

Environmental Protection

1991 SURVEY OF BATHING WATER QUALITY

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NRA

National Rivers Authority

South West Region

1991 SURVEY OF BATHING WATER QUALITY

1. INTRODUCTION

- 1.1 The National Rivers Authority (NRA) is the competent authority, in England and Wales, for the implementation of the European Commission Directive Concerning the Quality of Bathing Water.
- 1.2 In the South West there are 134 bathing waters identified under the Directive. 133 of these were sampled in 1991 in accordance with the requirements of the Directive. Porthleven (East) remains inaccessible until the steps to the beach (destroyed in 1989 by a landslide) are replaced.
- 1.3 In addition, 28 popular, but non-identified waters were also sampled in accordance with the Directive during the bathing season, as part of a rolling programme of work.
- 1.4 Compliance of bathing waters with the requirements of the Directive is assessed by the DoE on a parameter by parameter basis. In the UK, compliance is principally assessed against the mandatory standards for the bacteriological parameters total and faecal coliforms. Compliance with the Directive overall is assessed by the European Commission.
- 1.5 Failure to comply with the physico chemical parameters of the Directive is significant only if the Authority can influence or control the cause of failure.
- 1.6 The European Commission may investigate into any case where they have concerns over water quality.
- 1.7 Individual isolated failures may be caused by exceptional circumstances. In each case, the Authority must provide substantial reasoned arguments to support such a contention. In situations where discharges are adversely affecting the quality of bathing water it is a Directive requirement that additional monitoring be undertaken. The Directive also requires that investigations are undertaken to establish the volume and nature of all polluting and potentially polluting discharges and their effects according to their distance from the bathing area.
- 1.8 Bathing water quality will soon be protected by a system of statutory water quality objectives laid down by the Secretary of State for the Environment. The system is due for introduction during 1992, with full implementation by 1995. The appropriate regulations for bathing waters have now been issued.



2. 1991 SURVEY

2.1 EC Identified Bathing Waters

- 2.1.1 Samples for this year's survey were collected at all locations between May and September. NRA staff carried out the sampling. Bacterial analysis for the east area samples (i.e. Devon) was undertaken at the NRA's Exeter laboratory. All other analyses were contracted out to commercial laboratories.
- 2.1.2 28 of the 133 monitored EC bathing waters failed the Directive's mandatory standards for the principal bacteriological parameters - total and faecal coliforms (Appendix I, Figure 1). Viewed in isolation, these results suggest a worse level of water quality around the region compared to the previous two years' data. (In 1990, 15 waters failed the principal mandatory standards and in 1989, 19 waters failed - Appendix 4). The principal cause of this difference is due to the sunshine levels experienced in each summer. Levels of sunshine recorded in 1989 and 1990 were significantly higher than those in 1988 and 1991 (Table 1). High levels of incident solar radiation encourage the rapid die off of sewage derived bacteria in the sea which can produce an over-optimistic picture of water quality.
- 2.1.3 4 of these 28 unsatisfactory bathing waters, namely Porthluney, Perran Sands, Carbis Bay (Porth Kidney Sands) and Watergate, have not failed in previous years. Investigations have been carried out to identify the probable cause of these failures so that necessary improvements may be carried out. In 3 cases failures have been linked to specific discharges in the vicinity of the bathing water. Further investigation is required to establish the cause of the failure at the fourth site.
- 2.1.4 Two spot checks for salmonellae bacteria were made at all EC identified bathing waters during 1991. Salmonellae were detected on one occasion at Sidmouth (Town and Jacobs Ladder), Redgate, Broadsands, Plymouth Hoe (East and West), Polstreath, Westward Ho! and Ilfracombe (Capstone). At no sites were salmonellae detected on both occasions. The Plymouth Hoe sites (East and West) were the only sites which also failed the coliform parameters.
- 2.1.5 As part of an on-going investigation into the occurrence and distribution of enteroviruses in the environment, two spot checks were made at the majority of EC bathing waters. These organisms are not necessarily harmful and may enter the environment via a number of routes. Enteroviruses were detected at 28 sites. They were detected on both occasions at 4 sites. 8 sites which recorded positive enteroviruses results also failed coliform parameters and 1 site failed all four mandatory microbiological parameters.

Concentrations of enteroviruses were very variable. However, a different method of determination was used this year which appears to be more sensitive than the one used previously. The lack of correlation between positive virus results and high coliform counts reinforces the contention that the presence of enteroviruses is not necessarily indicative of significant pollution by sewage.

- 2.1.6 Physico-chemical measurements required by the Directive were made by observations at the time of sampling except for transparency which is measured on samples taken back to the laboratory. Extensive failures have again been recorded around the region (Appendix 2). A waiver for transparency is still in force as it is clear that the high levels of turbidity commonly found in the region's tidal waters result from natural processes outside the control of this Authority.
- 2.1.7 Observations of sea colour indicate that unusual colourations may be present at many locations around the region. In many cases these may be due to rough sea conditions. Investigation is required to establish the significance of these observations before any application for waiver is submitted to the DoE.
- 2.1.8 Surface active substances are detected by the observation of a lasting foam. Investigations have suggested that marine algae are commonly the cause. Detergents are not implicated in any instance.
- 2.1.9 Phenolic odours were detected on a single occasion at 2 sites.
- 2.1.10 Mineral oils, indicated by the presence of a surface film were observed on more than one occasion at 6 locations (Appendix 2). They were observed on single isolated occasions at a further 6 sites.

2.2 Non Identified Bathing Waters

- 2.2.1 28 non identified bathing waters were monitored 20 times between May and September for total and faecal coliforms. (Appendix 3 and Figure 3). The results of this work will be used in the intended review of the list of EC identified waters in the region.

3. DOE POSTER SCHEME

- 3.1 The DoE, in conjunction with local maritime authorities, has initiated a poster scheme publicising water quality data at each identified bathing water during the summer season. The NRA provide the data for each site.

