

ENVIRONMENTAL DEPARTMENT  
CORNWALL AREA



NRA

FINAL DRAFT REPORT

AN INVESTIGATION INTO  
THE BACTERIOLOGICAL  
LEVELS IN THE  
RIVER SEATON

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*RIVER SEATON  
BACTERIOLOGICAL SURVEY  
NOVEMBER'94 TO MARCH'95*

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NRA SOUTH WESTERN REGION

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## **INTRODUCTION**

In June of 1993 , the Regional Tidal Waters Investigations Units surveyed the River Seaton and its tributaries which highlighted the village of Hessenford as one source of bacterial loading on the river and thus the beach.

Area Water Quality and Regulations staff have since instigated improvements to several sewerage systems in Hessenford.

This investigation is therefore to assess these improvements to Hessenford's sewerage and identify current bacterial levels within the River Seaton with respect to possible effect on bathing water quality.

## **METHOD**

The investigation used spot bacterial monitoring at the sites identified on the map (appendix 1 ) Each site was sampled in number order to create a run of five samples . Each run was repeated, as often as time would allow, on days selected to reflect varying weather states. The samples were analysed at the Exeter Laboratory for Coliforms , Faecal Coliforms and Faecal Streptococci. The results given in appendix 2 have been used to draw up the conclusions of this report. The results were also be used to identify the following :-

1. The bacterial levels downstream of Hessenford.
2. The bacterial levels upstream of Hessenford.
3. The level attributable to Hessenford.
4. The relationship between rainfall and the results for 1-3 above.

The rainfall data was collected from the 'Rainark' system and is given in appendix 4. It should be noted that these figures are raw data , and are used here only to show any trend in rainfall , not to quantify any rainfall.

## **CONCLUSIONS**

The results as tabulated in appendix 2 show the averaged counts for each site during the survey period.

These results indicate two main points :-

- 1; The Widegates tributary shows a significant count level , though dilution in the main river would tend to suggest that the overall loading was not significant . It should be noted here that the discharge from Widegates WWTW is on a batch system and on the 24 /11 /94 was not discharging at the time of sampling . It is for this reason that the true effects of this tributary are not fully understood following this investigation .
- 2; The sample results for the main river would indicate that the effects of Hessenford sewage, as highlighted in the June'93 survey , were not evident . This would imply that the work undertaken by Area Water Quality staff assisted by the Authorisations Section has been successful in reducing the inputs from Hessenford village. A steady increase in counts / 100ml is evident as one moves upstream , and that there would appear to be influences further up the catchment than previously believed , possibly from catchment use or point sources such as waste water treatment works.
- 3; The rainfall data when viewed along with the analytical data shows a correlation between increased rainfall and elevated bacteriological counts . The samples taken on the 24 / 11 / 94 follow a period of relatively low rainfall . The samples of 08/12/94 were taken immediately following heavy rain . The rainfall for March '95 was consistently low and the samples reflect this . The elevation in count numbers for 17/03/95 was preceded by heavier rain relative to the rest of the month.
- 4; The River Seaton appears to be more effected bacteriologically by rainfall and catcment use generally than by local point sources.

