Such rapid methods were successfully developed to provide next morning (9am) results from samples delivered to a laboratory by 5pm. However, obtaining same day results for samples delivered by 9am was possible for Escherichia coli only.

So far the rapid method has only been tested on a small number of samples collected close to the laboratory used for analysis. The next steps in evaluating this method are: trialling of the method on samples from around the country to examine logistics and to analyse a sub-set of routine samples to check equivalence and reproducibility.

Such rapid methods will be particularly helpful as operational tools providing prompt quantitative evidence to support decision making following breaches of mandatory water quality standards. For example, enabling the rapid re-opening of bathing waters after a short-term pollution incident.

Improving the capability of predictive models for signage

SEPA is working in-house to develop new modelling tools which will enhance the accuracy of our bathing water quality predictions for real time signage. Although our current prediction tool is effectively making predictions against the current Bathing Water Directive (see Section 2.4), more complex models are required to achieve acceptable levels of performance against the tighter revised Bathing Water Directive standards.

The new models SEPA is developing use decision trees to predict a target value, in this case bathing water quality class, based on multiple predictor variables. Both categorical and numeric variables can be used as inputs to these models and interactions between these variables can be explored. Predictive performance of the new models can be improved by applying weightings to the target values and utilising multiple decision trees within a single model (boosting technique) to optimise the predictions.

So far we have managed to successfully set up and make predictions at 10 of the current signage sites. We are continuing to fine tune these new models and explore options for including additional input variables to further improve their predictive capability. These models will be in operation by 2012, inline with the implementation timetable for revised Bathing Water Directive.

4 Conclusions

More than half of Scotland's 80 designated bathing waters achieved the most stringent guideline standards in 2009 (45 which represents 56%), with all but five of the remaining beaches meeting the mandatory standards. In total, therefore, 75 (94%) of our bathing waters complied with the EU bathing water quality standards. Of the five beaches which failed to meet the required standards this season, four failed as a result of wet weather and one because of short-term sewer network problems. These results were an improvement on 2008, when the similarly wet summer resulted in seven mandatory failures, contrasting with the full mandatory compliance enjoyed in 2006, a year which was reasonably dry. Again, 2009 saw a continuation of the substantial progress to many aspects of the bathing water environment from when monitoring started over 20 years ago.

There were no changes to the list of designated beaches in 2009 compared to 2008. Scottish Ministers designated an additional 20 bathing waters for the 2008 season, increasing the number of official sites by a third. In light of the extensive review exercise undertaken in 2008 and the large number of new sites designated, SEPA recommended, and it was agreed that, no additional sites be designated or de-designated in 2009.

To assist Scottish Ministers in the review process from 2009 onwards and to ensure that there is appropriate public participation, Scottish Government officials asked SEPA to form and chair a new multi-stakeholder group to review future designations. The new Bathing Waters Designation Panel and designation process has been operational during 2009 for consideration of sites for the 2010 season and this will continue as an annual process.

The revised Bathing Water Directive seeks greater public participation in its implementation. It puts more emphasis on providing information to bathers, including via the internet, and particularly on the risks bathers might face from pollution. This will be achieved by the new bathing water profiles which SEPA will be drafting and consulting on during 2010 for completion by March 2011.

The revised directive also allows up to 15% of sample results to be discounted during short-term pollution events, provided there is a public warning system in place to inform prospective bathers of potentially less good quality.

The SEPA signage network is a leading example of how this can be achieved. SEPA's real-time electronic signs, located at 11 beaches around Scotland, successfully provided daily water quality forecasts throughout the 2009 bathing season. Similar to last year, these signs indicated correct or precautionary conditions to the public 98% of time. Preparations are underway to expand the signage network to around another 10 to 15 beaches for 2011. Work is also on-going to improve the predictive capacity of our models to meet the requirements of the revised directive.

The Scottish Government recognised that significant changes will be required to meet the conditions of the revised directive. In November 2007 it consulted on draft legislative proposals in Better Bathing Waters for All and, following consultation, the Bathing Waters (Scotland) Regulations 2008 came into force in May 2008. These fully transpose the directive, establish SEPA's role and set out the timeframe over which its duties come into effect.

The revised Bathing Water Directive changes the parameters and standards used to assess bathing water quality, classifying waters as excellent, good, sufficient or poor. The standards under the revised directive are notably more stringent than those of the current directive. The timeframe over which the assessment is made will also change, with annual quality assessments carried out using a rolling four year assessment period. The revised directive requires all bathing waters to be of sufficient or better quality by 2015.

