

GA-SOUTH WEST BOX 17



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AGENCY

**SOUTH WEST  
REGION**

**BATHING WATER  
TRIALS 2000 SEASON**

**Report No. TWQ/00/2**

**August 2000**



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### APPENDIX

Summary of comments and issues on the beach management approach and its consequences

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## **1. INTRODUCTION**

The following report provides the output from the application of a trial protocol for the revised Bathing Water Directive to six beaches in the South West:

- Poole Harbour Rockley Sands and Durdle Door East in Dorset;
- Ladram Bay in Devon;
- Kingsand, Porthluney and Fistral in Cornwall

The data for each beach are provided in Sections 1 to 6. In addition, comments and issues arising from discussions with local authorities, private beach managers/owners, and sewerage undertakers on the beach management team approach proposed in the trial protocol are provided in the Appendix.

## **2. RESULTS**

Each section contains the following information:

- Location Map
- Arial Photograph
- Summary of pollutant sources, pathway and necessary conditions
- Summary of compliance with trials standards using historical bathing water data  
Note: EU conversion factors are E.Coli (EC) = 0.6 x Faecal Coliform and Intestinal Enterococci (IE) = 0.75 x Faecal Streptococci. Pessimistic conversion is at 1:1
- Compulsory Brief Profile (Box 1)
- Template 1 - Historical Water Quality
- Template 2 - Faecal Contamination Risk Assessment for the 3 Trial Standards
- Template 3 - In Season Actions
- Beach Management Actions
- Key to Environmental Parameter Codes
- Template 4 - Indicative Costs of Actions when Exceedance of the 3 Trial Standards

**SECTION 1**

**POOLE HARBOUR ROCKLEY SANDS**





**Figure 1.1 Location Map**  
**BW Trials 2000 - Poole Harbour Rockley Sands Pier**

0 1 2 Kilometres

- Bathing Water Sampling Point
- Point Source Discharge



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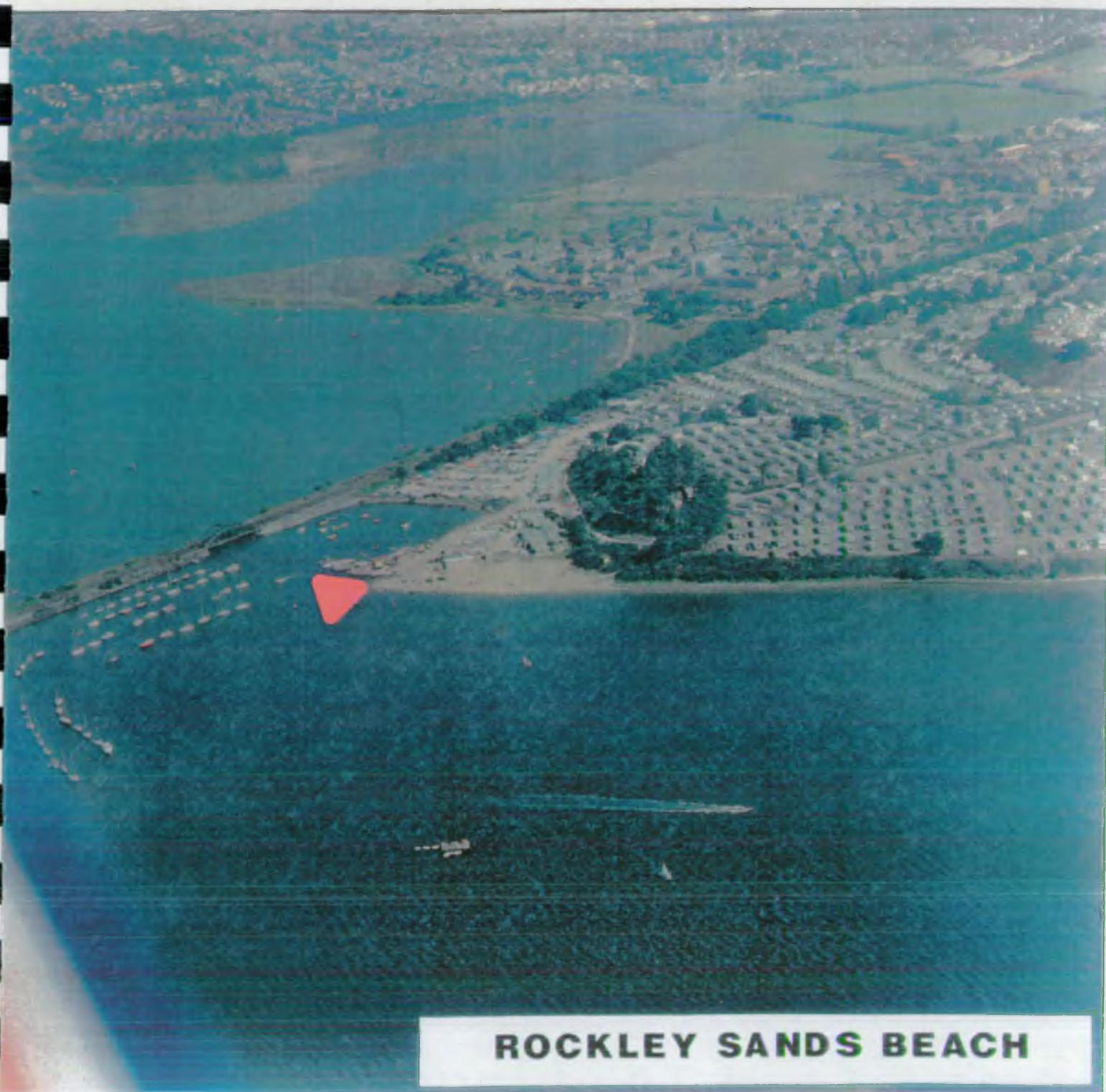


## **ROCKLEY SANDS BEACH**

URN: 50950300

NGR: SY 9720 9110

Location: Slipway.



**ROCKLEY SANDS BEACH**





## ROCKLEY SANDS – POOLE HARBOUR

### Pathway and Necessary Conditions

The bathing water and principal discharges in the vicinity of Rockley Sands are identified on the accompanying map (Figure 1.1). The main potential sources of contamination impacting directly on the bathing water are those entering Lychett Bay. These comprise two continuous discharges and four intermittent discharges. The two continuous discharges are the secondary treated effluent from Lychett Minster Sewage Treatment Works (PE 8500) and the outflow of the Sherford River (Mean flow of 0.543 m<sup>3</sup>/s). In terms of average loading during the bathing season the faecal contaminant loading from Lychett Minster Sewage Treatment Works is calculated to be about 10 times that of the Sherford River, as the river does not appear to have high levels of faecal contamination. The catchment of the Sherford River is mainly woodland with some mixed agriculture and the only significant sewage input is the secondary treated effluent from Blackheath Sewage Treatment Works (SY9094092650, PE 6000), which is discharged about 6 km from Lychett Bay.

The four intermittent discharges and their estimated spill frequencies from sewer modelling are:

- Lychett Minster Sewage Treatment Works storm discharge - <1 spill per annum.
- Moorland Way Pumping Station storm overflow - 13 spills per annum (Total spill volume 3550m<sup>3</sup>, ca. 5 spills per bathing season).
- Turlin Main Pumping Station storm overflow - 1 spill per 5 years.
- Egmont Road Storm overflow - <1 spill per annum.

Of these intermittent discharges, Moorland Pumping Station Storm Overflow is the most significant potential source of contamination. Emergency overflows can also potentially occur from the two pumping stations, although none are known to have occurred in the past 5 years.

In summary, the major potential source of contamination to the bathing water at Rockley Sands is therefore considered to be the continuous discharge from Lychett Minster Sewage Treatment Works. There have been no specific studies on the plume behaviour or impact of the individual inputs to Lychett Bay. However, it is evident that the main pathway for the impact of any of these sources entering the Bay is during the ebb outflow, when the bathing waters consist of these waters leaving the bay. Further impact can occur during the flood tide when the ebb outflow is returned to the Bay, either directly or diluted with Poole Harbour water.

It should be noted that the tidal regime in Poole Harbour is not a simple semi-diurnal regime of one high water (HW) and one low water (LW) every 12.5 hours, but is modified by quarter-diurnal tides. These result in the occurrence of two HWs within each 12.5 hour period, separated by a small secondary LW for spring and intermediate tidal ranges; while for neap tides there is only one HW every 12.5 hours (see Admiralty Tide Tables (ATT), 1999). The tidal currents as a consequence also possess quarter-diurnal characteristics which occur for all tidal ranges (e.g. the tidal current data on Admiralty chart 2611). The pattern of the tidal currents can also be

affected by wind stress, as Poole Harbour is a relatively shallow entrance system, although there are no detailed studies of these effects.

There is also a secondary treated discharge from Holten Heath (PE 1000) about 2 km to the west of Rockley Sands. This can only potentially impact on Rockley Sands on the flood tide following mixing with water in the Wareham Channel. It is therefore not considered to be a significant source of faecal contamination.

Finally, the background water quality in Poole Harbour is affected by several different potential sources including the continuous discharges of secondary treated effluent from Wareham Sewage Treatment Works (PE 12,337) and Poole Sewage Treatment Works (PE 169,788), the outflow from the Rivers Frome, Piddle and Corfe, and a number of intermittent discharges. The significance of each of these 'background' inputs on the water quality at Rockley Sands is unknown, but is considered to be significantly less than the more local inputs which can impact directly.

The background water quality is also affected by diffuse inputs from yachts in the Harbour. There are approximately 70 yacht moorings in the vicinity of Rockley Sands. The potential impact arriving from moored yachts is not known and it is not possible to discriminate the relative significance of this source from the available data. Given the rather diffuse and intermittent nature of the input from the local moored yachts, the potential risk has been assessed as negligible, low and medium for the three standards of the trial.

#### **Report References**

1. Poole Harbour Drainage Area Study, Wessex Water, 1998
2. Poole Harbour Investigations, July 1999, Environment Agency (report in progress)



SUMMARY OF COMPLIANCE WITH TRIALS STANDARDS USING HISTORICAL BATHING WATER DATA - POOLE HARBOUR ROCKLEY SANDS												
			Using EU Conversion Factors				Using Pessimistic Conversion Factors					
	Year	Count	Mandatory (95% of samples)		Intermediate (90% of samples)		Expert (90% of samples)		Intermediate (90% of samples)		Expert (90% of samples)	
			TC 10000	FC 2000	EC 400	IE 200	EC 100	IE 50	EC 400	IE 200	EC 100	IE 50
NO. OF EXCEEDANCES	1995	20	0	1	2	1	6	2	2	2	8	3
	1996	20	0	0	2	1	6	4	2	1	9	6
	1997	20	0	0	0	1	4	4	1	2	5	4
	1998	21	0	0	0	0	2	5	1	0	5	7
	1999	20	0	0	0	1	4	5	0	1	6	6
TOTALS	95'-99'	101	0	1	4	4	22	20	6	6	33	26
RISK RATING	95'-99'	101	Negligible	Low	High	High	High	High	High	High	High	High
NO. OF FAILURES (0=PASS, 1=FAIL)	1995	20	0	0	0	0	1	0	0	0	1	1
	1996	20	0	0	0	0	1	1	0	0	1	1
	1997	21	0	0	0	0	1	1	0	0	1	1
	1998	21	0	0	0	0	0	1	0	0	1	1
	1999	20	0	0	0	0	1	1	0	0	1	1
TOTALS	95'-99'	101	0	0	0	0	4	4	0	0	5	5

<b>Compulsory Brief Profile</b>	
<b>General information</b>	
Name of beach and bathing water:	Poole Harbour Rockley Sands, Poole Harbour, Dorset
Location (Grid Reference):	397200E, 90800N (SY97209080)
Limits of bathing area: length/width/gradient	50m / 30m / Gradient:
Type of bathing water: river/lake/estuarine/marine/open/confined/natural/artificial	Confined in natural harbour, Estuarine
Type of beach area: sandy/rocky/pebbles/grassy/other	Sandy, Mud
Beach/bathing water usage: swimming/sailsports/motorsports/other	Swimming, Sailing, Wind surfing
Estimate of peak usage (eg bank holiday):	50
Character of surrounding area: urban/residential/industrial/agricultural/dunes/marsh (more than 1 category can be used) river mouth/hills&mountains/grassland/others	Agricultural, Urban with Caravan Park
<b>Characteristics of bathing water</b>	
Average water temperature:	17-18 Celsius
Prevailing wind direction:	SW
Residual current direction:	Variable
River flow (mean/Q95/Q5):	Sherford River: ADF 0.543 cumecs, Q95 0.18 cumecs
Tidal amplitude: Standard Port	Mean ranges at Poole Harbour - Springs 1.6m, Neaps 0.5m
Secondary Port/Local Amplitude and Phase Differences	
Distance between mean high and low water:	200m (from Admiralty Chart 2611)
<b>Administration</b>	
Beach manager or contact person in case of pollution incident:	Mr Jeff Morley
Phone:	01202 261710
Address:	Customer Protection Services
	Poole Borough Council
	Newfields Business Park
	No. 2 Spinsford Road
	Poole
	Dorset
	BH17 0NF

Template 1: Historical Water Quality - Poole Harbour Rockley Sands

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
1995	1	04-May-95	70	80	0.91	73	< 10	0.97	
	2	12-May-95	10	10		9	< 10		
	3	22-May-95	98	30		27	10		10
	4	01-Jun-95	432	210		191	10		10
	5	11-Jun-95	90	32		29	10		10
	6	15-Jun-95	144	20		18	< 10		
	7	21-Jun-95	< 10	10		9	< 10		
	8	28-Jun-95	40	30		27	< 10		
	9	04-Jul-95	100	130		118	30		29
	10	12-Jul-95	1700	1200		1092	260		252
	11	20-Jul-95	310	210		191	10		10
	12	25-Jul-95	270	208		189	60		58
	13	03-Aug-95	50	< 10			< 10		
	14	10-Aug-95	90	10		9	< 10		
	15	16-Aug-95	10	< 10			10		10
	16	24-Aug-95	10	< 10			10		10
	17	02-Sep-95	700	112		102	20		19
	18	07-Sep-95	8000	5100		4641	5600		5432
	19	22-Sep-95	10	10		9	< 10		
	20	25-Sep-95	640	320		291	30		29
1996	1	03-May-96	512	108		98	36		35
	2	11-May-96	210	6		5	< 10		
	3	22-May-96	76	108		98	18		17
	4	29-May-96	50	54		49	< 10		
	5	07-Jun-96	47	27		25	54		52
	6	13-Jun-96	9	9		8	< 10		
	7	19-Jun-96	36	18		16	18		17
	8	24-Jun-96	207	162		147	117		113
	9	03-Jul-96	680	700		637	430		417
	10	14-Jul-96	18	9		8	< 10		
	11	19-Jul-96	89	45		41	< 10		
	12	24-Jul-96	360	330		300	54		52
	13	30-Jul-96	342	279		254	18		17
	14	08-Aug-96	200	210		191	27		26
	15	15-Aug-96	36	9		8	< 10		
	16	20-Aug-96	27	18		16	18		17
	17	28-Aug-96	1064	827		753	126		122
	18	05-Sep-96	154	63		57	< 10		
	19	11-Sep-96	470	290		264	99		96
	20	18-Sep-96	36	9		8	9		9
1997	1	02-May-97	171	< 10			< 10		
	2	14-May-97	< 10	9		8	< 10		
	3	29-May-97	436	43		39	< 10		
	4	30-May-97	45	27		25	18		17
	5	04-Jun-97	103	36		33	< 10		
	6	13-Jun-97	54	27		25	45		44
	7	21-Jun-97	1273	650		592	310		301
	8	30-Jun-97	198	63		57	< 10		
	9	08-Jul-97	138	27		25	< 10		
	10	17-Jul-97	36	36		33	36		35
	11	25-Jul-97	54	54		49	9		9
	12	30-Jul-97	63	9		8	< 10		
	13	05-Aug-97	200	180		164	108		105
	14	14-Aug-97	154	72		66	260		252
	15	28-Aug-97	45	117		106	36		35
	16	01-Sep-97	280	225		205	99		96
	17	17-Sep-97	45	63		57	9		9
	18	19-Sep-97	45	9		8	18		17



**Template 1: Historical Water Quality - Poole Harbour Rockley Sands**

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
1995	1	04-May-95	70	80	0.91	73	< 10	0.97	
	2	12-May-95	10	10		9	< 10		
	3	22-May-95	98	30		27	10		10
	4	01-Jun-95	432	210		191	10		10
	5	11-Jun-95	90	32		29	10		10
	6	15-Jun-95	144	20		18	< 10		
	7	21-Jun-95	< 10	10		9	< 10		
	8	28-Jun-95	40	30		27	< 10		
	9	04-Jul-95	100	130		118	30		29
	10	12-Jul-95	1700	1200		1092	260		252
	11	20-Jul-95	310	210		191	10		10
	12	25-Jul-95	270	208		189	60		58
	13	03-Aug-95	50	< 10			< 10		
	14	10-Aug-95	90	10		9	< 10		
	15	16-Aug-95	10	< 10			10		10
	16	24-Aug-95	10	< 10			10		10
	17	02-Sep-95	700	112		102	20		19
	18	07-Sep-95	8000	5100		4641	5600		5432
	19	22-Sep-95	10	10		9	< 10		
	20	25-Sep-95	640	320		291	30		29
1996	1	03-May-96	512	108		98	36		35
	2	11-May-96	210	6		5	< 10		
	3	22-May-96	76	108		98	18		17
	4	29-May-96	50	54		49	< 10		
	5	07-Jun-96	47	27		25	54		52
	6	13-Jun-96	9	9		8	< 10		
	7	19-Jun-96	36	18		16	18		17
	8	24-Jun-96	207	162		147	117		113
	9	03-Jul-96	680	700		637	430		417
	10	14-Jul-96	18	9		8	< 10		
	11	19-Jul-96	89	45		41	< 10		
	12	24-Jul-96	360	330		300	54		52
	13	30-Jul-96	342	279		254	18		17
	14	08-Aug-96	200	210		191	27		26
	15	15-Aug-96	36	9		8	< 10		
	16	20-Aug-96	27	18		16	18		17
	17	28-Aug-96	1064	827		753	126		122
	18	05-Sep-96	154	63		57	< 10		
	19	11-Sep-96	470	290		264	99		96
	20	18-Sep-96	36	9		8	9		9
1997	1	02-May-97	171	< 10			< 10		
	2	14-May-97	< 10	9		8	< 10		
	3	29-May-97	436	43		39	< 10		
	4	30-May-97	45	27		25	18		17
	5	04-Jun-97	103	36		33	< 10		
	6	13-Jun-97	54	27		25	45		44
	7	21-Jun-97	1273	650		592	310		301
	8	30-Jun-97	198	63		57	< 10		
	9	08-Jul-97	138	27		25	< 10		
	10	17-Jul-97	36	36		33	36		35
	11	25-Jul-97	54	54		49	9		9
	12	30-Jul-97	63	9		8	< 10		
	13	05-Aug-97	200	180		164	108		105
	14	14-Aug-97	154	72		66	260		252
	15	28-Aug-97	45	117		106	36		35
	16	01-Sep-97	280	225		205	99		96
	17	17-Sep-97	45	63		57	9		9
	18	19-Sep-97	45	9		8	18		17

TEMPLATE 2 Faecal Contamination Risk Assessment for the 3 standards - Poole Harbour Rockley Sands						
Potential Source	Location	Description of Source	Pathway and Necessary Conditions	Risk Rating 10000 TC 2000 FC	Risk Rating 400 EC 200 IE	Risk Rating 100 EC 50IE
<b>Continuous Wastewater Discharges</b>						
Four wastewater treatment works outfalls		Lytchett Minster STW (PE 8500), Lytchett Bay, Secondary Treatment		Low	High	High
		Holton Heath STW, Poole Harbour, Secondary Treatment (PE 1000).		Negligible	Negligible	Low
industrial discharge						
unsewered discharge						
<b>Intermittent Wastewater Discharges</b>						
industrial discharge		Mooland Way PS (CSO & EO)		Low	Medium	Medium
combined sewer overflow		Turlin Main PS (CSO & EO)		Negligible	Negligible	Negligible
stormwater overflow		Egmont Road		Negligible	Negligible	Negligible
emergency overflow						
River or Stream Discharge		Sherford River		Negligible	Low	Medium
Groundwater Discharge						
Diffuse contamination from associated catchments						
Agriculture						
<b>Other Local Developments or Inputs</b>						
ships and/or boats		Approximately 70 moorings in close proximity to the beach.		Negligible	Low	Medium
ports and/or marinas						
leisure development (eg caravan parks, restaurants etc.)		Caravan Park behind bathing water but no impact as flows go to sewer.				
aquaculture						
others... (specify)						
<b>Bathers</b>						
Animals: dogs, birds, donkeys, cows, etc.)						
<b>Historic contamination of sediments</b>						
Other sources...(specify)						
			Overall Risk Rating:	Low	High	High

TEMPLATE 3 In Season Actions - Poole Harbour Rockley Sands

1 Existing Standard

10,000 TC/100ml at 95% of samples  
2,000 FC/100ml at 95% of samples

Sample	Date	Time BST	Time of low tide (Poole Harbour) BST	Microbiology			Environmental Parameters										Beach Management when exceedance of standards - see attached note
				TC	FC	FS	Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)	
							(per 100ml)			Wind Direction	Wind Speed	Rain (Present)	Cloud Cover				
1	18-May-00	1627	1737	340	300	27	270	4	3	6	7.4	1	3	23.6	8.1	16.5	
2	24-May-00	1210	838	600	250	370	135	3	1	7	4.7	1	3	24.6	8.1	17	
3	25-May-00	1135	921	545	500	108	1	4	1		9.5	3	3	20.4	8.1	17	
4	02-Jun-00	933	447	200	54	54	225	5	1	8	1.8	2	3	26.5	8.05	16.5	
5	06-Jun-00	1130	803	1540	414	250		3	3	6	7.8	3	3	24.1	8.05	16.4	
6	11-Jun-00	945	1306	101	63	< 10	180	4	1	2	12.7	1	3	23	8.2	17	
7	14-Jun-00	1005	1549	380	216	63	225	3	2	7		3	3	26.2	8.2	17.1	
8	15-Jun-00	940	415	280	108	< 10	270	2	1	7		1	3	26.9	8.15	17.5	
9	19-Jun-00	945	643	730	146	54	180	3	2	7		3	3	22.2	8.2	20	
10	27-Jun-00	930	1257	162	151	144	90	3	1	1		1	4	25.2	8.4	17	
11	30-Jun-00	1005	1557	138	63	18	180	1	2	1		1	3	26.7	8.35	18.9	
12	04-Jul-00	1007	703	1164	480	310	90	0	6	8	0.4	0	4	25	8.05	19	
13	06-Jul-00	1010	841	2430	1182	310	180	2	2	7	5.3	1	3	23.8	7.85	18.9	
14	07-Jul-00	1130	930	2720	1310	550	225	4	2	6	0	2	3	20.9	7.95	16.2	
15	11-Jul-00	1615	1325	27	63	18	0	3	3	3		0	4	27.2	8.35	16	
16	12-Jul-00	1120	1427	234	108	72	225	2	3	4	7.5	3	4	26.9	8.3	17.2	
17	18-Jul-00	1210	624	27	18	< 10	0	1	1	1		0	5	28.7	8.3	19	
18	21-Jul-00	1000	800	296	138	45	180	1	1	0		2	5	25.2	8.35	20.6	
19	26-Jul-00	1007	1217	360	280	99	90	3	1	3	1	0	5	23.5	8.45	18.5	
20	31-Jul-00	1050	512	36	< 10	< 10	180	2	1	3		2	5	29.8	8.25	20.2	



