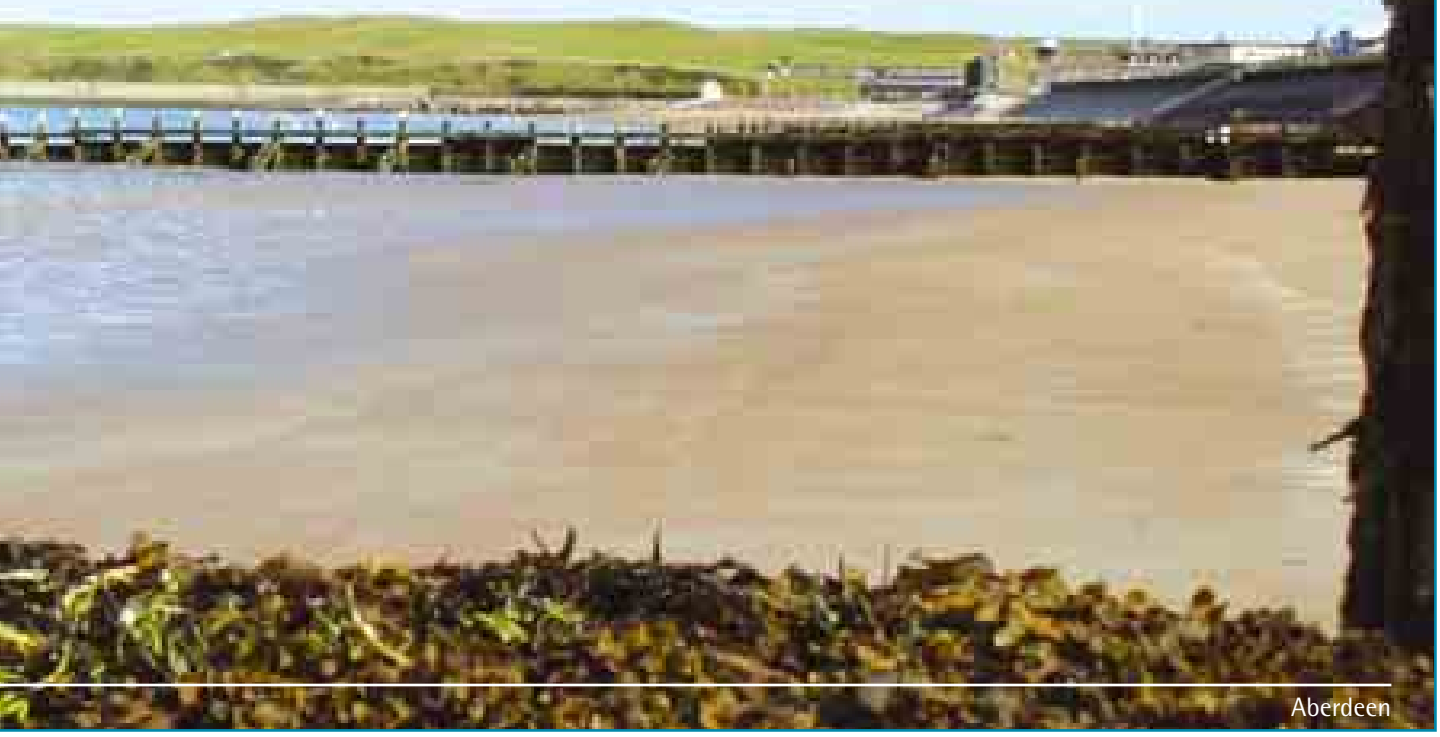
SEPA
Scottish Environment Protection Agency

Scottish Bathing Waters

2004

Contents



Aberdeen

Foreword

by **Campbell Gemmell, Chief Executive Officer,**
Scottish Environment Protection Agency
December 2004

I am pleased to present the Scottish Environment Protection Agency's (SEPA's) report for the 2004 bathing water season. Bathing water quality was good, and underlying quality has shown further improvement, but the headline numbers are slightly below 2003's record highs. Last year we reported that the results had undoubtedly been helped by the generally fine and dry weather. In 2004, the summer weather was just not as warm and dry, and this affected the monitoring outcomes. In fact, the summer of 2004 was very wet. June was the wettest on record in parts of the East Coast, and there were several torrential downpours in August, which was the wettest since 1956. The exceptional August rains caused widespread flooding and landslides, including infrastructure damage, such as the prolonged closure of the main A9 trunk route. Overall, August was characterised by rainfall of twice the August average in the west and north of Scotland and was very wet in the east of the country, according to the Hydrological Summary for the United Kingdom published by the Centre for Ecology and Hydrology. Similarly, many river flows were classified as either notably or exceptionally high; for example, the River Tay, Scotland's largest river, recorded a flow of over 1 million litres per second on the 11th August. This was the highest flow recorded in August since records began over 50 years ago, and well over 10 times the average for this time of year.

Against this background, the monitoring results for Scotland's 60 identified bathing waters continue to show overall underlying quality improvement. Fifty-six of them (93%) met required European standards, only one fewer than the record set last year. As anticipated in last year's report, the wetter weather also resulted in a reduction in the number of waters meeting the Directive's most stringent 'guideline' water quality standards. This number fell from 41 in 2003, to 34 in 2004.

Thanks to the continuing work and investment to reduce both point and diffuse sources of pollution, the 2004 results compare favourably with the results for 2002, which was another wet year. Then, the numbers of bathing waters reaching the mandatory and guideline standards were 55 and 26, respectively. This comparison against a similarly wet year is a clearer indication of the continuing improvement in the quality of our bathing waters. Despite the weather, the 2004 results are the second best for Scotland.

The causes of the rainfall-related diffuse pollution events are also increasingly well understood. This year, in conjunction with the Scottish Executive, the scope of the real-time electronic bathing water quality prediction signs was expanded to 10 of the waters most susceptible to diffuse pollution. The predictive accuracy of these signs was improved relative to their first trial in 2003, with 98% of daily messages given being accurate or precautionary.

It is encouraging that we are moving towards achieving the aim of ensuring that Scotland's bathing waters meet European quality standards, although we still have some way to go. At remaining problem sites, our ability to warn of occasional pollution has improved. Progress may not be immediate and the remaining challenges are considerable, but the gains we have made are clear. I look forward to the time, now not far off, when we will be able to report that, with the exception of a few days when there is a real-time electronic warning of poor quality in place, all of Scotland's identified bathing waters are of good quality. This realistic aim can only be met by maintaining the developmental work outlined in Section 5 of this report. This implies continuing our strategy of working in partnership with stakeholders to deal with the diffuse sources of pollution and ensuring cost-effective investment to improve Scotland's ageing sewerage infrastructure.

Burntisland

St Andrews

1 Introduction

1.1 SEPA's role in bathing water quality

The Scottish Environment Protection Agency (SEPA) was established in 1996 as the national public body responsible for environmental protection and improvement in Scotland. It is accountable to the Scottish Ministers and, through them, to the Scottish Parliament. SEPA's duties include regulating discharges to water, air and land. Additional powers and duties continue to be given to SEPA, particularly through regulations implementing EC Directives. SEPA also provides environmental advice and information and works in partnership with many public, voluntary and private sector organisations to deliver environmental improvements. In addition to publishing this annual report, SEPA places monitoring results from bathing waters on its website[1] throughout the bathing season from the 1st June to the 15th September.

1.2 SEPA's commitment to improving bathing water quality

SEPA recognises the immense economic value of Scotland's relatively unspoiled environment. High-quality bathing waters are important for a wide variety of interests and help to promote the tourism industry within Scotland. All possible sources of pollution must be recognised and controlled in order to protect and, where necessary, improve the quality of waters. Since its inception, SEPA has continued the aim of its predecessors to improve bathing water quality as rapidly as possible. It will continue working with all other relevant authorities to achieve the goal of full compliance with European bathing water standards, to which the Scottish Executive is committed. Section 5 of this report provides specific information about the ongoing work towards the attainment of current quality standards, and for the future attainment of anticipated new and more stringent European standards.

Identified bathing waters represent only a small part of Scotland's waters. SEPA is committed to protecting and improving all waters and, in recognition of this, SEPA maintains a policy on microbiological standards for relevant discharges. This requires that all new or modified discharges to identified bathing waters must be designed to ensure that the Bathing Water Directive's guideline standards are met. These high standards are also promoted by SEPA for other recreational waters; areas where SEPA recognises that water contact activities are practiced outwith identified bathing waters, and with a necessarily lower priority in respect of investment, to other beaches well used by the public.

1.3 Purpose of this report

This report contributes to SEPA's duties to monitor and report on the state of Scotland's environment. Furthermore, in addition to containing the water quality monitoring results, it also describes factors underlying the results and outlines site-specific plans for improvement.

The results of SEPA's routine monitoring in 2004 are presented in two parts. Sections 4.1 and 4.2 cover Scotland's 60 identified bathing waters, while Section 4.4 covers other waters which were subject to routine bacteriological quality monitoring during the 2004 bathing season.

The report illustrates trends in compliance and provides background information on the identified waters in Scotland. These data are used to identify priorities for investment and to focus effort on delivering environmental improvements. The report also details some site-specific issues and the initiatives necessary to ensure high-quality bathing water at these sites in the future.

As required by the Directive, the water quality results for the 60 identified bathing waters have been reported to the European Commission (EC), which will publish the results as part of their annual report on the overall quality of bathing waters throughout the countries of the European Union.

[1] www.sepa.org.uk/data/bathingwaters

2 Background and legislation

2.1 EC Bathing Water Directive (76/160/EEC)

The EC Bathing Water Directive (referred to in this report as 'the 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 or is not prohibited and is traditionally practiced by a large number of bathers. The Bathing Water (Classification) (Scotland) Regulations 1991 implement the Directive in Scotland. The prescribed environmental quality standards are set to protect the environment and public health, and include limits for safe microbiological, physical and chemical parameters. 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 unrepresentative results obtained in abnormal circumstances.

2.2 Related legislation

Under the Control of Pollution Act 1974 as amended (COPA), SEPA issues consents for discharges of treated sewage and trade effluent to controlled waters, which include inland and all coastal 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 EC Urban Waste Water Treatment Directive (91/271/EEC) specifies minimum legal standards for the treatment of municipal waste water. These standards are principally determined by the size of the community, or agglomeration, served by a waste water treatment plant (WWTP), and by the nature of the receiving environment. This Directive also requires treatment to ensure compliance with all other relevant EC directives, including the Bathing Water Directive. The Urban Waste Water Treatment (Scotland) Regulations 1994 implement this Directive in Scotland.

The EC Water Framework Directive (2000/60/EC) will be the principal driver for water quality improvements in Scotland over the next decade and beyond. This Directive was approved in December 2000 and defines a planning mechanism for delivering specified environmental objectives. It generally 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 these plans must be finalised by 2009. This framework directive will replace seven existing directives and will provide the context within which other continuing directives, including the Bathing Water Directive, will operate. As well as having implications for investment to reduce point source pollution, the Water Framework Directive will also require controls to be put in place to minimise the impact of diffuse pollution sources.

2.3 Working with others

In 1998, SEPA's Environmental Strategy identified environmental protection priorities for Scotland and committed SEPA to make continual progress towards total compliance with the Bathing Water Directive's mandatory standards. This is not something that SEPA can achieve on its own and SEPA will continue to work with all relevant organisations, the agricultural community and the public to attain its goal. Only by working in partnership can SEPA give the people of Scotland, and visitors, the high quality of bathing water that they are entitled to expect in the 21st century.

All large continuous sewage discharges to Scottish waters are now subject to at least full secondary treatment, but sewage remains a significant cause of pollution to coastal waters. Storm overflows, to both rivers and directly to the 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 Executive work with Scottish Water and the Water Industry Commissioner to ensure:

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

Investment is required not only in sewage treatment but also in sewerage infrastructure, particularly in storm water overflows. Combined sewer overflows (CSO), designed to prevent flooding during periods of high rainfall, discharge diluted but minimally treated sewage to watercourses and coastal waters. SEPA imposes conditions on the location and frequency of operation of CSO to minimise their impact on water quality.

As sewage-related pollution sources are gradually eliminated, other sources of pollution become more apparent. The Scottish Executive's publication *Strategy for Improving Scotland's Bathing Waters*, published in March 2002, and subsequent development of the *Four Point Plan for reduction of agricultural pollution sources*, published in December 2002, are proving very helpful in enabling these problem sources to be tackled. This is particularly important as many of these problems are not yet subject to statutory control.

In respect of urban areas, the principles embodied in the successful Sustainable Urban Drainage Systems (SUDS) manual are increasingly limiting urban diffuse pollution from new developments, but there remains a large problem of contaminated surface water run-off from existing urban areas. It is encouraging that the Scottish Executive has undertaken an evaluation of retrofitting SUDS to urban areas near to bathing waters[2].

Local authorities are responsible for keeping beaches identified as Amenity Beaches under the Environmental Protection Act 1990 free from litter. All identified bathing waters are now classed as Amenity Beaches. Local authorities are also obliged to display notice boards at identified bathing waters providing a variety of information including the water quality data supplied by SEPA.

2.4 Identification of bathing waters

The first set of identified bathing waters in Scotland, 23 in total, was announced by the Secretary of State for Scotland in February 1987. Initially, these were based on the criteria set by the UK Government for identifying waters coming within the scope of the Directive, based on the number of people using the water for bathing.

In 1998, the Scottish Office carried out a review to decide whether additional waters should be identified in Scotland under the Bathing Water Directive. A panel with a wide-ranging membership was set up by the Scottish Office to ensure that all stakeholders were involved in the decision-making process. The result was that in May 1999, an additional 37 bathing waters were identified, bringing the total in Scotland to 60 (see Maps 1 and 2).

Post-devolution, it is Scottish Ministers who are responsible for identifying bathing waters in Scotland, and during summer 2004, the Scottish Executive carried out a public consultation on standards which might be applied to the identification of bathing waters. The view of SEPA is that the number of identified bathing waters should not be reduced, but that there may be scope for replacing some little used waters with others which are much better used. A summary of the responses is available on the Scottish Executive's website; individual responses can be viewed at the Executive's library[3].

2.5 Revision of the Bathing Water Directive

The European Commission's proposals for a substantially revised Bathing Waters Directive have made progress during the year, and a text is available. The next stage is for it to be taken through the European Parliament, but it is not yet known when this will be. If approved by the European Parliament, the revised Directive will eventually require new quality standards to be met.

The proposed new standards are numerically substantially more stringent than those of the current Directive but, as currently drafted, there will be much more flexibility in sampling and determining compliance. Assessment would be spread over 4 years and sampling frequency would be lower. Sampling schedules would be published in advance of the bathing season, but there will be greater flexibility, potentially allowing sampling during very wet weather to be avoided. There may also be provision made to discount a limited number of samples, perhaps if a signage scheme to warn of less good quality similar to that trialled in Scotland during the last 2 years (see Section 5.3) is in place. The abnormal events provisions of the current Directive also look set to be maintained.

[2]www.scotland.gov.uk/topics/environment/water/
[3]www.scotland.gov.uk/ Scottish Executive Information and Library Service (0131-244 4565 or library@scotland.gsi.gov.uk)

3 How results are determined

3.1 Interpretation of results and requirements for monitoring programmes

The requirements of the current Directive have been implemented in Scotland by the Bathing Waters (Classification) (Scotland) Regulations 1991. The Directive contains two series of water quality standards: mandatory quality standards which Member States must meet, and more stringent guideline quality standards which Member States must endeavour to achieve.

Mandatory standards (Good quality)

Mandatory standards apply to 10 quality indicators: total coliforms; faecal coliforms; salmonella; enteroviruses; pH; colour; mineral oils; detergents; phenols; and transparency. Of the samples taken during the bathing season, 95% must comply with the mandatory coliform quality standards for the site to achieve a mandatory level pass. Waters which meet this standard are classified as being of good quality, while those that do not are classed as poor.