SEPA, the Environment Agency and the Northern Ireland Environment Agency have continued to work together on the UK Bathing Waters Technical Advisory Group. This group has considered and advised the government on best practice for the many aspects and challenges of the revised directive.

The last three wet summers have resulted in a slight dip in the trend of improving bathing water quality at Scotland's beaches seen in previous years. Longer-term the trend reflects the very substantial environmental improvements delivered by Scottish Water's investment in new sewage treatment schemes and the success of continuing work by SEPA and others to minimise diffuse pollution from agricultural sources. This work will continue and be driven forward under the Water Framework Directive via river basin management planning.

Continued investment by Scottish Water under their Quality and Standards programme is enabling improvements to be made to reduce the impacts of unsatisfactory intermittent discharges. Bathing waters are a key driver for these improvements and, with more studies proposed for 2010 to 2015 aimed at understanding possible impacts on newly designated bathing waters, this programme looks set to result in further improvements in bathing water quality.

Diffuse pollution remains the principal source of problems at numerous bathing waters, threatening compliance with the current EU bathing water standards. Further improvements are required, particularly as we move towards classification of bathing waters under the more stringent standards of the revised directive. SEPA's approach to mitigating rural diffuse pollution includes a new national Rural Diffuse Pollution Strategy, involving targeted action in specific priority catchments, a campaign of awareness and engagement and the formation of the Diffuse Pollution Management Advisory Group. The range of measures to mitigate diffuse pollution includes the Diffuse Pollution Regulations, funding under the Scotland Rural Development Programme, Scotland's Environmental and Rural Services (SEARS) and the river basin planning process. These measures provide a major opportunity to address diffuse pressures at a national scale for the first time. SEPA will also continue to work with farmers, NFU Scotland, the Scottish Government, SEARS and Scottish Natural Heritage to reduce sources of diffuse agricultural pollution.

Although the weather is beyond our control, we must not lose sight of the need for Scotland's bathing waters to be of the highest possible quality. Under the new directive, we are required to achieve tighter standards and new beach management duties in just three years time. There is clearly more to do and we must all intensify our efforts to maintain progress and, if recent trends continue, learn to cope with summer intense rainfall events.

Photo: Portobello Beach

Annex one: 2009 Monitoring data from Scotland's 80 identified bathing waters

			EC mandatory standard		EC guideline standard			
Bathing water	Local authority	No. of sample results	No. of TC* ≤ 10,000/ 100ml	No. of FC* ≤ 2000/ 100ml	No. of TC* ≤ 500/ 100ml	No. of FC* ≤ 100/ 100ml	No. of FS* ≤ 100/ 100ml	Overall quality
Southerness	D&G	20 (+1AWW)[9][†]	20	20	11	8	14	Mandatory
Sandyhills	D&G	20	19	17	7	3	10	Fail
Rockcliffe	D&G	20	20	20	8	4	11	Mandatory
Dhoon Bay	D&G	20	20	20	9	7	12	Mandatory
Brighouse Bay	D&G	20	19	19	10	10	14	Mandatory
Carrick	D&G	20	20	20	15	11	17	Mandatory
Mossyard	D&G	20	20	19	18	10	17	Mandatory
Girvan	SA	20	20	19	14	11	14	Mandatory
Maidens	SA	20	20	20	15	11	15	Mandatory
Culzean	SA	20	20	20	19	17	18	Guideline
Heads of Ayr	SA	20	20	18	13	12	15	Fail
Ayr (South Beach)	SA	20	20	20	13	8	2	Mandatory
Prestwick	SA	20	20	19	17	15	18	Mandatory
Troon (South Beach)	SA	20	20	20	17	15	17	Mandatory
Irvine	NA	20	19	18	9	8	12	Fail
Saltcoats/Ardrossan	NA	20	20	17	11	7	10	Fail
Seamill	NA	20	20	19	13	11	13	Mandatory
Largs (Pencil Beach)	NA	20	20	19	17	12	18	Mandatory
Lunderston	Inv	20	20	20	16	11	17	Mandatory
Millport Bay	NA	20	20	20	17	16	17	Mandatory
Luss Bay	A&B	20	20	20	15	8	17	Mandatory
Ettrick Bay	A&B	20	18	17	10	7	10	Fail
Machrihanish	A&B	10	10	10	9	9	10	Guideline
Ganavan	A&B	20	20	20	20	19	19	Guideline
Achmelvich	H	10	10	10	10	10	10	Guideline
Thurso	H	20	20	20	18	17	17	Mandatory
Dunnet	H	20	20	20	19	15	20	Mandatory
Dornoch	H	5	5	5	5	5	5	Guideline
Rosemarkie	H	20	20	20	19	16	16	Mandatory
Dores	H	20	20	20	12	13	14	Mandatory
Nairn (Central)	H	20	20	19	19	17	18	Guideline
Nairn (East)	H	20	20	20	17	16	19	Guideline
Findhorn	Moray	20	20	20	19	18	20	Guideline
Loch Morlich	H	10	10	10	10	10	10	Guideline
Lossiemouth (East)	Moray	20	20	20	16	17	15	Mandatory
Cullen Bay	Moray	20	20	20	18	19	18	Guideline
Inverboyndie	Aber	20	20	20	19	19	20	Guideline