TEMPLATE 3 In Season Actions - Poole Harbour Rockley Sands

2 proposed Standard	400 EC/100ml at 90% of samples 200 IE/100ml at 90% of samples
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Sample	Date	Time BST	Time of low tide (Poole Harbour) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)		
							(per 100ml)	Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State				Weather Today	
1	18-May-00	1627	1737	300		27		270	4	3	6	7.4	1	3	23.6	8.1	16.5	
2	24-May-00	1210	838	250		370		135	3	1	7	4.7	1	3	24.6	8.1	17	Action 1.I
3	25-May-00	1135	921	432		99		1	4	1		9.5	3	3	20.4	8.1	17	Action 1.I
4	02-Jun-00	933	447	54		45		225	5	1	8	1.8	2	3	26.5	8.05	16.5	
5	06-Jun-00	1130	803	414		240			3	3	6	7.8	3	3	24.1	8.05	16.4	Action 2.I
6	11-Jun-00	945	1306	54	<	10		180	4	1	2	12.7	1	3	23	8.2	17	
7	14-Jun-00	1005	1549	156		63		225	3	2	7		3	3	26.2	8.2	17.1	
8	15-Jun-00	940	415	97	<	10		270	2	1	7		1	3	26.9	8.15	17.5	
9	19-Jun-00	945	643	146		54		180	3	2	7		3	3	22.2	8.2	20	
10	27-Jun-00	930	1257	113		144		90	3	1	1		1	4	25.2	8.4	17	
11	30-Jun-00	1005	1557	36		18		180	1	2	1		1	3	26.7	8.35	18.9	
12	04-Jul-00	1007	703	480		310		90	0	6	8	0.4	0	4	25	8.05	19	Actions 2.I and 2.S
13	06-Jul-00	1010	841	1182		310		180	2	2	7	5.3	1	3	23.8	7.85	18.9	Actions 2.I and 2.S
14	07-Jul-00	1130	930	1273		480		225	4	2	6	0	2	3	20.9	7.95	16.2	Action 2.I, 2.S, and 2.M/L
15	11-Jul-00	1615	1325	63		18		0	3	3	3		0	4	27.2	8.35	16	
16	12-Jul-00	1120	1427	86		63		225	2	3	4	7.5	3	4	26.9	8.3	17.2	
17	18-Jul-00	1210	624	<	10	<	10	0	1	1	1		0	5	28.7	8.3	19	
18	21-Jul-00	1000	800		138	45		180	1	1	0		2	5	25.2	8.35	20.6	
19	26-Jul-00	1007	1217		280	99		90	3	1	3	1	0	5	23.5	8.45	18.5	
20	31-Jul-00	1050	512	<	10	<	10	180	2	1	3		2	5	29.8		20.2	

TEMPLATE 3 In Season Actions - Poole Harbour Rockley Sands

3 proposed standard 100 EC/100ml at 90% of samples  
50 IE/100ml at 90% of samples

Sample	Date	Time BST	Time of low tide (Poole Harbour) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)		
							(per 100ml)	Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State				Weather Today	
1	18-May-00	1627	1737	300		27		270	4	3	6	7.4	1	3	23.6	8.1	16.5	Action 1.I
2	24-May-00	1210	838	250		370		135	3	1	7	4.7	1	3	24.6	8.1	17	Action 2.I
3	25-May-00	1135	921	432		99		1	4	1		9.5	3	3	20.4	8.1	17	Actions 2.I and 2.S
4	02-Jun-00	933	447	54		45		225	5	1	8	1.8	2	3	26.5	8.05	16.5	
5	06-Jun-00	1130	803	414		240			3	3	6	7.8	3	3	24.1	8.05	16.4	Actions 2.I and 2.S
6	11-Jun-00	945	1306	54	<	10		180	4	1	2	12.7	1	3	23	8.2	17	
7	14-Jun-00	1005	1549	156		63		225	3	2	7		3	3	26.2	8.2	17.1	Actions 2.I and 2.S
8	15-Jun-00	940	415	97	<	10		270	2	1	7		1	3	26.9	8.15	17.5	
9	19-Jun-00	945	643	146		54		180	3	2	7		3	3	22.2	8.2	20	Actions 2.I and 2.S
10	27-Jun-00	930	1257	113		144		90	3	1	1		1	4	25.2	8.4	17	Actions 2.I and 2.S
11	30-Jun-00	1005	1557	36		18		180	1	2	1		1	3	26.7	8.35	18.9	
12	04-Jul-00	1007	703	480		310		90	0	6	8	0.4	0	4	25	8.05	19	Actions 2.I and 2.S
13	06-Jul-00	1010	841	1182		310		180	2	2	7	5.3	1	3	23.8	7.85	18.9	Actions 2.I and 2.S
14	07-Jul-00	1130	930	1273		480		225	4	2	6	0	2	3	20.9	7.95	16.2	Actions 2.I and 2.S
15	11-Jul-00	1615	1325	63		18		0	3	3	3		0	4	27.2	8.35	16	
16	12-Jul-00	1120	1427	86		63		225	2	3	4	7.5	3	4	26.9	8.3	17.2	Actions 2.I and 2.S
17	18-Jul-00	1210	624	<	10	<	10	0	1	1	1		0	5	28.7	8.3	19	
18	21-Jul-00	1000	800	138		45		180	1	1	0		2	5	25.2	8.35	20.6	Actions 2.I and 2.S
19	26-Jul-00	1007	1217	280		99		90	3	1	3	1	0	5	23.5	8.45	18.5	Action 2.I, 2.S, and 2.M/L
20	31-Jul-00	1050	512	<	10	<	10	180	2	1	3		2	5	29.8		20.2	

## BEACH MANAGEMENT ACTIONS

Three different levels of beach management actions have been defined in relation to three categories of bathing water quality impact. These actions apply to each of the three standards defined in the Trial.

### 1. In Season Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 1.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, and Beach Manager;
- Re-sample of bathing water;
- Initial investigation of cause of contamination, eg. assessment of rainfall data, storm overflow operation, tidal conditions;
- Inform beach users through posting of results.

### 2. Repeat Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 2.1 Immediate Actions:

- As for Category 1.

#### 2.S Short-term Actions (instigated as a consequence of 2 mandatory standard exceedances, or 3 intermediate/expert standard exceedances):

- Systematic investigations to assess the impact from significant point source discharges (both continuous and intermittent) and from streams/ rivers including the inputs to them.

#### 2.M/L Medium/ Long-term Actions:

Based on the outcome of investigations, and if any immediate remedial action does not resolve the water quality problem.

- Implementation of sewage treatment improvement programmes;
- Pollution prevention campaigns in stream/ river catchments.

### 3. Emergency Incidents Affecting Bathing Water Quality (eg. PS breakdown, STW failure, rupture of farm slurry storage tank)

#### 3.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, Beach Manager, Environment Agency;

Depending on the nature of the emergency incident, additional actions could involve:

- Beach clean-up operations;
- Erection of warning signs or barriers;
- Total or partial beach closure.

# KEY TO ENVIRONMENTAL PARAMETER CODES

DESCRIPTION	RESULT	INTERPRETATION
<b>Rain (Present)</b>	1	Dry
	2	Showery
	3	Occasional Rain
	4	Light Rain
	5	Rain
	6	Heavy Rain In Last 24 hrs
<b>Cloud Cover</b>	0	Clear Sky
	1	1/8 Cloud Cover
	2	1/4 Cloud Cover
	3	3/8 Cloud Cover
	4	1/2 Cloud Cover
	5	5/8 Cloud Cover
	6	3/4 Cloud Cover
	7	7/8 Cloud Cover
	8	8/8 Cloud Cover
<b>Wind Speed (Beaufort Scale)</b>	0	Calm
	1	Light Air
	2	Light Breeze
	3	Gentle Breeze
	4	Moderate Breeze
	5	Fresh Breeze
	6	Strong Breeze
<b>Sea State</b>	0	Calm - Glassy
	1	Calm 0-10cm Crest to Trough
	2	Smooth Wavelets 10-50cm
	3	Light-Waves 0.5-1.25m
	4	Moderate 1.25-2m White Horses
	5	Rough Waves 2.5-5m
	6	Very Rough Waves 4-6m
<b>Weather Today</b>	1	Very Cold
	2	Cold
	3	Mild
	4	Warm
	5	Hot
	6	Very Hot



TEMPLATE 4 Indicative Costs of actions when exceedance of the standard at Rockley Sands						
1 Existing Standard		10,000 TC/100ml at 95% of samples 2,000 FC/100ml at 95% of samples				
Action		Describe			Cost (£k)	
A. Engineering Solutions		None			0	
B. Beach Management		Number times implemented			Cost per time (£)	Total (£k)
		None				0
		Total (Net Present Value at 6% discount rate)				
2 proposed Standard		400 EC/100ml at 90% of samples 200 IE/100ml at 90% of samples				
Action		Describe			Cost (£k)	
A. Engineering Solutions		Provision of UV treatment at Lytchett Minster STW, and reduction in storm spills from Moorland Way PS to <3 spills/bathing season			1500	
B. Beach Management		Number times implemented			Cost per time (£)	Total (£k)
Resampling		6			250	1.5
Surveys and modelling of contaminant sources, pollution prevention and control work						50
		Total (Net Present Value at 6% discount rate)				
3 proposed standard		100 EC/100ml at 90% of samples 50 IE/100ml at 90% of samples				
Action		Describe			Cost (£k)	
A. Engineering Solutions		Provision of UV treatment at Lytchett Minster STW and Holton Heath STW. Reduction in storm spills from Moorland Way PS to <1 spill/bathing season. Reduction in background levels in Poole Harbour with provision of UV treatment at Poole and Wareham STWs.			11500	
B. Beach Management		Number times implemented			Cost per time (£)	Total (£k)
Resampling		13			250	3.25
Surveys and modelling of contaminant sources, pollution prevention and control work						70
		Total (Net Present Value at 6% discount rate)				
NOTES						
None of the cost estimates for the engineering solutions include the capital and operating costs of engineering schemes fully completed before 2000. All cost estimates are approximate. Operating costs have not been specifically defined for the defined improvements. However they are estimated from the available information relating to the present trial to equate to approximately 2 - 5% of the capital cost per year.						

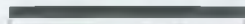
**SECTION 2**  
**DURDLE DOOR EAST**



**Figure 2.1 Location Map**  
**BW Trials 2000 - Durdle Door East**



0 0.5 Kilometres



- Bathing Water Sampling Point
- Point Source Discharge



**ENVIRONMENT**  
**AGENCY**





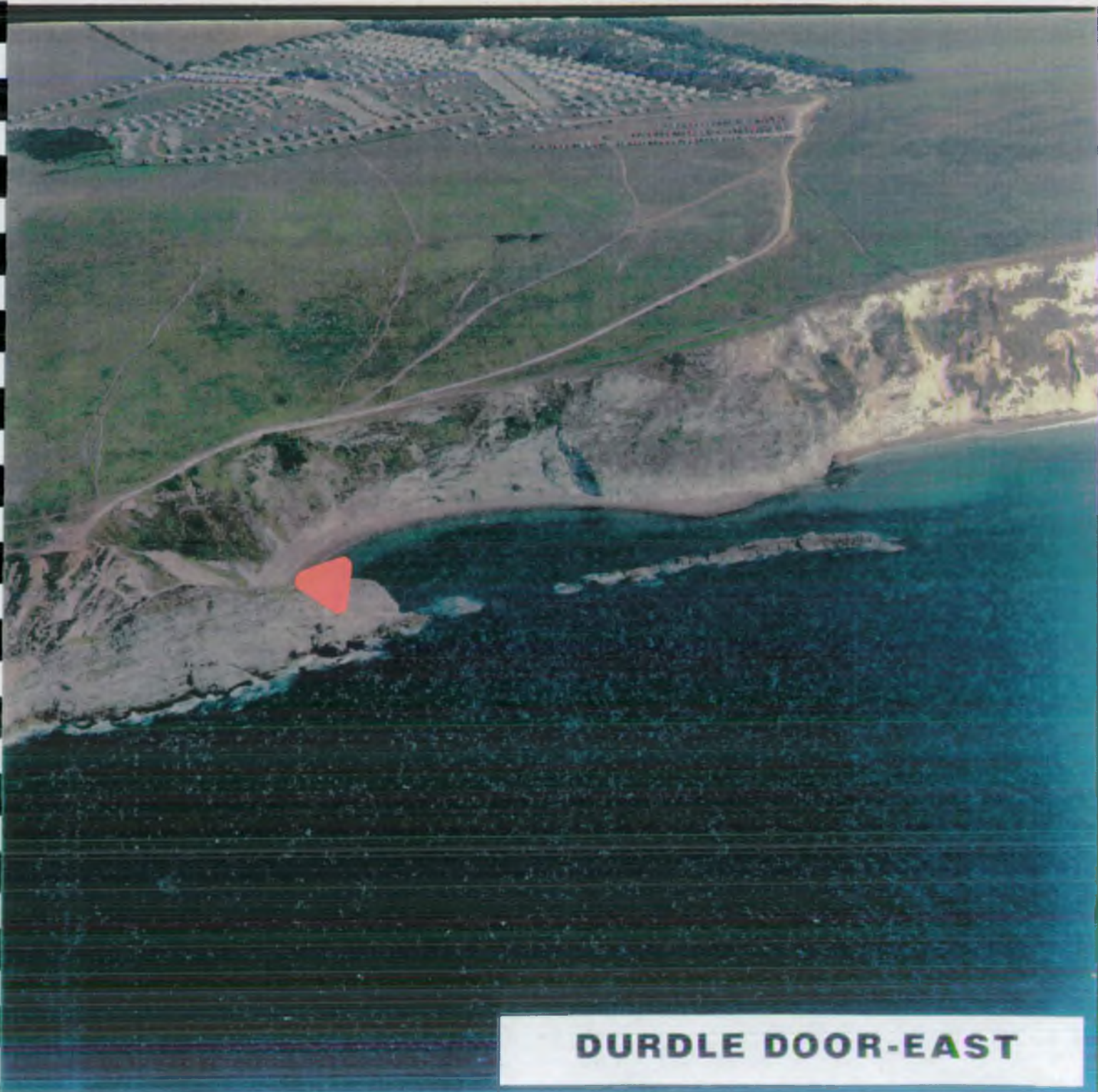


# **DURDLE DOOR EAST**

URN: 50034638

NGR: SY 8080 8030

Location: 100m east of cliff path.



**DURDLE DOOR-EAST**





## **DURDL E DOOR EAST**

### **Pathway and Necessary Conditions**

The bathing water is identified on the accompanying map (Figure 2.1). The only known discharge from Lulworth is approximately 2 km to the east near Lulworth Cove (NGR SY8240079600). The effluent consists of 6mm screened crude sewage. The DWF is 1000 m<sup>3</sup>/day and the population served is approximately 3000.

There have been no studies undertaken on the western transport of the Lulworth discharge. The main impact of the discharge has been considered to be Lulworth Cove and the bathing water at Lulworth. Given that the tidal currents are generally weak (about 0.25 m/s on Spring tides), the impact on Durdle Door East is considered to be small, even under strong onshore winds.

There is also a stream which flows into Lulworth Cove but this has been excluded from consideration. It is not considered to impact on Durdle Door East on account of its distance from the bathing water and its generally low bacterial levels.

The effluent from the holiday camp which is located on top of the cliffs backing the bathing water drains to the Lulworth outfall. There are no known discharges associated with the holiday camp. There are no toilet facilities on the beach; the nearest are in the holiday camp.

[illegible]



<b>Compulsory Brief Profile</b>	
<b>General information</b>	
Name of beach and bathing water:	Durdle Door East, Man O' War Cove, St. Oswald's Bay, Dorset
Location (Grid Reference):	380660E, 80260N (SY80668026)
Limits of bathing area: length/width/gradient	250m/25m
Type of bathing water: river/lake/estuarine/marine/open/confined/natural/artificial	Open Marine, but confined to some extent by offshore rock reef
Type of beach area: sandy/rocky/pebbles/grassy/other	Sandy, some rock
Beach/bathing water usage: swimming/sailsports/motorsports/other	Swimming, Diving
Estimate of peak usage (eg bank holiday):	100
Character of surrounding area: urban/residential/industrial/agricultural/dunes/marsh	Agriculture, Caravan Park, Cliffs.
(more than 1 category can be used) river mouth/hills&mountains/grassland/others	
<b>Characteristics of bathing water</b>	
Average water temperature:	15-16 Celsius
Prevailing wind direction:	SW
Residual current direction:	Variable
River flow (mean/Q95/Q5):	N/A
Tidal amplitude: Standard Port	Mean ranges at Portland - Springs 2.0m, Neaps 0.6m
Secondary Port/Local Amplitude and Phase Differences	Lulworth Cove - Springs 2.0m, Neaps 0.5m
Distance between mean high and low water:	20m (from 1:10000 OS Map)
<b>Administration</b>	
Beach manager or contact person in case of pollution incident:	Mr Simon Down
Phone:	01929 400352
Address:	Weld Estate Office
	Lulworth Castle
	East Lulworth
	Wareham
	BH20 5QS

Template 1: Historical Water Quality - Durdle Door East

Year	sample	date		TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
1995	1	03-May-95	<	1	<	1	1	<	1	1
	2	11-May-95		20	18		18	<	1	
	3	19-May-95	<	1	<	1		1		1
	4	27-May-95		2	1		1	<	1	
	5	06-Jun-95	<	1	<	1		<	1	
	6	14-Jun-95		5	1		1	4		4
	7	20-Jun-95	<	1	1		1	<	1	
	8	26-Jun-95	<	1	<	1		9		9
	9	03-Jul-95		3	<	1		<	1	
	10	10-Jul-95		3300	260		260	1300		1300
	11	19-Jul-95		36	34		34	5		5
	12	27-Jul-95		10	4		4	4		4
	13	02-Aug-95		40	40		40	2		2
	14	13-Aug-95		3	2		2	1		1
	15	22-Aug-95		10	<	1		<	1	
	16	23-Aug-95		20	10		10	3		3
	17	31-Aug-95		4	2		2	<	1	
	18	05-Sep-95	<	1	<	1		1		1
	19	12-Sep-95		22	4		4	8		8
	20	21-Sep-95		1	3		3	1		1
1996	1	02-May-96		10	2		2	1		1
	2	10-May-96		5	<	1		2		2
	3	16-May-96		5	4		4	1		1
	4	31-May-96		1	1		1	3		3
	5	04-Jun-96		5	2		2	<	1	
	6	11-Jun-96		13	14		14	2		2
	7	20-Jun-96		1200	1500		1500	900		900
	8	30-Jun-96		5	5		5	8		8
	9	04-Jul-96	<	10	<	10		<	10	
	10	10-Jul-96	<	10	<	10		<	10	
	11	17-Jul-96		7	4		4	76		76
	12	23-Jul-96		20	21		21	11		11
	13	02-Aug-96		3	2		2	1		1
	14	06-Aug-96		6	7		7	9		9
	15	14-Aug-96		6	5		5	<	1	
	16	17-Aug-96		9	11		11	6		6
	17	29-Aug-96		24	4		4	1		1
	18	04-Sep-96	<	10	18		18	<	10	
	19	11-Sep-96		4	2		2	2		2
	20	19-Sep-96		10	6		6	1		1
	21	20-Sep-96		13	3		3	<	1	
1997	1	06-May-97		24	23		23	2		2
	2	21-May-97		3	5		5	<	1	
	3	23-May-97		2	1		1	2		2
	4	31-May-97		2	<	1		1		1
	5	05-Jun-97		4	7		7	6		6
	6	17-Jun-97	<	1	<	1		<	1	
	7	25-Jun-97		3	4		4	4		4
	8	01-Jul-97		5	2		2	3		3
	9	09-Jul-97		4	<	1		10		10
	10	18-Jul-97	<	1	<	1		3		3
	11	22-Jul-97		3	2		2	3		3
	12	03-Aug-97		14	10		10	5		5
	13	06-Aug-97		154	92		92	118		118
	14	11-Aug-97		4	<	1		2		2
	15	19-Aug-97		36	36		36	0		0
	16	29-Aug-97		6	1		1	4		4
	17	02-Sep-97		7	<	1		<	1	