4. AESTHETIC SURVEY

- 4.1 A 2 year survey of the aesthetic impact of crude discharges on the coastline of the region has been completed. The detailed results of this survey have been reported separately.
- 4.2 The results from the 1990 (or preliminary) survey were used to refine the methods used in the 1991 (or main) survey.
- 4.3 The aesthetic quality of 202 beach locations was assessed by recording the amount of sewage derived debris present over 5 different surveys carried out between July and September 1991.
- 4.4 At only 8 beaches was no debris found on any occasion. 25 beaches were found to be contaminated with objectionable quantities of debris. The remaining sites had trace or intermittent quantities of debris.
- 4.5 The results of this work will be used to prioritise crude discharges requiring immediate improvement in treatment.

5. FUTURE WORK

- 5.1 A review of the measured water quality of each bathing water in the region, will be completed during 1992. This will include an assessment of the data with the guideline standards of the Directive. The review will further quantify the extent of water quality problems at bathing waters which do not consistently fail the mandatory standards of the Directive.
- 5.2 A review of the list of EC identified bathing waters will also be completed during 1992. Any recommendations for additions to the list will be sent to DoE for their consideration. Deletions from the list are not anticipated.

6. SUMMARY

- 6.1 The 1991 survey of bathing water quality has been completed. Of the 133 EC identified bathing waters monitored, 28 failed to comply with the principal bacteriological standards of the Directive. Overall, 73 of the 134 identified bathing waters have failed to meet these standards in 1 or more years since 1986 (Appendix 4, Figure 2).

7. RECOMMENDATIONS

- 7.1 It is recommended that the assessments outlined in Section 5 be completed as a matter of priority.

{EP.WQ}JC_060192_JLM_1991SURVEY.WP

TABLE 1 MEAN MONTHLY TOTALS OF HOURS OF SUNSHINE RECORDED AT SELECTED SITES AROUND THE REGION OVER THE PAST 4 YEARS (DATA SUPPLIED BY THE METEOROLOGICAL OFFICE, PLYMOUTH)

Year Month	1988					1989					1990					1991				
	M	J	J	A	S	M	J	J	A	S	M	J	J	A	S	M	J	J	A	S
Exmouth	7.2	6.4	5.2	5.3	5.8	9.2	8.3	9.8	8.1	4.6	9.0	4.3	10.0	7.0	7.0	5.7	5.0	5.5	7.0	6.0
Torbay	7.3	6.4	6.4	5.8	5.3	9.3	8.1	9.3	8.7	4.8	9.2	5.0	10.0	7.8	7.0	6.2	5.1	6.0	7.6	6.5
Falmouth	6.6	5.9	5.7	6.2	5.1	9.1	9.7	9.8	8.4	4.8	8.5	6.2	10.4	-	-	6.9	5.0	3.5	3.1	5.3
Penzance	7.8	6.6	6.0	6.1	5.8	8.6	9.0	9.5	8.6	5.1	8.2	5.9	9.8	7.0	6.6	7.4	5.4	4.1	6.3	5.5
Newquay	7.2	6.0	5.5	5.8	5.2	9.1	9.2	9.6	7.8	4.7	-	4.7	10.1	-	-	-	-	4.0	6.0	5.5
Culdrose	7.5	6.0	-	4.9	4.8	8.4	9.3	9.3	8.6	4.9	8.4	6.1	-	7.0	6.3	7.5	4.5	3.8	6.0	5.0
Bude	-	-	4.4	5.2	7.1	-	8.5	9.8	8.0	4.2	9.3	4.8	9.8	6.0	6.3	6.9	5.3	4.5	6.3	6.5

[EP.WQ]JD_060192_JLM_TABLE1.WP

APPENDIX 1

1991 SURVEY OF BATHING WATER QUALITY
RESULTS OF MICROBIOLOGICAL MONITORING

DISTRICT COUNCIL	BATHING WATER		X INDICATES FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS			
	MONITORING SITE	N.G.R.	TOTAL COLIFORMS	FAECAL COLIFORMS	SALMONELLAE	ENTEROVIRUSES
West Dorset D.C.	Lyne Regis, Cobb Beach	SY 3390 9185				
West Dorset D.C.	Lyne Regis, Church Beach	SY 3438 9212	X	X		X
East Devon D.C.	Seaton	SY 2450 8985				X
East Devon D.C.	Beer	SY 2315 8910				X
East Devon D.C.	Sidmouth, Town Beach	SY 1270 8720			X	X
East Devon D.C.	Sidmouth, Jacobs Ladder	SY 1190 8695			X	
East Devon D.C.	Ladram Bay	SY 0972 8515				
East Devon D.C.	Budleigh Salterton	SY 0695 8190				X
East Devon D.C.	Sandy Bay	SY 0335 7980				X
East Devon D.C.	Exmouth	SY 0098 7995				X
Teignbridge D.C.	Dawlish Warren	SX 9830 7875				
Teignbridge D.C.	Dawlish, Town Beach	SX 9655 7880				
Teignbridge D.C.	Dawlish, Coryton Cove	SX 9611 7606				
Teignbridge D.C.	Teignmouth, Town Beach	SX 9430 7285				
Teignbridge D.C.	Teignmouth, Holcombe Beach	SX 9565 7461				
Teignbridge D.C.	Shaldon	SX 9350 7230	X	X		
Teignbridge D.C.	Ness Cove	SX 9385 7170	X	X		X
Torquay B.C.	Maidencombe	SX 9278 8850				X
Torbay B.C.	Watcombe	SX 9262 8730				
Torbay B.C.	Oddicombe	SX 9265 8585				X
Torbay B.C.	Babbacombe	SX 9300 8545				
Torbay B.C.	Redgate	SX 9350 8480			X	
Torbay B.C.	Headfoot	SX 9305 8305				
Torbay B.C.	Beacon Cove	SX 9195 8307				
Torbay B.C.	Torre Abbey	SX 9095 8351				
Torbay B.C.	Hollicombe	SX 8980 8215				
Torbay B.C.	Paignton, Paignton Sands	SX 8949 8063				
Torbay B.C.	Paignton, Preston Sands	SX 8984 8177				