			EC mandatory standard		EC mandatory standard			
Bathing water	Local authority	No. of sample results	No. of TC* ≤ 10000/ 100ml	No. of FC* ≤ 2000/ 100ml	No. of TC* ≤ 500/ 100ml	No. of FC* ≤ 100/ 100ml	No. of FS* ≤ 100/ 100ml	Overall quality
Rosehearty	Aber	20	20	20	16	16	17	Mandatory
Fraserburgh (Tiger Hill)	Aber	20	20	19	17	16	15	Mandatory
Fraserburgh (Philorth)	Aber	20	20	20	20	20	19	Guideline
Peterhead (Lido)	Aber	20	20	20	20	20	20	Guideline
Cruden Bay	Aber	20	20	19	15	13	16	Mandatory
Balmedie	Aber	20	20	20	20	20	20	Guideline
Aberdeen	ACC	20	20	19	17	17	19	Guideline
Stonehaven	Aber	20	20	19	8	7	9	Mandatory
Montrose	Angus	20	20	20	16	17	20	Guideline
Lunan Bay	Angus	10	10	10	9	8	9	Guideline
Arbroath (West Links)	Angus	20	20	20	20	16	19	Guideline
Carnoustie	Angus	20	20	20	17	16	17	Mandatory
Broughty Ferry	DC	20 (+1AWW[§])[†]	20	20	17	17	19	Guideline
Tentsmuir Sands	Fife	10	10	10	10	10	10	Guideline
St Andrews (West Sands)	Fife	20	20	20	20	18	19	Guideline
St Andrews (East Sands)	Fife	20 (+1AWW[§])[†]	20	20	20	20	20	Guideline
Kingsbarns	Fife	20	20	20	19	19	20	Guideline
Crail (Roome Bay)	Fife	20 (+1AWW[§])[†]	20	20	19	18	18	Guideline
Elie (Ruby Bay)	Fife	20	20	20	19	18	19	Guideline
Elie (Harbour) and Earlsferry	Fife	20	19	19	18	15	15	Mandatory
Leven	Fife	20 (+1AWW[§])[†]	20	19	18	17	18	Guideline
Kirkcaldy (Seafield)	Fife	20	20	20	18	17	18	Guideline
Kinghorn (Harbour Beach)	Fife	20 (+2AWW[§])[†]	20	20	18	16	17	Mandatory
Kinghorn (Pettycur)	Fife	20	20	20	20	19	20	Guideline
Burntisland	Fife	20 (+1AWW[§])[†]	20	20	20	20	20	Guideline
Aberdour (Silver Sands)	Fife	20	20	20	20	20	20	Guideline
Portobello (West)	CofE	20 (+1AWW[§])[†]	20	20	17	12	16	Mandatory
Portobello (Central)	CofE	20 (+1AWW[§])[†]	20	20	19	19	19	Guideline
Seton Sands	EL	20 (+1AWW[§])[†]	20	20	20	19	19	Guideline
Longniddry	EL	20 (+1AWW[§])[†]	20	20	19	17	18	Guideline
Gullane	EL	6	6	6	6	6	6	Guideline
Yellowcraig	EL	20 (+1AWW[§])[†]	20	20	20	17	18	Guideline
Broad Sands	EL	20	20	20	20	19	19	Guideline
North Berwick (West)	EL	20	20	20	20	19	17	Mandatory
North Berwick (Milsey Bay)	EL	20 (+2AWW[§])[†]	20	20	17	16	18	Guideline
Seacliff	EL	20	20	20	20	19	20	Guideline
Dunbar (Belhaven)	EL	20	20	20	19	18	20	Guideline