Template 1: Historical Water Quality - Durdle Door East

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
	18	04-Sep-97	2	<	1		<	1	
	19	15-Sep-97	19		20	20	10		10
	20	18-Sep-97	64		25	25	200		200
	21	24-Sep-97	3	<	1		1		1
1998	1	07-May-98	<	1	<	1	<	1	
	2	15-May-98	3		1	1	1		1
	3	20-May-98	1	<	1		<	1	
	4	26-May-98	<	1	5	5	<	1	
	5	04-Jun-98	<	1	<	1	1		1
	6	10-Jun-98	5	<	1		4		4
	7	17-Jun-98	<	1	<	1	<	1	
	8	29-Jun-98	2	<	1		4		4
	9	08-Jul-98	1	<	1		2		2
	10	15-Jul-98	4		5	5	1		1
	11	23-Jul-98	7		2	2	2		2
	12	28-Jul-98	9	<	1		<	10	
	13	07-Aug-98	6		1	1	3		3
	14	15-Aug-98	3		3	3	6		6
	15	19-Aug-98	<	1	<	1	<	1	
	16	28-Aug-98	2	<	1				0
	17	03-Sep-98	8		4	4	3		3
	18	08-Sep-98	33		23	23	22		22
	19	15-Sep-98	6			0	<	1	
	20	17-Sep-98	3	<	1		2		2
	21	23-Sep-98	8		8	8	3		3
	22	26-Sep-98	270		138	138	109		109
1999	1	04-May-99	<	1	<	1	<	1	
	2	11-May-99	3		3	3	<	1	
	3	18-May-99	8		13	13	21		21
	4	23-May-99	2	<	1		<	1	
	5	28-May-99	1		2	2	<	1	
	6	07-Jun-99	<	1	<	1	<	1	
	7	17-Jun-99	<	10	<	10	<	10	
	8	25-Jun-99		<	10		<	10	
	9	30-Jun-99	<	10	<	10	<	10	
	10	09-Jul-99	<	10	<	10	<	10	
	11	17-Jul-99	<	10	<	10	<	10	
	12	21-Jul-99	<	10	<	10	<	10	
	13	28-Jul-99	<	10	<	10	27		27
	14	05-Aug-99	<	10	<	10	<	10	
	15	12-Aug-99	<	10	<	10	<	10	
	16	18-Aug-99	<	10	<	10	<	10	
	17	27-Aug-99	<	10	<	10	<	10	
	18	03-Sep-99	<	10	<	10	<	10	
	19	08-Sep-99	<	10	<	10	<	10	
	20	16-Sep-99	<	10	<	10	<	10	
	21	20-Sep-99	86		27	27	18		18
			0		0	(opt 1)	1	(opt 1)	2
						(opt 2)	3	(opt 2)	6
			0.00		0.00	(opt1)	1.00	(opt 1)	2
						(opt2)	3.00	(opt 2)	6

TEMPLATE 2 Faecal Contamination Risk Assessment for the 3 Standards - Durdle Door East						
Potential Source	Location	Description of Source	Pathway and Necessary Conditions	Risk Rating 10000 TC 2000 FC	Risk Rating 400 EC 200 IE	Risk Rating 100 EC 50IE
<b>Continuous Wastewater Discharges</b>						
Lulworth wastewater treatment works outfall	SY 8242 7973	Screened (6mm) Crude Effluent, DWF 1000m <sup>3</sup> /day. PE ca 3000	Strong southerly wind (on shore), Spring tidal range	Negligible	Medium	High
industrial discharge	None					
unsewered discharge	None					
<b>Intermittent Wastewater Discharges</b>						
industrial discharge	None					
combined sewer overflow	None					
stormwater overflow	None					
emergency overflow	None					
River or Stream Discharge		Lulworth Stream flowing into Lulworth Cove	Impact of this source is considered to be negligible.	Negligible	Negligible	Negligible
Groundwater Discharge	None					
Diffuse contamination from associated catchments	None					
Agriculture	None					
<b>Other Local Developments or Inputs</b>						
ships and/or boats	None					
ports and/or marinas	None					
leisure development (eg caravan parks, restaurants etc.)	None	Caravan Park on cliffs behind bathing water but no input as flows go to sewer.				
aquaculture	None					
others... (specify)	None					
<b>Bathers</b>						
Animals: dogs, birds, donkeys, cows, etc.)		Roosting birds There is no dog ban				
<b>Historic contamination of sediments</b>						
Other sources...(specify)						
Overall Risk Rating:				Negligible	Medium	High



TEMPLATE 3 In Season Actions - Durdle Door

1 Existing Standard

10,000 TC/100ml at 95% of samples  
2,000 FC/100ml at 95% of samples

				Microbiology					Environmental Parameters										Beach Management when exceedance of standards - see attached note
Sample	Date	Time BST	Time of high tide (Portland) BST	TC	FC	FS	Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)			
							(per 100ml)			Wind Direction	Wind Speed	Rain (Present)	Cloud Cover				Hours of Sunshine	Sea State	
				1	17-May-00	11:33	07:02	< 10	< 10	< 10	135	4	2	7	4.5	3	2	34.7	
2	22-May-00	11:25	09:44	< 10	< 10	< 10	135	3	1	4	6.2	1	4	34.7	8.15	15			
3	25-May-00	09:30	11:20	< 10	< 10	< 10	135	4	2	6	9.5	4	3	34.8	8.05	12			
4	30-May-00	11:34	17:18	< 10	< 10	< 10	90	4	5	8		2	2	34.8	8.1	15			
5	03-Jun-00	10:37	08:15	< 10	< 10	< 10	135	2	1	8	5.4	1	3	35	8.1	15			
6	06-Jun-00	10:50	10:33	< 10	< 10	< 10		3	2	6	7.8	2	3	34.9	8.05	13.2			
7	13-Jun-00	14:15	17:27	< 10	< 10	< 10	270	3	1	8		2	3	35	8.25	15			
8	14-Jun-00	11:15	18:14	< 10	< 10	< 10	135	4	2	7		3	3	34.9	8.15	12			
9	19-Jun-00	11:15	08:57	18	< 10	< 10	135	3	2	7	5.8	3	3	34.9	8.1	15.1			
10	28-Jun-00	11:11	16:35	< 10	< 10	< 10	135	4	1	0		2	5	34.8	8.25	16.5			
11	30-Jun-00	11:45	18:35	< 10	< 10	36	135	1	2	1		2	3	34.9	8.15	16.5			
12	05-Jul-00	11:44	10:27	< 10	< 10	< 10	180	3	6	4	2.2	1	4	34.9	8.1	17			
13	06-Jul-00	11:10	11:12	< 10	< 10	< 10	225	1	2	6	5.3	1	3	34.7	8.05	16.2			
14	07-Jul-00	09:55	11:57	< 10	< 10	18	180	3	2	7	1.8	1	3	34.9	8.15	18			
15	12-Jul-00	12:10	16:48	< 10	< 10	< 10	180	2	3	3	7.5	2	4	34.9	8.25	17.2			
16	13-Jul-00	11:17	17:39	< 10	< 10	< 10	270	5	3	8		3	3	35	8.2	15			
17	18-Jul-00	10:45	08:44	< 10	< 10	< 10		1	1	1		0	6	35.2	8.15	17.6			
18	21-Jul-00	11:25	10:24	< 10	< 10	< 10	135	1	1	0		1	5	34.8	8.1	18.2			
19	25-Jul-00	11:27	13:06	< 10	< 10	< 10	90	3	2	8	1	1	3	34.9	8.1	16			
20	31-Jul-00	10:07	07:50	< 10	< 10	18	90	3	1	4		1	5	34.9	8.1	18.5			

TEMPLATE 3 In Season Actions - Durdle Door

2 proposed Standard      400 EC/100ml at 90% of samples  
200 IE/100ml at 90% of samples

Sample	Date	Time BST	Time of high tide (Portland) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note	
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)			
							(per 100ml)	Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State				Weather Today		
1	17-May-00	11:33	07:02	<	10	<	10		135	4	2	7	4.5	3	2	34.7	8.05	15	
2	22-May-00	11:25	09:44	<	10	<	10		135	3	1	4	6.2	1	4	34.7	8.15	15	
3	25-May-00	09:30	11:20	<	10	<	10		135	4	2	6	9.5	4	3	34.8	8.05	12	
4	30-May-00	11:34	17:18	<	10	<	10		90	4	5	8		2	2	34.8	8.1	15	
5	03-Jun-00	10:37	08:15	<	10	<	10		135	2	1	8	5.4	1	3	35	8.1	15	
6	06-Jun-00	10:50	10:33	<	10	<	10			3	2	6	7.8	2	3	34.9	8.05	13.2	
7	13-Jun-00	14:15	17:27	<	10	<	10		270	3	1	8		2	3	35	8.25	15	
8	14-Jun-00	11:15	18:14	<	10	<	10		135	4	2	7		3	3	34.9	8.15	12	
9	19-Jun-00	11:15	08:57	<	10	<	10		135	3	2	7	5.8	3	3	34.9	8.1	15.1	
10	28-Jun-00	11:11	16:35	<	10	<	10		135	4	1	0		2	5	34.8	8.25	16.5	
11	30-Jun-00	11:45	18:35	<	10		36		135	1	2	1		2	3	34.9	8.15	16.5	
12	05-Jul-00	11:44	10:27	<	10	<	10		180	3	6	4	2.2	1	4	34.9	8.1	17	
13	06-Jul-00	11:10	11:12	<	10	<	10		225	1	2	6	5.3	1	3	34.7	8.05	16.2	
14	07-Jul-00	09:55	11:57	<	10		18		180	3	2	7	1.8	1	3	34.9	8.15	18	
15	12-Jul-00	12:10	16:48	<	10	<	10		180	2	3	3	7.5	2	4	34.9	8.25	17.2	
16	13-Jul-00	11:17	17:39	<	10	<	10		270	5	3	8		3	3	35	8.2	15	
17	18-Jul-00	10:45	08:44	<	10	<	10			1	1	1		0	6	35.2	8.15	17.6	
18	21-Jul-00	11:25	10:24	<	10	<	10		135	1	1	0		1	5	34.8	8.1	18.2	
19	25-Jul-00	11:27	13:06	<	10	<	10		90	3	2	8	1	1	3	34.9	8.1	16	
20	31-Jul-00	10:07	07:50	<	10		18		90	3	1	4		1	5	34.9	8.1	18.5	

TEMPLATE 3 In Season Actions - Durdle Door

3 proposed standard

100 EC/100ml at 90% of samples  
50 IE/100ml at 90% of samples

				Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note
Sample	Date	Time BST	Time of high tide (Portland) BST	EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)		
							Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State	Weather Today					
				(per 100ml)														
1	17-May-00	11:33	07:02	< 10	< 10			135	4	2	7	4.5	3	2	34.7	8.05	15	
2	22-May-00	11:25	09:44	< 10	< 10			135	3	1	4	6.2	1	4	34.7	8.15	15	
3	25-May-00	09:30	11:20	< 10	< 10			135	4	2	6	9.5	4	3	34.8	8.05	12	
4	30-May-00	11:34	17:18	< 10	< 10			90	4	5	8		2	2	34.8	8.1	15	
5	03-Jun-00	10:37	08:15	< 10	< 10			135	2	1	8	5.4	1	3	35	8.1	15	
6	06-Jun-00	10:50	10:33	< 10	< 10				3	2	6	7.8	2	3	34.9	8.05	13.2	
7	13-Jun-00	14:15	17:27	< 10	< 10			270	3	1	8		2	3	35	8.25	15	
8	14-Jun-00	11:15	18:14	< 10	< 10			135	4	2	7		3	3	34.9	8.15	12	
9	19-Jun-00	11:15	08:57	< 10	< 10			135	3	2	7	5.8	3	3	34.9	8.1	15.1	
10	28-Jun-00	11:11	16:35	< 10	< 10			135	4	1	0		2	5	34.8	8.25	16.5	
11	30-Jun-00	11:45	18:35	< 10	36			135	1	2	1		2	3	34.9	8.15	16.5	
12	05-Jul-00	11:44	10:27	< 10	< 10			180	3	6	4	2.2	1	4	34.9	8.1	17	
13	06-Jul-00	11:10	11:12	< 10	< 10			225	1	2	6	5.3	1	3	34.7	8.05	16.2	
14	07-Jul-00	09:55	11:57	< 10	18			180	3	2	7	1.8	1	3	34.9	8.15	18	
15	12-Jul-00	12:10	16:48	< 10	< 10			180	2	3	3	7.5	2	4	34.9	8.25	17.2	
16	13-Jul-00	11:17	17:39	< 10	< 10			270	5	3	8		3	3	35	8.2	15	
17	18-Jul-00	10:45	08:44	< 10	< 10				1	1	1		0	6	35.2	8.15	17.6	
18	21-Jul-00	11:25	10:24	< 10	< 10			135	1	1	0		1	5	34.8	8.1	16.2	
19	25-Jul-00	11:27	13:06	< 10	< 10			90	3	2	8	1	1	3	34.9	8.1	16	
20	31-Jul-00	10:07	07:50	< 10	18			90	3	1	4		1	5	34.9	8.1	18.5	

## BEACH MANAGEMENT ACTIONS

Three different levels of beach management actions have been defined in relation to three categories of bathing water quality impact. These actions apply to each of the three standards defined in the Trial.

### 1. In Season Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 1.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, and Beach Manager;
- Re-sample of bathing water;
- Initial investigation of cause of contamination, eg. assessment of rainfall data, storm overflow operation, tidal conditions;
- Inform beach users through posting of results.

### 2. Repeat Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 2.1 Immediate Actions:

- As for Category 1.

#### 2.S Short-term Actions (instigated as a consequence of 2 mandatory standard exceedances, or 3 intermediate/expert standard exceedances):

- Systematic investigations to assess the impact from significant point source discharges (both continuous and intermittent) and from streams/ rivers including the inputs to them.

#### 2.M/L Medium/ Long-term Actions:

Based on the outcome of investigations, and if any immediate remedial action does not resolve the water quality problem.

- Implementation of sewage treatment improvement programmes;
- Pollution prevention campaigns in stream/ river catchments.

### 3. Emergency Incidents Affecting Bathing Water Quality (eg. PS breakdown, STW failure, rupture of farm slurry storage tank)

#### 3.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, Beach Manager, Environment Agency;

Depending on the nature of the emergency incident, additional actions could involve:

- Beach clean-up operations;
- Erection of warning signs or barriers;
- Total or partial beach closure.

# KEY TO ENVIRONMENTAL PARAMETER CODES

DESCRIPTION	RESULT	INTERPRETATION
Rain (Present)	1	Dry
	2	Showery
	3	Occasional Rain
	4	Light Rain
	5	Rain
	6	Heavy Rain In Last 24 hrs
Cloud Cover	0	Clear Sky
	1	1/8 Cloud Cover
	2	1/4 Cloud Cover
	3	3/8 Cloud Cover
	4	1/2 Cloud Cover
	5	5/8 Cloud Cover
	6	3/4 Cloud Cover
	7	7/8 Cloud Cover
	8	8/8 Cloud Cover
Wind Speed (Beaufort Scale)	0	Calm
	1	Light Air
	2	Light Breeze
	3	Gentle Breeze
	4	Moderate Breeze
	5	Fresh Breeze
	6	Strong Breeze
Sea State	0	Calm - Glassy
	1	Calm 0-10cm Crest to Trough
	2	Smooth Wavelets 10-50cm
	3	Light-Waves 0.5-1.25m
	4	Moderate 1.25-2m White Horses
	5	Rough Waves 2.5-5m
	6	Very Rough Waves 4-6m
Weather Today	1	Very Cold
	2	Cold
	3	Mild
	4	Warm
	5	Hot
	6	Very Hot



TEMPLATE 4 Indicative Costs of actions when exceedance of the standard at Durdle Door East						
<b>1 Existing Standard</b>		10,000 TC/100ml at 95% of samples				
		2,000 FC/100ml at 95% of samples				
Action		Describe				Cost (£k)
A. Engineering Solutions		None				0
B. Beach Management		Number times implemented				Cost per time (£)
		None				0
		Total (Net Present Value at 6% discount rate)				
<b>2 proposed Standard</b>		400 EC/100ml at 90% of samples				
		200 IE/100ml at 90% of samples				
Action		Describe				Cost (£k)
A. Engineering Solutions		Provision of secondary treatment at Lutworth, and outfall and sewerage improvements.				3500
B. Beach Management		Number times implemented				Cost per time (£)
		None				0
		Total (Net Present Value at 6% discount rate)				
<b>3 proposed standard</b>		100 EC/100ml at 90% of samples				
		50 IE/100ml at 90% of samples				
Action		Describe				Cost (£k)
A. Engineering Solutions		Provision of secondary treatment and storm storage at Lutworth, and outfall and sewerage improvements.				4000
B. Beach Management		Number times implemented				Cost per time (£)
		None				0
		Total (Net Present Value at 6% discount rate)				
<b>NOTES</b>						
None of the cost estimates for the engineering solutions include the capital and operating costs of engineering schemes fully completed before 2000. All cost estimates are approximate. Operating costs have not been specifically defined for the defined improvements. However they are estimated from the available information relating to the present trial to equate to approximately 2 - 5% of the capital cost per year.						

**SECTION 3**  
**LADRAM BAY**



**Figure 3.1 Location Map**  
**BW Trials 2000 - Ladram Bay Beach**



0 0.5 1 Kilometres



● Bathing Water Sampling Point

● Point Source Discharge



**ENVIRONMENT  
 AGENCY**

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 Environment Agency GD 03177G Map produced: 4th May 2000.





## **LADRAM BAY**

### **Pathway and Necessary Conditions**

The bathing water is identified on the accompanying map (Figure 3.1). The main potential source of contamination is the primary treated effluent from Otterton Sewage Treatment Works (PE 7000) which is discharged about 1 km to the South-South East of Ladram Bay. Recent dye studies on the behaviour of the effluent plume have confirmed that the impact occurs primarily during the northerly going tidal flow, in conjunction with a southerly wind. The minimum time of travel from these studies was about two hours (EA 2000).

The other potential source of contamination is the crude effluent from Sidmouth (PE 29600), some 4 km to the North Easterly of Ladram Bay. Float tracking studies undertaken on the discharge have shown that Ladram Bay is within the limit of the spring tidal excursion of the effluent plume during light North Easterly winds (Acer 1996).

The foul drainage from the Holiday Centre (caravan park and camping site) is pumped to the Sewage Treatment Works at Otterton. Another potential source is the emergency overflow (309800E, 85300N) from this pumping station which discharges to the bay to the north of Ladram Bay. This discharge has never been known to operate.

### **References:**

Environment Agency, 2000. Dye studies on the behaviour of the Otterton STW discharge.

Acer Environmental, 1996. HNDA Comprehensive Studies Project No AS143. Sidmouth Marine Survey.

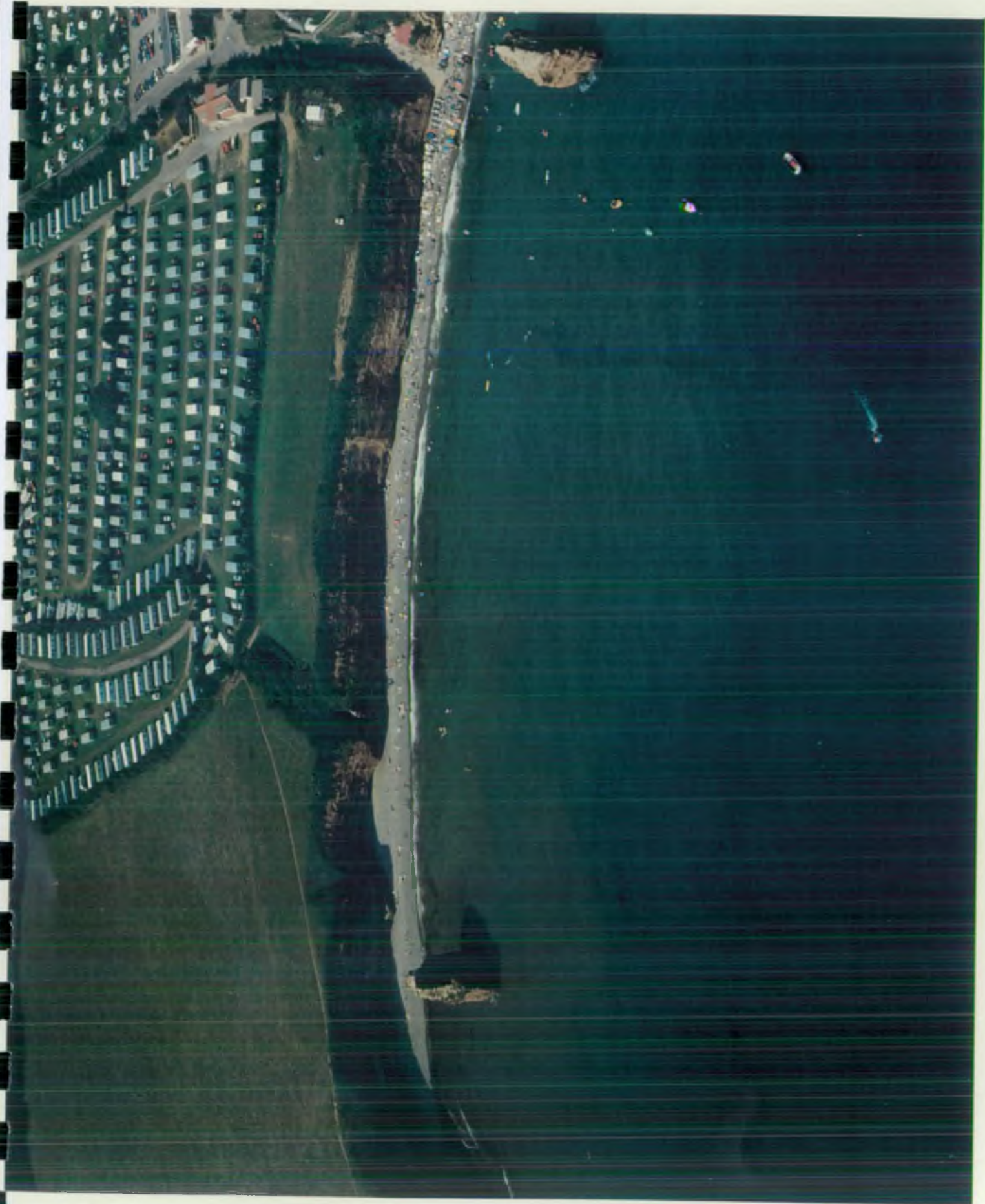
SUMMARY OF COMPLIANCE WITH TRIALS STANDARDS USING HISTORICAL BATHING WATER DATA - LADRAM BAY BEACH												
	Year	Count			Using EU Conversion Factors				Using Pessimistic Conversion Factors			
			Mandatory (95% of samples)		Intermediate (90% of samples)		Expert (90% of samples)		Intermediate (90% of samples)		Expert (90% of samples)	
			TC 10000	FC 2000	EC 400	IE 200	EC 100	IE 50	EC 400	IE 200	EC 100	IE 50
NO. OF EXCEEDANCES	1995	20	0	0	1	1	7	7	3	3	10	8
	1996	20	0	0	0	1	6	4	2	2	8	6
	1997	21	0	1	4	3	5	11	4	6	10	12
	1998	21	0	0	1	2	6	9	2	2	11	13
	1999	20	0	0	2	3	6	5	5	3	9	5
TOTALS	95'-99'	102	0	1	8	10	30	36	16	16	48	44
RISK RATING	95'-99'	102	Negligible	Low	High	High	High	High	High	High	High	High
NO. OF FAILURES (0=PASS, 1=FAIL)	1995	20	0	0	0	0	1	1	1	1	1	1
	1996	20	0	0	0	0	1	1	0	0	1	1
	1997	21	0	0	1	1	1	1	1	1	1	1
	1998	22	0	0	0	0	1	1	0	0	1	1
	1999	20	0	0	0	1	1	1	1	1	1	1
TOTALS	95'-99'	102	0	0	1	2	5	5	3	3	5	5