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DISTRICT COUNCIL	BATHING WATER		X INDICATES FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS			
	MONITORING SITE	N.G.R.	TOTAL COLIFORMS	FAECAL COLIFORMS	SALMONELLAE	ENTEROVIRUSES
Torbay B.C.	Goodrington	SX 8935 5940				
Torbay B.C.	Broadsands	SX 8970 5745			X	
Torbay B.C.	Shoalstone	SX 9320 5862				
Torbay B.C.	St Mary's Bay	SX 9320 5510				
South Hams D.C.	Dartmouth Castle and Sugary Cove	SX 8865 5020				X
South Hams D.C.	Blackpool Sands	SX 8550 4785				
South Hams D.C.	Slapton Sands, Monument	SX 8295 4430				
South Hams D.C.	Slapton Sands, Torcross	SX 8235 4195				
South Hams D.C.	Mill Bay	SX 7407 3825				
South Hams D.C.	Salcombe North Sands	SX 7310 3820	X	X		X
South Hams D.C.	Salcombe South Sands	SX 7285 3775				X
South Hams D.C.	Hope Cove	SX 6755 3975				
South Hams D.C.	Thurlestone South	SX 6765 4170				X
South Hams D.C.	Thurlestone North	SX 6740 4210	X	X		
South Hams D.C.	Banham	SX 6623 4380				
South Hams D.C.	Bigbury-on-Sea, South	SX 6510 4415				
South Hams D.C.	Bigbury-on-Sea, North	SX 6495 4430				
South Hams D.C.	Challaborough	SX 6492 4480				
South Hams D.C.	Nothecombe	SX 6105 4734				
South Hams D.C.	Wembury	SX 5180 4850				
South Hams D.C.	Bovisand	SX 4930 5050				
Plymouth C.C.	Plymouth Hoe, East	SX 4780 5370		X	X	
Plymouth C.C.	Plymouth Hoe, West	SX 4750 5370	X	X	X	X
Caradon D.C.	Portwrinkle	SX 3590 5380				
Caradon D.C.	Dowderry	SX 3140 5380				
Caradon D.C.	Seaton	SX 3030 5430				
Caradon D.C.	Millendreath	SX 2880 5410				X
Caradon D.C.	East Looe	SX 2570 5320				
Restormel B.C.	Readymoney Cove	SX 1180 5110		X		X

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	MONITORING SITE	N.G.R.	TOTAL COLIFORMS	FAECAL COLIFORMS	SALMONELLAE	ENTEROVIRUSES
Restormel B.C.	Polkerris	SX 0928 5210				
Restormel B.C.	Par	SX 0830 5330				
Restormel B.C.	Crinnis, Golflinks	SX 0630 5220				
Restormel B.C.	Crinnis, Leisure Centre	SX 0500 5210				
Restormel B.C.	Charlestown	SX 0420 5160				X
Restormel B.C.	Duport	SX 0350 5120				
Restormel B.C.	Porthpean	SX 0320 5070				
Restormel B.C.	Pentewan	SX 0180 4670				
Restormel B.C.	Polstreath	SX 0170 4540			X	
Restormel B.C.	Port Mellon	SX 0160 4390				
Restormel B.C.	Gorran Haven, Little Perhaver	SX 0130 4170				
Restormel B.C.	Gorran Haven, Vault	SX 0100 4080				
Restormel B.C.	Porthluney	SW 9730 4130	X			
Carrick D.C.	Pendower	SW 9050 3830				
Carrick D.C.	Gyllyngvase	SW 8090 3160				
Carrick D.C.	Swanpool	SW 8030 3130				X
Carrick D.C.	Maen Porth	SW 7900 2960				
Kerrier D.C.	Porthallow	SW 7970 2330				
Kerrier D.C.	Porthoustock	SW 8070 2170				
Kerrier D.C.	Coverack	SW 7830 1840				
Kerrier D.C.	Kennack Sands	SW 7340 1650				
Kerrier D.C.	Polurrian Cove	SW 6680 1870				X
Kerrier D.C.	Poldhu Cove	SW 6650 1980				X
Kerrier D.C.	Gunwalloe Cove	SW 6540 2250				
Kerrier D.C.	Porthleven East	SW 6360 2470	←----- NO DATA ----->			
Kerrier D.C.	Porthleven West	SW 6320 2530	X	X		
Kerrier D.C.	Praa Sands East	SW 5850 2760				
Kerrier D.C.	Praa Sands West	SW 5770 2810				X

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DISTRICT COUNCIL	BATHING WATER		X INDICATES FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS			
	MONITORING SITE	N.G.R.	TOTAL COLIFORMS	FAECAL COLIFORMS	SALMONELLAE	ENTEROVIRUSES
Penwith D.C.	Perran Sands	SW 5390 2930		X		
Penwith D.C.	Marazion and Mounts Bay, Little Holgus	SW 5130 3100				X
Penwith D.C.	Marazion and Mounts Bay, Heliport	SW 4850 3110	X	X		X
Penwith D.C.	Marazion and Mounts Bay, Penzance	SW 4750 2980	X	X		X
Penwith D.C.	Marazion and Mounts Bay, Wherry Town	SW 4870 2940	X	X		X
Penwith D.C.	Porthcurno	SW 3870 2230				
Penwith D.C.	Sennen	SW 3552 2845				
Penwith D.C.	Porthmeor	SW 5150 4103				
Penwith D.C.	Porthgwidden	SW 5220 4110	X	X		
Penwith D.C.	Porthminster	SW 5220 4025				
Penwith D.C.	Carbis Bay, Station Beach	SW 5280 3890				
Penwith D.C.	Carbis Bay, Porth Kidney Sands	SW 5400 3850		X		
Penwith D.C.	The Towans, Hayle	SW 5830 3950				
Penwith D.C.	The Towans, Godrevy	SW 5810 4170				
Kerrier D.C.	Porthreath	SW 6530 4550				
Carrick D.C.	Porthtowan	SW 6915 4812				
Carrick D.C.	Trevaunance Cove	SW 7230 5170		X		
Carrick D.C.	Perranporth, Village End	SW 7570 5480		X		
Carrick D.C.	Perranporth, Penhale Sands	SW 7820 5700				
Carrick D.C.	Holywell Bay	SW 7850 5950				
Restormel B.C.	Crantock	SW 7840 6080				
Restormel B.C.	Fistral	SW 7960 6230				
Restormel B.C.	Towan	SW 8100 6205				
Restormel B.C.	Watergate	SW 8410 6490	X	X		
Restormel B.C.	Mawgan Porth	SW 8480 6740		X		
North Cornwall D.C.	Treyarnon Bay	SW 8570 7390				
North Cornwall D.C.	Constantine Bay	SW 8580 7480				
North Cornwall D.C.	Mother Ivey's Bay	SW 8630 7600				
North Cornwall D.C.	Harlyn Bay	SW 8770 7550				