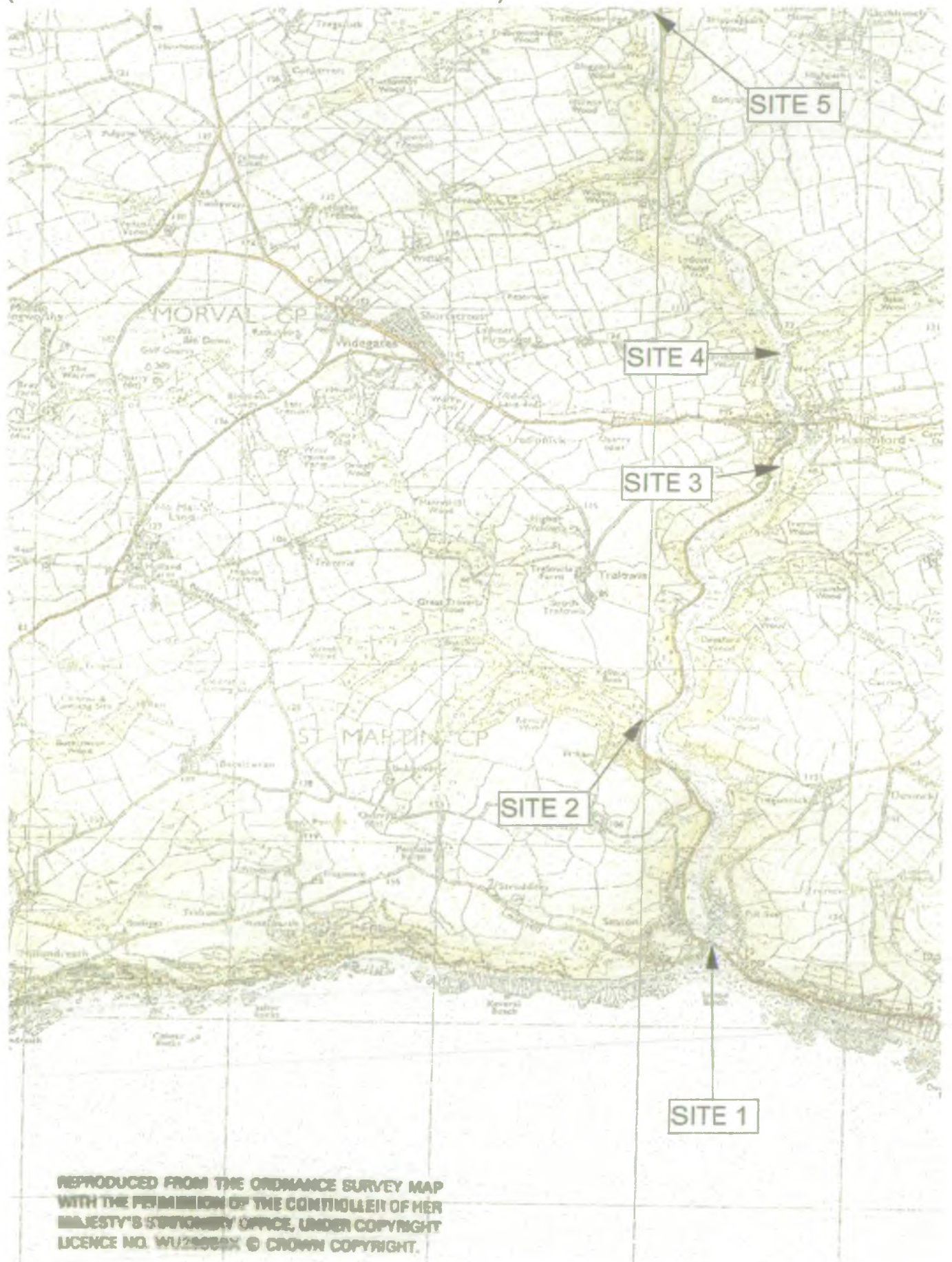
## **RECOMMENDATIONS**

It is recommended that :-

- 1, An investigation be undertaken on the Widegates tributary to take into account the nature of the discharge from Widegates WWTW to ascertain the true loading of this stream.
- 2, Further investigation is required upstream of the A38 to indicate whether or not the bacterial loading can be attributed to catchment or point sources.



Appendix  
RIVER SEATON  
(SHOWING SAMPLING POINTS)



Appendix 1:1

DISCRIPTION OF SAMPLE POINTS:-

SITE 1; RIVER SEATON AT ROAD BRIDGE OF B3247 (SX 3030 5440)

SITE 2; TRIBUTARY OF RIVER SEATON AT ROAD BRIDGE OF B3247  
(SX 2990 5570)