Guideline values (Excellent quality)

In addition to the mandatory standards, there are guideline values for the two coliform groups and faecal streptococci bacterial quality indicators. These guideline values are more stringent than the mandatory standards and, if achieved, indicate very good bathing water quality, described as 'excellent' in this report.

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. Application of this provision in 2004 is described in Section 4.3.

Exceptional geographic conditions

Under Article 8, the requirements of the Directive may be waived 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 Beach), a waiver has been granted for both transparency and colour, because the River Nairn, when in spate, discharges peaty coloured water into the sea near the sampling point. Currently, four identified bathing waters in Scotland have waivers for colour and 23 have waivers for transparency.

3.2 Sampling frequency

The minimum frequency of sampling is prescribed in the Annex to the Directive. Checks must normally be made at least once every 2 weeks during the bathing season for total and faecal coliforms, transparency, colour, mineral oil, 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 used to be taken from all waters, so that they are sampled 20 times during the bathing season.

The Directive also permits that the sampling frequency may be halved for waters where quality is consistently good. Following the improvements made to Scottish bathing waters, the European Commission in 2003 indicated a list of Scottish sites where this provision may be applied. As indicated in last year's monitoring report, SEPA implemented this provision for the first time in 2004. For 2004, it was planned to apply the provision to all waters which met a very much higher quality hurdle than that required by the EC. This hurdle required high statistical confidence that the Directive's guideline quality standards had been met over the preceding 3-year period. It thus included results from years before recent quality improvement schemes were completed.

SEPA consulted stakeholders on this proposal, and learned that the continuing award of 'blue flag' and other beach quality indicators requires a monitoring frequency higher than the minimum specified in the Directive. In order that these sites did not lose their accreditation, they were maintained on SEPA's more frequent monitoring list. In 2004, the reduced sampling frequency provision was therefore only applied to three identified bathing waters and three other sites. It is pleasing to be able to report that, despite the wet weather, samples from these six sites achieved 100% compliance with the guideline standards. In future years, as more waters attain the high quality hurdle and reduced monitoring is applied, continuing application of this provision will free up monitoring resources to concentrate on other locations where there are potential pollution problems.

3.3 Interpretation of microbiological values

The microbiological quality indicator organisms, for which standards are set by the Directive, are all naturally present in the guts of humans and 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 which have not been given adequate treatment or dilution. Equally, large concentrations of seabirds or agricultural run-off may also give rise to these microbiological indicators in bathing waters. Livestock slurries and manure, if applied to agricultural land inappropriately, can enter inland watercourses and be transported to coastal areas. 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 1 (below).

Table 1: Interpretation of microbiological values for bathing waters, where 20 samples have been taken

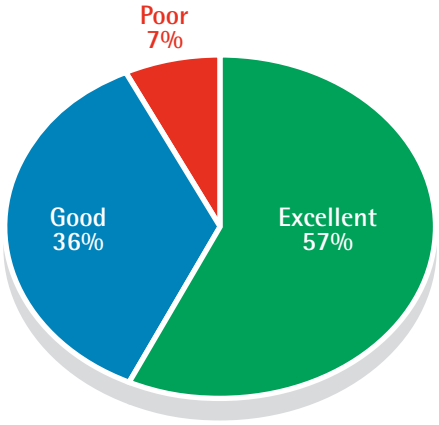
Level of pass	Symbols used in this report	Interpretations	Total coliforms	Faecal coliforms	Faecal streptococci
Pass - Guideline	E (Excellent)	Directive states:	80% of samples should not exceed 500 total coliforms per 100 ml.	80% of samples should not exceed 100 faecal coliforms per 100 ml.	90% of samples 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 faecal streptococci per 100 ml.
Pass - Mandatory	G (Good)	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 1 sample with greater than 10,000 total coliforms per 100 ml.	Can only have 1 sample with greater than 2,000 faecal coliforms per 100 ml.	The Directive contains no mandatory standard for faecal streptococci.

4 2004 bathing water quality results

4.1 Results from Scotland's 60 identified bathing waters

For 2004, the number of bathing waters reaching the EC mandatory standard was 56 out of 60 beaches (93%). The number of beaches reaching the guideline standard was 34 (57%). Investigation of the four failures showed that the majority of the problems were from diffuse pollution sources rather than continuous sewage discharges. This result is, in some respects, very good as the previous investments in sewage infrastructure have clearly made real sustained improvements in bathing water quality. The remaining problems are harder to deal with. Diffuse pollution has no single solution as there is no single source at which to direct remedial actions, and SEPA does not have legal powers to remediate these sources. Recent field-scale investigative work has shown that during heavy rainfall onto saturated pastures, even the normal presence of animal droppings can cause surface water run-off to be seriously polluted. Any recent slurry spreading just adds to the problem.

Figure 1: Scotland's 2004 bathing water results

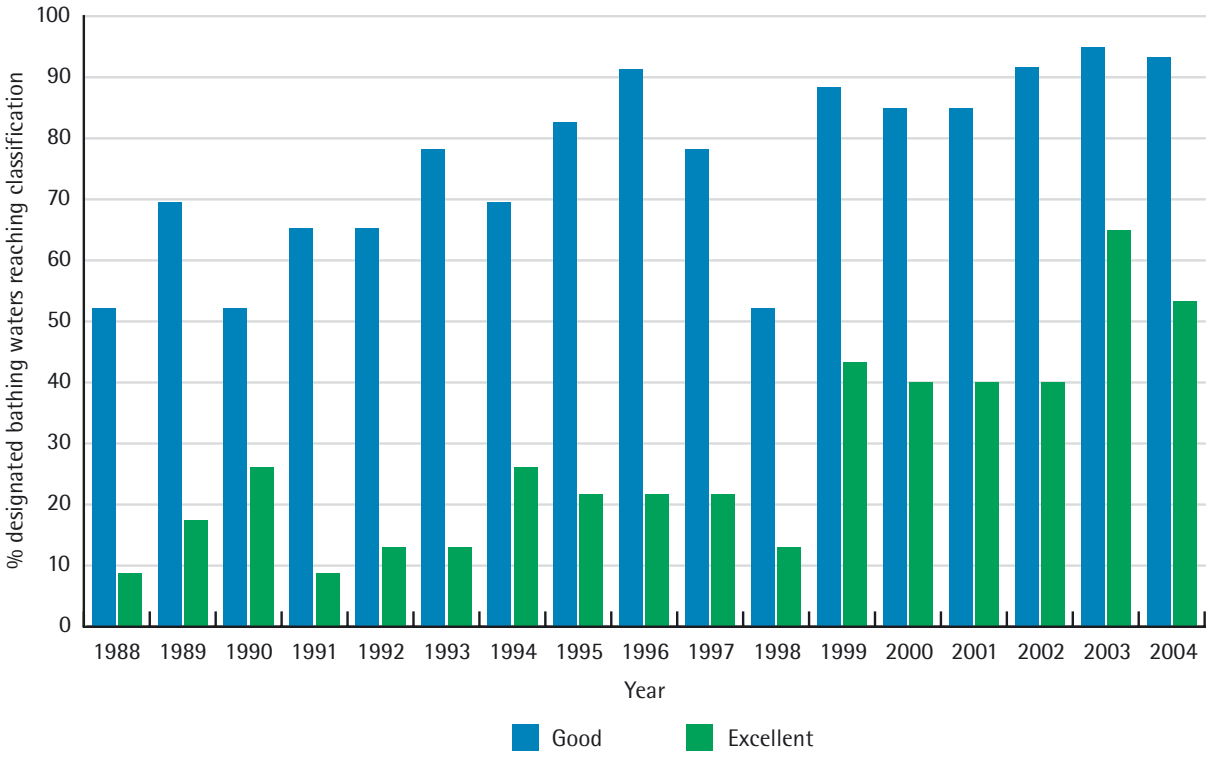


The wet weather during June and especially August had considerable influence on the results observed this year. August was the wettest since 1956, and in view of the weather, the increase of only one in the number of waters failing mandatory standards is good. Taken together, the results for the last 2 years are easily the best ever for Scottish bathing waters (Figure 2). This is a direct result of the actions taken to improve sewage infrastructure in Scotland and SEPA's work with and through others to reduce diffuse pollution sources and, in particular our Environmental Improvement Plans. It is particularly pleasing that, although the number of bathing waters reaching the guideline standard was reduced in comparison with 2003, it was the second highest number achieved.

The full set of microbiological monitoring data from the 60 identified bathing waters in Scotland can be found in Annex 1 and is summarised below (see also Figure 1, and Maps 1 and 2):

- 32 of the 60 identified bathing waters (53%) met the Directive's guideline quality standards and are of 'excellent' quality;
- 24 of the 60 identified bathing waters (40%) met the Directive's mandatory coliform quality standards and are of 'good' quality; and
- 4 of the 60 identified bathing waters (7%) failed the Directive's mandatory coliform quality standards and are of 'poor' quality.

Figure 2: Summary of compliance history for good (mandatory) and excellent (guideline) since 1988



4.2 2004 information on Scotland's 60 identified bathing waters

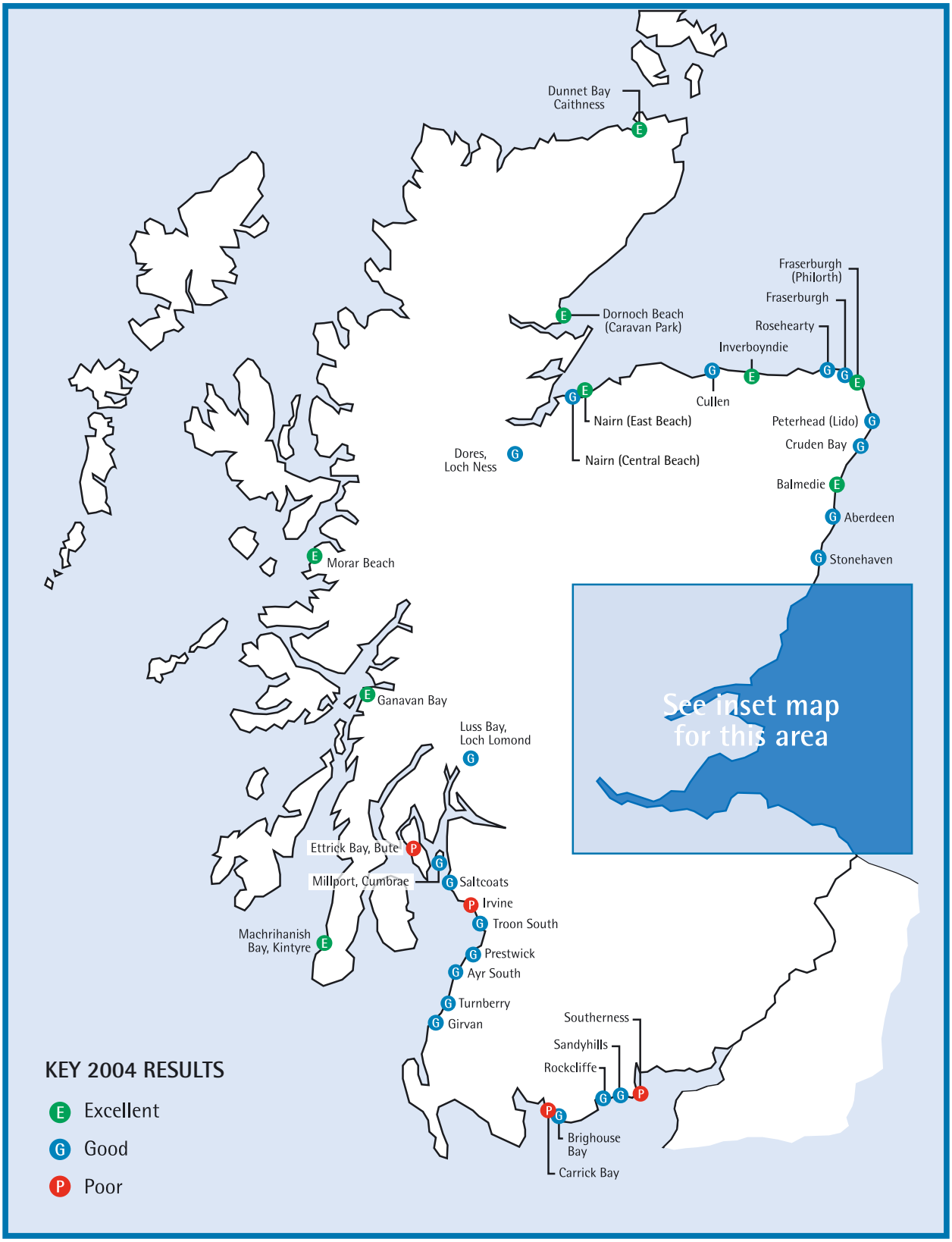
This section contains background information for each of Scotland's identified waters. It also focuses on the underlying factors behind bathing water quality at each site and outlines the plans for improvements. Waters are described in clockwise order around Scotland, starting in the southwest.

The four failing waters were all in southwest Scotland. The Ettrick Bay and Irvine failures were due to diffuse pollution exacerbated by the wet weather, and were predicted. Problems at a sewage pumping station south of Dumfries may have contributed to the failure at Southerness. The unexpected first-time failure at Carrick bathing water on the Solway coast was very out of character for this site, and no obvious cause has yet been ascribed.

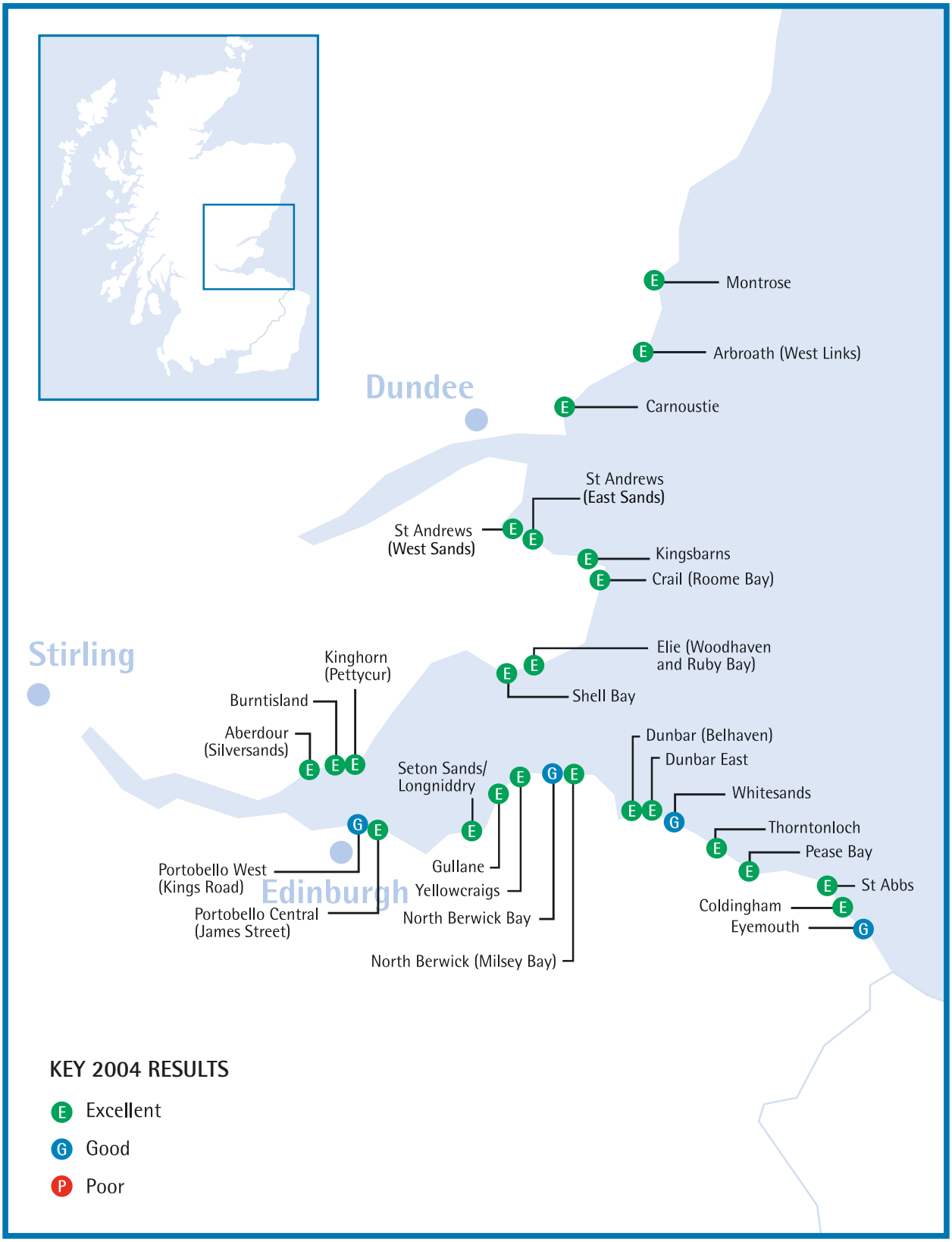
In the following paragraphs: n/s indicates not sampled, good quality indicates a pass of the Directive's mandatory standards and excellent quality indicates a pass of the Directive's guideline quality standards.