<b>Compulsory Brief Profile</b>	
<b>General information</b>	
Name of beach and bathing water:	Ladram Bay Beach, Ladram Bay, Lyme Bay, S. Devon
Location (Grid Reference):	309720E, 85150N (SY09728515)
Limits of bathing area: length/width/gradient	350m / 30m / Gradient:
Type of bathing water: river/lake/estuarine/marine/open/confined/natural/artificial	Open Marine
Type of beach area: sandy/rocky/pebbles/grassy/other	Pebbles
Beach/bathing water usage: swimming/sailsports/motorsports/other	Swimming, Diving, Motorsports, Canoeing
Estimate of peak usage (eg bank holiday):	500
Character of surrounding area: urban/residential/industrial/agricultural/dunes/marsh	Agricultural and Caravan Park
(more than 1 category can be used) river mouth/hills&mountains/grassland/others	
<b>Characteristics of bathing water</b>	
Average water temperature:	15-16 Celsius
Prevailing wind direction:	SW
Residual current direction:	Variable
River flow (mean/Q95/Q5):	N/A
Tidal amplitude: Standard Port	Mean ranges at Plymouth (Devonport) - Springs 4.7m, Neaps 2.2m
Secondary Port/Local Amplitude and Phase Differences	Exmouth Approaches: Springs 4.1m, Neaps 1.7m
Distance between mean high and low water:	25m (from EA sampling map)
<b>Administration</b>	
Beach manager or contact person in case of pollution incident:	Mr Luedicke, Site Manager
Phone:	01395 568398
Address:	Ladram Bay Holiday Centre
	Otterton
	Budleigh Salterton
	Devon
	EX9 7BX



Template 1: Historical Water Quality - Ladram Bay Beach

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
1995	1	01-May-95	290	180	0.82	148	50	0.98	49
	2	11-May-95	190	108		89	20		20
	3	21-May-95	140	170		139	10		10
	4	24-May-95	380	310		254	70		69
	5	01-Jun-95	30	50		41	20		20
	6	07-Jun-95	< 10	< 10			< 10		
	7	09-Jun-95	< 10	10		8	< 10		
	8	19-Jun-95	10	20		16	10		10
	9	29-Jun-95	220	70		57	60		59
	10	07-Jul-95	50	10		8	50		49
	11	17-Jul-95	162	120		98	150		147
	12	20-Jul-95	120	80		66	50		49
	13	27-Jul-95	700	570		467	260		255
	14	04-Aug-95	110	90		74	40		39
	15	14-Aug-95	30	40		33	< 10		
	16	24-Aug-95	120	140		115	80		78
	17	05-Sep-95	200	210		172	230		225
	18	08-Sep-95	700	460		377	170		167
	19	13-Sep-95	120	10		8	10		10
	20	23-Sep-95	1440	1350		1107	520		510
1996	1	02-May-96	360	280		230	63		62
	2	13-May-96	18	< 10			< 10		
	3	19-May-96	539	290		238	18		18
	4	30-May-96	113	99		81	27		26
	5	07-Jun-96	54	54		44	9		9
	6	12-Jun-96	59	45		37	< 10		
	7	17-Jun-96	63	126		103	9		9
	8	27-Jun-96	45	< 10			< 10		
	9	05-Jul-96	81	18		15	< 10		
	10	13-Jul-96	27	36		30	9		9
	11	19-Jul-96	36	45		37	< 10		
	12	25-Jul-96	410	590		484	280		274
	13	02-Aug-96	54	45		37	9		9
	14	12-Aug-96	135	90		74	36		35
	15	15-Aug-96	< 10	9			9		9
	16	22-Aug-96	470	360		295	126		123
	17	01-Sep-96	290	280		230	230		225
	18	11-Sep-96	27	27		22	< 10		
	19	19-Sep-96	200	160		131	54		53
	20	30-Sep-96	620	480		394	117		115
1997	1	02-May-97	135	126		103	45		44
	2	13-May-97	180	122		100	54		53
	3	19-May-97	2160	1273		1044	1727		1692
	4	30-May-97	54	36		30	< 10		
	5	09-Jun-97	45	36		30	27		26
	6	12-Jun-97	97	54		44	27		26
	7	17-Jun-97	< 10	< 10			27		26
	8	25-Jun-97	4320	2300		1886	230		225
	9	27-Jun-97	350	230		189	230		225
	10	07-Jul-97	81	81		66	9		9
	11	13-Jul-97	171	63		52	72		71
	12	21-Jul-97	9	9		7	18		18
	13	25-Jul-97	162	54		44	72		71
	14	04-Aug-97	2000	818		671	610		598
	15	12-Aug-97	630	256		210	126		123
	16	15-Aug-97	120	101		83	27		26
	17	22-Aug-97	173	89		73	90		88

Template 1: Historical Water Quality - Ladram Bay Beach

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
	18	01-Sep-97	1164	800		656	530		519
	19	11-Sep-97	230	132		108	81		79
	20	18-Sep-97	144	144		118	220		216
	21	29-Sep-97	< 10	9			9		9
1998	1	01-May-98	63	45		37	< 10		
	2	12-May-98	9	18		15	9		9
	3	19-May-98	< 10	< 10			< 10		
	4	29-May-98	198	126		103	63		62
	5	05-Jun-98	450	440		361	198		194
	6	14-Jun-98	310	122		100	45		44
	7	23-Jun-98	146	108		89	56		55
	8	30-Jun-98	171	99		81	18		18
	9	10-Jul-98	270	260		213	144		141
	10	13-Jul-98	137	135		111	36		35
	11	16-Jul-98	171	220		180	81		79
	12	03-Aug-98	610	380		312	380		372
	13	10-Aug-98	79	63		52	63		62
	14	19-Aug-98	9	< 10			99		97
	15	27-Aug-98	27	54		44	54		53
	16	04-Sep-98	350	306		251	180		176
	17	07-Sep-98	2400	2000		1640	740		725
	18	11-Sep-98	250	115		94	9		9
	19	16-Sep-98	36	54		44	45		44
	20	20-Sep-98	36	27		22	72		71
	21	24-Sep-98	171	86		71	117		115
1999	1	01-May-99	< 10	< 10			< 10		
	2	10-May-99	1,882	525		431	27		26
	3	19-May-99	189	189		155	< 10		
	4	26-May-99	18	< 10			< 10		
	5	14-Jun-99	27	< 10			< 10		
	6	21-Jun-99	99	27		22	45		44
	7	30-Jun-99	97	126		103	27		26
	8	07-Jul-99	< 10	18		15	< 10		
	9	12-Jul-99	99	36		30	117		115
	10	16-Jul-99	97	59		48	36		35
	11	23-Jul-99	18	< 10			27		26
	12	28-Jul-99	18	< 10			< 10		
	13	01-Aug-99	310	18		15	36		35
	14	10-Aug-99	5120	827		678	380		372
	15	17-Aug-99	1680	495		406	610		598
	16	26-Aug-99	2900	122		100	45		44
	17	07-Sep-99	18	< 10			18		18
	18	16-Sep-99	636	410		336	189		185
	19	23-Sep-99	3420	1800		1476	330		323
	20	26-Sep-99	288	105		86	< 10		
			0	1	(opt 1)	12		(opt 1)	16
					(opt 2)	43		(opt 2)	44
			0.00	0.98	(opt1)	11.76		(opt 1)	15.69
					(opt2)	42.16		(opt 2)	43.14

TEMPLATE 2 Faecal Contamination Risk Assessment for the 3 standards - Ladram Bay						
Potential Source	Location	Description of Source	Pathway and Necessary Conditions	Risk Rating 10000 TC 2000 FC	Risk Rating 400 EC 200 IE	Risk Rating 100 EC 50IE
<b>Continuous Wastewater Discharges</b>						
Otterton wastewater treatment works outfall		Primary Treated Sewage (PE: 7000 )	See Attached Note	Low	High	High
Sidmouth Outfall		Crude Sewage (PE: 29600 )	See Attached Note	Negligible	Low	High
industrial discharge	None					
unsewered discharge						
<b>Intermittent Wastewater Discharges</b>						
industrial discharge	None					
combined sewer overflow	None					
stormwater overflow	None					
emergency overflow	None					
<b>River or Stream Discharge</b>						
		None. (Intermittant stream flowing to Southern end of BW in winter)				
<b>Groundwater Discharge</b>						
		None				
<b>Diffuse contamination from associated catchments</b>						
		None				
<b>Agriculture</b>						
<b>Other Local Developments or Inputs</b>						
		None				
ships and/or boats						
ports and/or marinas						
leisure develoment (eg caravan		Caravan Park behind BW but no foul water input as flows are directed to sewer. EO from PS to bay north of Ladram. Surface water from rainfall drains to Ladram Beach.				
parks, restaurants etc.)						
aquaculture						
others... (specify)						
<b>Bathers</b>						
Animals: dogs, birds, donkeys, cows, etc.)		Dog Ban on beach during bathing season Approx. 50 cattle on cliff pasture				
<b>Historic contamination of sediments</b>						
		None				
Other sources...(specify)		None				
			Overall Risk Rating:	Low	High	High

TEMPLATE 3 In Season Actions - Ladram

1 Existing Standard	10,000 TC/100ml at 95% of samples 2,000 FC/100ml at 95% of samples
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Sample	Date	Time BST	Time of high tide (Plymouth +40 mins) BST	Microbiology			Environmental Parameters										Beach Management when exceedance of standards - see attached note
				TC	FC	FS	Meteorological conditions on day of sampling (1)						Salinity for coast	pH	Water temp (°C)		
							(per 100ml)			Wind Direction	Wind Speed	Rain (Present)				Cloud Cover	
1	19-May-00	1115	754	162	153	27	315	3	1	5	4	2	2	34.9	8.1	12.5	
2	22-May-00	1508	1543	63	63	90	180	0	2	7	3.7	2	3	34.4	8.15	12.7	
3	26-May-00	1115	1219	340	264	144	180	3	5	8		3	2	34.7	8.05	12	
4	01-Jun-00	1530	1836	1091	189	54	180	5	1	.8	4.5	4	3	34.8	8.1	14.1	
5	05-Jun-00	1130	927	18	< 10	< 10	315	2	1	4	4.4	1	4	34.8	8.1	13.5	
6	07-Jun-00	930	1108	81	54												
7	14-Jun-00	1125	1753	420	390	180	180	4	1	4		3	4	34.9	8.15	14.5	
8	16-Jun-00	1330	1910	168	189	81											
9	19-Jun-00	1030	839	420	410	99	800	3	1	4	12	2	4	34.8	8.1	16	
10	23-Jun-00	945	1105	727	779	36											
11	26-Jun-00	1105	1349	< 10	< 10	< 10											
12	30-Jun-00	1130	542	243	105	72	135	2	1	9		2	4	34.6	8.15	17	
13	03-Jul-00	920	825	72	27	54											
14	05-Jul-00	1130	1009	36	18	< 10											
15	07-Jul-00	1045	1147	200	171	710	0	5	1	7		2	4	34.9	8.1	16.5	
16	11-Jul-00	1000	1533	36	27	36											
17	13-Jul-00	905	453	440	360	171	310	4	3	8	2.2	1	3	35	8.05	14.2	
18	16-Jul-00	1141	705	< 10	27	< 10	630	1	1	6		1	4	35.1	8.15	17.1	
19	19-Jul-00	1120	902						5			0		34.9	8.1	18.5	
20	21-Jul-00	1155	1013	45	< 10	27	200	1	1	0	1	0	5	35	8.15	14.9	
21	24-Jul-00	1140	1209	454	216	144	45	4	1	8	1.5	4	4	35	8	17	
22	26-Jul-00	1135	1417	< 10	< 10	< 10	140	1	1	0		1	5	35.1	8.1	18	
23	27-Jul-00	1225	1536	450	430	171	220	3	1	6		1		35	8.15	18	
24	28-Jul-00	1055	1649	63	27	117	220	4	2	8	1.2	1	4	34.7	8.1	17.9	
25	31-Jul-00	1235	720	210	240	144	200	3	1	4		1	5	35	8.1	18.6	

TEMPLATE 3 In Season Actions - Ladram

2 proposed Standard      400 EC/100ml at 90% of samples  
200 IE/100ml at 90% of samples

Sample	Date	Time BST	Time of high tide (Plymouth +40 mins) BST	Microbiology				Environmental Parameters											Beach Management when exceedance of standards - see attached note
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)			
							(per 100ml)	Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State				Weather Today		
1	19-May-00	1115	754					315	3	1	5	4	2	2	34.9	8.1	12.5		
2	22-May-00	1508	1543	54	90			180	0	2	7	3.7	2	3	34.4	8.15	12.7		
3	26-May-00	1115	1219	264	144			180	3	5	8		3	2	34.7	8.05	12		
4	01-Jun-00	1530	1836	189	54			180	5	1	8	4.5	4	3	34.8	8.1	14.1		
5	05-Jun-00	1130	927	< 10	< 10			315	2	1	4	4.4	1	4	34.8	8.1	13.5		
6	07-Jun-00	930	1108	45	< 10														
7	14-Jun-00	1125	1753	256	164			180	4	1	4		3	4	34.9	8.15	14.5		
8	16-Jun-00	1330	1910	132	72														
9	19-Jun-00	1030	839	328	99			800	3	1	4	12	2	4	34.8	8.1	16		
10	23-Jun-00	945	1105	492	36													Actions 2.I and 2.S	
11	26-Jun-00	1105	1349	< 10	< 10														
12	30-Jun-00	1130	542	70	63			135	2	1	9		2	4	34.6	8.15	17		
13	03-Jul-00	920	825	18	54														
14	05-Jul-00	1130	1009	18	< 10														
15	07-Jul-00	1045	1147	120	710			0	5	1	7		2	4	34.9	8.1	16.5	Action 2.S	
16	11-Jul-00	1000	1533	27	36														
17	13-Jul-00	905	453	252	171			310	4	3	8	2.2	1	3	35	8.05	14.2		
18	16-Jul-00	1141	705	18	< 10			630	1	1	6		1	4	35.1	8.15	17.1		
19	19-Jul-00	1120	902							5			0		34.9	8.1	18.5		
20	21-Jul-00	1155	1013	< 10	27			200	1	1	0	1	0	5	35	8.15	14.9		
21	24-Jul-00	1140	1209	192	144			45	4	1	8	1.5	4	4	35	8	17		
22	26-Jul-00	1135	1417	< 10	< 10			140	1	1	0		1	5	35.1	8.1	18		
23	27-Jul-00	1225	1536	344	171			220	3	1	6		1		35	8.15	18	Actions 2.I, 2.S and 2.M/L	
24	28-Jul-00	1055	1649	27	117			220	4	2	8	1.2	1	4	34.7	8.1	17.9		
25	31-Jul-00	1235	720	240	135			200	3	1	4		1	5	35	8.1	18.6		



TEMPLATE 3 In Season Actions - Ladram

3 proposed standard	100 EC/100ml at 90% of samples 50 IE/100ml at 90% of samples
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Sample	Date	Time BST	Time of high tide (Plymouth +40 mins) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note
				EC	IE			Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)	
								Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State	Weather Today				
(per 100ml)																		
1	19-May-00	1115	754					315	3	1	5	4	2	2	34.9	8.1	12.5	
2	22-May-00	1508	1543	54		90		180	0	2	7	3.7	2	3	34.4	8.15	12.7	Action 2.1
3	26-May-00	1115	1219	264		144		180	3	5	8		3	2	34.7	8.05	12	Actions 2.1, and 2.S
4	01-Jun-00	1530	1836	189		54		180	5	1	8	4.5	4	3	34.8	8.1	14.1	Actions 2.1, and 2.S
5	05-Jun-00	1130	927	< 10	<	10		315	2	1	4	4.4	1	4	34.8	8.1	13.5	
6	07-Jun-00	930	1108	45	<	10												Actions 2.1, and 2.S
7	14-Jun-00	1125	1753	256		164		180	4	1	4		3	4	34.9	8.15	14.5	Actions 2.1, and 2.S
8	16-Jun-00	1330	1910	132		72												Actions 2.1, and 2.S
9	19-Jun-00	1030	839	328		99		800	3	1	4	12	2	4	34.8	8.1	16	Actions 2.1, and 2.S
10	23-Jun-00	945	1105	492		36												Actions 2.1, and 2.S
11	26-Jun-00	1105	1349	< 10	<	10												
12	30-Jun-00	1130	542	70		63		135	2	1	9		2	4	34.6	8.15	17	Actions 2.1, and 2.S
13	03-Jul-00	920	825	18		54												Action 2.S
14	05-Jul-00	1130	1009	18	<	10												
15	07-Jul-00	1045	1147	120		710		0	5	1	7		2	4	34.9	8.1	16.5	Actions 2.1, and 2.S
16	11-Jul-00	1000	1533	27		36												
17	13-Jul-00	905	453	252		171		310	4	3	8	2.2	1	3	35	8.05	14.2	Actions 2.1, and 2.S
18	16-Jul-00	1141	705	18	<	10		630	1	1	6		1	4	35.1	8.15	17.1	
19	19-Jul-00	1120	902							5			0		34.9	8.1	18.5	
20	21-Jul-00	1155	1013	< 10		27		200	1	1	0	1	0	5	35	8.15	14.9	
21	24-Jul-00	1140	1209	192		144		45	4	1	8	1.5	4	4	35	8	17	Actions 2.1, and 2.S
22	26-Jul-00	1135	1417	< 10	<	10		140	1	1	0		1	5	35.1	8.1	18	
23	27-Jul-00	1225	1536	344		171		220	3	1	6		1		35	8.15	18	Actions 2.1, and 2.S
24	28-Jul-00	1055	1649	27		117		220	4	2	8	1.2	1	4	34.7	8.1	17.9	Action 2.S
25	31-Jul-00	1235	720	240		135		200	3	1	4		1	5	35	8.1	18.6	Actions 2.1, 2.S and 2.M/L

## BEACH MANAGEMENT ACTIONS

Three different levels of beach management actions have been defined in relation to three categories of bathing water quality impact. These actions apply to each of the three standards defined in the Trial.

### 1. In Season Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 1.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, and Beach Manager;
- Re-sample of bathing water;
- Initial investigation of cause of contamination, eg. assessment of rainfall data, storm overflow operation, tidal conditions;
- Inform beach users through posting of results.

### 2. Repeat Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 2.1 Immediate Actions:

- As for Category 1.

#### 2.S Short-term Actions (instigated as a consequence of 2 mandatory standard exceedances, or 3 intermediate/expert standard exceedances):

- Systematic investigations to assess the impact from significant point source discharges (both continuous and intermittent) and from streams/ rivers including the inputs to them.

#### 2.M/L Medium/ Long-term Actions:

Based on the outcome of investigations, and if any immediate remedial action does not resolve the water quality problem.

- Implementation of sewage treatment improvement programmes;
- Pollution prevention campaigns in stream/ river catchments.

### 3. Emergency Incidents Affecting Bathing Water Quality (eg. PS breakdown, STW failure, rupture of farm slurry storage tank)

#### 3.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, Beach Manager, Environment Agency;

Depending on the nature of the emergency incident, additional actions could involve:

- Beach clean-up operations;
- Erection of warning signs or barriers;
- Total or partial beach closure.

## KEY TO ENVIRONMENTAL PARAMETER CODES

DESCRIPTION	RESULT	INTERPRETATION
Rain (Present)	1	Dry
	2	Showery
	3	Occasional Rain
	4	Light Rain
	5	Rain
	6	Heavy Rain In Last 24 hrs
Cloud Cover	0	Clear Sky
	1	1/8 Cloud Cover
	2	1/4 Cloud Cover
	3	3/8 Cloud Cover
	4	1/2 Cloud Cover
	5	5/8 Cloud Cover
	6	3/4 Cloud Cover
	7	7/8 Cloud Cover
	8	8/8 Cloud Cover
Wind Speed (Beaufort Scale)	0	Calm
	1	Light Air
	2	Light Breeze
	3	Gentle Breeze
	4	Moderate Breeze
	5	Fresh Breeze
	6	Strong Breeze
Sea State	0	Calm - Glassy
	1	Calm 0-10cm Crest to Trough
	2	Smooth Wavelets 10-50cm
	3	Light-Waves 0.5-1.25m
	4	Moderate 1.25-2m White Horses
	5	Rough Waves 2.5-5m
	6	Very Rough Waves 4-6m
Weather Today	1	Very Cold
	2	Cold
	3	Mild
	4	Warm
	5	Hot
	6	Very Hot

TEMPLATE 4 Indicative Costs of actions when exceedance of the standard at Ladram Bay				
<b>1 Existing Standard</b> 10,000 TC/100ml at 95% of samples				
2,000 FC/100ml at 95% of samples				
Action		Describe		Cost (£k)
A. Engineering Solutions		Provision of storm tanks at Otterton STW		500
B. Beach Management		Number times implemented	Cost per time (£)	Total (£k)
		None		0
		Total (Net Present Value at 6% discount rate)		
<b>2 proposed Standard</b> 400 EC/100ml at 90% of samples				
200 IE/100ml at 90% of samples				
Action		Describe		Cost (£k)
A. Engineering Solutions		Provision of secondary treatment and storm tanks at Otterton STW. Provision of secondary treatment at Sidmouth		12500
B. Beach Management		Number times implemented	Cost per time (£)	Total (£k)
Resampling		8	250	2
Surveys on the impact of contaminant sources (Sidmouth and Otterton discharges).				25
		Total (Net Present Value at 6% discount rate)		
<b>3 proposed standard</b> 100 EC/100ml at 90% of samples				
50 IE/100ml at 90% of samples				
Action		Describe		Cost (£k)
A. Engineering Solutions		Provision of secondary treatment and UV treatment at Otterton STW. Provision of storm storage at Otterton STW (<1 spill/bathing season). Provision of secondary treatment and UV treatment at Sidmouth. Storm overflow improvements at Sidmouth including DAS and modelling.		17500
B. Beach Management		Number times implemented	Cost per time (£)	Total (£k)
Resampling		15	250	3.75
Surveys on the impact of contaminant sources (continuous and storm discharges from Sidmouth and Otterton STW).				35
		Total (Net Present Value at 6% discount rate)		
<b>NOTES</b>				
None of the cost estimates for the engineering solutions include the capital and operating costs of engineering schemes fully completed before 2000. All cost estimates are approximate. Operating costs have not been specifically defined for the defined improvements. However they are estimated from the available information relating to the present trial to equate to approximately 2 - 5% of the capital cost per year.				