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RESULTS OF MICROBIOLOGICAL MONITORING

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	MONITORING SITE	N.G.R.	TOTAL COLIFORMS	FAECAL COLIFORMS	SALMONELLAE	ENTEROVIRUSES
North Cornwall D.C.	Trevone Bay	SW 8920 7610		X		
North Cornwall D.C.	Rock	SW 9360 7550				
North Cornwall D.C.	Daymer Bay	SW 9280 7760				
North Cornwall D.C.	Polzeath	SW 9360 7920				
North Cornwall D.C.	Widemouth Bay	SS 1980 0240				
North Cornwall D.C.	Bude, Summerlease	SS 2040 0660		X		
North Cornwall D.C.	Bude, Crooklets	SS 2030 0720		X		
North Cornwall D.C.	Bude, Sandy Mouth	SS 2020 0990				
Torrige D.C.	Hartland Quay	SS 2230 2485				
Torrige D.C.	Westward Ho!	SS 4325 2940			X	
North Devon D.C.	Instow	SS 4717 3044	X	X		X
North Devon D.C.	Saunton Sands	SS 4455 3760				
North Devon D.C.	Croyde Bay	SS 4347 3930				
North Devon D.C.	Woolacombe, Putsborough	SS 4475 4085				
North Devon D.C.	Woolacombe, Village	SS 4562 4370				X
North Devon D.C.	Ilfracombe, Tunneis Beach	SS 5145 4780				
North Devon D.C.	Ilfracombe, Hele Beach	SS 5355 4792		X		
North Devon D.C.	Ilfracombe, Capstone Beach	SS 5182 4790			X	
North Devon D.C.	Combe Martin	SS 5772 4732		X		
North Devon D.C.	Lynmouth	SS 7250 4975	X	X		

1991 SURVEY OF BATHING WATER QUALITY
RESULTS OF MONITORING - PHYSICO-CHEMICAL PARAMETERS

DISTRICT COUNCIL	BATHING WATER		X INDICATES SAMPLE/OBSERVATION IMPLYING FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS					
	MONITORING SITE	N.G.R.	pH	TRANSPARENCY	COLOUR	MINERAL OILS	SURFACE-ACTIVE SUBSTANCES	PHENOLS
West Dorset D.C.	Lyme Regis, Cobb Beach	SY 3390 9185		ND	X			
West Dorset D.C.	Lyme Regis, Church Beach	SY 3436 9212		ND	X			
East Devon D.C.	Seaton	SY 2450 8985		ND	X			
East Devon D.C.	Beer	SY 2315 8910		ND	X	X		
East Devon D.C.	Sidmouth, Town Beach	SY 1270 8720		ND	X			
East Devon D.C.	Sidmouth, Jacobs Ladder	SY 1190 8695		ND	X			
East Devon D.C.	Ladram Bay	SY 0972 8515		ND	X			
East Devon D.C.	Budleigh Salterton	SY 0695 8190		ND	X			
East Devon D.C.	Sandy Bay	SY 0335 7980		ND	X			
East Devon D.C.	Exmouth	SY 0098 7995		ND				
Teignbridge D.C.	Dawlish Warren	SX 9830 7875		ND	X			
Teignbridge D.C.	Dawlish, Town Beach	SX 9655 7680		ND	X			
Teignbridge D.C.	Dawlish, Coryton Cove	SX 9611 7606		ND	X			
Teignbridge D.C.	Teignmouth, Town Beach	SX 9430 7285		ND	X			
Teignbridge D.C.	Teignmouth, Holcombe Beach	SX 9565 7461		ND	X			
Teignbridge D.C.	Shaldon	SX 9350 7230		ND			X	
Teignbridge D.C.	Ness Cove	SX 9385 7170		ND	X			
Torbay B.C.	Maidencombe	SX 9278 6850		ND	X		X	
Torbay B.C.	Watcombe	SX 9262 6730		ND	X		X	
Torbay B.C.	Oddicombe	SX 9265 6585		ND	X		X	
Torbay B.C.	Babbacombe	SX 9300 6545		ND	X			
Torbay B.C.	Redgate	SX 9350 6480		ND	X		X	
Torbay B.C.	Noadfoot	SX 9305 6305		ND	X		X	
Torbay B.C.	Beacon Cove	SX 9195 6307		ND				
Torbay B.C.	Torre Abbey	SX 9095 6351		ND	X			
Torbay B.C.	Hollicombe	SX 8980 6215		ND				
Torbay B.C.	Paignton, Paignton Sands	SX 8949 6063		ND	X			
Torbay B.C.	Paignton, Preston Sands	SX 8964 6177		ND	X			