For each of the identified waters, a previous record of compliance is provided. For the 23 waters originally identified, results are given for the past 11 years. For the waters identified for the first time in 1999, the comprehensiveness of the records varies. Records are provided where they exist.

Map 1: Results for Scotland's 60 identified bathing waters 2004



Map 2: Results for Scotland's 60 identified bathing waters 2004 (south east area)



Southerness

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Poor	Good	Good	Poor

Southerness was identified as an EC Bathing water in 1999. Unfortunately this year, for the second time since monitoring began in 1999, Southerness failed to meet required quality standards.

This failure of two consecutive samples (over a 3-day period) occurred during unsettled weather in August when heavy showers would have caused the storm overflows in Dumfries to begin discharging. Previous studies have indicated that the sewerage systems in Dumfries contribute significantly to the bacterial loadings in the River Nith, especially during wet periods. There was also a failure of a pumping station in Dumfries, prior to the second failure. Unfortunately, although a reasonable distance from the bathing beach area, these discharges occurred at a time which coincided with very high flows in the River Nith which in conjunction with the particular combination of tidal current and wind direction at the time of sampling, transported pollution to the shoreline area.

In addition to the sources of sewage from Dumfries (Troqueer, Dalscone and Lincluden WWTP), there are tidal storage tanks at Airds Point, which previously accepted the drainage from Cargenbridge village, as well as the drainage from the Du Pont factory at Cargenbridge. The village drainage is now pumped to Troqueer WWTP for full treatment. The only private waste water treatment plant is the settlement tanks at Southerness, which serve the caravan park and village. This discharge is due to be upgraded to full treatment before the end of 2005.

Sandyhills

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Good	Good	Poor	Poor	Good	Poor	Poor	Good	Good	Good

Sandyhills bathing water has had a varied history of compliance but again achieved good quality in 2004. The main threat to water quality here is from agricultural run-off. There is currently a Scottish Executive funded programme of works on 10 farms in the local catchment, which is aimed at reducing the potential for polluting inputs.

This bathing water was part of the bathing water signage pilot project, which provided an on-line electronic variable message sign to inform potential bathers of daily predicted water quality conditions. Further details on this project are given in Section 5.3 of this report.

Rockliffe

Rockcliffe

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Poor	Good	Poor	Poor	Good

Since first identification in 1999, the bathing water at Rockcliffe has not been of consistently satisfactory quality, although after recent local sewage treatment upgrading, it complied with good quality requirements this year.

After SEPA's addition of a consent limit on faecal coliform numbers in the final effluent, Scottish Water installed UV disinfection at their Rockcliffe WWTP in 2002/3. It is imperative that the UV treatment operates effectively at all times during the bathing season and Scottish Water have been reminded that failure to comply with the bacteriological consent limit will lead to enforcement action by SEPA.

Brighouse Bay

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	Good	Good	Good	Good	Good	Good	Poor	Good

Brighouse Bay is a small sandy beach between rock outcrops and although there was a poor result last year, the beach has achieved good quality for 2004. However, one sample during the season did exceed the coliform standards. This had been immediately preceded by heavy rain after a period of relatively dry weather.

With no significant sewage discharges into the bay, there is little doubt that high bacterial counts arise from agricultural drainage, both from the land and steading areas. All farms in the catchment were inspected and revisited to ensure that remedial work, where requested, had been carried out. Further investigation will take place through a project sponsored by the Scottish Executive that will also evaluate control techniques throughout 2004.

In 2004, an electronic bathing water quality status sign was installed as part of a trial project to provide beach users with real-time bathing water quality predictions. Further details on this project are given in Section 5.3 of this report.

Carrick Bay

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Good	Good	Excellent	Poor

This year, the bathing waters of Carrick Bay failed to comply with the quality standards of the Directive, after 5 consecutive years of good and excellent quality.

This beach was previously a guideline pass and the fail this year has been a considerable surprise and disappointment. Immediate post-failure inspections were carried out around the local area; however, no obvious source of contamination has been found. Further detailed catchment and shoreline sampling has been initiated and will be reviewed by SEPA before next season.

Threats to the quality of this bathing water are considered to be relatively few. There are no major sewage or freshwater inputs nearby and the small numbers of holiday chalets in the area are not considered to be a significant risk as the septic tank effluent from each drains to a soakaway system.

Girvan

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Poor	Poor	Poor	Poor	Good	Good	Good	Good	Good	Good

Bathing water quality at Girvan has substantially improved since the successive phases of major new sewerage and sewage treatment schemes were completed during the 2001 season. There remain potential impacts during high river flows, but a sixth year of good quality was achieved in 2004.

Turnberry

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Poor	Poor	Good	Poor	Poor	Good	Poor	Good	Good	Good

The bathing water at Turnberry was again of good quality in 2004. The new sewage scheme was brought into use immediately prior to the bathing season. A pumping station that includes a storm overflow with a spill frequency of no more than three times per season has replaced Kirkoswald WWTP.

The sewage from Turnberry Hotel is now connected to the new Turnberry Pumping Station, which pumps to Girvan WWTP where it receives full secondary treatment with the sewage from Girvan, Maidens and Kirkoswald. There remain some small private sewage effluent discharges and Scottish Water is investigating the feasibility of a first time sewerage scheme. All farms in the local Milton Burn catchment were inspected previously as part of the agricultural pollution prevention action plan, and remedial measures have been taken where necessary.

Ayr South

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Poor	Good	Poor	Poor	Poor	Poor	Poor	Good	Good	Good

Ayr South bathing water was of good quality in 2004. The town's sewage is now pumped to Meadowhead WWTP for full treatment including disinfection, before discharge via a long outfall. Diffuse pollution remains a concern. Investigations continue regarding potential pollution sources from urban drainage and a number of cross connections into surface water sewers have been identified in the town. Improvement measures have been taken at most farms in the river catchments.

As diffuse pollution can still be a problem, this bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

Prestwick

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Good	Good	Good	Poor	Good	Good	Good	Good	Good	Good

Prestwick again recorded good quality for the 2004 season. The bathing water at Prestwick does not have a direct sewage outfall nearby, although there are storm overflows. Sewage from the town is pumped to Meadowhead WWTP for full treatment. Because of its past quality record, this bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

In late May, just prior to the start of the bathing water's season, the rising main burst leading to a shutdown of the large Pow Burn pumping station and an overflow to the adjacent burn. Prompt action by Scottish Water brought the situation under control and sampling confirmed that the bathing water quality was not compromised, although, as a precaution, the public were informed of the risk via SEPA's electronic beach message sign and local radio.

Troon South

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Good	Good	Poor	Good	Good	Excellent	Good

Following commissioning of the new Meadowhead WWTP, the bathing water at Troon was of excellent quality for the first time in 2003. This year, due to the wet weather, this was unfortunately not sustained. However, overall good water quality was fairly comfortably attained, and results show encouraging improvement trends, coincident with the increasing treatment given by Meadowhead WWTP.

This bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

Irvine

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Good	Good	Poor	Poor	Poor	Good	Good	Good	Good	Poor

During 2004, Irvine beach failed after periods of wet weather in the upland catchments and elevated river flows. In addition, on one occasion, a local sewer choke and overflow were discovered and notified to the relevant authority for correction – this may have contributed to the failure, though it was unlikely to have been the main cause.

The new biological treatment plant at Meadowhead WWTP and an extended sea outfall were completed and commissioned in 2002. Scottish Water is continuing investigations into the most effective improvement measures for intermittent storm overflow discharges into the Irvine catchment. In the meantime, 80% of farms in the River Irvine and River Garnock catchments where potential problems were identified by SEPA have started or completed remedial measures.

As there remains a continuing threat from diffuse pollution, this bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

Saltcoats

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Poor	Good	Poor	Poor	Good	Poor	Poor	Good	Good	Good

Prior to 2001, Saltcoats had a history of poor bathing water quality, but encouragingly the waters achieved the good standard again in 2004. The improvement is attributed mainly to the waste water treatment plant at Stevenston Point which was completed in 2002. However, the monitoring results again confirm the vulnerability of this beach to high bacterial levels after rainfall. As elsewhere in Ayrshire, action plan work to reduce pollution from urban drainage and intermittent discharges continues.

As there is still a threat to quality from diffuse pollution sources, this bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

Millport, Cumbrae

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Poor	Good	Good	Good

Millport was identified as a bathing water in 1999 and was once again classed as of good quality in 2004. The predominant threat to water quality is the 10 septic tank outfalls discharging into shallow water in the bay. A scheme has been designed to pump the sewage from all of these to a new treatment works discharging away from the bathing water. This scheme was originally scheduled to be commissioned before the 2003 season, however, planning issues unfortunately delayed the start of engineering works, but these are now well underway and Scottish Water intends to complete and implement this scheme during 2004/05.

Luss Bay, Loch Lomond

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Good	Good	Good	Good

Luss Bay was identified as a bathing water in 1999 and was first sampled by SEPA in that year. It has attained good quality standards every year, but sometimes not by a wide margin.

There is a small treated sewage discharge about 0.5 km to the south of the bathing water. Disinfection of the discharge by the addition of chlorine was carried out in 2003. This chlorination plant was replaced by UV disinfection in 2004. However, one sample failed quality compliance early in the season during the period of changeover in treatment systems at the WWTP. With the new disinfection system in place, the waters attained good status for the rest of the season.

Ettrick Bay, Bute

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Poor	Poor	Poor	Poor	Poor	Poor

Ettrick Bay was identified as a bathing water in 1999 but has never met the EC Directive's quality standards.

There are no significant sewage discharges in the vicinity of the beach, and failure to meet required standards is attributed solely to agricultural pollution, which reaches the bathing water via local streams which flow across the beach. The surrounding area is intensively farmed and high levels of bacteria have been found in these streams, particularly after heavy rainfall.

Farmers in the area are being encouraged to adopt practices that should lead to a reduction in bacterial pollution of the local streams. All of the farms in the catchment have been inspected as part of SEPA's agricultural pollution reduction programme. Remedial action was requested at a number of farms which were found to have a problem with excess surface water draining from contaminated yard areas. In addition, the Scottish Agricultural College have been carrying out advisory/assessment visits to all farms as part of a Scottish Executive project, and giving recommendations on what further remedial measures could be undertaken to reduce bacterial pollution.

As water quality is still predictably threatened by diffuse pollution, this bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

Machrihanish Bay, Kintyre

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Good	Good	Excellent	Excellent

Machrihanish Bay was identified as an EC bathing water in 1999. Until 2003, it had achieved the 'good' quality standard. After diversion by pumping of sewage from the small communities of Machrihanish, Stewarton and Drumlemble to Campbeltown WWTP for full treatment, 'excellent' quality standards have now been met for the second successive year. Provided potential agricultural pollution sources in the area are kept under control, this satisfactory quality should now be maintained.

Ettrick Bay

Ganavan Bay (North of Oban)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Good	Good	Good	Excellent

Ganavan Bay was first identified as a bathing water in 1999. Until this year it achieved the 'good' quality standard. This year, the location attained a guideline pass for the first time.

This significant improvement may be ascribed to a new pumping station which now transfers local sewage sources to Oban WWTP. Discharge consents relating to a caravan site and public toilet have been reviewed to require compliance with the microbiological standards set out in the bathing water directive. As a result the public toilets have been closed.

The Scottish Water pumping station pumps sewage from the Ganavan public system to Oban for treatment at the WWTP prior to discharge into the Sound of Kerrera. This works, serving the resident population of Oban (9000 rising to 20,000 in summer), discharges offshore into deep water approximately 2 km to the south of the bathing water and provides good protection to the Ganavan bathing water location.

Morar Beach (Sound of Sleat at Morar Golf Course)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Excellent	Good	Good	Excellent	Excellent	Excellent

The 7-km stretch of the Morar coast, which was identified as a bathing water in 1999, continued this year to achieve excellent quality. 2004 is the third consecutive year that an overall guideline pass has been achieved.

The provision of improved drainage facilities at some caravan/camping sites continued to be progressed and further investigation into potential diffuse sources was undertaken with a view to further reducing potential bacterial contamination sources.

Dunnet Bay (Caithness)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	Excellent	Excellent	Poor	Excellent	Good	Excellent	Good	Excellent	Excellent

Dunnet Bay was identified as a bathing water in 1999. Excellent quality was recorded in 2004, for the third time in 4 years. The input of sewage from Castletown has previously affected the quality of the bathing water in Dunnet Bay. As part of ongoing investment to ensure water quality in the identified area is improved, Scottish Water will remove this source of potential pollution. To ensure that bathing water quality is protected until that time, Scottish Water has installed a peracetic acid disinfection unit on the discharge at Castletown as an interim measure. This will be improved by the addition of a storage facility and monitoring of the efficiency of the disinfection unit will be carried out during next season.

The adequacy of the septic tanks serving the small settlement at Dunnet and a caravan park at the Dunnet end of the beach are also under review. Again, as a temporary measure, Scottish Water provided peracetic acid dosing to the Dunnet discharge for the 2003 and 2004 seasons. The discharge from the caravan park septic tank to a soakaway is under review and the treatment of waste water will be improved in the near future.

The impact of surface water runoff to the Stanergill Burn, which discharges into Dunnet Bay, has been examined and improvements, particularly to potentially oily discharges from an industrial site, have been secured. All farms and private dwellings in the catchment have been inspected and although very few problems were found, action will be taken when necessary to protect the status of this bathing water.

Dornoch Beach (Caravan Park)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Dornoch Beach was identified as a bathing water in 1999. Local sewage and potential agricultural sources of pollution have been progressively diminished, and in 2004, for the seventh consecutive year, it again achieved excellent quality. The beach continues to be a popular destination for visitors and locals who value the high standard of the bathing water.

Dores (Loch Ness)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Good	Good	Good	Good

An area of Loch Ness next to the village of Dores was identified as a bathing water in 1999. This is one of only two identified freshwater bathing waters in Scotland and it again achieved good quality this year.

Scottish Water extended the public sewerage system in the village last year, to pick up numerous septic tanks, which had previously been identified as a potential risk to water quality, and which were previously discharged to either the Dores Burn or Loch Ness. This year the sewage flows from the village system were diverted to a new septic tank with an extended outfall to Loch Ness. There were problems this bathing season with the new pumps feeding the septic tank. This highlighted telemetry system problems, which on investigation turned out to be to be a national issue and which is now being followed-up with Scottish Water.

Nairn (Central Beach)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Poor	Good	Good	Good	Good	Excellent	Excellent	Good	Excellent	Good

Nairn (Central Beach) was identified as a bathing water in 1999. The initially installed disinfection system at Nairn WWTP was unreliable, and led SEPA to issue a Section 49A Enforcement Notice. This has led to the installation of a replacement new disinfection system, which is now working extremely well and the old UV system has been switched off.