**SECTION 4**  
**KINGSAND BEACH**





**Figure 4.1 Location Map  
BW Trials 2000 - Kingsand Beach**



0 0.5 1 Kilometres



- Bathing Water Sampling Point
- Point Source Discharge



**ENVIRONMENT  
AGENCY**











## KINGSAND BEACH

### Pathway and Necessary Conditions

The bathing water and principal discharges in the vicinity of Kingsand Beach are identified on the accompanying map (Figure 4.1). There are 4 outfalls discharging from Kingsand and Cawsand serving a total population equivalent of 730. The main potential sources of contamination are the two crude discharges from Kingsand, one to the north of the bathing water (PE 330,  $177\text{m}^3/\text{day}$ ) and the other to the south (PE 670,  $363\text{m}^3/\text{day}$ ). The southern discharge serves the larger estimated population and also carries the small stream which rises about 1 km to the West north west of Kingsand village. The two discharges lie either side of the bathing water and owing to their proximity can impact directly on the bathing water under a variety of conditions. The two crude discharges in Cawsand which discharge about 100m (PE 185,  $82\text{m}^3/\text{day}$ ) and 200m (PE 250,  $111\text{m}^3/\text{day}$ ) to the south also impact on the bathing water particularly during south to south easterly winds. However, the estimated populations served by these discharges are less than those of the Kingsand discharges. In addition, the southern outfall at Cawsand carries a small stream which rises about 1 km to the west of Cawsand.

In terms of the risk assessment for the 3 standards it is not possible to differentiate the potential impact of the four crude discharges, although in terms of proximity and size the most significant is the Kingsand south discharge. The relative significance of the streams, particularly the Kingsand Stream is also not clear as the surface water is combined with the foul system in both villages. The bacterial levels in the Kingsand Stream above the village are low and given the size of the catchment, agricultural inputs are thus considered not to be significant.

There are small ( $<5\text{ m}^3/\text{day}$ ) septic tanks discharges to Cawsand Bay both to the north and south of Kingsand, but the nearest is about 1 km distant to the SSE. As these discharges are small and distant from the bathing water their impact is considered to be negligible.

There are approximately 30 permanent yacht moorings in Cawsand Bay and visiting anchorage of up to 200 vessels. The potential impact arriving from yachts moored in Cawsand Bay is not known and it is not possible to discriminate the relative significance of this source from the available data. Given the rather diffuse and intermittent nature of this source, and the location of the moorings offshore from the bathing water, the potential risk has been assessed as negligible, low and medium for the three standards.

Finally, the background water quality in Cawsand Bay is affected by numerous potential sources to the Tamar estuary, the Inner Sound, and the Plym estuary including continuous discharges, intermittent discharges, rivers, streams and yachts. The significance of each of these 'background' inputs on the water quality is not known but is considered to be significantly less than the more local inputs which can impact directly.



[illegible]

<b>Compulsory Brief Profile</b>	
<b>General information</b>	
Name of beach and bathing water:	Kingsand Beach, Cawsand Bay, Plymouth Sound, S. Devon
Location (Grid Reference):	243570E, 50500N (SX43575050)
Limits of bathing area: length/width/gradient	200m / 50m
Type of bathing water: river/lake/estuarine/marine/open/confined/natural/artificial	Outer Estuary
Type of beach area: sandy/rocky/pebbles/grassy/other	Sandy, some rock, gravel
Beach/bathing water usage: swimming/sailsports/motorsports/other	Swimming, Sailing, Diving
Estimate of peak usage (eg bank holiday):	200
Character of surrounding area: urban/residential/industrial/agricultural/dunes/marsh	Rural Urban
(more than 1 category can be used) river mouth/hills&mountains/grassland/others	
<b>Characteristics of bathing water</b>	
Average water temperature:	15-16 Celsius
Prevailing wind direction:	SW
Residual current direction:	Variable
River flow (mean/Q95/Q5):	Kingsand Stream;
Tidal amplitude: Standard Port	Mean ranges at Plymouth (Devonport) - Springs 4.7m, Neaps 2.2m
Secondary Port/Local Amplitude and Phase Differences	
Distance between mean high and low water:	100m (from Admiralty Chart 1967)
<b>Administration</b>	
Beach manager or contact person in case of pollution incident:	Mr Ian Berry, Acting Park Manager
Phone:	01752 822236
Address:	Mount Edgcumbe House
	Mount Edgcumbe Country Park
	Torpoint
	Cornwall
	PL10 1HZ

Template 1: Historical Water Quality - Kingsand Beach

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
1998	1	05-May-98	112	20	0.95	19	40	0.9	36
	2	09-May-98	42	20		19	< 10		
	3	18-May-98	1170	480		456	260		234
	4	26-May-98	40	20		19	10		9
	5	04-Jun-98	230	144		137	150		135
	6	13-Jun-98	2560	480		456	220		198
	7	18-Jun-98	760	603		573	60		54
	8	23-Jun-98	3000	464		441	60		54
	9	02-Jul-98	800	450		428	30		27
	10	12-Jul-98	2240	1800		1710	390		351
	11	17-Jul-98	120	110		105	60		54
	12	27-Jul-98	720	330		314	50		45
	13	01-Aug-98	224	80		76	40		36
	14	10-Aug-98	6800	2480		2356	640		576
	15	21-Aug-98	360	203		193	70		63
	16	26-Aug-98	10	< 10			< 10		
	17	01-Sep-98	470	256		243	20		18
	18	09-Sep-98	875	585		556	20		18
	19	19-Sep-98	21400	7600		7220	3500		3150
	20	25-Sep-98	12800	8600		8170	1090		981
1999	1	01-May-99	5800	2430		2309	160		144
	2	13-May-99	32,000	18500		17575	1320		1188
	3	19-May-99	522	387		368	500		450
	4	25-May-99	9400	6930		6584	4000		3600
	5	31-May-99	8550	7440		7068	760		684
	6	06-Jun-99	440	270		257	80		72
	7	11-Jun-99	200	180		171	70		63
	8	16-Jun-99	43	10		10	30		27
	9	28-Jun-99	99	71		67	50		45
	10	04-Jul-99	432	324		308	40		36
	11	10-Jul-99	9720	7800		7410	10300		9270
	12	16-Jul-99	41	60		57	60		54
	13	22-Jul-99	950	414		393	200		180
	14	02-Aug-99	2700	350		333	700		630
	15	11-Aug-99	17500	6080		5776	3400		3060
	16	28-Aug-99	9460	2753		2615	4600		4140
	17	03-Sep-99	120	70		67	30		27
	18	09-Sep-99	26000	14000		13300	10000		9000
	19	15-Sep-99	20700	12500		11875	4800		4320
	20	22-Sep-99	20000	16100		15295	3100		2790
			7	13	(opt 1)	20		(opt 1)	16
					(opt 2)	31		(opt 2)	27
			17.50	32.50	(opt1)	50.00		(opt 1)	40.00
					(opt2)	77.50		(opt 2)	67.50

TEMPLATE 2 Faecal Contamination Risk Assessment for the 3 standards - Kingsand Beach						
Potential Source	Location	Description of Source	Pathway and Necessary Conditions	Risk Rating 10000 TC 2000 FC	Risk Rating 400 EC 200 IE	Risk Rating 100 EC 50IE
<b>Continuous Wastewater Discharges</b>						
Four wastewater treatment works outfall		Cawsands Outfall (South Rock) Cawsand ECBW Crude effluent		High	High	High
		Cawsand South O'F S edge of Cawsand ECBW Crude Effluent		High	High	High
		Kingsand South O'F Kingsand ECBW Crude effluent		High	High	High
		Kingsand North O'F Kingsand ECBW Crude effluent		High	High	High
industrial discharge						
unsewered discharge						
<b>Intermittent Wastewater Discharges</b>						
industrial discharge						
combined sewer overflow						
stormwater overflow						
emergency overflow						
<b>River or Stream Discharge</b>						
		Stream Cawsand ECBW (discharges through Cawsand South Outfall)				
		Stream Kingsand ECBW (discharges through Kingsand South Outfall)				
<b>Groundwater Discharge</b>						
Diffuse contamination from associated catchments						
Agriculture						
<b>Other Local Developments or Inputs</b>						
ships and/or boats		30 yacht moorings, ca. 200 visiting yachts				
ports and/or marinas						
leisure development (eg caravan parks, restaurants etc.)						
aquaculture						
others... (specify)						
<b>Bathers</b>						
Animals: dogs, birds, donkeys, cows, etc.)						
<b>Historic contamination of sediments</b>						
Other sources...(specify)						
Overall Risk Rating:				High	High	High

TEMPLATE 3 In Season Actions - Kingsand

1 Existing Standard	10,000 TC/100ml at 95% of samples 2,000 FC/100ml at 95% of samples
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Sample	Date	Time BST	Time of high tide (Plymouth) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note		
				TC	FC	FS	Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)				
							(per 100ml)			Wind Direction	Wind Speed	Rain (Present)	Cloud Cover				Hours of Sunshine		Sea State	Weather Today
1	20-May-00	1040	746	<	10		10	<	10	270	2	1	7		0	1	34.3	8.05	13.8	
2	26-May-00	1715	1139		5150		2240		310	270	3	2	6		3	3	33.6	8.1	12.5	Action 1.I
3	01-Jun-00	900	529		2240		785		350	225	4	2	8		3	3	32.4	8.05	12.2	
4	02-Jun-00	1050	619		1680		936		145	270	3	2	8	1.2	1	2	34.8	8.05	13	
5	05-Jun-00	915	847		10	<	10		82	315	2	1	1		2	3	34.6	8.05	12.5	
6	07-Jun-00	1410	1028		125		10		10	135	2	1	1		1	3	34	8.1	14.6	
7	13-Jun-00	1005	1627		124		73		36	225	1	2	8		2	4	34.6	8.1	14.5	
8	16-Jun-00	1050	611	>	20000		8480		2400	90	3	1	0		1	3	33.6	8.1	14.5	Actions 2.I, 2.S, and 2.M/L
9	19-Jun-00	1340	2013		6200		1125		620	270	3	1	8	4	1	4			15.2	
10	21-Jun-00	1345	910		2600		760		182	225	3	1	6		1	4	34.9	8.1	16.1	
11	26-Jun-00	1110	1309		145		47		181	45	0		1		0	4	33.9	8.15	17.1	
12	03-Jul-00	1150	745		2240		1540		530	180	4	2	5		3	4			17.6	
13	04-Jul-00	1635	2053		1009		530		118	225	3	2	6		1	4	34.8	8.2	18.2	
14	05-Jul-00	905	929		234		176		790	225	2	1	4	4.5	1	4			17	
15	10-Jul-00	950	1353		380		200		82	225	4	1	6		1	4	34.7	8.15	16.1	
16	14-Jul-00	900	502		27		10	<	10	315	3	1	6		1	3	34.9	8.1	14.4	
17	17-Jul-00	1417	1921		807		800		154		2	1	1		1	3	34.5	8.25	15.5	
18	18-Jul-00	1430	1959		290		82		65	270	1	1	2	12.8	0	5	34.7	8.2	20	
19	21-Jul-00	950	933		216		27		73	180	0	1	0		0	5	34.7	8.15	16.9	
20	23-Jul-00	1210	1043		932		204		100		3	1	7		1	4	34.8	8.1	15.9	
21	24-Jul-00	1210	1129		280		64	<	10	45	2	1	7	1	0	4			15.9	
22	25-Jul-00	1310	1227		472		368		220	225	2	2	6		0	4	34.7	8.15	18.4	
23	28-Jul-00	1410	1609		513		130		340	225	2	2	6		0	4	34.7	8.15	18.4	
24	29-Jul-00	900	444		45		27		18	270	3	2	4		1	4	35	8.1	17	



TEMPLATE 3 In Season Actions - Kingsand

2 proposed Standard	400 EC/100ml at 90% of samples 200 IE/100ml at 90% of samples
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Sample	Date	Time BST	Time of high tide (Plymouth) BST	Microbiology					Environmental Parameters										Beach Management when exceedance of standards see attached note	
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)				
							(per 100ml)	Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State				Weather Today			
1	20-May-00	1040	746	<	10	<	10			270	2	1	7		0	1	34.3	8.05	13.8	
2	25-May-00	1715	1139		2240*		279			270	3	2	6		3	3	33.6	8.1	12.5	Action 1.I
3	01-Jun-00	900	529		785		350			225	4	2	8		3	3	32.4	8.05	12.2	Action 2.I
4	02-Jun-00	1050	619		936		116			270	3	2	8	1.2	1	2	34.8	8.05	13	Actions 2.I and 2.S
5	05-Jun-00	915	847	<	10		82			315	2	1	1		2	3	34.6	8.05	12.5	
6	07-Jun-00	1410	1028		10		10			135	2	1	1		1	3	34	8.1	14.6	
7	13-Jun-00	1005	1627		73		36			225	1	2	8		2	4	34.6	8.1	14.5	
8	16-Jun-00	1050	611		8480		1680			90	3	1	0		1	3	33.6	8.1	14.5	Actions 2.I and 2.S
9	19-Jun-00	1340	2013		625		620			270	3	1	8	4	1	4			15.2	Actions 2.I and 2.S
10	21-Jun-00	1345	910		760		146			225	3	1	6		1	4	34.9	8.1	16.1	Actions 2.I and 2.S
11	26-Jun-00	1110	1309		35		181			45	0		1		0	4	33.9	8.15	17.1	
12	03-Jul-00	1150	745		1540		530			180	4	2	5		3	4			17.6	Actions 2.I and 2.S
13	04-Jul-00	1635	2053		424		118			225	3	2	6		1	4	34.8	8.2	18.2	Actions 2.I and 2.S
14	05-Jul-00	905	929		176		790			225	2	1	4	4.5	1	4			17	Actions 2.I and 2.S
15	10-Jul-00	950	1353		200		36			225	4	1	6		1	4	34.7	8.15	16.1	
16	14-Jul-00	900	502		10	<	10			315	3	1	6		1	3	34.9	8.1	14.4	
17	17-Jul-00	1417	1921		800		154				2	1	1		1	3	34.5	8.25	15.5	Actions 2.I and 2.S
18	18-Jul-00	1430	1959		82		65			270	1	1	2	12.8	0	5	34.7	8.2	20	
19	21-Jul-00	950	933		27		37			180	0	1	0		0	5	34.7	8.15	16.9	
20	23-Jul-00	1210	1043		204		100				3	1	7		1	4	34.8	8.1	15.9	
21	24-Jul-00	1210	1129		55	<	10			45	2	1	7	1	0	4			15.9	
22	25-Jul-00	1310	1227		368*		220			225	2	2	6		0	4	34.7	8.15	18.4	Actions 2.I and 2.S
23	28-Jul-00	1410	1609		130		272			225	2	2	6		0	4	34.7	8.15	18.4	Actions 2.I, 2.S, and 2.M/L
24	29-Jul-00	900	444		27					270	3	2	4		1	4	35	8.1	17	

\* EC sample not analysed so result for FC based on 1:1 conversion

TEMPLATE 3 In Season Actions - Kingsand

3 proposed standard 100 EC/100ml at 90% of samples  
50 IE/100ml at 90% of samples

Sample	Date	Time BST	Time of high tide (Plymouth) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)		
							(per 100ml)	Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State				Weather Today	
1	20-May-00	1040	746	< 10	< 10			270	2	1	7		0	1	34.3	8.05	13.8	
2	26-May-00	1715	1139	2240*	279			270	3	2	6		3	3	33.6	8.1	12.5	Action 1.I
3	01-Jun-00	900	529	785	350			225	4	2	8		3	3	32.4	8.05	12.2	Action 2.I
4	02-Jun-00	1050	619	936	116			270	3	2	8	1.2	1	2	34.8	8.05	13	Actions 2.I and 2.S
5	05-Jun-00	915	847	< 10	82			315	2	1	1		2	3	34.6	8.05	12.5	Actions 2.I and 2.S
6	07-Jun-00	1410	1028	10	10			135	2	1	1		1	3	34	8.1	14.6	
7	13-Jun-00	1005	1627	73	36			225	1	2	8		2	4	34.6	8.1	14.5	
8	16-Jun-00	1050	611	8480	1680			90	3	1	0		1	3	33.6	8.1	14.5	Actions 2.I and 2.S
9	19-Jun-00	1340	2013	625	620			270	3	1	8	4	1	4			15.2	Actions 2.I and 2.S
10	21-Jun-00	1345	910	760	146			225	3	1	6		1	4	34.9	8.1	16.1	Actions 2.I and 2.S
11	26-Jun-00	1110	1309	35	181			45	0		1		0	4	33.9	8.15	17.1	Actions 2.I and 2.S
12	03-Jul-00	1150	745	1540	530			180	4	2	5		3	4			17.6	Actions 2.I and 2.S
13	04-Jul-00	1635	2053	424	118			225	3	2	6		1	4	34.8	8.2	18.2	Actions 2.I and 2.S
14	05-Jul-00	905	929	176	790			225	2	1	4	4.5	1	4			17	Actions 2.I and 2.S
15	10-Jul-00	950	1353	200	36			225	4	1	6		1	4	34.7	8.15	16.1	Actions 2.I and 2.S
16	14-Jul-00	900	502	10	< 10			315	3	1	6		1	3	34.9	8.1	14.4	
17	17-Jul-00	1417	1921	800	154				2	1	1		1	3	34.5	8.25	15.5	Actions 2.I and 2.S
18	18-Jul-00	1430	1959	82	65			270	1	1	2	12.8	0	5	34.7	8.2	20	Actions 2.I and 2.S
19	21-Jul-00	950	933	27	37			180	0	1	0		0	5	34.7	8.15	16.9	
20	23-Jul-00	1210	1043	204	100				3	1	7		1	4	34.8	8.1	15.9	Actions 2.I and 2.S
21	24-Jul-00	1210	1129	55	< 10			45	2	1	7	1	0	4			15.9	
22	25-Jul-00	1310	1227	368*	220			225	2	2	6		0	4	34.7	8.15	18.4	Actions 2.I and 2.S
23	28-Jul-00	1410	1609	130	272			225	2	2	6		0	4	34.7	8.15	18.4	Actions 2.I, 2.S, and 2.M/L
24	29-Jul-00	900	444	27				270	3	2	4		1	4	35	8.1	17	

\* EC sample not analysed so result for FC based on 1:1 conversion

## BEACH MANAGEMENT ACTIONS

Three different levels of beach management actions have been defined in relation to three categories of bathing water quality impact. These actions apply to each of the three standards defined in the Trial:

### 1. In Season Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 1.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, and Beach Manager;
- Re-sample of bathing water;
- Initial investigation of cause of contamination, eg. assessment of rainfall data, storm overflow operation, tidal conditions;
- Inform beach users through posting of results.

### 2. Repeat Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 2.1 Immediate Actions:

- As for Category 1:

#### 2.S Short-term Actions (instigated as a consequence of 2 mandatory standard exceedances, or 3 intermediate/expert standard exceedances) :

- Systematic investigations to assess the impact from significant point source discharges (both continuous and intermittent) and from streams/ rivers including the inputs to them.

#### 2.M/L Medium/ Long-term Actions:

Based on the outcome of investigations, and if any immediate remedial action does not resolve the water quality problem.

- Implementation of sewage treatment improvement programmes;
- Pollution prevention campaigns in stream/ river catchments.

### 3. Emergency Incidents Affecting Bathing Water Quality (eg. PS breakdown, STW failure, rupture of farm slurry storage tank)

#### 3.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, Beach Manager, Environment Agency;

Depending on the nature of the emergency incident, additional actions could involve:

- Beach clean-up operations;
- Erection of warning signs or barriers;
- Total or partial beach closure.