			EC mandatory standard		EC mandatory standard			
Bathing water	Local authority	No. of sample results	No. of TC* ≤ 10000/ 100ml	No. of FC* ≤ 2000/ 100ml	No. of TC* ≤ 500/ 100ml	No. of FC* ≤ 100/ 100ml	No. of FS* ≤ 100/ 100ml	Overall quality
Dunbar (East)	EL	20 (+1AWW[§])[†]	20	20	18	17	18	Guideline
Whitesands	EL	20 (+1AWW[§])[†]	20	20	20	19	19	Guideline
Thorntonloch	EL	20	20	19	18	18	18	Guideline
Pease Bay	SB	20	20	20	20	18	19	Guideline
Coldingham	SB	20	20	20	20	17	19	Guideline
Eyemouth	SB	20	20	20	17	17	18	Guideline

* FC = faecal coliforms; FS = faecal streptococci; TC = total coliforms.

[†] AWW = Abnormal Weather Waiver.

[§] 20 (+xAWW) denotes 20 samples used for compliance, plus x AWW.

Local Authority Abbreviation codes:

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

Annex two: Current legislation and results assessment

EU Bathing Water Directive (76/160/EEC)

The EU Bathing Water Directive 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, physical and chemical quality measures. The directive lays down requirements for the frequency of sampling, methods of analysis and inspection of bathing areas, and the interpretation of results. It also requires the exclusion of results obtained in abnormal circumstances.

Related legislation

The Bathing Waters (Scotland) Regulations 2008 introduce the requirements of the revised Bathing Waters Directive, 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.

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 within 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.

The variable nature of our environment is recognised by the legislation which allows some of the samples taken have to not meet the published standards.

Mandatory standards (good quality)

Mandatory standards apply to 10 quality indicators:

- total coliforms (TC);
- faecal coliforms (FC);
- salmonella;
- enteroviruses;
- pH;
- colour;
- mineral oils;
- detergents;
- phenols;
- transparency.

95% of samples taken during the bathing season must comply with the mandatory coliform quality standards for the site to achieve a mandatory level pass. Waters which do meet this standard are classified as failing.

Guideline values (excellent quality)

In addition to the mandatory standards, there are guideline values for the two coliform groups and for faecal streptococci (FS) bacterial quality indicators. These guideline values are more stringent than the mandatory standards and, if achieved, indicate very good bathing water quality.

Abnormal weather

Under Article 5.2 of the directive, results must be excluded from consideration if they are the consequence of abnormal weather conditions. If a result is excluded, then a replacement sample is taken immediately after the abnormal effects have ceased. A number of events justified application of this provision in 2009, leading to 17 sample results being disregarded and later replaced.

Exceptional geographic conditions

Under Article 8, the requirements of the directive may be waived by Scottish Government because of exceptional natural geographical conditions in respect of the colour and transparency conditions. For example, Sandyhills on the Solway Firth has a waiver for transparency because tidal action can lead to high levels of suspended sediment being stirred up. At Nairn (East), a waiver has been granted for both transparency and colour because, when in spate, the River Nairn discharges peaty coloured water into the sea near the sampling point. In 2009, six identified bathing waters in Scotland had waivers for colour and 75 waivers for transparency.

Sampling frequency

The minimum frequency of sampling is prescribed in the Annex to the Bathing Water Directive. Checks must normally be made at least once every two weeks during the bathing season for total and faecal coliforms, transparency, colour, mineral oils, detergents (officially, surface-active substances reacting with methylene blue) and phenols. For the remaining parameters with mandatory standards (salmonella, enteroviruses and pH) and for other parameters where inspection is prescribed, concentrations should be checked whenever inspections show that the substance may be present or where the quality of the bathing water has deteriorated.

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. SEPA will only apply the provision to waters that meet a very 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. It thus 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 2009 are identified in Annex one.

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 received inadequate treatment or dilution. Large concentrations of seabirds or livestock slurries and manure also give rise to these microbiological indicators in bathing waters and the latter must therefore be applied properly to agricultural land to prevent 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.

Article 5 of the directive specifies how the results of faecal coliform, total coliform and faecal streptococci monitoring are to be interpreted. These are summarised in Table A1.