Continuing bacterial loadings from the River Nairn are considered sufficient to pose a risk to the bathing beaches at Nairn. Consequently, Scottish Water was issued with new consents for discharges from four WWTP on the River Nairn. These consents effectively require disinfection of the effluent prior to discharge. To ensure that the upgrades are completed by the start of the 2005 bathing season, SEPA intends to issue new enforcement notices. It is noted that unregulated horse riding and dog walking on the beach may also pose a risk to water quality.

Nairn (East Beach)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Poor	Good	Excellent	Good	Good	Excellent	Excellent

This popular expanse of sandy beach again achieved excellent quality in 2004. Like Nairn Central, it has been helped by the new flow-balancing and UV disinfection arrangement at Nairn WWTP.

It is occasionally influenced by water from the River Nairn, so the above comments are applicable also to this beach.

Cullen

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Good	Good	Good	Excellent	Excellent	Good	Excellent	Excellent	Good

The bathing water at Cullen has maintained its record of achieving at least good quality status since 1988. Despite the variable weather during the summer of 2004, 17 of the 20 samples met the Directive's guideline quality standards. Periods of heavy rainfall appeared to be responsible for the slight dips in water quality on the other three occasions, all of which occurred in August.

Inverboyndie

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Excellent	Good	Good	Good	Good	Excellent	Good	Good	Excellent	Excellent

Inverboyndie was identified as a bathing water in 1999. The beach is a popular recreational area and attracts many walkers, swimmers, surfers and windsurfers. It achieved excellent bathing water quality in 2004.

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 a treatment plant at Macduff where it undergoes full biological treatment followed by UV disinfection. The outfall itself has been retained only as a storm and emergency overflow for the pumping station. These improvements have resulted in the excellent performance demonstrated at the bathing water since their completion in 2002.

Another potential impact on bathing water quality comes from the Inverboyndie Burn which discharges to the sea at the western end of the beach. All farms draining to this watercourse were inspected in 2003 in order to determine potential sources of bacterial contamination which could pollute the bathing water. A number of these farms have since been revisited, and the response from the farming community has been encouraging. The majority of farms had carried out the measures previously identified as required to minimise agricultural pollution from this catchment.

Inverboyndie

Rosehearty

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Excellent	NS	NS	Excellent	Good	Good	Good	Excellent	Good

Rosehearty was identified as a bathing water in 1999, although it had been monitored intermittently since 1989. It achieved good bathing water quality in 2004.

Sewage from the town was diverted to the new waste water treatment plant at Fraserburgh in 2001. There is now only a pumping station, which has consent to discharge screened sewage only under certain storm and emergency conditions. Several farm steadings draining to watercourses in the vicinity of Rosehearty were audited to assess for potential pollution sources in 2003. It was concluded in that dry year that they do not play a significant role in bathing water compliance but they may have contributed to the less high quality of 2004.

Fraserburgh (Tigerhill)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Poor	Good	Good	Poor	Good	Excellent	Good

This sandy beach next to the town of Fraserburgh is a popular location for many water sports as well as for walking and family outings. When car parking and access arrangements were changed, so did the area most used by bathers, so the water sampling point was moved accordingly. It was relocated to the 'Tigerhill' site prior to the 2003 bathing water season. The waters achieved good quality in 2004.

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 3 km to the west of the bathing water. Bacteriological monitoring of the effluent has shown that the disinfection treatment is extremely effective.

The local Kessock Burn drains to the beach to the west of the monitoring point and remains a potential source of bacterial contamination. Audit inspections of farms in this catchment carried out in 2003 showed that agricultural pollution is unlikely to have a significant effect on bathing water quality. However, a surface water sewer owned by Scottish Water has in the past been responsible for the discharge of untreated sewage to this burn, and is currently the target for remedial action.

Fraserburgh (Philorth)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Good	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Fraserburgh (Philorth), which was identified as a bathing water in 1999, achieved excellent bathing water quality in 2004 for the sixth consecutive year. On account of its outstanding record this beach has been selected for reduced monitoring (as prescribed by the EC Bathing Waters Directive), and was sampled only five times during the 2004 season. All samples met the required high quality standards. The beach is a popular recreational and windsurfing area, located at one end of the sandy bay that links Fraserburgh and Philorth. There are no sewage discharges in the immediate vicinity of the bathing water, and the Water of Philorth discharges some distance to the east of the monitoring point.

Peterhead Lido

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Excellent	Good	Good	Good	Excellent	Excellent	Good	Poor	Excellent	Good

Peterhead Lido is located within the outer harbour (Bay of Refuge) of the town of Peterhead. This bathing water attracts a diverse range of water sports enthusiasts, with dinghy sailing in the sheltered waters of the bay particularly popular. Peterhead Lido achieved good bathing water quality in 2004, continuing a generally good compliance record with the exception of the short-term poor quality in 2002 which was believed to have been caused by an unauthorised overflow of untreated sewage from a nearby pumping station during engineering works.

Improvements to the sewerage infrastructure were completed prior to the 2003 season, and include increased storage capacity at the pumping station and a better telemetry system. Discharges from the pumping station are now only permitted under emergency or storm conditions, with the consent conditions designed to protect the bathing water.

Cruden Bay

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Good	Good	Poor	Poor	Good	Poor	Good	Poor	Good	Good

This extensive sandy beach, situated next to the small village of Cruden Bay, achieved good bathing water quality in 2004.

Sewerage improvement plans came into effect prior to the 2003 season, when an unsatisfactory short outfall was removed. Local sewage is now pumped to the waste water treatment plant at Peterhead, with the former outfall retained only as a storm and emergency overflow.

The Water of Cruden flows into the sea at one end of the bathing water and, as well as draining an agricultural catchment, receives treated sewage effluent from both a waste water treatment plant serving the village of Hatton and a large septic tank at Bridgend. UV disinfection at Hatton WWTP is due to be commissioned by 2006.

Over 60 farms in the catchment were visited in 2003 as part of a national plan to determine potential sources of bathing water pollution. Revisits to some of these farms are being carried out to check compliance with the measures outlined after the initial visits, although indications are that pollution from agricultural steadings is not contributing significantly towards bathing water quality at this location.

Peterhead Lido

Balmedie

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Good	Good	Good	Excellent	Good	Good	Good	Excellent	Excellent

This popular expanse of sandy beach is located adjacent to Balmedie Country Park, north of Aberdeen. It was identified as a bathing water in 1999. In 2004, for the second successive year, excellent water quality was achieved at the site. That this was achieved despite the poor weather may be attributed to the new waste water treatment plant at Balmedie, which was commissioned prior to the 2004 bathing season.

Farm audits of premises located in the Balmedie area carried out during the 2003 season revealed a number of minor problems which resulted in several follow-up inspections in 2004. Agricultural pollution is not now considered to have a significant effect on bathing water quality at this location.

Aberdeen

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Excellent	Good	Good	Excellent	Good	Good	Good	Good	Good

Aberdeen has an extensive sandy beach, which is well used for water sports and sea bathing. The bathing water again achieved good quality in 2004. To protect it, the waste water treatment plant at Persley, which discharges to the River Don, was upgraded in 2001 to include UV disinfection. Prior to the bathing season 2003, work was undertaken on the Kings Links combined sewer overflow (CSO) to ensure that the number of overflows met the requirement of a maximum of three spills per season. Improvements to the network have seen the installation of two mechanical screens, two static screens and seven rainfall event recorders. Five other CSO have been eliminated. Further investigations into the efficiency of the entire sewerage network serving Aberdeen are now essential to identify the sources of pollution that are impacting upon the waters in and around the bathing beach. Work to report on the bacterial loading of river systems above the urban area is also planned to ensure that pollution control measures are targeted effectively.

Although it is only relatively slightly affected by rainfall, this bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

Aberdeen

Stonehaven

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Excellent	n/s	Poor	Poor	Good	Good	Good	Good	Good

Stonehaven is an increasingly popular coastal resort, which is well used by water sports enthusiasts. The bathing water was identified in 1999 but has been monitored since the 1980s. Stonehaven again achieved good quality in 2004.

Improvement of the local sewerage infrastructure was planned to take place by 2004, by which time sewage effluent from Stonehaven was to be pumped to the main Aberdeen treatment plant and long sea outfall at Nigg Bay. However, serious delays have occurred as Scottish Water has failed to secure planning permission for the pumping station proposed. It now seems unlikely that the new facilities will be in place ahead of the 2005 bathing waters season. In order to protect the bathing waters prior to the completion of the connection to Nigg WWTP, Scottish Water will provide facilities to disinfect the sewage effluent discharged via the Stonehaven outfall during the bathing water season, in order to meet SEPA licence requirements.

Montrose

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Good	Good	Excellent	Poor	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The bathing water at Montrose has consistently achieved European guideline quality standards since 1999.

The commissioning of Montrose WWTP and associated works in January 2002 should ensure that this high quality is maintained. The treatment plant and few remaining storm overflows (which include storm storage and screening) were all designed to be compatible with the attainment of the Directive's guideline quality standards.

Arbroath (West Links)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Good	Good	Good	Excellent	Poor	Good	Excellent

The identified bathing water at Arbroath (West Links) met the EC guideline standards in 2004. The improvement since the 1990's is ascribed to the pumping of local sewage to the Hatton WWTP which was commissioned in 2001.

SEPA required that the new works were designed to ensure that the Bathing Water Directive's 'guideline' quality standards would be met at Arbroath (West Links). In view of this, the overall fail result for 2002 was particularly disappointing.

No obvious source has been found for the failure in 2002, though a number of potential problem sources have been identified including some local freshwater tributaries, and there remains the possibility that unplanned discharges from CSOs may have taken place.

In 2003 in order that any source of contamination at the bathing water could quickly be identified, samples were taken from the freshwater inputs close to the bathing water on the same days as bathing water samples were collected. The quality of these inputs has been variable, and though none have contained excessive bacterial indicator counts, there have been a few occasions when moderate to high faecal contamination was present. This work was continued in 2004 with additional intensive sampling of the watercourses and the data collected is currently being interpreted. Early signs are that during normal weather conditions the bacterial loadings found are unlikely to impact significantly on the bathing water. During wet conditions when CSO spills to local streams may be anticipated, the bacterial loadings are higher.

Carnoustie

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Good	Excellent	Excellent	Excellent	Good	Excellent	Excellent

Carnoustie again met EC guideline quality standards in 2004. All normal sewage flows from the Carnoustie catchment are now pumped to Hatton WWTP for full treatment. SEPA required that the upgraded works were designed to ensure that 'guideline' quality standards are met at Carnoustie.

The apparent drop in bathing water quality in 2002 was thought to be due to contamination from local surface water inputs, which were affected by increased rainfall. Investigations since 2002 have identified a number of potential problems with surface water drains, sewer overflows and possibly sewer leakage to the Lochty Burn, which outflows close to the bathing water sampling site. A number of small sewage sources have been identified, and several of these been diverted to sewer when found. However, the complexity and age of the system requires continued vigilance and investigative effort.

St Andrews (West Sands)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Good	Excellent

St Andrews (West Sands) has a good record of compliance with EC standards and has achieved excellent quality in 12 of the last 13 years. This bathing water also holds a 'blue flag'.

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

St Andrews (East Sands)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Good	Good	Excellent	Good	Poor	Good	Good	Good	Excellent	Excellent

This bathing water was identified in 1999, although it has been monitored by SEPA and its predecessors for many years. In 2004, as in 2003, it achieved the European guideline bathing water quality standards. The new works described above for St Andrews (West Sands) reduces the risk of bathing water non-compliance at both of the St Andrews bathing waters. This bathing water also holds a 'blue flag'.

Kingsbarns

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Good	Excellent	Good	Poor	Excellent	Excellent	Excellent

Kingsbarns was identified as a bathing water in 1999, although it has been monitored by SEPA and its predecessors since 1993. It met the EC guideline standards for the third year running in 2004.

Kingsbarns has a small WWTP with effluent discharging via a short outfall to the north of the bathing water. The reason for poor quality in 2001 was thought to be an unusual combination of weather and tidal conditions directing the effluent plume onto the bathing water site. To ensure compliance in 2002, Scottish Water added chemical disinfection as an interim measure and increased the length of the outfall. Scottish Water plan to install a new waste water treatment plant by June 2005. The new works will be a submerged aerated media system, followed by sand filtration and UV disinfection of the final effluent during the bathing season.

Crail (Roome Bay)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

First identified as a bathing water in 1999, Crail (Roome Bay) has achieved excellent bathing water quality since that time. All local sewage sources are pumped to a WWTP at Kilminning, which provides adequate protection of these waters.

Elie (Woodhaven and Ruby Bay)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Elie (Woodhaven and Ruby Bay) was formally identified a bathing water in 1999, although SEPA began monitoring in 1998. In each year, the bathing water has achieved excellent quality. The Elie Harbour beach is managed, and holds a 'blue flag' award.

Shell Bay

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The Shell Bay bathing water, just west of St Monans, was officially identified in 1999, and has achieved guideline quality classifications since that time.

Shell Bay is a small private beach that is managed by the adjoining holiday caravan park. The aesthetic appearance of Shell Bay Beach was often blighted by sewage-related debris, most of which was thought to be derived from beyond the Shell Bay area. The aesthetic quality could be vastly improved at this beach by improved beach cleaning. Much of the problem with sewage debris is caused by re-circulating debris that has been lying on the beach strand line, for several weeks in some instances.

The provision of sewage treatment to European Urban Waste Water Treatment Directive (UWWTD) standards at Levenmouth has markedly reduced the input of sewage debris to this part of the Forth. The Levenmouth works also provides disinfection of the treated sewage effluent during the bathing season.

Elie

Kinghorn (Pettycur)

Kinghorn (Pettycur)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Poor	Good	Excellent	Good	Good	Excellent	Excellent

In 2004 Kinghorn (Pettycur) achieved excellent quality, after 5 years of good or excellent quality bathing water results.

Prior to the 1993 bathing season, new treatment facilities and a long sea outfall pipe at Pettycur were commissioned. The work comprised a new interceptor sewer and the treatment of effluent by septic tanks, prior to discharge through a long sea outfall. During 2001, a scheme was completed whereby all of Kinghorn's sewage is now treated and discharged through this system. This has resulted in much improved water quality being achieved at Kinghorn's other beach, Kinghorn Harbour.

Burntisland

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Poor	Poor	Poor	Poor	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Burntisland is another of the bathing waters identified in 1999, although monitoring for bathing water quality has been undertaken at this location since the 1970s. Apart from occasional mandatory passes, bathing water quality was usually very poor at Burntisland, mainly due to sewage that was discharged untreated at nearby short outfalls.

Scottish Water have continued a programme of improvements, started by the former Fife Regional Council, which involved collecting the flows from the old outfalls and diverting these to a new waste water treatment works, before discharge via a long sea outfall. The unsatisfactory discharge from Lammerlaws was diverted to this works at the end of the 1998 bathing season, and satisfactory water quality has been attained since that time. A new Lochies Road pumping station scheme was completed prior to the 2003 bathing season. This removed the discharge that immediately threatened the bathing water. The Harbour outfall and a few other small outfalls were intercepted and connected into the main sewers prior to the 2004 bathing season, and this should ensue that guideline quality standards continue to be attained. Burntisland beach is well managed and also holds a 'blue flag' award.

Aberdour (Silversands)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The very popular identified bathing water at Aberdour (Silversands) has achieved excellent quality for the last 7 years and holds a 'blue flag' award. The diversion of Dalgety Bay sewage by means of a pumping station and rising main to Dunfermline WWTP was completed in spring 2003, removing this distant potential risk to bathing water quality.

Aberdour (Silversands)

Portobello West (Kings Road)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Poor	Good	Good	Poor	Good	Good	Poor	Good	Good	Good	Good

Portobello West (Kings Road) was identified as a bathing water in 1999. In 2004, it was again of good quality.