ND = No Data

APPENDIX 2

1991 SURVEY OF BATHING WATER QUALITY
RESULTS OF MONITORING - PHYSICO-CHEMICAL PARAMETERS

DISTRICT COUNCIL	BATHING WATER		X INDICATES SAMPLE/OBSERVATION IMPLYING FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS					
	MONITORING SITE	N.G.R.	pH	TRANSPARENCY	COLOUR	MINERAL OILS	SURFACE-ACTIVE SUBSTANCES	PHENOLS
Torbay B.C.	Goodrington	SX 8935 5940		NO	X			
Torbay B.C.	Broadsands	SX 8970 5745		NO	X			
Torbay B.C.	Shoalstone	SX 9320 5862		NO				
Torbay B.C.	St Mary's Bay	SX 9320 5510		NO	X		X	
South Hams D.C.	Dartmouth Castle and Sugary Cove	SX 8885 5020		NO	X			
South Hams D.C.	Blackpool Sands	SX 8550 4785		NO			X	
South Hams D.C.	Slapton Sands, Monument	SX 8295 4430		NO				
South Hams D.C.	Slapton Sands, Torcross	SX 8235 4195		NO				
South Hams D.C.	Mill Bay	SX 7407 3825		NO				
South Hams D.C.	Salcombe North Sands	SX 7310 3820		NO	X			
South Hams D.C.	Salcombe South Sands	SX 7285 3775		NO	X			
South Hams D.C.	Hope Cove	SX 6755 3975		NO	X			
South Hams D.C.	Thurlestone, South	SX 6785 4170		NO	X		X	
South Hams D.C.	Thurlestone, North	SX 6740 4210		NO	X			
South Hams D.C.	Bantham	SX 6623 4380		NO				
South Hams D.C.	Bigbury-on-Sea, South	SX 6510 4415		NO	X		X	
South Hams D.C.	Bigbury-on-Sea, North	SX 6495 4430		NO	X		X	
South Hams D.C.	Challaborough	SX 6492 4480		NO	X		X	
South Hams D.C.	Mothecombe	SX 6105 4734		NO	X		X	
South Hams D.C.	Wembury	SX 5180 4850		NO	X		X	
South Hams D.C.	Bovisand	SX 4930 5050		NO	X			
Plymouth C.C.	Plymouth Hoe, East	SX 4780 5370		NO	X	X	X	
Plymouth C.C.	Plymouth Hoe, West	SX 4750 5370		NO	X	X	X	
Caradon D.C.	Portwrinkle	SX 3590 5380		X				
Caradon D.C.	Downderry	SX 3140 5380		X	X			
Caradon D.C.	Seaton	SX 3030 5430		X	X			
Caradon D.C.	Millendreath	SX 2880 5410		X	X			
Caradon D.C.	East Looe	SX 2570 5320		X	X			

ND = No Data

APPENDIX 2

1991 SURVEY OF BATHING WATER QUALITY
RESULTS OF MONITORING - PHYSICO-CHEMICAL PARAMETERS

DISTRICT COUNCIL	BATHING WATER		X INDICATES SAMPLE/OBSERVATION IMPLYING FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS					
	MONITORING SITE	N.G.R.	pH	TRANSPARENCY	COLOUR	MINERAL OILS	SURFACE-ACTIVE SUBSTANCES	PHENOLS
Restormel B.C.	Readymoney Cove	SX 1180 5110		X	X			
Restormel B.C.	Polkerris	SX 0928 5210		X	X			
Restormel B.C.	Par	SX 0830 5330		X	X			
Restormel B.C.	Crinnis, Golflinks	SX 0630 5220		X				
Restormel B.C.	Crinnis, Leisure Centre	SX 0560 5210		X				
Restormel B.C.	Charlestown	SX 0420 5160		X				
Restormel B.C.	Duport	SX 0350 5120		X				
Restormel B.C.	Porthpean	SX 0320 5070		X				
Restormel B.C.	Pentewan	SX 0180 4670		X				
Restormel B.C.	Polstreath	SX 0170 4540		X				
Restormel B.C.	Port Mellon	SX 0160 4390		X				
Restormel B.C.	Gorran Haven, Little Penhaver	SX 0130 4170		X				
Restormel B.C.	Gorran Haven, Vault	SX 0100 4080		X				
Restormel B.C.	Porthluney	SW 9730 4130		X			X	
Carrick D.C.	Pendower	SW 9050 3830		X				
Carrick D.C.	Gyllyngvase	SW 8090 3160		X	X			
Carrick D.C.	Swanpool	SW 8030 3130		X	X			
Carrick D.C.	Maen Porth	SW 7900 2960		X	X			
Kerrier D.C.	Porthallow	SW 7970 2330		X	X			
Kerrier D.C.	Porthoustock	SW 8070 2170		X				
Kerrier D.C.	Coverack	SW 7830 1840		X		X		
Kerrier D.C.	Kennack Sands	SW 7340 1650					X	
Kerrier D.C.	Polurrian Cove	SW 6680 1870		X			X	
Kerrier D.C.	Poldhu Cove	SW 6650 1980		X			X	
Kerrier D.C.	Gunwalloe Cove	SW 6540 2250		X			X	
Kerrier D.C.	Porthleven, East	SW 6360 2470		ND	ND	ND	ND	ND
Kerrier D.C.	Porthleven, West	SW 6320 2530		X				
Kerrier D.C.	Praa Sands, East	SW 5850 2760		X	X		X	
Kerrier D.C.	Praa Sands, West	SW 5770 2810		X	X		X	