Table A1: Interpretation of microbiological values for bathing waters where 20 samples have been taken

Level of compliance	Interpretations	Total coliforms	Faecal coliforms	Faecal streptococci
Guideline	Directive states:	80% of samples should not exceed 500 total coliforms per 100 ml	80% of samples should not exceed 100 faecal coliforms per 100 ml	90% of samples should not exceed 100 faecal streptococci per 100 ml
	Based on 20 samples:	Must have at least 16 samples with less than, or equal to, 500 total coliforms per 100 ml	Must have at least 16 samples with less than, or equal to, 100 faecal coliforms per 100 ml	Must have at least 18 samples with less than, or equal to, 100 streptococci per 100 ml
	Based on five samples:	Must have at least four samples with less than, or equal to, 500 total coliforms per 100 ml	Must have at least four samples with less than, or equal to, 100 faecal coliforms per 100 ml	Must have five samples with less than, or equal to, 100 streptococci per 100 ml
Mandatory	Directive states:	95% of samples should not exceed 10,000 total coliforms per 100 ml	95% of samples should not exceed 2,000 faecal coliforms per 100 ml	The directive contains no mandatory standard for faecal streptococci
	Based on 20 samples:	Can only have one sample with greater than 10,000 total coliforms per 100 ml	Can only have one sample with greater than 2,000 faecal coliforms per 100 ml	The directive contains no mandatory standard for faecal streptococci
	Based on five samples:	Must have no samples with greater than 10,000 total coliforms per 100 ml	Must have no samples with greater than 2,000 faecal coliforms per 100 ml	The directive contains no mandatory standard for faecal streptococci

Annex three: Glossary of terms and abbreviations

ASFB	Association of Salmon Fisheries Boards
CEH	Centre for Ecology and Hydrology
Combined sewer overflows (CSOs)	Overflow pipes designed to operate during periods of high rainfall to relieve pressure on sewerage systems and so prevent flooding. Overflows allow rainwater and diluted but minimally treated sewage (usually screened to remove solids) to bypass treatment works and flow directly into rivers and coastal waters.
ConFor	Confederation of Forest Industries UK
Diffuse pollution	Pollution arising from land use activities (urban and rural) that are dispersed across a catchment or sub-catchment, and do not arise as a process effluent, municipal sewage effluent, or an effluent discharge from farm buildings.
DPMAG	Diffuse Pollution Management Advisory Group
EC	European Commission (of the EU)
EIAP	Environmental Improvement Action Plan
EU	European Union
Faecal coliforms (FC) and faecal streptococci (FS)	Types of bacteria found in sewage and animal excreta whose presence in high numbers indicates poor water quality. Although not necessarily disease-causing themselves, high levels of these indicator bacteria at a site indicate that disease-causing organisms may be present.
GBRs	General binding rules. The diffuse pollution GBRs provide a statutory baseline of good practice and their implementation will help to improve water quality.
Guideline value/standard	A value specified in EU legislation as a recommended standard, more stringent than the minimum mandatory standard.
Identified bathing water	A bathing water identified by the Scottish Government under the terms of the revised EU Bathing Water Directive.
Mandatory value/standard	A value specified in EU legislation as a minimum standard that Member States must observe.
MSC	Marine Conservation Society
MST	Microbial Source Tracking. Concept of tracing the origin of faecal pollution using microbiological, genotypic, phenotypic, and chemical methods.
NFUS	National Farmers Union Scotland
PEPFAA Code	Code of Good Practice for the Prevention of Environmental Pollution from Agricultural Activity
Point source pollution	Pollution from a discrete source, such as a discharge pipe or a slurry storage tank.
Poor quality	This indicates that a bathing water failed to meet mandatory value quality standards in the EU Bathing Water Directive over the season as a whole.
Preliminary treatment	The treatment of waste water to remove solids by means such as screens, macerators and/or grit separators.
Primary sewage treatment	The treatment of waste water to settle out suspended solids in primary sedimentation tanks. It is normal for waste water to receive preliminary treatment prior to sedimentation.