Bathing water quality at this site has been successively improved over many years by progressive improvement of sewage treatment and sewerage infrastructure. Edinburgh's WWTP has effluent disinfection, and the remaining water quality threats are from the local Figgate Burn, and potentially contaminated surface water run-off from adjacent urban areas.

A joint SEPA/Scottish Water workgroup was set up in 1998 to determine the impact of storm overflows and other inputs to the Figgate Burn, with a view to reducing these sources. A programme of CSO upgrading was carried out to reduce spill frequency. Several other sources of faecal contamination to the burn were identified and removed. This resulted in improved sanitary quality in the Figgate Burn, with a parallel improvement in bathing water quality at Portobello West as measured by the percentage of samples meeting the EC guideline standard for faecal coliforms. Other work to find sources of surface water run-off contamination is continuing.

Portobello Central (James Street)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	Good	Good	Good	Excellent	Excellent	Excellent	Excellent

Portobello Central (James Street) became an EC identified bathing water in 1999. Between 1998 and 2000 it achieved a mandatory pass.

After a sewer overflow in May 2000, the water authority carried out investigative work on the Joppa sewer. This resulted in removal of debris from the sewer, increasing the flow passing on to Seafield and reducing the frequency of overflow at Joppa.

Following these and other improvements by Scottish Water, and consequently reduced occurrence of storm sewage overflows, Portobello Central met the EC bathing water guideline quality standards for the first time in 2001 and has maintained this excellent standard since then.

Although the threat from diffuse pollution is relatively slight, this bathing water was part of the electronic signage pilot project, further details of which are given in Section 5.3 of this report.

Seton Sands/Longniddry

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Good	Good	Excellent	Excellent

Seton Sands/Longniddry was identified as a bathing water in 1999. Between 1999 and 2002 it achieved good quality and in 2003, for the first time, Seton Sands achieved excellent quality. In 2004 this excellent bathing water quality was maintained.

The reason behind this marked improvement is work completed at the end of 2002 to connect over 40 houses in the Seton Mains community to the main sewerage system, which conveys effluent to Edinburgh WWTP. Part of the cost of this work was borne by the residents. Other work to eliminate overflows from dual manholes in the nearby Canty Burn catchment is continuing.

In 2002, a new interceptor sewer was laid to convey the sewage from Longniddry to Edinburgh WWTP. The existing WWTP at Longniddry has now become a storm treatment works with a design overflow spill frequency of only once per 5 years. The impact of this improvement is best measured by the fact that the bathing water at Longniddry Bents met the excellent quality standard for the first time in 2004, despite it being a much wetter than normal bathing season.

Gullane

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The very popular and picturesque bathing water at Gullane has achieved excellent quality status every year since 1995.

The high quality of the bathing water at Gullane is due to the effective local WWTP, and the fact that storm overflows are located well away from the bathing water area. Work was completed early this year to build a new long sea outfall and to extend the existing outfall for the discharge of storm sewage which will provide further protection of the bathing waters in this area.

Yellowcraigs

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The identified bathing water at Yellowcraigs has achieved excellent quality for the sixth consecutive year.

The improvement in quality in 1999 followed diversion of sewage from Dirleton to the WWTP and long sea outfall to the east of North Berwick. Prior to this it had discharged at the western end of Broad Sands Bay.

North Berwick Bay

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Poor	Good	Good	Good	Excellent	Excellent	Excellent	Good

SEPA and its predecessor have sampled North Berwick Bay since the 1970s, though 1999 was North Berwick Bay's first year as an identified bathing water.

Prior to 1995, when the North Berwick WWTP scheme was completed [see text for North Berwick (Milsey Bay)], North Berwick Bay frequently failed to meet required quality standards. While bathing water quality improved markedly after this date, there have still been occasional problems with the sewage collection and treatment infrastructure. The reason for the slight reduction in quality in 2004 was probably related to a local sewage contamination incident, which was revealed and tracked down by SEPA's monitoring work. Remedial action promptly taken by Scottish Water should ensure this does not recur.

North Berwick (Milsey Bay)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Good	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent

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

Investigative surveys by SEPA prior to 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, in 2000, North Berwick (Milsey Bay) achieved a guideline pass for the first time. To further highlight the improvement in bathing water quality, this very high standard has been maintained since then.

In the early part of the 2004 bathing season, elevated indicator levels were observed in the Milsey Bay bathing water. SEPA investigative sampling found a slight discharge from the WWTP high-level overflow. Scottish Water found this to be a result of faulty bleed valve seals. As a result of SEPA investigations remedial action was carried out to remedy the situation and thus ensured that guideline water quality was maintained. The same problem had also occurred in 2002. To prevent recurrence, any future leaks will now be returned to the inlet rather than to the overflow channel. These leaks and discharges illustrate the need for ongoing vigilance. This is particularly true with bathing waters that have freshwater inputs and storm sewage infrastructure nearby.

Dunbar (Belhaven)

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The identified bathing water at Dunbar (Belhaven) has achieved excellent status each year since 1993.

Surveys carried out in 1988 indicated local pollution of near-shore waters from discharges of untreated sewage to the west and east of Dunbar. Since that time, the outfall pipes responsible for the discharges have been intercepted and diverted to West Barns WWTP and long sea outfall, which were commissioned in 1993. After this, the bathing water has achieved excellent quality standards. However, the WWTP and outfall have suffered frequent short circuiting with the result that untreated sewage can discharge via the old West Barns outfall and storm overflow. SEPA has required Scottish Water to eliminate this source of pollution. Scottish Water will therefore replace the current West Barns WWTP by the end of 2005. The new works will be built inland with a discharge to the Biel Water utilising the existing long sea outfall as a storm overflow. SEPA will require the new discharge to meet appropriately high standards which will further safeguard the achievement of high bathing water quality.

Dunbar East

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Poor	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

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

The sewage treatment facilities and planned improvements for Dunbar are described in the Dunbar (Belhaven) section. In 2004, Dunbar East again achieved the EC guideline standard for bathing water quality as it has done every year since sewage from the east side of Dunbar was diverted to the West Barns WWTP 9 years ago.

Whitesands

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good

Whitesands achieved excellent status each year from 1988 to 2003, although it was only prior to the 1999 season that it was formally identified as a bathing water.

Disappointingly, Whitesands only achieved good status in 2004, failing to meet excellent by the narrowest of margins. This was possibly a result of the wet weather increasing local surface water contamination, but the sources are unknown. This site is remote from any significant sewage inputs. Investigations will be carried out prior to the 2005 bathing season, concentrating on local surface water inputs.

Whitesands is a shallow enclosed bay, protected from the effects of strong waves and currents by the rocky outcrops at each end. These rock outcrops also restrict the turnover of water when the tide is receding. The effect of this confinement and the potential for contamination by seabirds will also be assessed. It was noted by the sampler during one of the sample visits when excellent status was not obtained, that there were lots of seabirds present.

Thorntonloch

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The identified bathing water at Thorntonloch has achieved guideline passes each year since 1988, although it was only identified as a bathing water under the Directive prior to the 1999 bathing season. This bathing water is consistently of excellent quality, though strong tidal currents are present, particularly at the west side of the bay during certain tide and wind combinations.

This year, in view of its consistently excellent status, the frequency of monitoring was reduced, as permitted by the Directive, from 20 samples a year to five. All samples taken met the Directive's guideline quality standards.

Pease Bay

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Excellent	Good	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The identified bathing water at Pease Bay has achieved at least good quality each year since 1988, and excellent quality since 1999.

The effluent from a privately owned septic tank treatment plant (serving a nearby caravan site on The Bents) enters Pease Bay to the south east of the bathing water. Sewage effluent discharge from this plant is controlled by a lunar clock and only occurs over a 4-hour period (2 hours either side of the high tide) between 2100 hours and 0700 hours. This ensures that maximum initial dilution is available and no effluent is discharged during the day. SEPA are currently considering whether this discharge is still appropriate, or if more control is required.

Until June 2001, the Cockburnspath Burn received effluent from the village of Cockburnspath (1.5 km inland) and discharged in the vicinity of the bathing water. This was a source of sewage contamination, particularly during periods of high rainfall. The effluent from Cockburnspath is now pumped to a new WWTP at Cove for full treatment, prior to discharge about 1.5 km north of the bathing water. The final effluent from the WWTP is disinfected prior to discharge during the bathing season.

In 2003, SEPA undertook a programme of inspections of discharges to bathing water catchments from rural sources. Six farms in the Pease Bay catchment were inspected to assess volumes of waste produced, examine storage facilities and discuss possible improvements to prevent future problems. Five of the farms were found to comply with the Silage, Slurry and Agricultural Fuel Oil Storage Regulations (SSAFO) and the 'Code of Good Practice for the Prevention of Environmental Pollution from Agricultural Activity' (PEPFAA code) and therefore represented little risk to bathing water quality. Improvements were required at one farm.

This year, in view of its consistently excellent status, the frequency of testing was reduced, as permitted by the EC, from 20 visits a year to five visits in 2004. All samples tested achieved excellent status.

Whitesands

St Abbs

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
n/s	n/s	n/s	n/s	n/s	Good	Good	Good	Excellent	Excellent	Excellent

St Abbs was identified as a bathing water in 1999, having never previously been sampled by SEPA. St Abbs was identified because of its water sports usage, particularly scuba diving. It should be noted that there is no safe or explicitly permitted bathing area at St Abbs. For the third year in succession, St Abbs has attained excellent status.

Until 2003, sewage from St Abbs was treated by a septic tank and a short outfall located west of the harbour mouth. There were also a few untreated outfalls, although these were small, some serving individual households. In March 2004, Scottish Water completed a programme of work to collect the effluent from most of these discharges and pump it all on to the WWTP at Eyemouth where it now receives full treatment.

Coldingham

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Excellent	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent

Coldingham, a very popular bathing and surfing beach, was identified as a bathing water in 1999, although it was monitored previously by SEPA and its predecessor. Excellent quality has been achieved each year since 1996 except for 2000, when several samples taken during or after heavy rain reduced it to good status.

Until 2003, comminuted sewage from Coldingham was discharged south east of the bathing area. There was also a small septic tank discharge at the northern edge of the bay. Occasional poorer bacteriological results at Coldingham showed that these two discharges posed a threat to water quality. To address this, Scottish Water now pumps the effluent from these discharges to Eyemouth WWTP where it receives secondary treatment. This sewage diversion work was completed in March 2004, well before the start of the bathing season.

Eyemouth

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Good	Good	Poor	Good	Poor	Poor	Poor	Good	Good	Good	Good

Eyemouth has been sampled by SEPA and its predecessor since the 1980s. It was identified as a bathing water in 1999. Eyemouth failed to meet the mandatory standards between 1998 and 2000.

By the end of the 2001 bathing season, sewage effluent, previously discharged via the two historic outfalls, was being screened and discharged through a new long sea outfall. A new WWTP providing secondary treatment was completed in October 2002 and became fully operational at the end of 2002.

Since 2001, Eyemouth has achieved good status for bathing water quality; however some of the results obtained suggested continuing sources of contamination, possibly storm overflow discharges via the Eye Water and harbour, which operate during wet weather. In addition, a largely culverted watercourse discharging close to the bathing water has been found to be contaminated with sewage. SEPA and Scottish Water have carried out investigations into the sources of this contamination, which can be very high at times. To reduce pollution, Scottish Water has removed identified problem sources to the foul sewer system. Two further septic tank discharges requiring diversion to sewer have been identified, and this work will go ahead provided that the cost is not excessive. Although a lot of sources have been removed, occasional high bacterial indicator levels in the North Burn suggest that there is still work to be done.

In 2003, SEPA undertook a programme of inspections of discharges to bathing water catchments from rural sources. SEPA inspected 46 farms in the Eye Water catchment, to assess volumes of waste produced on the farms, examine storage facilities and discuss possible improvements to prevent future problems. Thirty-seven of the farms were found to comply with the SSAFO Regulations and the PEPFAA Code and were of little risk to the bathing water quality. Improvements were required at seven farms. Wet weather during the summer caused elevated levels of bacterial contamination to wash off agricultural grazing land in the catchment posing a risk to bathing water quality.

4.3 Abnormal weather

In contrast to last year, the 'abnormal weather' provisions of the Directive (see Section 3.1) had to be invoked in respect of three particularly heavy rainfall events during the summer of 2004. This was entirely consistent with national rainfall patterns recorded in 2004, when June was the wettest on record in parts of the East coast, and August rainfall was more than double the normal average for this month over large areas of southern Scotland. However, it was the shorter-term exceptional events within these abnormal monthly totals which caused so much flooding, infrastructure damage and landslides, which also gave rise to numerous unrepresentative bathing water quality results.

The first event was on the 23/24 of June, and was a relatively localised summer storm centred on southeast Scotland. Near to North Berwick in East Lothian, 60 mm of rainfall fell with a return period estimated at 1 in 20 years, but at Nunraw Abbey, in the headwaters of the Borders River Eye, 130 mm were recorded in 36 hours – a storm with an estimated return period of 130 years. Sample results from seven sites between Fife Ness and Eyemouth taken at this time were judged abnormal, and re-samples were taken a few days later.

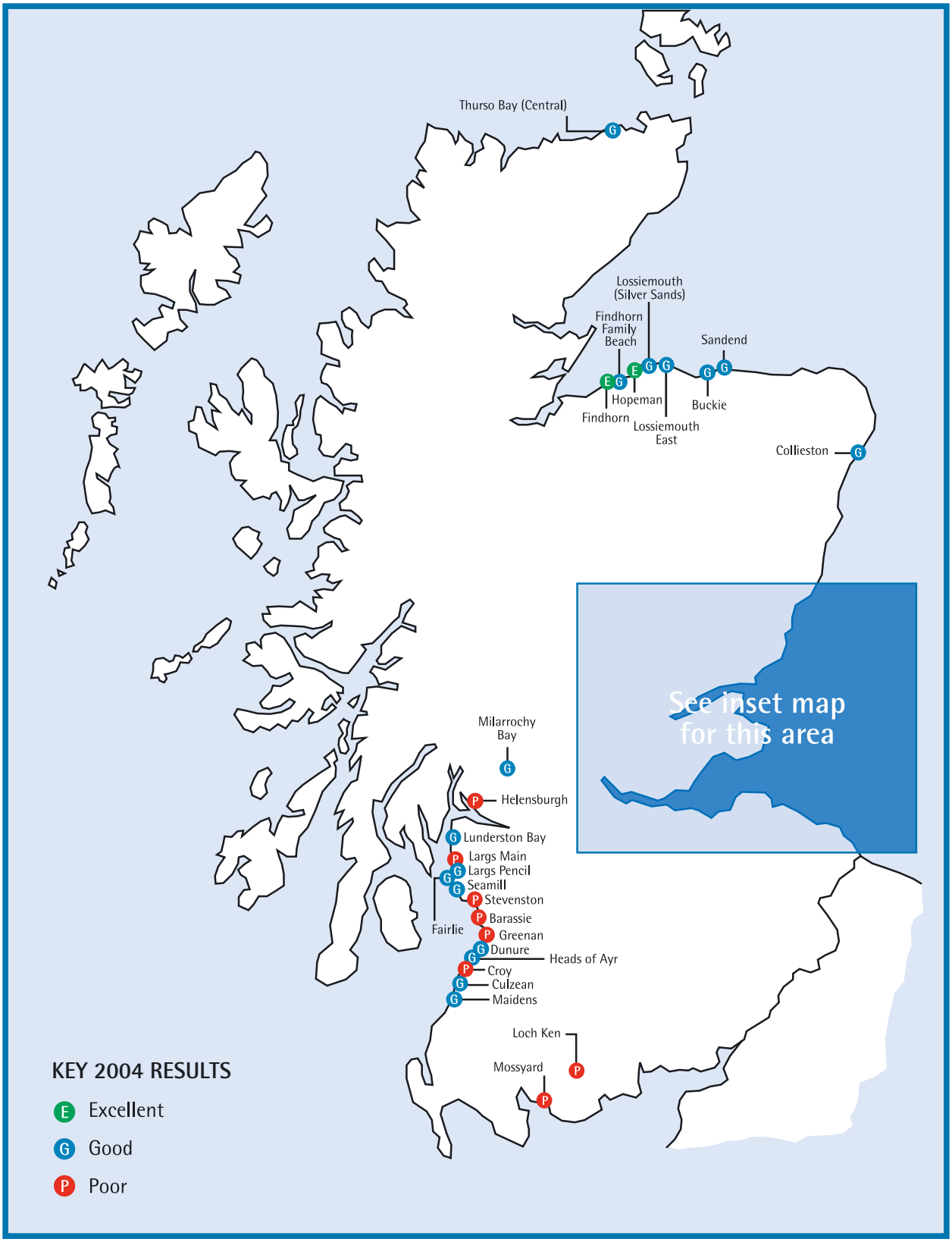
The next abnormal event, on the 11/12 of August, received most media attention because of the domestic flooding caused and the blockage of major arterial trunk routes, including the A9, many for the first time ever. The worst affected area was broadly the whole of southern Scotland, extending up to Glasgow on the western side, and Arbroath on the eastern side. Unfortunately, a particularly large number of bathing waters samples were scheduled to be taken during this period, and it was subsequently decided that 31 of them should be re-sampled.