ND = No Data

APPENDIX 2

1991 SURVEY OF BATHING WATER QUALITY
RESULTS OF MONITORING - PHYSICO-CHEMICAL PARAMETERS

DISTRICT COUNCIL	BATHING WATER		X INDICATES SAMPLE/OBSERVATION IMPLYING FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS					
	MONITORING SITE	N.G.R.	pH	TRANSPARENCY	COLOUR	MINERAL OILS	SURFACE-ACTIVE SUBSTANCES	PHENOLS
Penwith D.C.	Perran Sands	SW 5390 2930		X				
Penwith D.C.	Marazion and Mounts Bay, Little Holgus	SX 5130 3100		X				
Penwith D.C.	Marazion and Mounts Bay, Heliport	SX 4850 3110		X	X	X		
Penwith D.C.	Marazion and Mounts Bay, Penzance	SX 4750 2980		X	X			
Penwith D.C.	Marazion and Mounts Bay, Wherry Town	SX 4670 2940		X	X			
Penwith D.C.	Porthcurno	SW 3870 2230						
Penwith D.C.	Sennen	SW 3552 2645		X				
Penwith D.C.	Porthmeor	SW 5150 4103		X				
Penwith D.C.	Porthgwidden	SW 5220 4110		X				
Penwith D.C.	Porthminster	SW 5220 4025		X				
Penwith D.C.	Carbis Bay, Station Beach	SW 5280 3890		X				
Penwith D.C.	Carbis Bay, Porth Kidney Sands	SW 5400 3850						
Penwith D.C.	The Towans, Hayle	SW 5630 3950						
Penwith D.C.	The Towans, Godrevy	SW 5610 4170		X	X			
Kerrier D.C.	Portreath	SW 6530 4550		X				
Carrick D.C.	Porthtowan	SW 6915 4812		X	X		X	
Carrick D.C.	Trevaunance Cove	SW 7230 5170		X	X			
Carrick D.C.	Perranporth, Village End	SW 7570 5480		X			X	
Carrick D.C.	Perranporth, Penhale Sands	SW 7620 5700		X			X	
Carrick D.C.	Holywell Bay	SW 7650 5950		X			X	
Restormel B.C.	Crantock	SW 7840 6080					X	
Restormel B.C.	Fistral	SW 7960 6230		X			X	
Restormel B.C.	Towan	SW 8100 6205		X				
Restormel B.C.	Watergate	SW 8410 6490		X			X	
Restormel B.C.	Mawgan Porth	SW 8480 6740					X	
North Cornwall D.C.	Treyarnon Bay	SW 8570 7390		X			X	
North Cornwall D.C.	Constantine Bay	SW 8580 7480		X			X	
North Cornwall D.C.	Mother Ivey's Bay	SW 8630 7600		X			X	

ND = No Data

APPENDIX 2

1991 SURVEY OF BATHING WATER QUALITY
RESULTS OF MONITORING - PHYSICO-CHEMICAL PARAMETERS

DISTRICT COUNCIL	BATHING WATER		X INDICATES SAMPLE/OBSERVATION IMPLYING FAILURE TO COMPLY WITH E.C. DIRECTIVE MANDATORY I STANDARDS					
	MONITORING SITE	N.G.R.	pH	TRANSPARENCY	COLOUR	MINERAL OILS	SURFACE-ACTIVE SUBSTANCES	PHENOLS
North Cornwall D.C.	Harlyn Bay	SW 8770 7550		X			X	
North Cornwall D.C.	Trevone Bay	SW 8920 7810		X			X	
North Cornwall D.C.	Rock	SW 9360 7550		X			X	
North Cornwall D.C.	Daymer Bay	SW 9280 7760		X			X	
North Cornwall D.C.	Polzeath	SW 9360 7920		X			X	
North Cornwall D.C.	Widemouth Sand	SS 1980 0240		ND	X	X	X	
North Cornwall D.C.	Bude, Summerleaze	SS 2040 0660		ND	X		X	
North Cornwall D.C.	Bude, Crooklets	SS 2030 0720		ND	X		X	
North Cornwall D.C.	Bude, Sandy Mouth	SS 2020 0990		ND	X		X	
Torrige D.C.	Hartland Quay	SS 2230 2485		ND	X		X	
Torrige D.C.	Westward Ho!	SS 4325 2940		ND	X			
North Devon D.C.	Instow	SS 4717 3044		ND	X		X	
North Devon D.C.	Saunton Sands	SS 4455 3760		ND	X		X	
North Devon D.C.	Croyde Bay	SS 4347 3930		ND	X			
North Devon D.C.	Woolacombe, Putsborough	SS 4475 4085		ND	X			
North Devon D.C.	Woolacombe, Village	SS 4562 4370		ND	X			
North Devon D.C.	Ilfracombe, Tunnels Beach	SS 5145 4780		ND	X			
North Devon D.C.	Ilfracombe, Hele Beach	SS 5355 4792		ND	X			
North Devon D.C.	Ilfracombe, Capstone Beach	SS 5182 4790		ND	X			
North Devon D.C.	Combe Martin	SS 5772 4732		ND	X			
North Devon D.C.	Lynmouth	SS 7250 4975		ND	X			

ND = No Data

APPENDIX 3 MONITORING OF NON IDENTIFIED BATHING WATERS DURING 1991

Bathing Water	NGR	'X' indicates failure to comply with EC Directive Mandatory Standards	
		Total Coliforms	Faecal Coliforms
Lyme Regis (Monmouth Beach)	SY 3370 9156		X
Branscombe Mouth	SY 2080 8807		
Churston Cove	SX 9190 5700		
Beesands	SX 8205 4050		
Hallsands	SX 8180 3880		
Venerick Cove/Pigs Nose Beach	SX 7623 3633		
Sunny Cove	SX 7382 3795		
Soar Mill Cove	SX 6975 3755		
Lantic Bay	SX 1479 5088		
Polridmouth	SX 1033 5040		
Spit Beach	SX 0710 5230	X	X
Hemnick Beach	SW 9925 4052		
Portholland Beach	SW 9598 4125		
Porthcurnick Beach	SW 8791 3605		
St Antony Head	SW 8470 3151		
Loe Beach-Feock	SW 8260 3810		
St Mawes Beach	SW 8510 3300		
Porth Beach - Newquay	SW 8293 6275		X
Trebarwith Strand Beach	SX 0482 8638		
Crackington Haven Beach	SX 1427 9690		
Bude (Sea Pool)	SS 2025 6750		
Bude - Northcott Mouth	SS 2010 0850		
Welcombe Mouth	SS 2125 1795		
Shipload Bay	SS 2480 2745		
Clovelly Bay	SS 3196 2472		
Portledge Beach	SS 3860 2464		
Barricane Beach	SS 4535 4450		
Rockham Bay	SS 4585 4605		