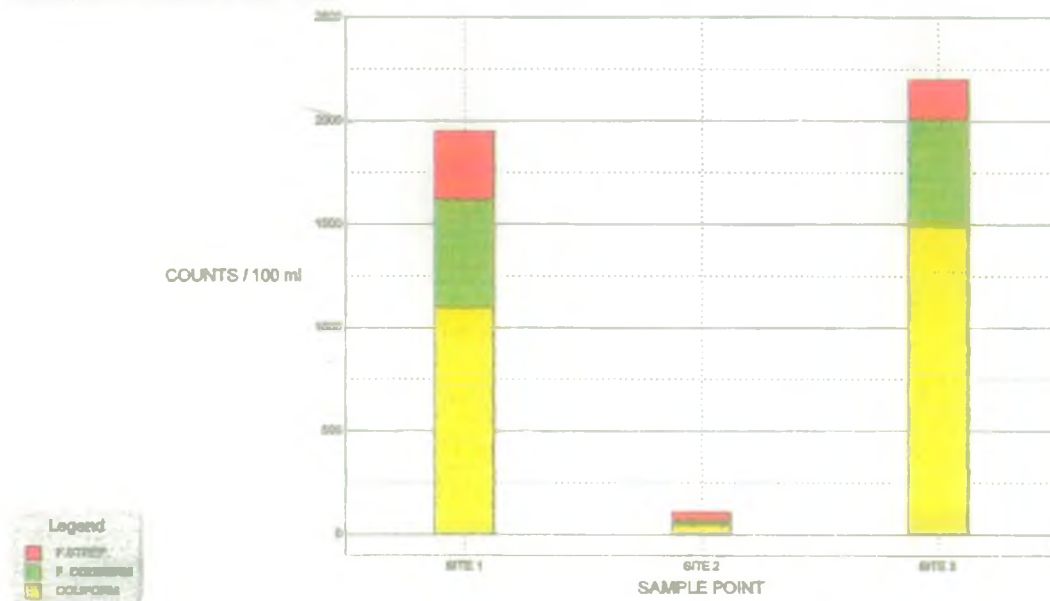
SITE 3; RIVER SEATON DOWNSTREAM OF HESSENFORD (SX 3050 5720)

SITE 4; RIVER SEATON UPSTREAM OF HESSENFORD (SX 3060 5770)

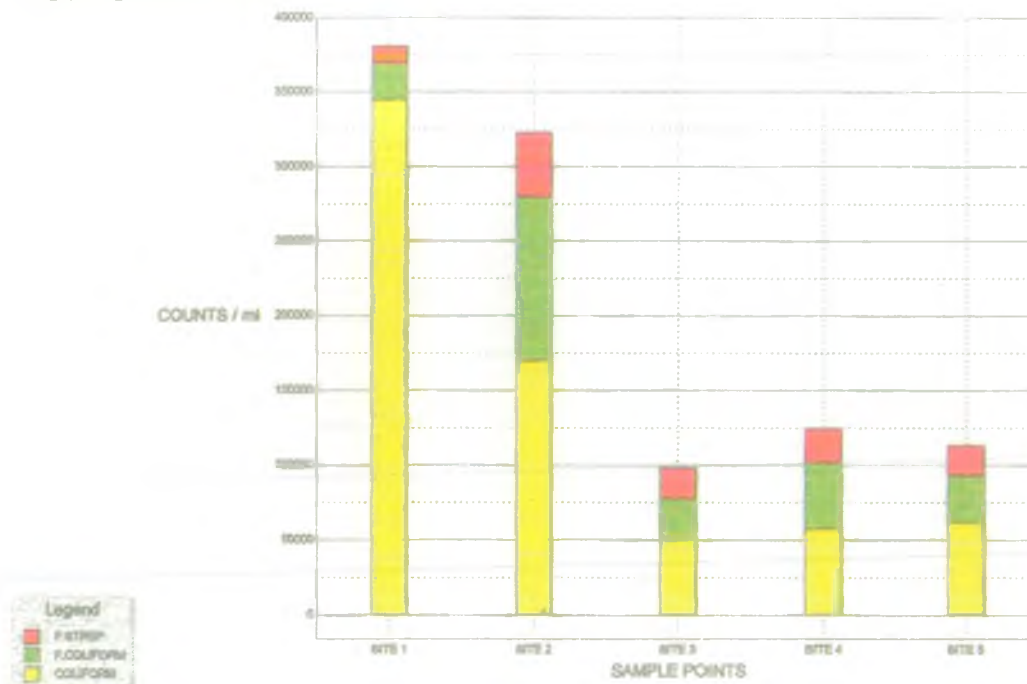
SITE 5; RIVER SEATON AT A38 ROAD BRIDGE (SX 2960 6050)