With the ground still saturated, the third exceptional event, around the 18 of August, was more limited to local areas of the extreme east of Scotland, including bathing waters at Stonehaven and Eyemouth. An intense 3-hour storm of 17 mm of rain (expected less than once/5 years) on the 18th, was followed by 24 mm in 12 hours on the 24th. As it was building on the previous week's rain, this rainfall had a disproportionate and lingering effect, particularly on the River Eye catchment where exceptional summer flows of over 7 m^3/second were recorded. It was at Stonehaven (1) and Eyemouth (2) that the last abnormal weather re-samples were required.

The overall record number of 41 re-samples from 32 waters is perhaps appropriate for a record wet year. It must be made clear that most of the re-samples were not in respect of samples which failed to meet mandatory standards, but of results which were of merely 'good' quality, when SEPA expected them to be of 'excellent' quality. If the abnormal results had not been discounted, six excellent quality waters would not have been recorded as such.

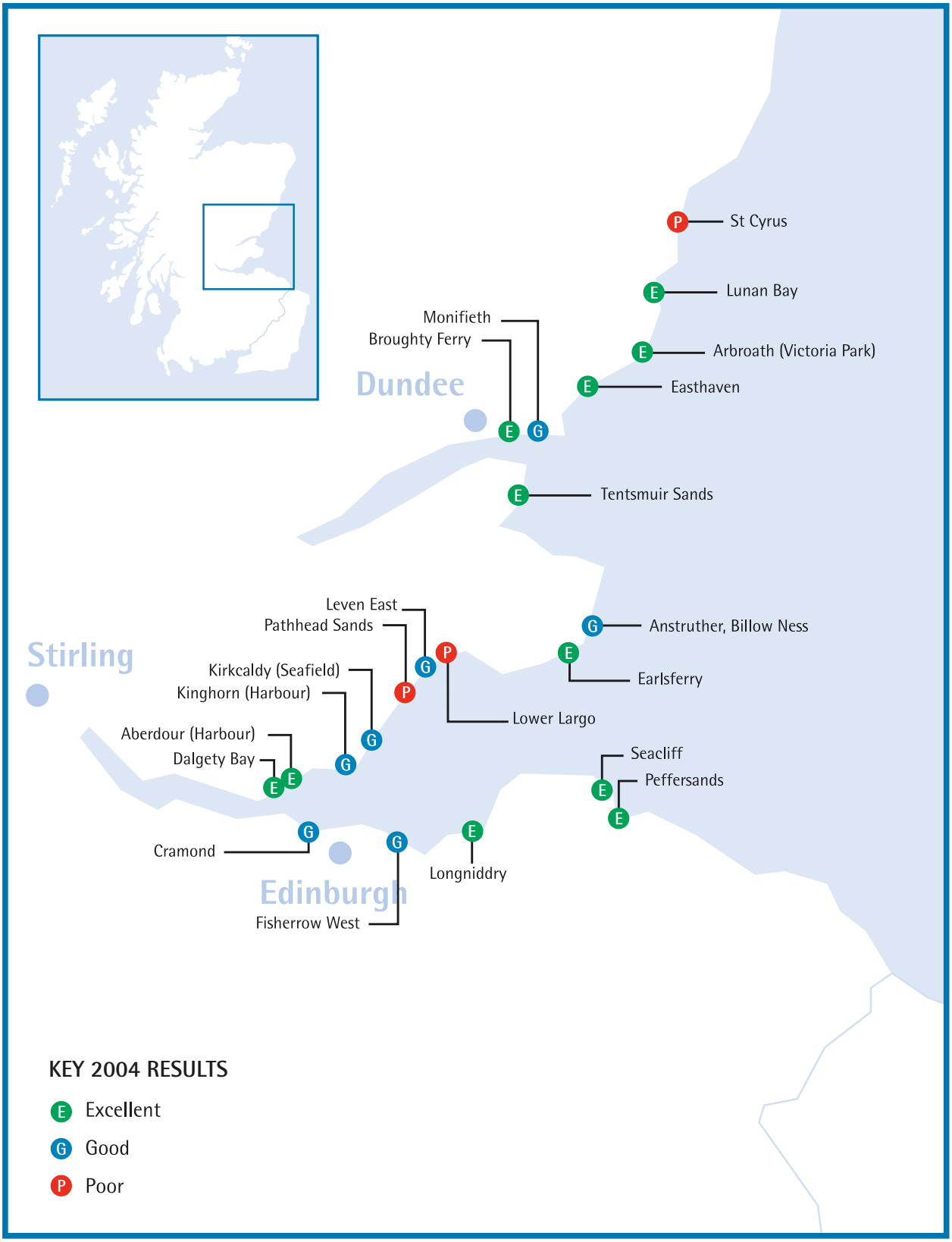
SEPA is now able to predict reduced water quality at those sites which are susceptible to diffuse pollution caused by heavy rainfall. It is noteworthy that if results from sites when there was public warning of poor quality were discounted, then the number of overall failures recorded would have been reduced from four to two.

Map 3: Location and results of other waters monitored by SEPA during 2004



Sites sampled at least 20 times during the bathing season

Map 4: Location and results of other waters monitored by SEPA during 2004 (south east area)



Sites sampled at least 20 times during the bathing season

4.4 Results from other coastal and inland waters

During the 2004 bathing waters season, SEPA monitored 47 other coastal, estuarine and inland sites for bacterial water quality. The locations of these are given in Maps 3 and 4.

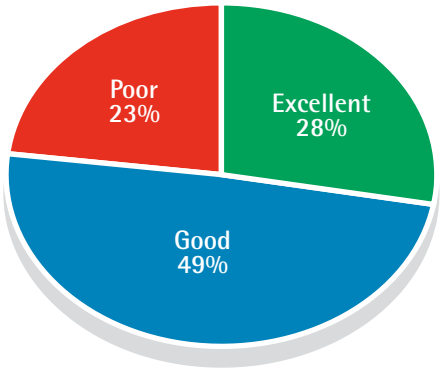
The purpose of this additional monitoring varies. In some cases, the monitoring was instigated to review the need for discharge improvement and in these cases, when the required works are in place the monitoring can be reviewed. For example, Loch Linnhe (Fort William) and St Combs were monitored up until last year. Lunan Bay and Tentsmuir are sampled because they are considered to be representative of a large number of remote clean beaches which have few visitors. Broughty Ferry (Dundee) is sampled in response to a specific request from the local authority.

Although these waters are not identified bathing waters, SEPA assesses the monitoring results from these sites in the same way, as compliance with the quality standards of the bathing waters directive is also part of our overall coastal waters quality classification scheme. Therefore, to be of 'excellent' or 'good' quality these waters must meet the guideline or mandatory standards of the Bathing Waters Directive, respectively.

Results are given in detail in Annex 2 and are summarised in Figure 3. Of the 47 sampling sites, in 2004:

- 13 (28 %) were classified as being of excellent quality;
- 23 (49 %) were classified as being of good quality; and
- 11 (23 %) were classified as being of poor quality.

Figure 3: Classification of non-identified bathing water sites



5 Developments

5.1 Scottish Water

Until very recently, many decades of significant under-investment in the water and sewerage infrastructure of Scotland have resulted in sewage discharges being the major cause of water pollution. In 2000, many bathing waters were still failing or at risk of failing to meet required EC standards due to unsatisfactory sewage discharges. The situation is now substantially improving, particularly with the introduction of the Quality and Standards (Q&S) process for setting the capital expenditure plans for Scottish Water and its predecessor authorities. Q&S I covered a 2-year period from April 2000 to March 2002 and delivered an investment in water and sewerage infrastructure of £740 million, complemented by a further £380 million in Public Private Partnership Schemes. However, these schemes generally only tackled the larger discharges. Much more remained to be done to achieve adequate environmental quality protection.

Q&S II covers the 4-year period from April 2002 to March 2006 and comprises an unprecedented scale of investment of £1.8 billion to upgrade and enhance drinking water supply and sewerage provision in Scotland. SEPA has worked with Scottish Water to identify schemes within the programme that are required to improve the quality of bathing waters and has ensured that these are scheduled for completion as early as possible, with interim temporary solutions being put in place where appropriate.

In 2001, 27 bathing waters were identified as being still at risk of failure as a result of public sewage discharges and the following works have consequently been included within the Q&S II programme. Not all of the projects scheduled for completion have been commissioned on time, and the current situation is described below. In addition, further works are planned in the next stage of the capital investment programme, Q&S III, which will run from 2006 to 2012, details of which are still being finalised with Scottish Water and the Scottish Executive.

Southerness: This bathing water had not previously been regarded as at risk of failure as a result of Scottish Water discharges. However, recent monitoring of the Nith and the failure in 2004 indicates that the Dumfries sewerage networks (some 15-20 km upstream) may have an impact. The improvement projects currently being undertaken in Dumfries will deal mainly with debris but will also reduce the spill frequency and duration at some of the CSOs. There is still a risk of failure of the bathing waters and the sewerage networks have been highlighted for upgrading under the Q&S III programme which is scheduled to commence in March 2006.

Rockcliffe: Permanent disinfection was installed, monitored and operational prior to the 2004 bathing season. A new pumping station and storm storage is to be installed by the 2005 bathing season to minimise storm overflows.

Turnberry: In 2003, all discharges from Maidens, Kirkoswald and Turnberry were transferred to Girvan WWTP. There remain some private sewage effluent discharges at Turnberry, and Scottish Water is investigating the feasibility of a scheme for first time sewerage provision.

Prestwick and Troon South: As Irvine below

Irvine: It is clear from discussions with Scottish Water that the work to be carried out under the Q&S II projects will not be as extensive as was originally understood by SEPA. The projects currently being undertaken will only tackle debris and will not address the underlying fundamental problem with the CSOs, namely spill frequency and duration. It is unlikely that any reduction in the impact from CSO spills or reduction in the risk of failure of the bathing waters will be seen until the implementation of improvements under the Q&S III programme, which is not scheduled to commence until March 2006.

Saltcoats: as Irvine

Millport, Cumbrae: Issues regarding the placement of the new treatment works and pumping stations resulted in the start date of the work being delayed from 2003. However, the new WWTP has now been built though not yet commissioned. The new sewerage infrastructure is well under way but not yet complete. Discharge consents have been granted for the emergency, storm and final effluent discharges associated with the scheme. The whole system should be fully operational before the start of the 2005 bathing season.

Luss Bay, Loch Lomond: Tertiary treatment in the form of UV light disinfection has now been provided on site. Consent review is underway to ensure that the WWTP provides full treatment to a sufficiently high sewage flow.

Morar: Consideration was given to improving the sewage treatment for the village of Morar. However, hydrographic studies confirmed that there was no need for any further sewage treatment at Morar.

Dunnet Bay (Caithness): Scottish Water has altered previously agreed options to transfer sewage to a new WWTP near Thurso. The option currently being considered by Scottish Water is to transfer Castletown sewage across the bay for discharge after septic tank treatment at Dunnet. Discussions are continuing as to whether the dispersion modelling studies can be considered to justify this option.

Dores (Loch Ness): First time sewerage has been provided to connect all properties (except one) within the village of Dores to the public sewerage system and eliminate private discharges which potentially impact on the quality of the Bathing Water. A new septic tank and extended outfall were also provided by April 2004. This has been modelled and designed to ensure the mandatory bathing water standards will be met at the designated beach.

Nairn Central and East Bathing Waters: Nairn WWTP had a new flow balancing tank and UV disinfection system installed by April 2004 to ensure compliance with a Section 49A Notice. This notice had been served by SEPA after repeated failures of the discharge to comply with its licence conditions and therefore posing a risk to bathing water quality. Since these modifications have been completed the discharge has complied with its licence conditions.

Improvements at Sunnyside Culloden, Croy and Cawdor WWTP, and consequent elimination of the Piperhill discharge, are due to be delivered by 2005 via the Q&S II substitution process. This is to reduce the bacterial load to the River Nairn and the consequential risk to the designated bathing waters which straddle the mouth of the river.

Cruden Bay: Late in 2002, the former local sewage effluent discharge to the bay was diverted to Peterhead. To provide further protection to the bathing water, disinfection of the effluent from Hatton WWTP, an inland works that discharges to the Water of Cruden, is due to be delivered by 2006, funded via the Q&S II process.

Aberdeen: Disinfection was provided to the Persley WWTP discharge and the secondary treatment works for the main Nigg discharge was commissioned in 2001. Some improvements to storm sewage arrangements were carried out last year but further investigation into the efficiency of the sewerage network in Aberdeen is now essential to identify the works that are required to secure further water quality improvements around the Aberdeen bathing beach. This has been highlighted as work required under Q&S III.

Stonehaven: Pending the provision of a pump and pipeline network to connect Stonehaven to the WWTP at Nigg Bay in Aberdeen, temporary disinfection was provided for the 2004 bathing season. However, as Scottish Water has experienced serious delays in securing planning permission for the new pumping station it now seems unlikely that they will meet the deadline of December 2005 for completing this scheme. SEPA anticipate that the disinfection unit installed for this year's bathing season will be required for at least one more year.

Kingsbarns: A new WWTP scheduled to be in place for the 2003 bathing season was not delivered on time, so the temporary disinfection provided in 2002 was maintained for the 2003 and 2004 bathing seasons. Scottish Water has recently reported to SEPA a further delay in providing the new treatment works due to difficulties over land acquisition. Completion of the new scheme is now expected in 2005.

Dunbar (Belhaven): Sewerage improvements and provision of a new WWTP are scheduled for completion by the end of 2005.

St Abbs and Coldingham: These local sewage discharges were to have been diverted to Eyemouth WWTP by the start of the 2003 bathing season, but the work was completed in March 2004.

Eyemouth: A new WWTP was commissioned in December 2002 and other sewerage improvements and connections were completed in March 2004. Provision of first time sewage for two septic tanks discharging to the North Burn at Acredale is going forward for costing and is likely to be confirmed as a project to be delivered via the Q&S II substitution process.

5.2 SEPA environmental improvement plans to reduce sources of diffuse pollution

The 2004 bathing water quality results clearly indicate that further improvement in water quality is required before all designated bathing waters will meet current EC mandatory quality standards, and progress towards attainment of the guideline standards.

Previous work by SEPA has shown that a variety of factors are responsible for poor quality bathing waters. During dry weather the primary risk to quality is from sewage discharges. This risk is rapidly diminishing after the investment in new schemes being made by Scottish Water. However, heavy rain puts water quality at greater risk from bacterial loading from sources within the catchment entering the bathing water via run-off to rivers. The south west area beaches have historically had problems with poor bathing water quality and, therefore, Environmental Improvement Plans have been in place in these areas over the past 3 years in an attempt to reduce the bacterial load entering watercourses.