PRP	Pollution reduction plans. SEPA's profile of a bathing water indicating the bathing water area, potential sources and risks of pollution and including measures for improvement. These are available on the SEPA website.
Q&S	Scottish Waters Quality and Standards Programme Scottish Waters' capital investment programme aimed at helping secure the future of services for their customers through delivering environmental improvements, reduced supply interruptions and better quality drinking water.
RBMP	River basin management planning
RSPB	Royal Society for the Protection of Birds
SAC	Scottish Agricultural College
Secondary sewage treatment	The treatment of sewage by a biological process (eg percolating filters or activated sludge) resulting in the further reduction of suspended solids, ammonia and biochemical oxygen demand (BOD).
Sea outfall pipe	A pipe which conveys and discharges treated waste water into coastal or estuarine waters.
Sewerage	The network of pipes, drains and pumps which conveys sewage effluent from homes to sewage treatment works.
SEARS	Scotland's Environment and Rural Services. Partnership that brings together nine public bodies aiming to provide Scotland's rural land managers, with an efficient and effective service.
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SNIFFER	Scotland and Northern Ireland Forum for Environmental Research
SRPBA	Scottish Rural Property and Business Association
STFA	Scottish Tennant Farmers Association
STW	Sewage treatment works – the same as a waste water treatment works (WWTW).
SUDS	Sustainable urban drainage systems
Tertiary sewage treatment	Further treatment of effluent, generally using sand sewage treatment filter beds, very fine screening or disinfection processes.
Total coliforms	A count of all the coliform type bacteria present in a sample of water.
UID	Unsatisfactory intermittent discharges. An overflow on the sewer network that is required to be improved to meet environmental standards for the water body into which it discharges or which it affects.
UKWIR	UK Water Industry Research
UV disinfection	The irradiation of treated sewage effluent with ultraviolet light in order to render the final effluent substantially disinfected.
UWWTD	Urban Waste Water Treatment Directive
Water Industry Commission	Appointed by the Scottish Government, the Water Industry Commission's remit is to promote the interests of Scottish Water's customers.
WFD	Water Framework Directive
WHO	World Health Organization
WWF	World Wildlife Fund

Annex four: Sources of additional information on bathing water quality

Technical queries or enquiries about SEPA's bathing water quality monitoring programme should be directed to your local SEPA office (see Annex 5 for details).

SEPA's website (www.sepa.org.uk) contains a wide collection of information on SEPA, as well as the text of previous Scottish bathing waters reports. The results from the monitoring programme for identified bathing waters are placed on SEPA's website as they are produced throughout the bathing water season.

A number of other organisations complement SEPA's role in promoting high standards of bathing water quality. The Scottish Government is responsible for implementing the directive in Scotland and 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 the protection of the marine environment and its wildlife, publishes the Good Beach Guide every year which lists all identified and many non-identified bathing waters around the entire UK coastline. The recommended beaches can be viewed at www.goodbeachguide.co.uk

In Scotland, the charity Keep Scotland Beautiful 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 36 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. In 2009 six beaches in Scotland achieved and retained Blue Flag status:

- Aberdour (Sliver Sands)
- Burntisland
- Elie (Ruby Bay)
- St Andrews (West Sands)
- Broughty Ferry
- Montrose

A seventh beach, Elie (Harbour) and Earlsferry achieved Blue Flag Status at the start of the season but unfortunately lost this status in July due to a short-term pollution incident.

Clean Coast Scotland (CCS) is a partnership bringing together 13 different government and non-government bodies to co-ordinate and raise the profile of Scottish beaches and bathing waters. CCS worked with SEPA in 2003 to produce a poster template for local authorities to display bathing water results at beaches in a consistent manner.

Water Authority
Scottish Water,
Castle House,
6 Castle Drive,
Carnegie Campus,
Dunfermline,
KY11 8GG

Tel: 0845 601 8855

www.scottishwater.co.uk

Scottish Government
Victoria Quay
Edinburgh EH6 6QQ
Tel: 0131 244 0396

waterdivision@scotland.gsi.gov.uk

www.scotland.gov.uk/bathingwaters

Keep Scotland Beautiful and Clean Coast Scotland
Wallace House,
17-21 Maxwell Place,
Stirling,
FK8 1JU

Tel: 01786 471333

www.keepscotlandbeautiful.org

The website address for the Blue Flag and Seaside Awards is: www.blueflag.org.uk
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
enquiries@environment-agency.gov.uk

Tel: 08708 506 506
www.environment-agency.gov.uk

Northern Ireland Environment Agency
ep@doeni.gov.uk
Calvert House
23 Castle Place
Belfast BT1 1FY