## R. SEATON BACTI SURVEY RESULTS

RESULTS FOR 24-NOV-94



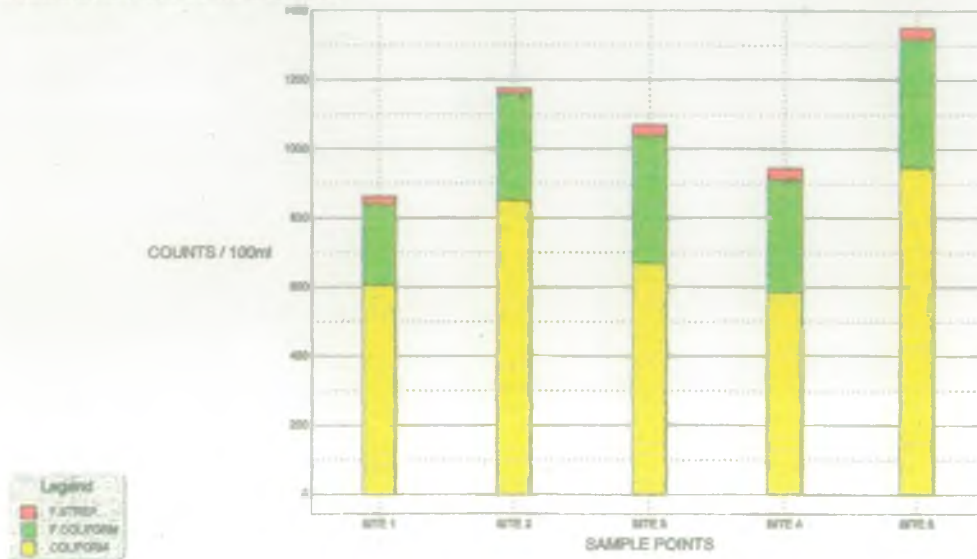
RESULTS FOR 08-DEC-94



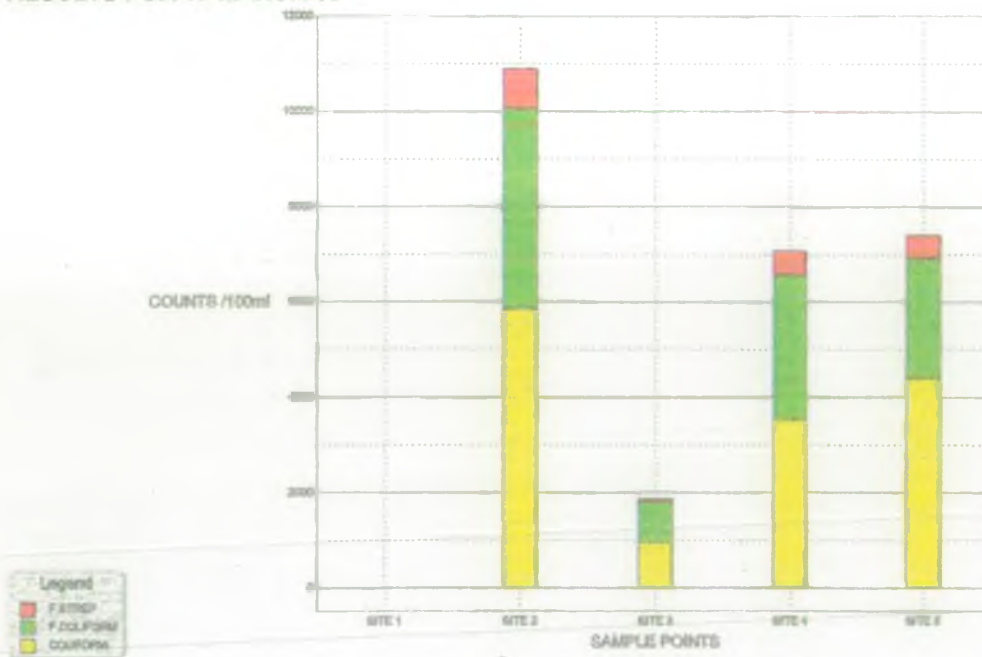


## R.SEATON BACTI SURVEY RESULTS

RESULTS FOR 09-MARCH-95



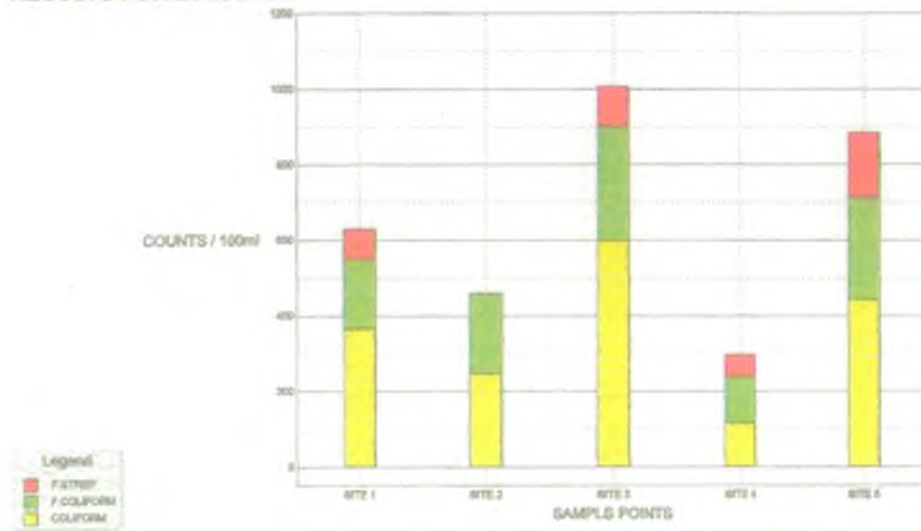
RESULTS FOR 17-MARCH-95





## R.SEATON BACTI SURVEY RESULTS

RESULTS FOR 24-MAR-95



Appendix3:1

RIVER SEATON BACTERIOLOGICAL SURVEY RESULTS

SITE 1:- SEATON BEACH

DATE	TIME	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994	11 40	1100	520	330
08 /12 /1994	9 50	28,000	23,000	800
08 /12 /1994	11 35	41,000	27,000	21,000
09 /03 /1995	9 00	420	170	30
09 /03 /1995	10 30	650	340	21
09 /03 /1995	11 50	750	190	20
17 /03 /1995	9 25	7200	4800	1200
17 /03 /1995	10 30	4000	3800	880
17 /03 /1995	11 35	6400	4000	480
24 /03 /1995	10 15	390	112	64
24 /03 /1995		300	240	90
24 /03 /1995		410	200	86

Appendix 3:1;a

SITE 1:- AVERAGE OF RESULTS PER DAY.

DATE	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994	1100	520	330
08 /12 /1994	34,500	25,000	10,900
09 /03 /1995	607	233	24
17 /03 /1995	5867	4200	833
24 /03 /1995	367	184	80

Appendix 3:2

RIVER SEATON BACTERIOLOGICAL SURVEY RESULTS.

SITE 2 :- WIDEGATES TRIBUTARY.