In a number of SEPA team areas, sewage treatment facilities, surface water outfalls, combined sewer overflows and key points on local watercourses have been inspected regularly, particularly during the bathing season with a view to reducing the pollution load entering watercourses draining into designated bathing beaches. This continuous monitoring programme has allowed a rapid response to problems throughout the various catchments, ensuring that preventive action can be taken as soon as possible once a problem has been identified.

Monthly liaison meetings with Scottish Water have ensured that persistent problems can be highlighted and that resources can be allocated effectively. One widespread problem that has been identified is that of wrong connections of foul drainage into surface water systems in urban areas. Local Scottish Water teams are putting increased effort into rectifying these problems. Outside the control of Scottish Water, there are still some issues with a number of private operators showing reluctance to correct deficiencies in drainage systems. These issues are being dealt with on an individual basis and may result in enforcement action.

Numerous bathing waters throughout Scotland are affected by bacteria originating from point and diffuse pollution sources on farms. To tackle the point source discharges, SEPA put together an agricultural action plan aimed at ensuring that pollution from farms is minimised by adherence to the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 2003 and the PEPFAA Code. This plan has now been active for 30 months, based at SEPA's Ayr Office, and initially concentrated on the catchment areas of the beaches at greatest risk in the south west area. It was extended nationwide in 2003 and 2004. In the identified high-priority catchments routine farm audits were undertaken during 2002 and 2003. In 2004, the plan focused on revisits to identified non-compliant farms, to check that identified remedial works had been carried out as required.

The agricultural team has continued to develop a partnership approach with other environment agencies in the UK through the training of their staff and acting as a centre of excellence. At the request of the National Farmers Union Scotland, SEPA staff provided presentations in catchments in order to publicise the purpose of the farms' auditing and inspection programme.

Some 2095 farms have been visited since the plan was implemented, and on initial visits 70% were found to have non-compliance issues. Of the 2095 farm audits completed, 53% of farms were found to have point sources of pollution at the time of SEPA's inspection. The main problems were found to be: no provision for the containment of midden drainage (12%); contaminated run-off from yard areas (10%); silage effluent or substandard silage pits (9%); and drainage from cattle housing (byres and high level slatted buildings) (10%). A significant percentage of farms (11%) were also found to possess fuel oil tanks that did not comply with oil storage Regulations and hence, while the majority was not causing pollution at the time of inspection, had the potential to have a severe impact on nearby watercourses. Improvements to these tanks generally involved relatively minor upgrades, such as installing the correct type of valve, or ensuring that the tank was correctly bunded. Surface water separation was another area (7%) where modest expenditure could significantly reduce the potential for pollution. By diverting clean roof water away from contaminated areas and by roofing middens, the volume of slurry produced can be greatly decreased. This reduces the likelihood of accidental spillages, and in the long-term, is of economic benefit to the farmer through the decreased requirement for the spreading of slurry on fields. The farms audited each had, on average, 4.5 months slurry storage capacity and in many cases this could be increased by improving the surface water separation systems.

Overall, cooperation from the agricultural community has been excellent, with 83% of farmers who had non-compliance problems taking action before SEPA's second visit. After a third visit the majority of farmers had completed the requested improvements with only 2.5% of farms so far requiring a fourth visit. Of the 2.5% requiring a fourth visit only a very small minority have not undertaken any of the remedial work requested by SEPA. It is in these instances that pre-notices and notices will be issued by SEPA requiring remedial measures to be implemented within a stipulated time scale.

In total, the SEPA farm officers have carried out approximately 3205 visits to farms in 29 different catchment areas throughout Scotland. The programme will continue with the team undertaking follow-up inspections in designated bathing water catchments to achieve compliance from farms in respect of the storage regulations. The SEPA agricultural project team has not yet looked at farming practices in catchments not draining to EC-identified bathing waters, but poor water quality at these sites, which has attracted some media interest during the year, may be reasonably assumed to be affected by the same mix of pollution pressures as those on the identified waters.

St Andrews (West Sands)

5.3 Bathing waters signage project

Providing local information on predicted bathing water quality

In 2003 a trial was undertaken at five identified EC bathing water sites in south west Scotland to provide online electronic variable message signs aimed at informing potential bathers of daily predicted water quality conditions. The project was a success and, as a result has been extended in 2004 to 10 locations across Scotland.

The original sites were: Ayr (south), Prestwick, Troon, Irvine and Saltcoats (all continued from 2003) with new locations trialled during 2004 at Sandyhills, Brighouse Bay, Ettrick Bay (Bute), Portobello (central) and Aberdeen.

The Scottish Executive initiated and funded this project and SEPA provided scientific advice, validation monitoring, technical input and management of the daily operation of the sign network and additional information systems (website and telephone information line). Other participants included FaberMaunsell (Consulting Engineers) who were responsible to the Scottish Executive for the sign installations and project report. In addition, the relevant local authorities and Clean Coast Scotland were consulted and provided advice.

These bathing waters with signage, although generally of a high quality, have been shown previously to be at risk of occasionally not meeting European standards during or after wet weather. The electronic message signs allow predictive water quality forecast messages to be shown daily to the public. These indicate either good quality, or risk of poor quality, i.e. failure of EU standards.

The signs are not intended as 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 expected to reduce the frequency with which potential poor quality warnings have to be issued.

From June to the end of September, SEPA issued daily water quality forecasts, using SEPA's extensive rainfall and hydrological information network to take a sign message management decision. The sign status was then recorded via a computer control station, which enabled switching to the relevant version of text message.

Predicted water quality conditions were also posted daily on the SEPA website and on the electronic signs, as they went online. From mid-August, SEPA also trialled a telephone message information line which replicated the daily water quality forecasts.

Further information on background to the project and details of the text messages are available on the SEPA website.

Project results

Of the 122 days assessed in the period 1st June to 30th September, on average 81% of these were predicted as good status. This was less than last year (91%), but reflects the higher rainfalls experienced across Scotland this summer. Of over 400 samplings taken, the signage project correctly predicted measured water quality on 85% of occasions.

Overall, the signage project at the 10 locations indicated correct, or protective precautionary conditions to the public for 98% of the time. This was the same performance as attained in 2003, and is particularly encouraging considering that there were additional locations included and that the trail included numerous wet weather days.

The site at Aberdeen included an additional variable. At this location, three water quality options of 'excellent', 'good' and 'poor' were trialled to test the prediction tool against both the Mandatory and Guideline water quality levels prescribed by the Directive. The Aberdeen sign provided the correct or a precautionary prediction on 80% of occasions and a correct prediction on 70% of occasions. The experience gained this year should enable this prediction rate to be improved next year.

Figure 4: Bathing waters signage performance and validation results

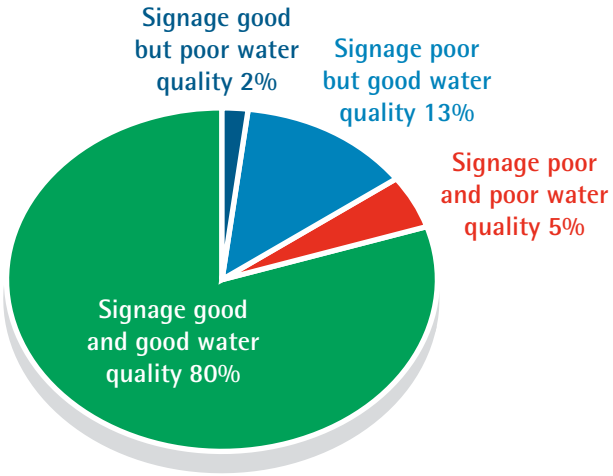
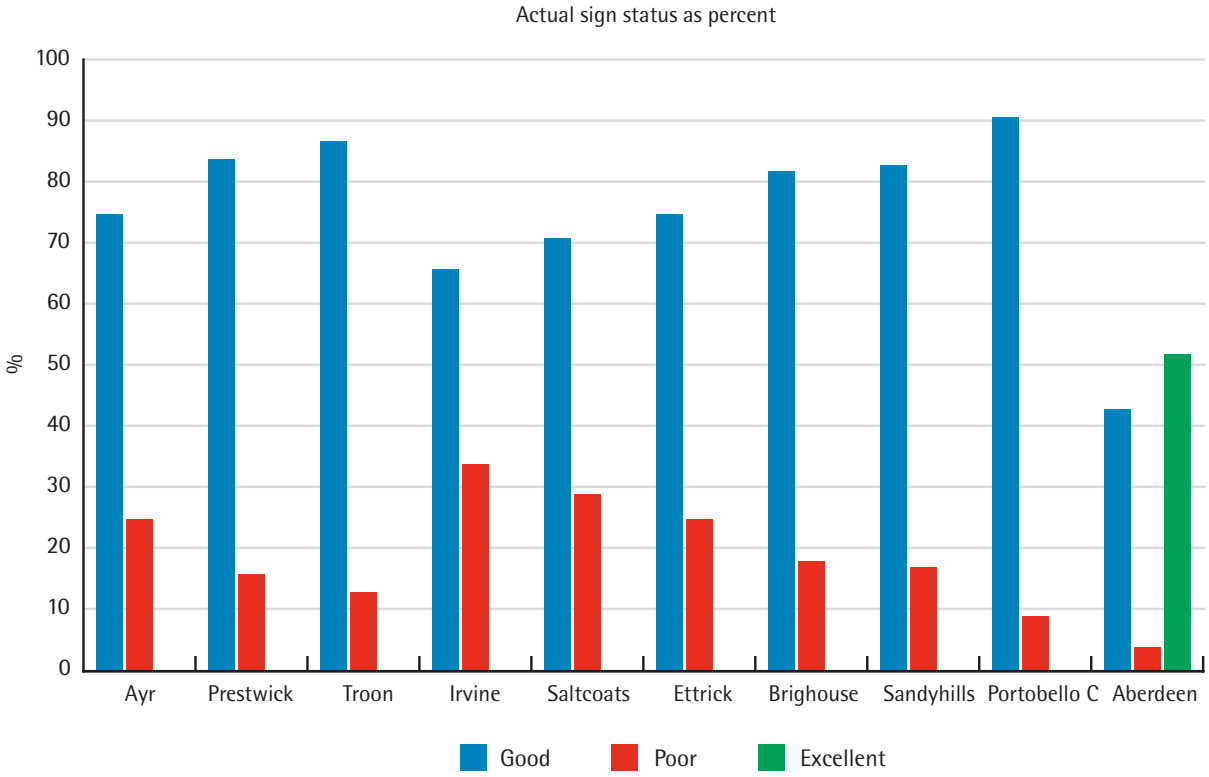


Figure 5: Message status of bathing water signs during 2004



Ongoing work

Further refinements of beach status decision protocols will be made once all the information gained during the project has been evaluated. This is intended to enable SEPA to further improve quality predictions for future bathing seasons, or to introduce other site-specific risk factors such as wind direction, tidal conditions, and assessment of other techniques such as rainfall radar data, or additional midday updates.

5.4 Scottish Executive funded pilot projects on diffuse pollution

Between 2002 and 2004, the Scottish Executive funded a number of pilot projects to assess different ways of addressing diffuse pollution and providing the public with information on bathing water quality. More information on these projects can be found in the bathing waters section of the Scottish Executive's website[4].

Bathing water signage project

The 2004 developments in the Scottish Executive's bathing waters signage project are described in Section 5.3. Also during the season, a market research survey was carried out at three beaches to establish the reaction of the public to this real time information. The Scottish Executive will now evaluate fully the results from the 2-year pilot signage exercise to establish a policy on the provision of bathing water quality information to the public.

Farm pilots project

In 2002, the Scottish Agricultural College, Macaulay Institute and Centre for Research into Environment and Health (CREH) were appointed to design farm-based measures to address diffuse pollution sources not covered by SEPA's regulatory powers. Forty-eight farms in the Nairn, Sandyhills, Cessnock (Ayrshire) and Ettrick Bay catchments were identified and agreed to participate. During 2003 and 2004, steading-based measures were constructed in the Ettrick Bay and Cessnock catchments while field-based abatement measures were tried in the Nairn and Sandyhills catchments. There was also monitoring of the receiving watercourses by CREH, to assess the effectiveness of the various measures installed. The results are expected to become available in early 2005.

Brighouse Bay project

During 2003 and 2004, SEPA managed another Scottish Executive funded project to evaluate the effectiveness of various best management practices in the small Brighouse Bay catchment. Many watercourses were fenced and alternative watering facilities were provided. The catchment was monitored during the 2004 bathing season, and the results are expected to be published in early 2005.

Biogas and composting project

In December 2003, a project was started to assess the effectiveness of biogas and composting technologies in reducing the bacterial content of slurry and farmyard manure. The subsequent spreading of the digestate and compost would greatly reduce the pollution threat to the watercourses and downstream bathing water. Four biogas plants and three composting sheds are under construction in the Sandyhills catchment, with a further three biogas plants in the Saltcoats catchment. Monitoring is being undertaken as well as a full assessment of the economic, environmental and sustainability of such plants. Reports are expected in early 2005.

Retrofitting of sustainable urban drainage systems (SUDS)

This project aimed to pilot SUDS techniques to minimise sewer system overflow, which can have a direct influence on bathing water quality. Managed by Scottish Water and funded by the Scottish Executive it identified sites for the retrofitting of SUDS and compared the costs of this with a conventional engineering approach. These reports are available on the Scottish Executive's website.

Co-digestion trial

This study investigated the co-digestion of cattle slurry with human sewage sludge at the Scottish Water Cumnock sludge treatment centre in Ayrshire, to assess the feasibility of this process. If adopted, it could reduce the need for slurry spreading on land, and subsequent bacterial run-off during wet weather. A report on this work is available on the Scottish Executive's website.

[4]www.scotland.gov.uk/topics/environment/water/15561/15068

6 Conclusions

The 2004 bathing waters quality monitoring results are once again overall good, indicating that Scotland has many high quality bathing waters. However, the quality of the few remaining unsatisfactory bathing waters remains a concern and significant improvements are required in some areas.

Four identified bathing waters failed to meet the Directive's mandatory quality standards this year, namely, Southerness, Ettrick Bay, Carrick and Irvine. All of these are in the south west of Scotland, where compliance has historically been poorest. The failure at Southerness appears to have coincided with high river flows, and a combination of tides and wind direction, which transported cumulative bacterial pollution loads from the Dumfries area to the shoreline. Ettrick Bay failed under wet weather conditions and the quality standard failures were predicted by the signage project. The season's results show that diffuse pollution from agriculture is still a problem during wet weather in this catchment. The wet weather failures at Irvine were also predicted and information on them made available to the public by the electronic signage system. Here the diffuse pollution is from a mixture of sources: run-off from agricultural land; overflows from sewerage systems and urban drainage. The failure at Carrick was a particularly disappointing result. This site has never failed previously and achieved excellent quality last year. Investigations are underway by the local team to find the reasons for failure, but there are no nearby sewage discharges. The failure was not associated with wet weather and a very localised animal source may be most likely.

The fact that more than half of the identified bathing waters reached the guideline standard was particularly pleasing given the wet weather experienced. August 2004 was the wettest since 1956, and to have the second best set of results under these circumstances is, in many respects, as satisfactory as last year's record. It demonstrates that the good weather of 2003 was not the dominant cause of the improvement in the quality of bathing waters observed over the past 2 years; infrastructure investment and pollution control measures are increasingly effective, but diffuse sources remain a concern for some waters.

Periods of heavy rain can cause storm sewer overflows to discharge to prevent urban flooding. Heavy rain also washes faecal bacterial pollution from grazed pastures into local watercourses. While fewer people bathe in the sea at these times, the effects of these downpours can persist for a couple of days afterwards. The pilot project carried out in conjunction with the Scottish Executive to use variable message signs to convey bathing water quality information to the public is important in this regard. The signs are used to inform bathers when water quality is likely to be of a poorer quality.