APPENDIX 4

SUMMARY SURVEY RESULTS (1986-1991) OF BATHING WATER QUALITY

BATHING WATERS FAILING TO MEET EC DIRECTIVE MANDATORY BACTERIOLOGICAL STANDARDS (1)

Site	Bathing Seasons(s) when failure recorded
Lyme Regis (Cobb)	1986, 1989
Lyme Regis (Church)	1987, 1988, 1989, 1990, 1991
Seaton (Devon)	1986, 1987
Budleigh Salterton	1987
Exmouth	1986
Teignmouth (Town)	1986, 1987
Teignmouth (Holcombe)	1989
Shaldon	1986, 1987, 1988, 1991
Ness Cove	1986, 1991
Hollicombe	1986
Paignton (Paignton Sands)	1988
Paignton (Preston Sands)	1988
Goodrington	1987
Dartmouth Castle + Sugary Cove	1986
Mill Bay	1987
Salcombe North Sands	1986, 1989, 1991
Salcombe South Sands	1986, 1988
Thurlestone (North)	1986, 1987, 1988, 1989, 1990, 1991
Bigbury-on-Sea (North)	1986
Challaborough	1987
Mothecombe	1986
Wembury	1986, 1987
Plymouth Hoe (East)	1986, 1987, 1988, 1990, 1991
Plymouth Hoe (West)	1986, 1987, 1988, 1990, 1991
Portwrinkle	1987
Downderry	1987
Seaton (Cornwall)	1986, 1987, 1988
Millendreath	1989
East Looe	1986, 1989
Readymoney Cove	1986, 1987, 1991
Polkerris	1987
Par	1986
Crinnis (Golflinks)	1989
Charlestown	1986, 1988, 1989
Duporth	1986, 1987, 1988, 1990
Pentewan	1986, 1987, 1988, 1989
Polstreath	1986

Site	Bathing Season(s) when failure recorded
Gorran Haven (Little Perhaver)	1986, 1987 1990
Pendower	1986
Gyllyngvase	1987
Swanpool	1987
Maen Porth	1987
Porthluney	1991
Porthallow	1986, 1987, 1988, 1989, 1991
Coverack	1986 CND(2)
Polurrian Cove	1986
Porthleven (East)	1986 ND(3) ND(3) ND(3)
Porthleven (West)	1986, 1987, 1988, 1990, 1991
Perran Sands	1991
Marazion + Mounts Bay (Little Holgus)	1986, 1987
Marazion + Mounts Bay (Heliport)	1986 1988, 1989, 1990, 1991
Marazion + Mounts Bay (Penzance)	1986, 1987, 1988, 1989, 1990, 1991
Marazion + Mounts Bay (Wherry Town)	1986, 1987, 1988, 1989, 1990, 1991
Porthmeor (St Ives)	1986
Porthgwiddden (St Ives)	1986, 1988, 1989, 1990, 1991
Porthminster (St Ives)	1989
Carbis Bay (Porth Kidney Sands)	1991
Trevaunance Cove (At Agnes)	1986, 1987, 1991
Perranporth (Village)	1987, 1991
Watergate	1991
Crantock	1986
Mawgan Porth	1986, 1987, 1989, 1990, 1991
Trevone Bay	1986, 1987, 1988, 1991
Rock	1986, 1987
Bude (Summerleaze)	1986, 1987, 1988, 1991
Bude (Crooklets)	1986, 1987, 1988, 1991
Westward Ho!	1986
Instow	1986, 1987, 1988, 1990, 1991
Saunton Sands	1986
Ilfracombe (Hele)	1987, 1991
Ilfracombe (Capstone)	1986, 1987, 1990
Combe Martin	1986, 1987, 1988, 1989, 1991
Lynmouth	1986, 1987 1989, 1990, 1991

(1) 95 per cent compliance with EC Directive 'I' values for total coliforms (max. 10,000 per 100ml) and faecal coliforms (max. 2,000 per 100ml).

(2) Compliance not determined.

(3) No data.

Figure 1.
Bathing Waters

* Indicates failure to comply with principal E.C. mandatory bacteriological standards in 1991