## KEY TO ENVIRONMENTAL PARAMETER CODES

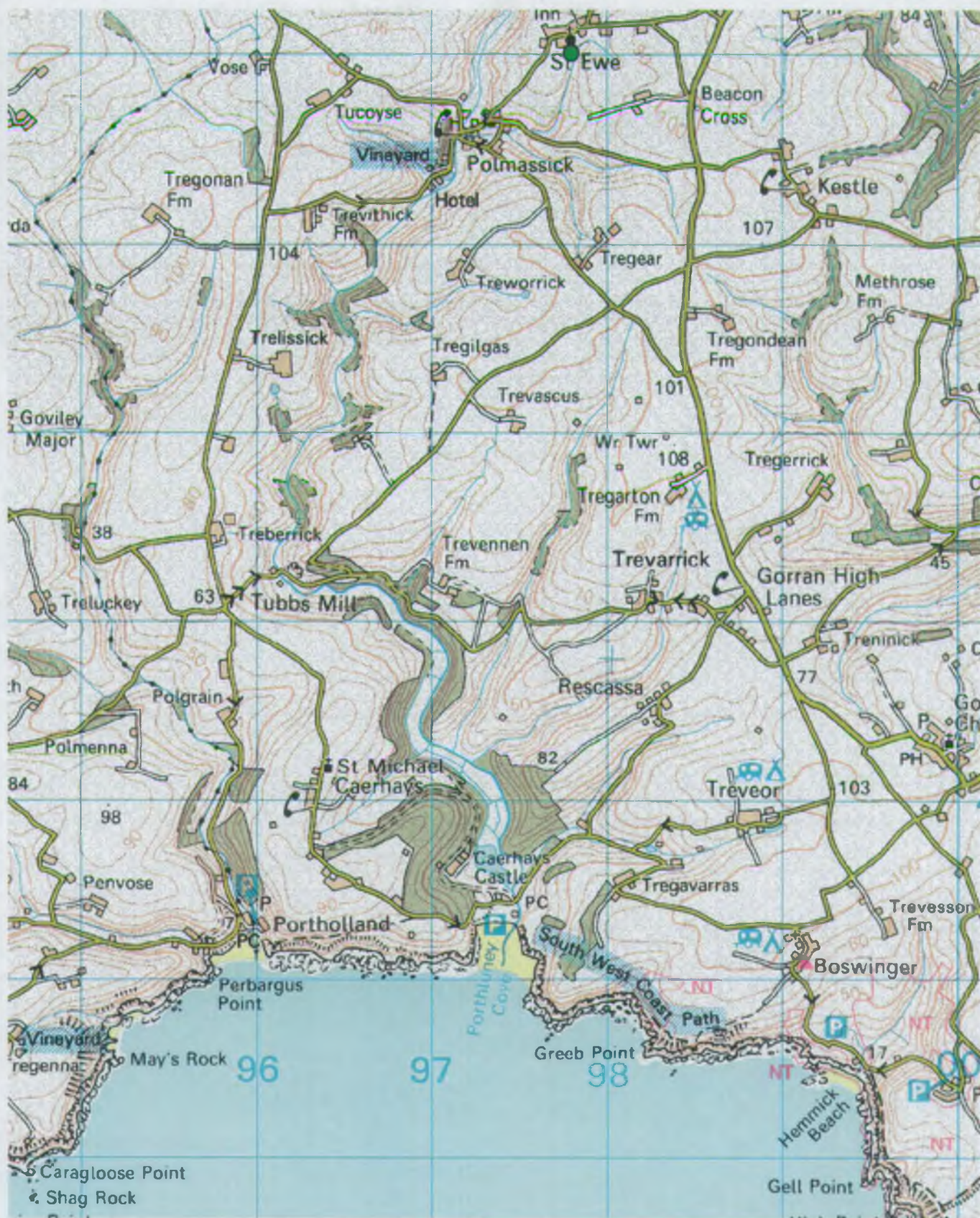
DESCRIPTION	RESULT	INTERPRETATION
<b>Rain (Present)</b>	1	Dry
	2	Showery
	3	Occasional Rain
	4	Light Rain
	5	Rain
	6	Heavy Rain In Last 24 hrs
<b>Cloud Cover</b>	0	Clear Sky
	1	1/8 Cloud Cover
	2	1/4 Cloud Cover
	3	3/8 Cloud Cover
	4	1/2 Cloud Cover
	5	5/8 Cloud Cover
	6	3/4 Cloud Cover
	7	7/8 Cloud Cover
	8	8/8 Cloud Cover
<b>Wind Speed (Beaufort Scale)</b>	0	Calm
	1	Light Air
	2	Light Breeze
	3	Gentle Breeze
	4	Moderate Breeze
	5	Fresh Breeze
	6	Strong Breeze
<b>Sea State</b>	0	Calm - Glassy
	1	Calm 0-10cm Crest to Trough
	2	Smooth Wavelets 10-50cm
	3	Light-Waves 0.5-1.25m
	4	Moderate 1.25-2m White Horses
	5	Rough Waves 2.5-5m
	6	Very Rough Waves 4-6m
<b>Weather Today</b>	1	Very Cold
	2	Cold
	3	Mild
	4	Warm
	5	Hot
	6	Very Hot

TEMPLATE 4 Indicative Costs of actions when exceedance of the standard at Kingsand Beach				
<b>1 Existing Standard</b> 10,000 TC/100ml at 95% of samples				
2,000 FC/100ml at 95% of samples				
Action		Describe		Cost (£k)
A. Engineering Solutions		Transfer flows to Millbrook STW and provide storm storage (<3 spills/bathing season).		2500
B. Beach Management		Number times implemented	Cost per time (£)	Total (£k)
Resampling		2	250	0.5
Surveys on the impact of local contaminant sources (sewage discharges and streams).				10
		Total (Net Present Value at 6% discount rate)		
<b>2 proposed Standard</b> 400 EC/100ml at 90% of samples				
200 IE/100ml at 90% of samples				
Action		Describe		Cost (£k)
A. Engineering Solutions		Transfer flows to Millbrook STW and provide storm storage (<3 spills/bathing season).		2500
B. Beach Management		Number times implemented	Cost per time (£)	Total (£k)
Resampling		12	250	3
Surveys on the impact of local contaminant sources (sewage discharges and streams).				10
		Total (Net Present Value at 6% discount rate)		
<b>3 proposed standard</b> 100 EC/100ml at 90% of samples				
50 IE/100ml at 90% of samples				
Action		Describe		Cost (£k)
A. Engineering Solutions		Transfer flows to Millbrook STW and provide storm storage (<1 spill/bathing season). Reduction in background levels in Plymouth Sound, with removal of crude discharges and provision of secondary treatment and UV disinfection, and storm storage (<3 spills/bathing season). Control on yachts and provision of waste reception facilities.		70000
B. Beach Management		Number times implemented	Cost per time (£)	Total (£k)
Resampling		17	250	4.25
Surveys on the impact of local contaminant sources, and also survey work in relation to impact of Plymouth discharges to the background levels in Plymouth Sound.				350
		Total (Net Present Value at 6% discount rate)		
<b>NOTES</b>				
None of the cost estimates for the engineering solutions include the capital and operating costs of engineering schemes fully completed before 2000. All cost estimates are approximate. Operating costs have not been specifically defined for the defined improvements. However they are estimated from the available information relating to the present trial to equate to approximately 2 - 5% of the capital cost per year.				



**SECTION 5**  
**PORTHLUNEY BEACH**





**Figure 5.1 Location Map  
BW Trials 2000 - Porthluney**



0 1 Kilometres

- Bathing Water Sampling Point
- Point Source Discharge



**ENVIRONMENT  
AGENCY**

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Environment Agency GD 03177G Map produced: 4th May 2000.

















## **PORTHLUNEY**

### **Pathway and Necessary Conditions**

The bathing water and surrounding catchment is identified on the accompanying map (Figure 5.1). The bathing water is impacted by the Caerhays stream and the inputs to it. The catchment is mainly agricultural, with few direct discharges, therefore, the contamination is predominantly agricultural and diffuse. Contamination of the bathing water is considered to be predominantly wet weather related, however, no relationship between rainfall/ river flow and bathing water quality has been quantified to date.

Agricultural activity in the Caerhays catchment is predominantly dairy farming with a total of approximately 30 working farms with an estimated cattle population of 3000. Pollution prevention and control exercises were carried out in 1988 and 1991/2 resulting in remedial action being undertaken by some farms identified as potentially causing a problem. These included construction of barrier ditches, settlement tanks and general improvements to farm waste management practices.

The only water company STW in the catchment is at St Ewe (PE <250), which discharges secondary treated effluent to a tributary of the Caerhays stream approximately 6 km from the bathing water. The impact of effluent from St. Ewe on bathing water quality is considered to be negligible. There are septic tank discharges from camping/ caravan sites, and numerous private septic tanks/ soakaways throughout the catchment. Work is being undertaken to assess the impact of certain discharges close to the bathing water eg. the toilet block in the car park behind the bathing water which discharges to a soakaway, and Caerhays Castle which drains to a lake.

The Caerhays catchment has been selected for an R & D project on the impact of diffuse agricultural pollution on bathing water quality. All farms in the catchment are currently being visited as part of a pollution prevention campaign. A catchment inventory is also being undertaken on all potential sources to the streams in the catchment.

### **Report References**

1. Caerhays River - (Porthluney Beach) Task Force Report, NRA Cornwall Area, May 1992.
2. Porthluney (Caerhays) Bathing Water Failures, Environment Agency (Cornwall Area), April 2000

SUMMARY OF COMPLIANCE WITH TRIALS STANDARDS USING HISTORICAL BATHING WATER DATA - PORTHLUNEY BEACH												
		Using EU Conversion Factors				Using Pessimistic Conversion Factors						
	Year	Count	Mandatory (95% of samples)		Intermediate (90% of samples)		Expert (90% of samples)		Intermediate (90% of samples)		Expert (90% of samples)	
			TC 10000	FC 2000	EC 400	IE 200	EC 100	IE 50	EC 400	IE 200	EC 100	IE 50
NO. OF EXCEEDANCES	1995	20	0	1	3	4	8	8	3	5	12	8
	1996	20	0	0	1	0	4	5	1	1	7	7
	1997	20	0	0	5	3	8	8	6	3	10	9
	1998	20	1	3	3	3	6	6	3	4	7	6
	1999	20	1	2	4	2	6	4	4	2	8	4
TOTALS	95'-99'	100	2	6	16	12	32	31	17	15	44	34
RISK RATING	95'-99'	100	Medium	High	High	High	High	High	High	High	High	High
NO. OF FAILURES (0=PASS, 1=FAIL)	1995	20	0	0	1	1	1	1	1	1	1	1
	1996	20	0	0	0	0	1	1	0	0	1	1
	1997	20	0	0	1	1	1	1	1	1	1	1
	1998	20	0	1	1	1	1	1	1	1	1	1
	1999	20	0	1	1	0	1	1	1	0	1	1
TOTALS	95'-99'	100	0	2	4	3	5	5	4	3	5	5



<b>Compulsory Brief Profile</b>	
<b>General information</b>	
Name of beach and bathing water:	Porthluney Beach, Porthluney Cove, Veryan Bay, S. Cornwall
Location (Grid Reference):	197340E, 41290N (SW97344129)
Limits of bathing area: length/width/gradient	320m / 220m / Gradient 1:70
Type of bathing water: river/lake/estuarine/marine/open/confined/natural/artificial	Open Marine
Type of beach area: sandy/rocky/pebbles/grassy/other	Predominantly sandy, some rock
Beach/bathing water usage: swimming/sailsports/motorsports/other	Swimming
Estimate of peak usage (eg bank holiday):	700
Character of surrounding area: urban/residential/industrial/agricultural/dunes/marsh (more than 1 category can be used) river mouth/hills&mountains/grassland/others	Agricultural
<b>Characteristics of bathing water</b>	
Average water temperature:	15-16 Celsius
Prevailing wind direction:	SW
Residual current direction:	Variable
River flow (mean/Q95/Q5):	Caerhays Stream: Mean 0.55cumecs, Q95 0.11cumecs
Tidal amplitude: Standard Port	Mean ranges at Plymouth (Devonport) - Springs 4.7m, Neaps 2.2m
Secondary Port/Local Amplitude and Phase Differences	Mevagissey - Springs 4.7m, Neaps 2.3m
Distance between mean high and low water:	280m (from Admiralty Chart 154)
<b>Administration</b>	
Beach manager or contact person in case of pollution incident:	Mr John Trudgeon, Estate Manager
Phone:	01872 501310
Address:	Caerhays Estate Office
	Caerhays Castle
	Gorran
	Cornwall



Template 1: Historical Water Quality - Porthluney Beach

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
1995	1	02-May-95	20	50	0.93	47	10	0.91	9
	2	13-May-95	400	390		363	10		9
	3	19-May-95	670	400		372	90		82
	4	28-May-95	120	126		117	30		27
	5	05-Jun-95	800 <	10			50		46
	6	14-Jun-95	40	20		19	10		9
	7	22-Jun-95	90	40		37 <	10		
	8	28-Jun-95	20	10		9 <	10		
	9	09-Jul-95	360	240		223	10		9
	10	14-Jul-95	960	820		763	210		191
	11	23-Jul-95	144	110		102	20		18
	12	29-Jul-95	270	144		134	150		137
	13	07-Aug-95	10	10		9 <	10		
	14	17-Aug-95	186	128		119	180		164
	15	22-Aug-95	50	30		28 <	10		
	16	30-Aug-95	80	20		19	10		9
	17	07-Sep-95	3000	2070		1925	5000		4550
	18	18-Sep-95	340	230		214	310		282
	19	23-Sep-95	405	180		167	300		273
	20	27-Sep-95	2800	1360		1265	1780		1620
1996	1	01-May-96	168	190		177	100		91
	2	10-May-96 <	10 <	10			< 10		
	3	18-May-96	70	60		56	40		36
	4	30-May-96	108	60		56	10		9
	5	02-Jun-96	180	90		84 <	10		
	6	09-Jun-96	108	128		119 <	10		
	7	17-Jun-96	400	90		84 <	10		
	8	22-Jun-96	30	10		9 <	10		
	9	01-Jul-96	360	300		279	170		155
	10	10-Jul-96	348	340		316	60		55
	11	18-Jul-96	40 <	10			< 10		
	12	27-Jul-96	10 <	10			< 10		
	13	01-Aug-96	200	91		85	60		55
	14	11-Aug-96	90	60		56	10		9
	15	20-Aug-96	40 <	10			< 10		
	16	30-Aug-96	1560	1360		1265	250		228
	17	10-Sep-96	340	70		65	40		36
	18	16-Sep-96	110	150		140	160		146
	19	24-Sep-96	135	117		109	20		18
	20	30-Sep-96	108 <	10			90		82
1997	1	07-May-97	234	144		134	110		100
	2	12-May-97	30	30		28 <	10		
	3	18-May-97	1,200	1070		995	90		82
	4	28-May-97	100	90		84	10		9
	5	03-Jun-97	860	750		698	170		155
	6	12-Jun-97	150	110		102	40		36
	7	20-Jun-97	2700	1000		930	1070		974
	8	28-Jun-97	20	20		19 <	10		
	9	06-Jul-97	40	10		9	40		36
	10	15-Jul-97	600	17		16	70		64
	11	21-Jul-97	43	70		65 <	10		
	12	31-Jul-97	690	600		558	70		64
	13	08-Aug-97	70	50		47 <	10		
	14	16-Aug-97	30	30		28	10		9
	15	22-Aug-97	280	198		184	30		27
	16	30-Aug-97	3,600	1560		1451	650		592
	17	08-Sep-97	315	200		186	60		55
	18	13-Sep-97	1370	1210		1125	430		391
	19	22-Sep-97	30	50		47 <	10		
	20	30-Sep-97	70	20		19 <	10		
1998	1	06-May-98	216	140		130	40		36

Template 1: Historical Water Quality - Porthluney Beach

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
	2	15-May-98	264	189		176	70		64
	3	20-May-98	162	80		74	10		9
	4	30-May-98	< 10	< 10			< 10		
	5	07-Jun-98	1062	396		368	260		237
	6	11-Jun-98	< 10	10		9	< 10		
	7	17-Jun-98	470	216		201	110		100
	8	25-Jun-98	10	< 10			30		27
	9	01-Jul-98	< 10	< 10			< 10		
	10	15-Jul-98	30	20		19	< 10		
	11	19-Jul-98	232	99		92	40		36
	12	24-Jul-98	30	30		28	< 10		
	13	07-Aug-98	50	40		37	< 10		
	14	15-Aug-98	84	10		9	< 10		
	15	20-Aug-98	50	53		49	10		9
	16	27-Aug-98	50	10		9	50		46
	17	04-Sep-98	11200	4506		4191	1060		965
	18	08-Sep-98	2800	2500		2325	340		309
	19	17-Sep-98	20	< 10			10		9
	20	26-Sep-98	9000	6480		6026	2400		2184
1999	1	03-May-99	672	230		214	50		46
	2	08-May-99	272	135		126	10		9
	3	14-May-99	168	25		23	< 10		
	4	26-May-99	20	< 10			< 10		
	5	01-Jun-99	< 10	10		9	< 10		
	6	07-Jun-99	30	51		47	20		18
	7	13-Jun-99	608	400		372	40		36
	8	17-Jun-99	10	< 10			< 10		
	9	23-Jun-99	62	80		74	10		9
	10	05-Jul-99	135	70		65	50		46
	11	12-Jul-99	153	90		84	50		46
	12	17-Jul-99	61	60		56	20		18
	13	23-Jul-99	210	105		98	50		46
	14	28-Jul-99	10	10		9	10		9
	15	04-Aug-99	110	20		19	30		27
	16	12-Aug-99	2340	1230		1144	200		182
	17	21-Aug-99	60	30		28	< 10		
	18	29-Aug-99	2500	740		688	200		182
	19	10-Sep-99	6600	7600		7068	1430		1301
	20	16-Sep-99	> 20000	> 20000			12800		11648
			2	6	(opt 1)	16		(opt 1)	14
					(opt 2)	42		(opt 2)	34
			2.00	6.00	(opt1)	16.00		(opt 1)	14
					(opt2)	42.00		(opt 2)	34

TEMPLATE 2 Faecal Contamination Risk Assessment for the 3 standards - Porthluney Beach						
Potential Source	Location	Description of Source	Pathway and Necessary Conditions	Risk Rating 10000 TC 2000 FC	Risk Rating 400 EC 200 IE	Risk Rating 100 EC 50IE
<b>Continuous Wastewater Discharges</b>						
wastewater treatment works		SWW St Ewe STW (secondary treatment, PE <250) discharging to a tributary of the Caerhays Stream		Negligible	Negligible	Negligible
				Negligible	Negligible	Negligible
industrial discharge	None					
unsewered discharge						
<b>Intermittent Wastewater Discharges</b>						
industrial discharge	None					
combined sewer overflow	None					
stormwater overflow	None					
emergency overflow	None					
<b>River or Stream Discharge</b>						
		Caerhays Stream		High	High	High
<b>Groundwater Discharge</b>						
	None					
<b>Diffuse contamination from associated catchments</b>						
Agriculture	Various	Dairy farms - see attached notes				
<b>Other Local Developments or Inputs</b>						
ships and/or boats	None					
ports and/or marinas	None					
leisure development (eg caravan parks, restaurants etc.)		Camping sites in catchment - see attached notes.				
aquaculture	None					
others... (specify)						
<b>Bathers</b>						
Animals: dogs, birds, donkeys, cows, etc.)		500-1000 sheep				
<b>Historic contamination of sediments</b>						
Other sources...(specify)						
			Overall Risk Rating:	High	High	High

TEMPLATE 3 In Season Actions - Porthluney

1 Existing Standard	10,000 TC/100ml at 95% of samples 2,000 FC/100ml at 95% of samples
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Sample	Date	Time BST	Time of high tide (Plymouth) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note		
				TC	FC	FS	Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)				
							(per 100ml)			Wind Direction	Wind Speed	Rain (Present)	Cloud Cover				Hours of Sunshine		Sea State	Weather Today
1	28-May-00	1555	1408		12000		350		1600	180	3	2	5	12.3	2	2	32.8	8	13.1	Action 1.i
2	02-Jun-00	1245	619		10		27		18	270	4	2	8	1.2	1	2	35	8.05	12.2	
3	03-Jun-00	1035	708		27		18		18	315	1	4	8		1	3	34.8	8.05	11.9	
4	05-Jun-00	1050	847		1064		36	<	10	315	2	1	5		2	3	35.1	8	12.5	
5	09-Jun-00	1155	1227		10	<	10	<	10	270	4	2	8	1.8	2	3	34.9	8.1	12.4	
6	15-Jun-00	1130	1753		27		18		18	270	3	1	8		2	4	34.2	8.1	13.5	
7	16-Jun-00	1250	611	<	10	<	10	<	10	90	4	1	8		1	3	35.1	8.1	14.2	
8	19-Jun-00	1510	2013	<	10	<	10	<	10	270	3	1	8	4	2	4			16.5	
9	22-Jun-00	1320	946		18		18	<	10	225	4	2	8		3	4	34.6	8.05	14.5	
10	28-Jun-00	1115	1531	<	10	<	10	<	10	125	3	1	2		3	5	34.7	8.15	16.2	
11	03-Jul-00	1320	745	<	10	<	10	<	10	125	4	2	7		2	4	34.7	8.15	16.9	
12	05-Jul-00	905	929		432		310		55	225	2	1	5	4.5	1	4			16.1	
13	12-Jul-00	1050	1549		54		10		27	225	4	1	8	2.6	2	4	34.4	8.1	14.7	
14	17-Jul-00	1000	1921		18		10		18	0	0	1	4		1	4	34.6	8.1	16	
15	18-Jul-00	1625	1959		182		18	<	10	180	2	1	3	13.7	2	5	32.2	8.2	19.7	
16	21-Jul-00	1200	933		18		18	<	10	0	0	1	0		0	5	34.9	8.1	18	
17	24-Jul-00	1125	1129		36		27	<	10	50	1	1	5	1.1	2	5	34	8.1	17.8	
18	25-Jul-00	1535	1227		73		37		18	45	1	2	3	2.5	1	5			19.3	
19	27-Jul-00	1720	1456		5000		2900		660	180	4	2	7	8	3	4	31.1	8.1	17.8	Action 1.i
20	28-Jul-00	1435	1609		1036		684		164	225	1	2	4		1	4	33.1	8.15	18	

TEMPLATE 3 In Season Actions - Porthluney

2 proposed Standard      400 EC/100ml at 90% of samples  
200 IE/100ml at 90% of samples

Sample	Date	Time BST	Time of high tide (Plymouth) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note		
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)				
							Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State	Weather Today							
1	28-May-00	1555	1408		105		1600			180	3	2	5	12.3	2	2	32.8	8	13.1	Action 1.i
2	02-Jun-00	1245	619		27		18			270	4	2	8	1.2	1	2	35	8.05	12.2	
3	03-Jun-00	1035	708		18		18			315	1	4	8		1	3	34.8	8.05	11.9	
4	05-Jun-00	1050	847		36	<	10			315	2	1	5		2	3	35.1	8	12.5	
5	09-Jun-00	1155	1227	<	10	<	10			270	4	2	8	1.8	2	3	34.9	8.1	12.4	
6	15-Jun-00	1130	1753		18		18			270	3	1	8		2	4	34.2	8.1	13.5	
7	16-Jun-00	1250	611	<	10	<	10			90	4	1	8		1	3	35.1	8.1	14.2	
8	19-Jun-00	1510	2013	<	10	<	10			270	3	1	8	4	2	4			16.5	
9	22-Jun-00	1320	946		18	<	10			225	4	2	8		3	4	34.6	8.05	14.5	
10	28-Jun-00	1115	1531	<	10	<	10			125	3	1	2		3	5	34.7	8.15	16.2	
11	03-Jul-00	1320	745	<	10	<	10			125	4	2	7		2	4	34.7	8.15	16.9	
12	05-Jul-00	905	929		279		37			225	2	1	5	4.5	1	4			16.1	
13	12-Jul-00	1050	1549		10		27			225	4	1	8	2.6	2	4	34.4	8.1	14.7	
14	17-Jul-00	1000	1921		10		18			0	0	1	4		1	4	34.6	8.1	16	
15	18-Jul-00	1625	1959		18	<	10			180	2	1	3	13.7	2	5	32.2	8.2	19.7	
16	21-Jul-00	1200	933		18	<	10			0	0	1	0		0	5	34.9	8.1	18	
17	24-Jul-00	1125	1129		27	<	10			50	1	1	5	1.1	2	5	34	8.1	17.8	
18	25-Jul-00	1535	1227		28		18			45	1	2	3	2.5	1	5			19.3	
19	27-Jul-00	1720	1456		2900		660*			180	4	2	7	8	3	4	31.1	8.1	17.8	Action 2.i
20	28-Jul-00	1435	1609		684		82			225	1	2	4		1	4	33.1	8.15	18	Action 2.i

\* - no result for IE therefore used presumptive FS value



TEMPLATE 3 In Season Actions - Porthluney

3 proposed standard 100 EC/100ml at 90% of samples  
50 IE/100ml at 90% of samples

Sample	Date	Time BST	Time of high tide (Plymouth) BST	Microbiology				Environmental Parameters										Beach Management when exceedance of standards - see attached note	
				EC	IE		Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)			
							(per 100ml)	Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State				Weather Today		
1	28-May-00	1555	1408		105		1600		180	3	2	5	12.3	2	2	32.8	8	13.1	Action 1.I
2	02-Jun-00	1245	619		27		18		270	4	2	8	1.2	1	2	35	8.05	12.2	
3	03-Jun-00	1035	708		18		18		315	1	4	8		1	3	34.8	8.05	11.9	
4	05-Jun-00	1050	847		36	<	10		315	2	1	5		2	3	35.1	8	12.5	
5	09-Jun-00	1155	1227	<	10	<	10		270	4	2	8	1.8	2	3	34.9	8.1	12.4	
6	15-Jun-00	1130	1753		18		18		270	3	1	8		2	4	34.2	8.1	13.5	
7	16-Jun-00	1250	611	<	10	<	10		90	4	1	8		1	3	35.1	8.1	14.2	
8	19-Jun-00	1510	2013	<	10	<	10		270	3	1	8	4	2	4			16.5	
9	22-Jun-00	1320	946		18	<	10		225	4	2	8		3	4	34.6	8.05	14.5	
10	28-Jun-00	1115	1531	<	10	<	10		125	3	1	2		3	5	34.7	8.15	16.2	
11	03-Jul-00	1320	745	<	10	<	10		125	4	2	7		2	4	34.7	8.15	16.9	
12	05-Jul-00	905	929		279		37		225	2	1	5	4.5	1	4			16.1	Action 2.I
13	12-Jul-00	1050	1549		10		27		225	4	1	8	2.6	2	4	34.4	8.1	14.7	
14	17-Jul-00	1000	1921		10		18		0	0	1	4		1	4	34.6	8.1	16	
15	18-Jul-00	1625	1959		18	<	10		180	2	1	3	13.7	2	5	32.2	8.2	19.7	
16	21-Jul-00	1200	933		18	<	10		0	0	1	0		0	5	34.9	8.1	18	
17	24-Jul-00	1125	1129		27	<	10		50	1	1	5	1.1	2	5	34	8.1	17.8	
18	25-Jul-00	1535	1227		28		18		45	1	2	3	2.5	1	5			19.3	
19	27-Jul-00	1720	1456		2900		660*		180	4	2	7	8	3	4	31.1	8.1	17.8	Actions 2.I, and 2.S
20	28-Jul-00	1435	1609		684		82		225	1	2	4		1	4	33.1	8.15	18	Actions 2.I, 2.S, and 2.M/L

\* - no result for IE therefore used presumptive FS value

## BEACH MANAGEMENT ACTIONS

Three different levels of beach management actions have been defined in relation to three categories of bathing water quality impact. These actions apply to each of the three standards defined in the Trial.