Tel: 028 9025 4754
www.ni-environment.gov.uk

Marine Conservation Society
Gloucester Road,
Ross-on-Wye,
Herefordshire,
HR9 5BU

Tel: 01989 566017

www.mcsuk.org

Annex five: SEPA offices

Corporate Office
Erskine Court,
Castle Business Park,
Stirling
FK9 4TR
Tel: 01786 457700
Fax: 01786 446885

Aberdeen Offices
Greyhope House
Greyhope Road
Torry,
Aberdeen
AB11 9RD
Tel: 01224 248338
Fax: 01224 248591

Aberdeen
Leading Light Building
142 Sinclair Road
Torry
Aberdeen
AB11 9PR
Tel: 01224 248338
Fax: 01224 248591

Arbroath Office
62 High Street
Arbroath
DD11 1AW
Tel: 01241 874370
Fax: 01241 430695

Ayr Office
31 Miller Road
Ayr KA7 2AX
Tel: 01292 294000
Fax: 01292 611130

Balloch Office
Carrochan
Carrochan Road
G83 8EG
Tel: 01389 727770
Fax: 01389 755387

Dingwall Office
Graesser House
Fodderty Way
Dingwall Business Park
Dingwall IV15 9XB
Tel: 01349 862021
Fax: 01349 863987

Dingwall Technical Building
Strathpeffer Road
Dingwall
IV15 9QY
Tel: 01349 862021
Fax: 01349 863987

Dumfries Office
Rivers House
Irongray Road
Dumfries DG2 0JE
Tel: 01387 720502
Fax: 01387 721154

East Kilbride Offices
5 Redwood Crescent
Peel Park
East Kilbride
G74 5PP
Tel: 01355 574200
Fax: 01355 574688

East Kilbride
Orbital House
3 Redwood Crescent
Peel Park
East Kilbride
G74 5PR
Tel: 01355 574200
Fax: 01355 574688

Edinburgh Office
Clearwater House
Heriot Watt Research Park
Avenue North
Riccarton
Edinburgh
EH14 4AP
Tel: 0131 449 7296
Fax: 0131 449 7277

Elgin Office
28 Perimeter Road
Pinefield
Elgin
IV30 6AF
Tel: 01343 547663
Fax: 01343 540884

Fort William Office
Carr's Corner Industrial Estate
Lochybridge
Fort William
PH33 6TL
Tel: 01397 704426
Fax: 01397 705404

Fraserburgh Office
Shaw House
Mid Street
Fraserburgh
AB43 9JN
Tel: 01346 510502
Fax: 01346 515444

Galashiels Office
Burnbrae
Mossilee Road
Galashiels
TD1 1NF
Tel: 01896 754797
Fax: 01896 754412

Glasgow Office
Law House
Todd Campus
West of Scotland Science Park
Maryhill Road
Glasgow
G20 0XA
Tel: 0141 945 6350
Fax: 0141 948 0006

Glenrothes Office
Pentland Court
The Saltire Centre
Glenrothes
KY6 2DA
Tel: 01592 776910
Fax: 01592 775923

Lochgilphead Office
2 Smithy Lane
Lochgilphead
PA31 8TA
Tel: 01546 602876
Fax: 01546 602337

Newton Stewart Office
Penkiln Bridge Court,
Minnigaff
Newton Stewart
DG8 6AA
Tel: 01671 402618
Fax: 01671 404121

Orkney Office
Norlantic House
Scotts Road
Hatston, Kirkwall
Orkney KW15 1RE
Tel: 01856 871080
Fax: 01856 871090

Perth Offices
7 Whitefriars Crescent
Perth PH2 0PA
Tel: 01738 627989
Fax: 01738 630997

Perth
Strathearn House
Broxden Business Park
Lamberkine Drive
Perth PH1 1RX
Tel: 01738 627989
Fax: 01738 630997

Shetland Office
The Esplanade
Lerwick
Shetland ZE1 0LL
Tel: 01595 696926
Fax: 01595 696946

Stirling Office
Bremner House
Castle Business Park
Stirling
FK9 4TF
Tel: 01786 452595
Fax: 01786 461425

Thurso Office
Thurso Business Park
Thurso, Caithness
KW14 7XW
Tel: 01847 894422
Fax: 01847 893365

Western Isles Office
2 James Square
James Street
Stornoway
Isle of Lewis
HS1 2QN
Tel: 01851 706477
Fax: 01851 70351