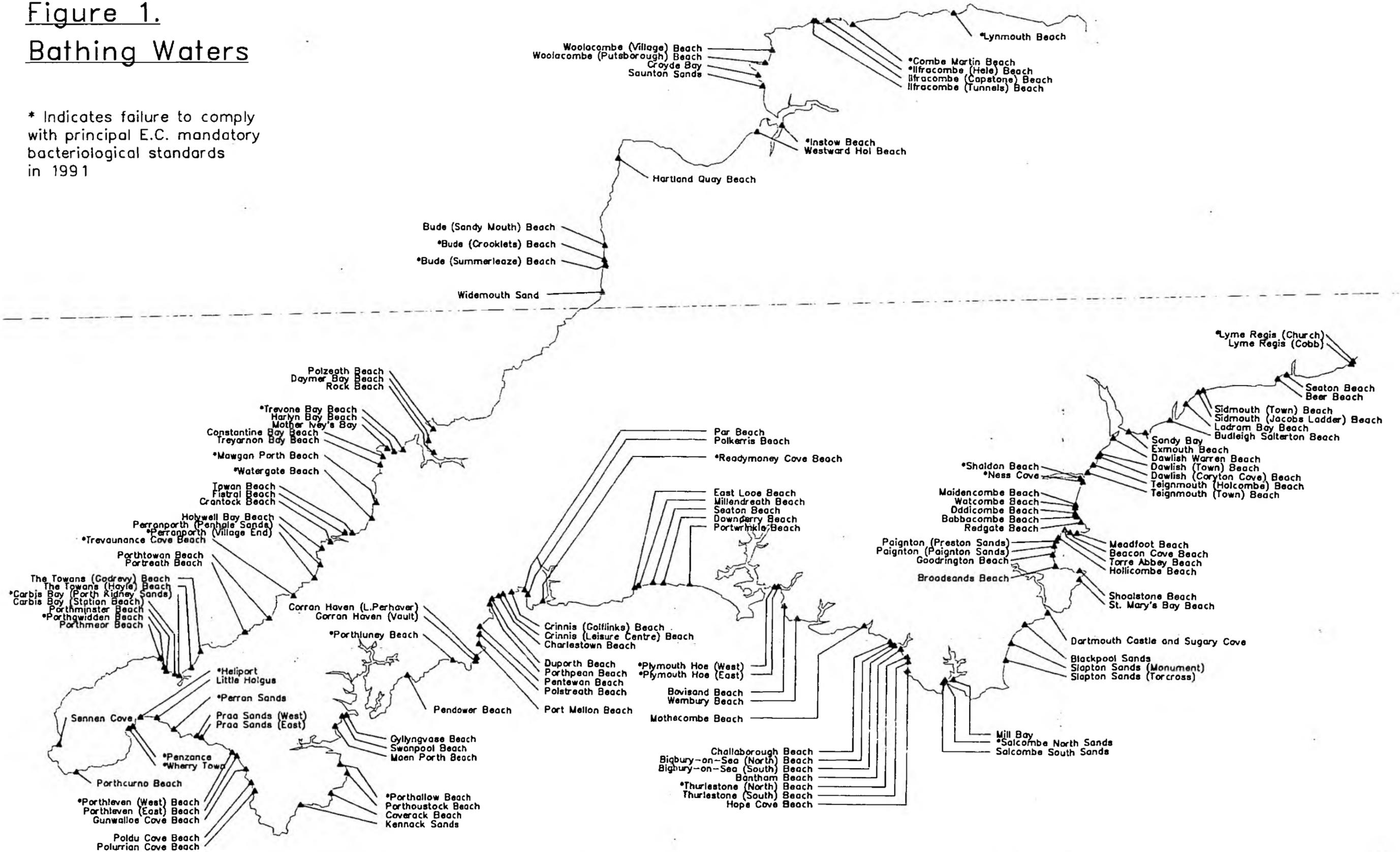


Figure 2.
Bathing Waters

* Indicates failure to comply with principal E.C. mandatory bacteriological standards in 1 or more years since 1986

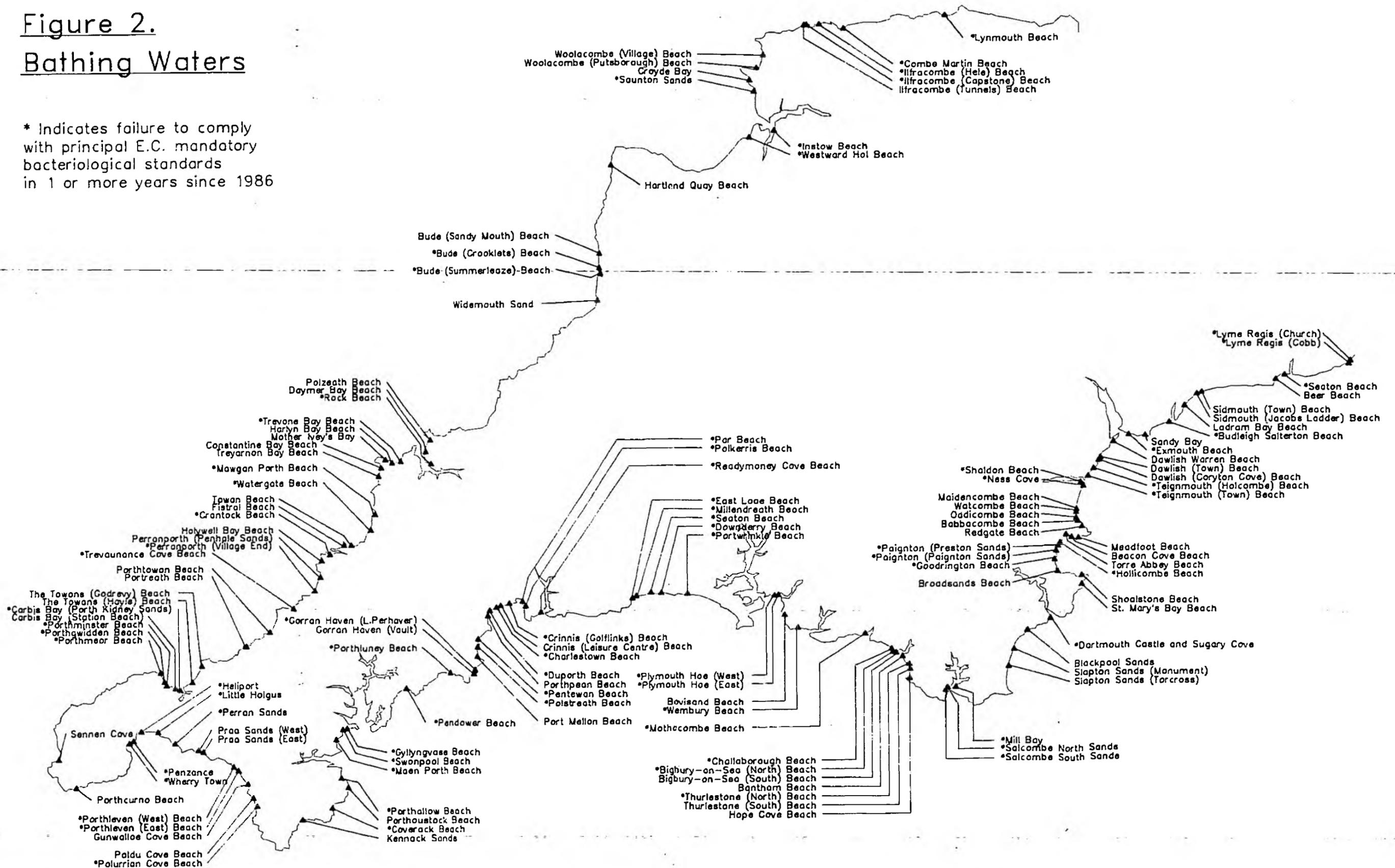


Figure 3. Non Identified Bathing Waters Monitored During 1991.

* Indicates failure to comply with principal E.C. mandatory bacteriological standards in 1991