### 1. In Season Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 1.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, and Beach Manager;
- Re-sample of bathing water;
- Initial investigation of cause of contamination, eg. assessment of rainfall data, storm overflow operation, tidal conditions;
- Inform beach users through posting of results.

### 2. Repeat Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 2.1 Immediate Actions:

- As for Category 1.

#### 2.S Short-term Actions (instigated as a consequence of 2 mandatory standard exceedances, or 3 intermediate/expert standard exceedances):

- Systematic investigations to assess the impact from significant point source discharges (both continuous and intermittent) and from streams/ rivers including the inputs to them.

#### 2.M/L Medium/ Long-term Actions:

Based on the outcome of investigations, and if any immediate remedial action does not resolve the water quality problem.

- Implementation of sewage treatment improvement programmes;
- Pollution prevention campaigns in stream/ river catchments.

### 3. Emergency Incidents Affecting Bathing Water Quality (eg. PS breakdown, STW failure, rupture of farm slurry storage tank)

#### 3.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, Beach Manager, Environment Agency;

Depending on the nature of the emergency incident, additional actions could involve:

- Beach clean-up operations;
- Erection of warning signs or barriers;
- Total or partial beach closure.

## KEY TO ENVIRONMENTAL PARAMETER CODES

DESCRIPTION	RESULT	INTERPRETATION
<b>Rain (Present)</b>	1	Dry
	2	Showery
	3	Occasional Rain
	4	Light Rain
	5	Rain
	6	Heavy Rain In Last 24 hrs
<b>Cloud Cover</b>	0	Clear Sky
	1	1/8 Cloud Cover
	2	1/4 Cloud Cover
	3	3/8 Cloud Cover
	4	1/2 Cloud Cover
	5	5/8 Cloud Cover
	6	3/4 Cloud Cover
	7	7/8 Cloud Cover
	8	8/8 Cloud Cover
<b>Wind Speed (Beaufort Scale)</b>	0	Calm
	1	Light Air
	2	Light Breeze
	3	Gentle Breeze
	4	Moderate Breeze
	5	Fresh Breeze
	6	Strong Breeze
<b>Sea State</b>	0	Calm - Glassy
	1	Calm 0-10cm Crest to Trough
	2	Smooth Wavelets 10-50cm
	3	Light-Waves 0.5-1.25m
	4	Moderate 1.25-2m White Horses
	5	Rough Waves 2.5-5m
	6	Very Rough Waves 4-6m
<b>Weather Today</b>	1	Very Cold
	2	Cold
	3	Mild
	4	Warm
	5	Hot
	6	Very Hot

**TEMPLATE 4 Indicative Costs of actions when exceedance of the standard at Porthluney Beach**

The proposed long-term actions at Porthluney are at present only indicative and under development, as the assessment of the major sources of contaminants to the stream catchment is in progress. Both 'soft' and 'hard' engineering solutions are given as possible example solutions, but require considerable further evaluation in relation to feasibility and cost/benefit. The scale and cost of the solutions may be under-estimates. The assessment of potential short-term beach management actions which are practical and manageable also requires further investigations and surveys, and discussion within the beach management team.

**1 Existing Standard** 10,000 TC/100ml at 95% of samples  
12,000 FC/100ml at 95% of samples

Action	Describe	Cost (£k)
<b>A. Engineering Solutions</b>		
'Soft Engineering'	Buffer strips/ fencing off cattle (20% of catchment = 18km). Offline drinking facilities at 5 farms. Improved farm management practices (10 farms). Septic tank improvements. Improvements to highway drainage.	500
OR 'Hard Engineering'	Piping of Caerhays stream 1000m offshore.	1500
<b>B. Beach Management</b>		
Resampling	2	250
Surveys on contamination levels in the stream and assessment of major sources in the catchment. Pollution prevention and control work and assessment of impact of farm management practices on bacterial levels in the streams.		100
Total (Net Present Value at 6% discount rate)		

**2 proposed Standard** 400 EC/100ml at 90% of samples  
200 IE/100ml at 90% of samples

Action	Describe	Cost (£k)
<b>A. Engineering Solutions</b>		
'Soft Engineering'	Buffer strips/ fencing off cattle (40% of catchment = 36km). Offline drinking facilities at 10 farms. Improved farm management practices (15 farms). Septic tank improvements. Improvements to highway drainage.	800
OR 'Hard Engineering'	Piping of Caerhays stream 1500m offshore.	2000
<b>B. Beach Management</b>		
Resampling	3	250
Surveys on contamination levels in the stream and assessment of major sources in the catchment. Pollution prevention and control work and assessment of impact of farm management practices on bacterial levels in the streams.		125
Total (Net Present Value at 6% discount rate)		

**3 proposed standard** 100 EC/100ml at 90% of samples  
50 IE/100ml at 90% of samples

Action	Describe	Cost (£k)
<b>A. Engineering Solutions</b>		
'Soft Engineering'	Buffer strips/ fencing off cattle (80% of catchment = 72km). Offline drinking facilities at 20 farms. Improved farm management practices (20 farms). Septic tank improvements. Improvements to highway drainage. First Time Rural Sewerage for Polmassick, Treveor and Treverrick.	1750
OR 'Hard Engineering'	Piping of Caerhays stream 2000m offshore.	2500
<b>B. Beach Management</b>		
Resampling	4	250
Surveys on contamination levels in the stream and assessment of major sources in the catchment. Pollution prevention and control work and assessment of impact of farm management practices on bacterial levels in the streams.		150
Total (Net Present Value at 6% discount rate)		

**NOTES**

None of the cost estimates for the engineering solutions include the capital and operating costs of engineering schemes fully completed before 2000. All cost estimates are approximate. Operating costs have not been specifically defined for the defined improvements. However they are estimated from the available information relating to the present trial to equate to approximately 2 - 5% of the capital cost per year.

**SECTION 6**  
**FISTRAL BEACH**





**Figure 6.1 Location Map  
BW Trials 2000 - Fistril, Newquay**



0

0.5 Kilometres



Bathing Water Sampling Point



Point Source Discharge



**ENVIRONMENT  
AGENCY**













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## **FISTRAL BEACH - NEWQUAY**

### **Pathway and Necessary Conditions**

The bathing water and principal discharges in the vicinity of Fistral Bay are identified on the accompanying map (Figure 6.1). The main source that may occasionally affect the bathing water is the discharge from the Towan Head outfall (SW 8008 6297), which discharged crude, screened effluent prior to the 2000 bathing season. The outfall was consented in July 2000 to discharge biologically treated and UV disinfected effluent (PE 73,000). Results from the water quality monitoring reflect these improvements.

There have been various studies on the circulation of the waters in Fistral and Newquay Bays and the impact of the Towan Head discharge (see table of references attached). Essentially the effluent from the Towan Head discharge is transported south on the ebb offshore from Fistral Beach, but can become entrained within the waters of the Bay during the early ebb, or during the subsequent flood tide. However, dilution of the effluent is generally sufficient to reduce the bacterial numbers below mandatory and frequently guideline standards of the Bathing Water Directive. On the flood tide the effluent is transported north into Newquay Bay.

The two small private discharges at the southern end of Fistral Bay approximately 1 km to the west of the beach may impact on the bathing water during the north going flood tide, but any impact is considered to be very small.

The intermittent discharge from Yellowsands CSO may similarly impact on the flood tide at the southern end of bathing water, and may be significant following prolonged operation during heavy rainfall. The monitoring data in 1999 from the Yellowsands outfall showed that the outfall operated whenever there was significant rainfall. This was not surprising since the outfall serves as a surface water discharge as well as the pumping station overflow. Following water company improvement early in 2000, the average spill frequency of the CSO (obtained from sewer modelling) is 2 to 3 spills during the Bathing season. Results from the water quality monitoring reflect these improvements.

There are toilet and shower facilities at the northern end of Fistral Beach by the car park. These drain to the main sewerage. There is dog ban on the beach during the bathing season (May to September).

Another potential source of faecal contamination is the River Gannel which enters coastal waters to the south of Pentire Point East, approximately 2km from Fistral Beach. The ebb outflow from the river after mixing with the coastal waters may become entrained into the bathing waters during the flood tide. However, because of the nature of this source and the dilution afforded before reaching the bathing waters, the impact of this source is considered to be small.

The water quality monitoring results from the 2000 bathing water trial show an improvement when compared with results from 1999 monitoring programme, which may be attributed to the waste water treatment improvements made at Towan Head outfall and Yellowsands CSO.

# NEWQUAY REPORTS HELD BY THE ENVIRONMENT AGENCY

TITLE	AUTHOR	STATUS	DATE
Use airborne Sensing, Bctrl Spore Tracing&Drogue Trackng-dispersn Marine Outfalls	University of Southampton	Final	May-92
Newquay Environmental Impact Assessment No RPEZ5240	Wimpey Environmental	Final	Mar-93
Newquay Environmental Impact Assessment - Contract RPEZ 5240	Wimpey Environmental	Final	Mar-93
Newquay Drainage Area Study - Verification Report	South West Water	Draft Final	Sep-93
Bacterial Quality of Bathing Waters at Crantock & River Gannel - TWU/93/32	EA TWG	Final	Jan-94
Newquay Drainage Area Study	South West Water	Final	Aug-95
SWW HNDA Newquay index	SWWSL (AWS)	Final	Feb-96
N Cornwall HNDA CS 1996 Newquay	Southern Science	Final	Oct-96
Newquay HNDA pollutant loading survey-winter/summer 1996	Southern Science	Final	Nov-96
Newquay WWTW Scheme Sewerage Model Check	SouthWest Water	Draft	Nov-97
Newquay Sewage Treatment Scheme - Hydraulic Model Verification Supplementary Reverification Report	Pell Frischmann	Initial Issue	Jul-98
Newquay Sewage Treatment Scheme - Engineering Summary Report	SouthWest Water	Final	Aug-98
Newquay Sewage Treatment Scheme - Environmental Summary Report	SouthWest Water	Final	Dec-98

SUMMARY OF COMPLIANCE WITH TRIALS STANDARDS USING HISTORICAL BATHING WATER DATA - FISTRAL BEACH NEWQUAY												
	Year	Count			Using EU Conversion Factors				Using Pessimistic Conversion Factors			
			Mandatory (95% of samples)		Intermediate (90% of samples)		Expert (90% of samples)		Intermediate (90% of samples)		Expert (90% of samples)	
			TC 10000	FC 2000	EC 400	IE 200	EC 100	IE 50	EC 400	IE 200	EC 100	IE 50
NO. OF EXCEEDANCES	1995	20	0	0	2	0	3	3	3	0	3	3
	1996	20	0	0	0	0	2	0	0	0	2	0
	1997	20	0	0	0	0	1	1	0	0	2	1
	1998	20	0	0	1	0	3	1	2	0	5	2
	1999	20	0	0	0	0	2	0	0	0	3	0
TOTALS	95'-99'	100	0	0	3	0	11	5	5	0	15	6
RISK RATING	95'-99'	100	Negligible	Negligible	Medium	Negligible	High	High	High	Negligible	High	High
NO. OF FAILURES (0=PASS, 1=FAIL)	1995	20	0	0	0	0	1	1	1	0	1	1
	1996	20	0	0	0	0	0	0	0	0	0	0
	1997	20	0	0	0	0	0	0	0	0	0	0
	1998	20	0	0	0	0	1	0	0	0	1	0
	1999	20	0	0	0	0	0	0	0	0	1	0
TOTALS	95'-99'	100	0	0	0	0	2	1	1	0	3	1

<b>Compulsory Brief Profile</b>	
<b>General information</b>	
Name of beach and bathing water:	Fistral Beach, Fistral Bay, Newquay, N. Cornwall
Location (Grid Reference):	179980E, 62130N (SW79986213)
Limits of bathing area: length/width/gradient	1100m / 300m / 1:50 Gradient
Type of bathing water: river/lake/estuarine/marine/open/confined/natural/artificial	Open Marine
Type of beach area: sandy/rocky/pebbles/grassy/other	Sandy, Rocky
Beach/bathing water usage: swimming/sailsports/motorsports/other	Swimming, Surfing
Estimate of peak usage (eg bank holiday):	3000
Character of surrounding area: urban/residential/industrial/agricultural/dunes/marsh	Urban, Dunes
(more than 1 category can be used) river mouth/hills&mountains/grassland/others	
<b>Characteristics of bathing water</b>	
Average water temperature:	15-16 Celsius
Prevailing wind direction:	SW
Residual current direction:	Variable, depends on offshore and near shore circulation and wind direction
River flow (mean/Q95/Q5):	N/A
Tidal amplitude: Standard Port	Mean ranges at Milford Haven - Springs 6.3m, Neaps 2.7m
Secondary Port/Local Amplitude and Phase Differences	Newquay - Springs 6.4m, Neaps 2.8m
Distance between mean high and low water:	340m (from Admiralty Chart 1168)
<b>Administration</b>	
Beach manager or contact person in case of pollution incident:	Mr Graham Martin
Phone:	01726 223566
Address:	Environmental Health
	Restormel Borough Council
	Penwinnick Road
	St Austell
	Cornwall
	PL25 5DR



Template 1: Historical Water Quality - Fistril Beach Newquay

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
1995	1	04-May-95	40	30	1	30	< 1	1	
	2	12-May-95	< 1	< 1			< 1		
	3	21-May-95	< 10	< 10			< 10		
	4	30-May-95	20	10		10	< 10		
	5	08-Jun-95	30	20		20	30		30
	6	13-Jun-95	< 10	< 10			< 10		
	7	19-Jun-95	< 10	< 10			< 10		
	8	24-Jun-95	20	10		10	10		10
	9	05-Jul-95	120	< 10			< 10		
	10	11-Jul-95	< 10	10		10	< 10		
	11	17-Jul-95	< 10	10		10	20		20
	12	28-Jul-95	77	20		20	40		40
	13	05-Aug-95	500	410		410	90		90
	14	09-Aug-95	140	20		20	10		10
	15	18-Aug-95	< 10	30		30	< 10		
	16	24-Aug-95	70	50		50	< 10		
	17	03-Sep-95	1200	1000		1000	130		130
	18	12-Sep-95	< 10	< 10			< 10		
	19	20-Sep-95	180	50		50	< 10		
	20	24-Sep-95	3060	2000		2000	160		160
1996	1	05-May-96	< 10	< 10			< 10		
	2	11-May-96	10	< 10			< 10		
	3	17-May-96	190	40		40	20		20
	4	26-May-96	30	10		10	< 10		
	5	03-Jun-96	110	20		20	< 10		
	6	11-Jun-96	126	30		30	< 10		
	7	19-Jun-96	10	< 10			< 10		
	8	27-Jun-96	< 10	< 10			< 10		
	9	08-Jul-96	< 10	< 10			10		10
	10	17-Jul-96	< 10	< 10			10		10
	11	24-Jul-96	< 10	< 10			< 10		
	12	30-Jul-96	40	10		10	10		10
	13	06-Aug-96	1060	400		400	40		40
	14	15-Aug-96	10	< 10			< 10		
	15	24-Aug-96	20	20		20	< 10		
	16	30-Aug-96	50	30		30	30		30
	17	05-Sep-96	< 10	< 10			< 10		
	18	13-Sep-96	10	10		10	< 10		
	19	21-Sep-96	480	232		232	10		10
	20	25-Sep-96	147	50		50	< 10		
1997	1	06-May-97	350	216		216	20		20
	2	11-May-97	< 10	< 10			< 10		
	3	17-May-97	< 10	< 10			< 10		
	4	23-May-97	< 10	< 10			< 10		
	5	01-Jun-97	< 10	< 10			< 10		
	6	09-Jun-97	< 10	< 10			< 10		
	7	18-Jun-97	< 10	< 10			< 10		
	8	26-Jun-97	80	28		28	10		10
	9	04-Jul-97	10	< 10			< 10		
	10	10-Jul-97	< 10	< 10			< 10		
	11	19-Jul-97	< 10	< 10			< 10		
	12	25-Jul-97	< 10	< 10			< 10		
	13	04-Aug-97	108	20		20	< 10		
	14	13-Aug-97	40	30		30	< 10		
	15	19-Aug-97	140	20		20	20		20
	16	28-Aug-97	96	20		20	< 10		
	17	07-Sep-97	336	104		104	110		110

Template 1: Historical Water Quality - Fistral Beach Newquay

Year	sample	date	TC/100ml	FC/100ml	conv.fact.	EC/100ml	FS/100ml	conv.fact.	IE/100ml
	18	14-Sep-97	70	< 10			< 10		
	19	19-Sep-97	60	70		70	40		40
	20	23-Sep-97	< 10	< 10			10		10
1998	1	01-May-98	< 10	< 10			< 10		
	2	12-May-98	10	< 10			< 10		
	3	23-May-98	< 10	< 10			< 10		
	4	27-May-98	920	558		558	30		30
	5	03-Jun-98	50	20		20	20		20
	6	08-Jun-98	72	60		60	30		30
	7	21-Jun-98	< 10	< 10			< 10		
	8	29-Jun-98	< 10	< 10			< 10		
	9	07-Jul-98	250	108		108	< 10		
	10	16-Jul-98	34	10		10	30		30
	11	22-Jul-98	10	< 10			< 10		
	12	26-Jul-98	10	< 10			< 10		
	13	04-Aug-98	10	20		20	20		20
	14	12-Aug-98	< 10	< 10			< 10		
	15	17-Aug-98	20	< 10			< 10		
	16	30-Aug-98	10	10		10	20		20
	17	07-Sep-98	2940	1292		1292	150		150
	18	14-Sep-98	400	273		273	< 10		
	19	21-Sep-98	128	120		120	60		60
	20	27-Sep-98	189	60		60	< 10		
1999	1	05-May-99	< 10	10		10	< 10		
	2	11-May-99	60	< 10			< 10		
	3	17-May-99	< 10	< 10			< 10		
	4	22-May-99	30	< 10			10		10
	5	28-May-99	30	10		10	20		20
	6	03-Jun-99	147	112		112	40		40
	7	15-Jun-99	20	< 10			< 10		
	8	21-Jun-99	34	20		20	10		10
	9	26-Jun-99	< 10	< 10			< 10		
	10	02-Jul-99	240	77		77	10		10
	11	07-Jul-99	30	10		10	40		40
	12	14-Jul-99	33	20		20	< 10		
	13	20-Jul-99	42	< 10			< 10		
	14	31-Jul-99	104	20		20	20		20
	15	08-Aug-99	53	30		30	10		10
	16	19-Aug-99	180	96		96	< 10		
	17	25-Aug-99	330	192		192	20		20
	18	01-Sep-99	112	41		41	30		30
	19	07-Sep-99	60	20		20	< 10		
	20	13-Sep-99	448	180		180	40		40
			0	0	(opt 1)	5		(opt 1)	0
					(opt 2)	15		(opt 2)	6
			0.00	0.00	(opt1)	5.00		(opt 1)	0
					(opt2)	15.00		(opt 2)	6

**TEMPLATE 2 Faecal Contamination Risk Assessment for the 3 standards - Fistril Beach, Newquay**

Potential Source	Location	Description of Source	Pathway and Necessary Conditions	Risk Rating 10000 TC 2000 FC	Risk Rating 400 EC 200 IE	Risk Rating 100 EC 50IE
<b>Continuous Wastewater Discharges</b>						
Towan Head outfall	SW 8008 6297	Secondary treatment with UV disinfection. Catchment PE 73000, DWF 4320m3/day.		Negligible	Negligible	Negligible
Storm Overflow from works	SW 8008 6297	5 spills / BS		Negligible	Negligible	Low
industrial discharge	None					
Two unsewered discharges	SW 7861 6155	Lewinnick Cove House, Biodisc (secondary treatment), discharge <5 m3/day	Possible impact of discharge on southern end of Fistril Beach. Considered to be very small.	Negligible	Negligible	Negligible
	SW 7848 6155	Lewinnick Lodge, Septic Tank to Soakaway, discharge <10 m3/day	Possible impact of discharge on southern end of Fistril Beach. Considered to be very small.	Negligible	Negligible	Negligible
<b>Intermittent Wastewater Discharges</b>						
Industrial discharge	None					
Yellowsands combined sewer overflow & surface water overflow	SW 7912 6173	6mm Screening. Catchment PE 52000, Pumping station telemetry operational	No known relationship between rainfall and water quality. Predicted average spill frequency for CSO- 3 spills per BS. The surface water overflow spills when there is rainfall.	Negligible	Medium	High
River or Stream Discharge		River Gannel which enters coastal waters to the south of Pentire Point East	Impact of this source is considered to be small.	Negligible	Negligible	Negligible?
Groundwater Discharge						
Diffuse contamination from associated catchments						
Agriculture	None					
<b>Other Local Developments or Inputs</b>						
ships and/or boats	None					
ports and/or marinas						
leisure development (eg caravan parks, restaurants etc.)						
aquaculture	None					
others... (specify)	None					
<b>Bathers</b>						
Animals: dogs, birds, donkeys, cows, etc.)			Dog ban during bathing season			
<b>Historic contamination of sediments</b>						
Other sources... (specify)						
			Overall Risk Rating:	Negligible	Medium	High