Although diffuse pollution has become an increasingly important factor in the reasons for poor bathing water quality in recent years, our working in partnership with Scottish Water to bring about continued improvements in the sewage infrastructure is still very important. The capital investments made so far under Quality and Standards phases I and II have brought about real environmental benefits which are increasingly visible. The next Scottish Water investment programme (Quality and Standards III) will deliver additional improvements. However, the completion of all proposed schemes will be very expensive and once more the investment programme will be prioritised to deliver environmental benefits over a long time-scale.

In addition to the improvements brought about by investing in new and improved infrastructure, SEPA will continue to carry out audit monitoring on existing facilities to ensure that they are working properly, so that risks of pollution are minimised.

The tackling of diffuse pollution is now a greater task than dealing with the point source discharges. However, the continuing work of SEPA's agricultural team and partner organisations will bring about real improvements in the longer term by helping to minimise diffuse pollution at source. The team have generally been successful in fostering and engendering a partnership style of working with stakeholders to bring about change and improvements through education, enabling them to keep the use of legal enforcement as an action of last resort.

So, whatever the weather, underlying water quality of Scottish bathing waters should continue to improve in 2005. A few sites will remain at risk from diffuse pollution in wet weather, but technology is now available to warn the public of potentially poor quality in the 'at risk' waters. This signage is geared to be slightly precautionary. Given a dry or average summer, we can be sure that they will generally be predicting good quality. They generally (81% of time) predicted good water quality even in a wet summer. At the other sites where excellent quality is the norm, fixed signage is in place. In conjunction with relevant local authorities and others, SEPA intends that these signs should be made increasingly widespread and informative in future years. There is a good news story to be told, and we hope that both residents and visitors to Scotland will enjoy leisure time at some of our clean beaches and bathing waters in the coming year.

Cullen

Annex One

2004 Monitoring data from Scotland's 60 identified bathing waters

			Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
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	19	18	12	9	11	Poor
Sandyhills	D&G	20	20	20	10	6	7	Good
Rockcliffe	D&G	20	20	20	11	6	10	Good
Brighouse Bay	D&G	20	20	19	10	4	9	Good
Carrick Bay	D&G	20	18	18	14	6	13	Poor
Girvan	SA	20	20	20	13	10	11	Good
Turnberry	SA	20	20	19	12	9	11	Good
Ayr South	SA	20	20	20	10	6	11	Good
Prestwick	SA	20	19	19	14	10	15	Good
Troon South	SA	20	20	20	14	13	14	Good
Irvine	NA	20	20	18	12	11	12	Poor
Saltcoats	NA	20	20	20	16	12	16	Good
Millport, Cumbrae	NA	20	20	20	10	8	13	Good
Luss Bay, Loch Lomond	A&B	20	20	19	16	12	16	Good
Ettrick Bay, Bute	A&B	20	20	17	11	9	14	Poor
Machrihanish Bay, Kintyre	A&B	20	20	20	19	18	19	Excellent
Ganavan Bay	A&B	20	20	20	18	17	18	Excellent
Morar Beach	H	20	20	20	20	19	20	Excellent
Dunnet Bay (Caithness)	H	20	20	20	17	16	20	Excellent
Dornoch Beach (Caravan Park)	H	20	20	20	20	20	20	Excellent
Dores (Loch Ness)	H	20	20	20	14	16	18	Good
Nairn (Central Beach)	H	20	20	20	17	18	17	Good
Nairn (East Beach)	H	20	20	20	18	18	18	Excellent
Cullen	Moray	20	20	20	19	19	17	Good
Inverboyndie	Aber	20	20	20	20	19	20	Excellent
Rosehearty	Aber	20	20	20	16	18	16	Good
Fraserburgh	Aber	20	20	20	18	19	17	Good
Fraserburgh Philorth	Aber	5	5	5	5	5	5	Excellent
Peterhead Lido	Aber	20	20	20	18	20	17	Good
Cruden Bay	Aber	20	20	20	15	15	15	Good
Balmedie	Aber	20	20	20	17	20	20	Excellent
Aberdeen	Aber	20	19	20	13	15	11	Good
Stonehaven	Aber	20	19	20	4	6	6	Good

			Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
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
Montrose	Angus	20	20	20	19	19	18	Excellent
Arbroath (West Links)	Angus	20	19	19	19	19	18	Excellent
Carnoustie	Angus	20	20	20	18	17	18	Excellent
St Andrews (West Sands)	Fife	20	20	20	19	19	20	Excellent
St Andrews (East Sands)	Fife	20	20	20	18	19	19	Excellent
Kingsbarns	Fife	20	20	20	16	20	20	Excellent
Crail (Roome Bay)	Fife	20	20	20	18	18	18	Excellent
Elie (Woodhaven and Ruby Bay)	Fife	20	20	20	18	19	20	Excellent
Shell Bay	Fife	20	20	20	18	19	19	Excellent
Kinghorn (Pettycur)	Fife	20	20	20	18	19	20	Excellent
Burntisland	Fife	20	20	20	17	18	20	Excellent
Aberdour (Silversands)	Fife	20	20	20	20	20	20	Excellent
Portobello West (Kings Road)	CofE	20	20	20	14	16	16	Good
Portobello Central (James Street)	CofE	20	20	20	19	19	20	Excellent
Seton Sands/Longniddry	EL	20	20	20	16	17	19	Excellent
Gullane	EL	20	20	20	20	20	20	Excellent
Yellowcraigs	EL	20	20	20	19	20	20	Excellent
North Berwick Bay	EL	20	20	20	18	19	17	Good
North Berwick (Milsey Bay)	EL	20	20	20	16	20	18	Excellent
Dunbar (Belhaven)	EL	20	20	20	17	17	19	Excellent
Dunbar East	EL	20	20	20	19	19	19	Excellent
Whitesands	EL	20	20	20	20	20	17	Good
Thorntonloch	EL	5	5	5	5	5	5	Excellent
Pease Bay	SB	5	5	5	5	5	5	Excellent
St Abbs	SB	20	20	20	17	17	18	Excellent
Coldingham	SB	20	20	20	19	20	20	Excellent
Eyemouth	SB	20	20	20	14	16	16	Good

* denotes TC Total coliforms or FC Faecal coliforms or FS Faecal streptococci.

Local Authority Abbreviation codes:

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

Annex Two

Monitoring data from other waters sampled during the 2004 bathing season

		Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
Bathing Water	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
Loch Ken	20	20	18	10	7	9	Poor
Mossyard	20	18	18	12	10	13	Poor
Maidens	20	20	20	14	8	10	Good
Culzean	20	20	20	18	17	16	Good
Croy	20	18	18	12	10	9	Poor
Heads of Ayr	20	20	20	12	10	15	Good
Dunure	20	20	20	16	11	12	Good
Greenan	20	19	18	9	9	10	Poor
Barassie	20	19	18	12	6	13	Poor
Stevenston	20	19	16	13	9	13	Poor
Seamill	20	20	19	13	8	12	Good
Fairlie	20	20	20	13	8	13	Good
Largs Pencil	20	20	20	16	12	17	Good
Largs Main	20	19	16	7	3	11	Poor
Lunderston Bay	20	20	20	15	15	16	Good
Helensburgh	20	17	16	6	2	9	Poor
Milarrochy Bay	20	20	20	16	16	16	Good
Thurso Bay (Central)	20	20	20	17	17	17	Good
Findhorn	20	20	20	18	19	20	Excellent
Findhorn Family Beach	20	20	20	8	7	10	Good
Hopeman	20	20	20	19	18	19	Excellent
Lossiemouth Silver Sands	20	20	20	17	18	15	Good
Lossiemouth East	20	19	20	13	12	13	Good
Buckie	20	20	20	16	19	16	Good

		Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
Bathing Water	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
Sandend	20	19	20	10	13	12	Good
Collieston	20	20	20	13	16	17	Good
St Cyrus	20	14	19	7	10	11	Poor
Lunan Bay	5	5	5	5	5	5	Excellent
Arbroath (Victoria Park)	20	20	20	18	19	18	Excellent
Easthaven	20	20	20	18	20	20	Excellent
Monifieth	20	20	20	11	15	16	Good
Broughty Ferry	20	20	20	19	18	20	Excellent
Tentsmuir Sands	5	5	5	5	5	5	Excellent
Anstruther, Billow Ness	20	20	20	15	17	17	Good
Earlsferry	20	20	20	17	18	20	Excellent
Lower Largo Beach	20	16	17	9	11	12	Poor
Leven East	20	20	20	16	17	17	Good
Pathhead Sands	20	18	20	12	16	15	Poor
Kirkcaldy (Seafield)	20	19	19	10	13	18	Good
Kinghorn (Harbour)	20	20	20	10	15	15	Good
Aberdour (Harbour)	20	20	20	17	20	20	Excellent
Dalgety Bay	20	20	20	17	17	19	Excellent
Cramond	20	20	19	6	11	15	Good
Fisherrow West	20	20	20	9	10	17	Good
Longniddry	20	20	20	16	19	19	Excellent
Seacliff	5	5	5	5	5	5	Excellent
Peffersands	20	20	20	19	19	19	Excellent

+ denotes TC Total coliforms or FC Faecal coliforms or FS Faecal streptococci.

Annex Three

Glossary of terms and abbreviations

Aesthetic pollution	In the context of this report, pollution caused by sewage solids, sanitary goods and other items which are visually offensive.
Combined Sewer Overflows (CSO)	Overflow pipes designed to operate during periods of high rainfall to relieve pressure on sewerage systems and so prevent flooding. CSO allow rain water and diluted but minimally treated sewage (usually screened to remove solids) to bypass treatment works and flow directly into rivers and coastal waters.
COPA	The Control of Pollution Act 1974, as amended by the Environment Act, 1995.
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.
EC	European Commission.
Excellent Quality	This indicates that a bathing water met guideline value quality standards in the EC Bathing Water Directive over the season as a whole.
Faecal coliforms and faecal streptococci	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.
Good quality	This indicates that a bathing water met mandatory value quality standards in the EC Bathing Water Directive over the season as a whole.
Guideline value	A value specified in EC legislation as a recommended standard, more stringent than the minimum mandatory standard.
Identified bathing water	A bathing water identified by the Government under the terms of the EC Bathing Water Directive.
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 EC Bathing Water Directive over the season as a whole.

Preliminary treatment	The treatment of waste water by means of such as screens, macerators and 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.
SAC	Scottish Agricultural College.
Secondary sewage treatment	The treatment of sewage by a biological process, for example, percolating filters or activated sludge, resulting in the further reduction of suspended solids, ammonia and biochemical oxygen demand.
Sea outfall pipe	A pipe which conveys and discharges treated waste water into coastal or estuarine waters.
Sewerage	The system of pipes and pumps which conveys sewage effluent from homes to treatment works.
SEPA	Scottish Environment Protection Agency.
Shellfish Waters Directive	EC Directive (79/923/EEC) which aims to protect the quality of coastal and brackish waters designated for protection or improvement in order to support particular shellfish populations.
Tertiary sewage treatment	Further treatment of effluent generally using sand sewage treatment filter beds or very fine screening, or disinfection processes.
Total coliforms	A count of all the coliform type bacteria present in a sample of water.
UV Disinfecton	The UV irradiation of treated sewage effluent, in order to render the final effluent substantially disinfected.
Water Industry Commissioner	Appointed by the Scottish Executive, the Water Industry Commissioner's remit is to promote the interests of the Water Authorities' customers.
WWTP	Waste Water Treatment Plant, the same as a Sewage Treatment Works (STW).

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 Five for details).

SEPA's website (http://www.sepa.org.uk) contains a wide collection of information on SEPA, as well as the text from 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 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, listing all identified and many non-identified bathing waters around the entire UK coastline. The recommended beaches can be viewed at http://www.goodbeachguide.co.uk. In Scotland, the charity Keep Scotland Beautiful administers the Seaside Awards for beaches. These awards recognise beaches which are clean, safe and which comply with the Bathing Water Directive's mandatory standards. As well as the Seaside Awards, Keep Scotland Beautiful administer the European Blue Flag Campaign in Scotland, on behalf of the Foundation for Environmental Education. This is an award presented to beaches across Europe that fulfil strict criteria relating to both water quality and environmental management in the surrounding beach area. The Blue Flag award requires water quality to be guideline standard. In 2004, six beaches in Scotland achieved Blue Flag status: Aberdour (Silversands), Burntisland, Elie Harbour, Nairn Central, St Andrews East Sands and St Andrews West Sands. Clean Coast Scotland (CCS) is a partnership bringing together 15 different government and non-government bodies to coordinate 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

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

Tel: 01989 566017
www.mcsuk.org

Keep Scotland Beautiful and Clean Coast Scotland
Islay House,
Livilands Lane,
Stirling,
FK8 2BG

Tel: 01786 471333
www.encams.org

The website address for the Seaside Awards is: www.seasideawards.org.uk

The website address for the Blue Flag Awards is: www.blueflag.org

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

Environment Agency
Enquiries@environment-agency.gov.uk

Tel: 0845 9333111
www.environment-agency.gov.uk

Environment and Heritage Service
ep@doeni.gov.uk

Environment Protection
Calvert House
23 Castle Place
Belfast BT1 1FY
Tel: 028 9025 4754
www.ehsni.gov.uk

Annex Five

SEPA offices

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

Aberdeen Office
Greyhope House, Greyhope Road,
Torry, Aberdeen, AB11 9RD
t: 01224 248338
f: 01224 248591

Arbroath Office
62 High Street, Arbroath,
DD11 1AW
t: 01241 874370
f: 01241 430695

Ayr Office
31 Miller Road,
Ayr KA7 2AX
t: 01292 294000
f: 01292 611130

Dingwall Office
Graesser House, Fodderty Way,
Dingwall Business Park,
Dingwall IV15 9XB
t: 01349 862021
f: 01349 863987

Dumfries Office
Rivers House, Irongray Road,
Dumfries, DG2 0JE
t: 01387 720502
f: 01387 721154

East Kilbride Office
5 Redwood Crescent, Peel Park,
East Kilbride, G74 5PP
t: 01355 574200
f: 01355 574688

Edinburgh Office
Clearwater House,
Heriot Watt Research Park,
Avenue North, Riccarton,
Edinburgh EH14 4AP
t: 0131 449 7296
f: 0131 449 7277

Elgin Office
28 Perimeter Road, Pinefield,
Elgin IV30 6AF
t: 01343 547663
f: 01343 540884

Fort William Office
Carr's Corner Industrial Estate,
Lochybridge, Fort William,
PH33 6TL
t: 01397 704426
f: 01397 705404

Fraserburgh Office
Shaw House, Mid Street,
Fraserburgh, AB43 9JN
t: 01346 510502
f: 01346 515444

Galashiels Office
Burnbrae, Mossilee Road,
Galashiels, TD1 1NF
t: 01896 754797
f: 01896 754412

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

Glenrothes Office
Pentland Court, Saltire Centre,
Glenrothes, KY6 2DA
t: 01592 776910
f: 01592 775923

Lochgilphead Office
2 Smithy Lane, Lochgilphead,
PA31 8TA
t: 01546 602876
f: 01546 602337

Newton Stewart Office
Penkiln Bridge Court, Minnigaff,
Newton Stewart, DG8 6AA
t: 01671 402618
f: 01671 404121

Orkney Office
Norlantic House, Scott's Road,
Hatston Industrial Estate,
Kirkwall, Orkney KW15 1RE
t: 01856 871080
f: 01856 871090

Perth Office
7 Whitefriars Crescent,
Perth PH2 0PA
t: 01738 627989
f: 01738 630997

Shetland Office
The Esplanade, Lerwick,
Shetland ZE1 0LL
t: 01595 696926
f: 01595 696946

Stirling Office
Bremner House, Castle Business Park,
Stirling FK9 4TF
t: 01786 452595
f: 01786 461425

Thurso Office
Thurso Business Park, Thurso,
Caithness, KW14 7XW
t: 01847 894422
f: 01847 893365

Western Isles Office
2 James Square, James Street,
Stornoway, Isle of Lewis,
HS1 2QN
t: 01851 706477
f: 01851 703510

Cruden Bay

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