TEMPLATE 3 In Season Actions - Fistral

1 Existing Standard	10,000 TC/100ml at 95% of samples 2,000 FC/100ml at 95% of samples
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Sample	Date	Time BST	Time of high tide Milford Haven -60 mins) BST	Microbiology						Environmental Parameters										Beach Management when exceedance of standards - see attached note
				TC	FC	FS	Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)				
							(per 100ml)			Wind Direction	Wind Speed	Rain (Present)	Cloud Cover				Hours of Sunshine	Sea State	Weather Today	
1	24-May-00	1045	934	<	10	<	10	<	10	225	2	1	8	0.04	4	3	35.1	8.1	12.9	
2	30-May-00	1105	1542		18		10	<	10	45	2	2	7	2.4	3	3	35.1	8.05	12.5	
3	02-Jun-00	1430	1805	<	10	<	10	<	10	270	4	1	8	1.2	3	2	35.2	8.05	14.1	
4	05-Jun-00	1215	805	<	10	<	10	<	10	315	2	1	6		2	3	35	8	13.5	
5	06-Jun-00	930	854		18	<	10	<	10	270	5	1	5	7.3	4	3	35	8.1	13.5	
6	12-Jun-00	1540	1505	<	10	<	10	<	10	270	4	1	7	0.8	2	3	35.1	8.1	16.4	
7	16-Jun-00	1410	1805	<	10	<	10	<	10	225	4	1	2		2	3	35.2	8.1	15.2	
8	19-Jun-00	1625	1949	<	10	<	10	<	10	270	2	1	8	4	1	4			16.2	
9	26-Jun-00	1030	1249	<	10	<	10	<	10	0	2	1	2	14.6	3	3	35.3	8.05	16.4	
10	01-Jul-00	1225	1748		10	<	10	<	10	225	2	2	5		3	4	35.1	8.1	16.3	
11	05-Jul-00	900	843		93	<	10	<	10	225	1	2	4	4.5	1	4			17.7	
12	07-Jul-00	1030	1020	<	10	<	10	<	10	45	3	1	5	6	2	4	35.2	8.1	15.8	
13	14-Jul-00	1450	1707		10	<	10		340	0	4	2	3		4	3	35.2	8.05	16.3	
14	16-Jul-00	1130	606	<	10	<	10	<	10	0	3	1	2	10.4	3	4	35.3	8.1	17.1	
15	17-Jul-00	1530	1859		10	<	10		10					14.4			35.2	8.1		
16	20-Jul-00	1210	821	<	10	<	10	<	10	0	0	1	0		2	5	35.1	8.1	19.7	
17	21-Jul-00	1300	855		10	<	10	<	10	180	2	1	0		1	5	35.2	8.1	19.1	
18	22-Jul-00	928	931	<	10	<	10	<	10	45	3	1	1		1	4	35.2	8.1	16	
19	25-Jul-00	1450	1203	<	10		10	<	10	45	0	2	8	2.5	0	5	35	8.05		
20	26-Jul-00	1105	1316	<	10	<	10	<	10	45	0	1	4	2.8	3	5	35.2	8.1	17.4	
21	28-Jul-00	1600	1540		118		191		100	225	1	2	4		2	4	35.1	8.05	18.5	

TEMPLATE 3 In Season Actions - Fistral

2 proposed Standard	400 EC/100ml at 90% of samples
	200 IE/100ml at 90% of samples

Sample	Date	Time BST	Time of high tide Milford Haven -60 mins) BST	Microbiology					Environmental Parameters										Beach Management when exceedance of standards - see attached note	
				EC	IE			Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)			
					(per 100ml)			Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State	Weather Today						
1	24-May-00	1045	934	<	10	<	10			225	2	1	8	0.04	4	3	35.1	8.1	12.9	
2	30-May-00	1105	1542	<	0	<	10			45	2	2	7	2.4	3	3	35.1	8.05	12.5	
3	02-Jun-00	1430	1805	<	10	<	10			270	4	1	8	1.2	3	2	35.2	8.05	14.1	
4	05-Jun-00	1215	805	<	10	<	10			315	2	1	6		2	3	35	8	13.5	
5	06-Jun-00	930	854	<	10	<	10			270	5	1	5	7.3	4	3	35	8.1	13.5	
6	12-Jun-00	1540	1505	<	10	<	10			270	4	1	7	0.8	2	3	35.1	8.1	16.4	
7	16-Jun-00	1410	1805	<	10	<	10			225	4	1	2		2	3	35.2	8.1	15.2	
8	19-Jun-00	1625	1949	<	10	<	10			270	2	1	8	4	1	4			16.2	
9	26-Jun-00	1030	1249	<	10	<	10			0	2	1	2	14.6	3	3	35.3	8.05	16.4	
10	01-Jul-00	1225	1748	<	10	<	10			225	2	2	5		3	4	35.1	8.1	16.3	
11	05-Jul-00	900	843	<	10	<	10			225	1	2	4	4.5	1	4			17.7	
12	07-Jul-00	1030	1020	<	10	<	10			45	3	1	5	6	2	4	35.2	8.1	15.8	
13	14-Jul-00	1450	1707	<	10		340*			0	4	2	3		4	3	35.2	8.05	16.3	Action 1.1
14	16-Jul-00	1130	606	<	10	<	10			0	3	1	2	10.4	3	4	35.3	8.1	17.1	
15	17-Jul-00	1530	1859	<	10		10							14.4			35.2	8.1		
16	20-Jul-00	1210	821	<	10	<	10			0	0	1	0		2	5	35.1	8.1	19.7	
17	21-Jul-00	1300	855	<	10	<	10			180	2	1	0		1	5	35.2	8.1	19.1	
18	22-Jul-00	928	931	<	10	<	10			45	3	1	1		1	4	35.2	8.1	16	
19	25-Jul-00	1450	1203		10	<	10			45	0	2	8	2.5	0	5	35	8.05		
20	26-Jul-00	1105	1316	<	10	<	10			45	0	1	4	2.8	3	5	35.2	8.1	17.4	
21	28-Jul-00	1600	1540		191		50			225	1	2	4		2	4	35.1	8.05	18.5	

\* IE sample not analysed so result for FS based on 1:1 conversion



TEMPLATE 3 In Season Actions - Fistril

3 proposed standard	100 EC/100ml at 90% of samples 50 IE/100ml at 90% of samples
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Sample	Date	Time BST	Time of high tide Milford Haven -60 mins) BST	Microbiology					Environmental Parameters											Beach Management when exceedance of standards - see attached note
				EC	IE			Meteorological conditions on day of sampling (1)							Salinity for coast	pH	Water temp (°C)			
								Wind Direction	Wind Speed	Rain (Present)	Cloud Cover	Hours of Sunshine	Sea State	Weather Today						
				(per 100ml)																
1	24-May-00	1045	934	<	10	<	10			225	2	1	8	0.04	4	3	35.1	8.1	12.9	
2	30-May-00	1105	1542		0	<	10			45	2	2	7	2.4	3	3	35.1	8.05	12.5	
3	02-Jun-00	1430	1805	<	10	<	10			270	4	1	8	1.2	3	2	35.2	8.05	14.1	
4	05-Jun-00	1215	805	<	10	<	10			315	2	1	6		2	3	35	8	13.5	
5	06-Jun-00	930	854	<	10	<	10			270	5	1	5	7.3	4	3	35	8.1	13.5	
6	12-Jun-00	1540	1505	<	10	<	10			270	4	1	7	0.8	2	3	35.1	8.1	16.4	
7	16-Jun-00	1410	1805	<	10	<	10			225	4	1	2		2	3	35.2	8.1	15.2	
8	19-Jun-00	1625	1949	<	10	<	10			270	2	1	8	4	1	4			16.2	
9	26-Jun-00	1030	1249	<	10	<	10			0	2	1	2	14.6	3	3	35.3	8.05	16.4	
10	01-Jul-00	1225	1748	<	10	<	10			225	2	2	5		3	4	35.1	8.1	16.3	
11	05-Jul-00	900	843	<	10	<	10			225	1	2	4	4.5	1	4			17.7	
12	07-Jul-00	1030	1020	<	10	<	10			45	3	1	5	6	2	4	35.2	8.1	15.8	
13	14-Jul-00	1450	1707	<	10		340*			0	4	2	3		4	3	35.2	8.05	16.3	Action 1.1
14	16-Jul-00	1130	606	<	10	<	10			0	3	1	2	10.4	3	4	35.3	8.1	17.1	
15	17-Jul-00	1530	1859	<	10		10							14.4			35.2	8.1		
16	20-Jul-00	1210	821	<	10	<	10			0	0	1	0		2	5	35.1	8.1	19.7	
17	21-Jul-00	1300	855	<	10	<	10			180	2	1	0		1	5	35.2	8.1	19.1	
18	22-Jul-00	928	931	<	10	<	10			45	3	1	1		1	4	35.2	8.1	16	
19	25-Jul-00	1450	1203		10	<	10			45	0	2	8	2.5	0	5	35	8.05		
20	26-Jul-00	1105	1316	<	10	<	10			45	0	1	4	2.8	3	5	35.2	8.1	17.4	
21	28-Jul-00	1600	1540		191		50			225	1	2	4		2	4	35.1	8.05	18.5	Action 1.1

\* IE sample not analysed so result for FS based on 1:1 conversion

## BEACH MANAGEMENT ACTIONS

Three different levels of beach management actions have been defined in relation to three categories of bathing water quality impact. These actions apply to each of the three standards defined in the Trial.

### 1. In Season Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 1.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, and Beach Manager;
- Re-sample of bathing water;
- Initial investigation of cause of contamination, eg. assessment of rainfall data, storm overflow operation, tidal conditions;
- Inform beach users through posting of results.

### 2. Repeat Exceedance of the Bathing Water Quality Standard shown by Routine Monitoring Data

#### 2.1 Immediate Actions:

- As for Category 1.

#### 2.S Short-term Actions (instigated as a consequence of 2 mandatory standard exceedances, or 3 intermediate/expert standard exceedances) :

- Systematic investigations to assess the impact from significant point source discharges (both continuous and intermittent) and from streams/ rivers including the inputs to them.

#### 2.M/L Medium/ Long-term Actions:

Based on the outcome of investigations, and if any immediate remedial action does not resolve the water quality problem.

- Implementation of sewage treatment improvement programmes;
- Pollution prevention campaigns in stream/ river catchments.

### 3. Emergency Incidents Affecting Bathing Water Quality (eg. PS breakdown, STW failure, rupture of farm slurry storage tank)

#### 3.1 Immediate Actions:

- Notification of Environmental Health/ Local Authority, Water Service Company, Beach Manager, Environment Agency;

Depending on the nature of the emergency incident, additional actions could involve:

- Beach clean-up operations;
- Erection of warning signs or barriers;
- Total or partial beach closure.

## KEY TO ENVIRONMENTAL PARAMETER CODES

DESCRIPTION	RESULT	INTERPRETATION
<b>Rain (Present)</b>	1	Dry
	2	Showery
	3	Occasional Rain
	4	Light Rain
	5	Rain
	6	Heavy Rain In Last 24 hrs
<b>Cloud Cover</b>	0	Clear Sky
	1	1/8 Cloud Cover
	2	1/4 Cloud Cover
	3	3/8 Cloud Cover
	4	1/2 Cloud Cover
	5	5/8 Cloud Cover
	6	3/4 Cloud Cover
	7	7/8 Cloud Cover
	8	8/8 Cloud Cover
<b>Wind Speed (Beaufort Scale)</b>	0	Calm
	1	Light Air
	2	Light Breeze
	3	Gentle Breeze
	4	Moderate Breeze
	5	Fresh Breeze
	6	Strong Breeze
<b>Sea State</b>	0	Calm - Glassy
	1	Calm 0-10cm Crest to Trough
	2	Smooth Wavelets 10-50cm
	3	Light-Waves 0.5-1.25m
	4	Moderate 1.25-2m White Horses
	5	Rough Waves 2.5-5m
	6	Very Rough Waves 4-6m
<b>Weather Today</b>	1	Very Cold
	2	Cold
	3	Mild
	4	Warm
	5	Hot
	6	Very Hot

**TEMPLATE 4 Indicative Costs of actions when exceedance of the standard at Fistral Beach**

**1 Existing Standard** 10,000 TC/100ml at 95% of samples  
2,000 FC/100ml at 95% of samples

Action	Describe	Cost (£k)
A. Engineering Solutions	None	0
B. Beach Management	Number times implemented	Cost per time (£)
	None	0
Total (Net Present Value at 6% discount rate)		

**2 proposed Standard** 400 EC/100ml at 90% of samples  
200 IE/100ml at 90% of samples

Action	Describe	Cost (£k)
A. Engineering Solutions	Provision of secondary treatment at Newquay. Provision of storm storage at Yellowsands CSO (<3 spills/bathing season).	15000
B. Beach Management	Number times implemented	Cost per time (£)
Resampling	1	250
Total (Net Present Value at 6% discount rate)		0.25

**3 proposed standard** 100 EC/100ml at 90% of samples  
50 IE/100ml at 90% of samples

Action	Describe	Cost (£k)
A. Engineering Solutions	Provision of secondary treatment and UV treatment at Newquay. Provision of storm storage at Yellowsands CSO and for Towan Head storm discharge (<1 spill/bathing season).	18000
B. Beach Management	Number times implemented	Cost per time (£)
Resampling	2	250
Surveys on the impact of the Towan Head discharge and assessment of Yellowsands CSO.		150
Total (Net Present Value at 6% discount rate)		

**NOTES**

None of the cost estimates for the engineering solutions include the capital and operating costs of engineering schemes fully completed before 2000. All cost estimates are approximate. Operating costs have not been specifically defined for the defined improvements. However they are estimated from the available information relating to the present trial to equate to approximately 2 - 5% of the capital cost per year.

## **APPENDIX**

### **Summary of comments and issues on the beach management approach and its consequences**



## **SUMMARY OF COMMENTS AND ISSUES ON THE BEACH MANAGEMENT APPROACH AND ITS CONSEQUENCES**

Overall, the principle of a beach management team approach was favourably received, but the application of it in practice is not straightforward. The simple model of the beach management team outlined in the Trial Protocol, neglects private beach owners / managers, local political and commercial interests and other recreational users of the beach and nearshore waters. The accommodation of all these interested parties in any management team approach would need to be addressed in any future proposals. The potential number of beach management teams is large and this could present resourcing issues for several of the agencies identified in the Trial Protocol.

Bathing Waters form part of a broader management issue of the coastal zone for recreational and non-recreational use, and any management approach therefore needs to be considered within this broader context.

There was no apparent pressure to change existing microbiological standards. Any change from present standards and sampling methods is likely to cause public concern and misconceptions. Guidance was considered necessary on any standards defined to protect public health, and also on the potential action plans arising from the exceedance of these standards. In the absence of such guidance, it was thought that there would be inconsistencies in the action plans defined by different management teams and public health authorities.

Finally the legal framework of beaches and bathing water quality needs to be established. The jurisdiction of the different public agencies involved in bathing waters, and also that of beach and seashore owners or lessees needs to be clearly defined. In addition, the legal liability attached to this jurisdiction, together with that of those bodies or individuals controlling potential sources of microbiological contamination, are also aspects of the legal framework which need to be addressed.

### **Specific Issues / Comments Arising from Meetings with the Local Authorities and Sewerage Undertakers.**

The main issues or comments have been grouped into four main areas:

1. The Beach Management Team Approach
2. Beach Management Actions
3. Possible Standards
4. Legal Issues

#### **1. The Beach Management Team Approach**

- a) In principle it is thought to be a good idea.
- b) Liaison between agencies / bodies is important.
- c) Private beach owners / managers need to be included in any team.
- d) Local representatives, both political (e.g. local Chamber of Commerce, Hoteliers Association) need to be included in any team.
- e) Teams could potentially be very large, taking account of local representation.

- f) A proposal was put forward for two teams: a strategic team (meeting annually for example) including all relevant representatives and agencies making strategic decisions/ proposals; and an executive day-to-day working team making any decisions on actions arising from bathing water quality monitoring during the bathing season.
- g) The need for a team was questioned where the water quality is known to be very good.
- h) Potentially there could be a large number of beach management teams. There are therefore likely resource implications for Local Authorities, particularly Environmental Health Departments, the bathing water regulator (EA in England and Wales) and the sewerage undertakers.
- i) How does a beach management team approach for bathing waters fit into the broader context of Coastal Management, both for other recreational uses and for non-recreational uses (e.g. fishing and shipping)? Also would it be more effective to include the beach management team into existing coastal forums or management structures where these exist?

## 2. **Beach Management Actions**

- a) In relation to water quality, the attached list of proposed actions essentially reflects present procedures.
- b) Actions and procedures in response to pollution emergencies have been defined by the relevant agencies and are currently in use. Statutory powers are potentially available through notices in relation to public health.
- c) Monitoring data provide only a historic view of water quality. Any 'in season' actions based on these data are therefore reactionary to past events. The monitoring data provide useful information for developing longer-term action plans.
- d) Predictive knowledge of factors causing reduced water quality is available in certain instances e.g. for beaches where freshwater inputs are significant, particularly following rainfall. No definitive actions were put forward however in response to these known associations between reduced water quality and the impact of a potential contaminant source.
- e) The integration of bathing water usage into the wider context of beach and nearshore waters management needs to be made, for example bathing water zones and other usage zones are being defined for some beaches on the Dorset coast. However, it is not clear how the proposed zones relate to existing statutory monitoring points or whether any water quality aspects were considered in the definition of the zones.
- f) Guidance on potential actions is required in the context of a graduated response to instances and levels of reduced water quality, in order to obtain a consistent approach nationally.
- g) The management of diffuse and point sources of contamination and the drainage in catchments needs to be addressed by all relevant agencies, and consideration given to developing a consistent approach.
- h) For the more stringent standards proposed in the Trial Protocol, there are potentially considerable resource implications in the short and longer term for the bathing water regulator, local authorities, and sewerage undertakers.

- i) The medium/long-term solutions defined for each of the bathing waters in the trial are site-specific. The cost estimates for the solutions to achieve the 3 different standards are therefore also site-specific to each bathing water.

### 3. Possible Standards

- a) Guidance is required from public health experts on the standards defined in relation to the safety of public health. The levels of pathogenic viruses need to be addressed in the context of any such standards.
- b) Any changes to the present standards and the sampling frequency could lead to public concern and misunderstanding. A major educational exercise could be required to ensure that any new standards and sampling frequencies were understood.

### 4. Legal Issues

Various legal aspects / issues were raised in relation to jurisdictions and potential liabilities - of fundus owners, beach owners/managers, health authorities, local authorities, water companies, and bathing water regulators. This whole area needs to be clarified. Any management team approach may need to be given a statutory basis.

- a) Who has legal jurisdiction for the public health aspects of estuarine and nearshore coastal waters? Is it the Port Health Authority (if there is one), the Environmental Health Department of the Local Authority or the Local Health Authority? What jurisdiction does each of these bodies have?
- b) What legal responsibilities would be expected to lie within the proposed approach with the beach or fundus owner / manager, the bathing water regulator and the water companies?
- c) Is there a distinction in law between nearshore coastal waters below mean low water spring (MLWS) tide level and that between mean high water spring (MHWS) tide level, as ownership of the fundus may vary 'across' the beach from MLWS to above MHWS?
- d) With whom does potential legal liability lie in the following examples:
  - i) A beach is closed due to reduced water quality which may not be attributable to a particular source of contamination, and local commerce loses trade;
  - ii) Conversely if there is an outbreak of a serious illness associated with a beach which passes the water quality standards defined for the safety of public health.
- e) Does the proposed beach management approach increase the likelihood of litigation for compensation either for lost revenues by local commercial interests or for possible illness arising from reduced water quality?

## **General and Specific Issues / Comments Arising from Discussions with Private Beach Owners / Managers**

Four of the beaches in the South West are under private ownership/management: Durdle Door East (Dorset), Ladram Bay (Devon), Kingsand and Porthluney (Cornwall). The beach managers of all four beaches were contacted and their views sought on the beach management team approach. Detailed discussions were held with 2 of the private beach owners/managers (Ladram Bay and Porthluney).

In summary, the comments made by the private beach owners/managers reflected the general views arising from the discussions with the Local Authorities and sewerage undertakers. The beach management team approach was considered good in principle. However, its application raises potentially significant issues concerning legal liabilities and commercial viability, particularly as the sources of contamination are usually outside the control of the beach owner/manager. In addition, questions were raised on the possible statutory basis of the management team approach and management action plans, and how it would be ensured that the action plans were consistently applied by all teams, both nationally and internationally.

Other comments/issues raised include:

1. The requirement for emergency action plans is accepted.
2. Monitoring data only provide a historic view of bathing water quality, as the results are only available a day or more later. However they are important in assisting to define medium/long-term actions.
3. Spatial variation in bathing water quality across a beach can be significant, and more information should be available on this.
4. A clearer and more understandable method is needed to provide information to the public on the bathing water quality and risk factors associated with a bathing water.
5. Has a system of categorising different types of beach (eg. rural or urban) been considered? Could such a system also allow the differentiation of potential sources of contamination (eg. human or animal)?
6. Where diffuse agricultural sources of contamination are a major source of contamination of the bathing water, the cost of improvements in farm management practices to farmers is potentially large. A significant issue is how this cost can or should be met. A system of grants to reduce the cost burden to farmers was proposed.
7. Beach management covers a wide range of issues relating to all the different recreational users and usage of a beach and the adjacent waters. Bathing water quality forms only one aspect of the management of a beach, and needs to be integrated into this wider context. Where bathing water quality is known to be very good, is there a need for a beach management team?
8. The legal jurisdiction of private beach owners/lessees/managers and their potential liabilities in relation to bathing water quality need to be clearly established.