DATE	TIME	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994	11 49	50	20	40
08 /12 /1994	10 00	210,000	130,000	69,000
08 /12 /1994	11 45	130,000	90,000	17,000
09 /03 /1995	9 15	540	180	16
09 /03 /1995	10 45	830	560	11
09 /03 /1995	12 05	380	180	23
17 /03 /1995	9 40	1500	1500	68
17 /03 /1995	10 45	500	320	80
17 /03 /1995	11 50	900	720	40
24 /03 /1995	10 30	500	420	2
24 /03 /1995		104	94	3
24 /03 /1995		144	112	<1

Appendix3:2;a

Figure 2 : 1  
SITE 2:- AVERAGE RESULTS PER DAY.

DATE	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994	50	20	40
08 /12 /1994	170,000	110,000	43,000
09 /03 /1995	853	307	17
17 /03 /1995	967	847	63
24 /03 /1995	249	209	3

Appendix 3:3

RIVER SEATON BACTERIOLOGICAL SURVEY RESULTS

SITE 3:- DOWNSTREAM OF HESSENFORD.

DATE	TIME	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994	12 00	1500	510	190
08 /12 /1994	10 15	48,000	20,000	24,000
08 /12 /1994	11 50	55,000	32,000	18,000
09 /03 /1995	9 30	470	220	45
09 /03 /1995	11 00	940	660	31
09 /03 /1995	12 20	610	220	21
17 /03 /1995	9 55	4000	4000	720
17 /03 /1995	11 00	3600	2600	450
17 /03 /1995	12 05	3000	2500	360
24 /03 /1995	10 45	460	260	109
24 /03 /1995		640	168	84
24 /03 /1995		700	480	124

Appendix 3:3;a

Figure 3 : 1

SITE 3:-AVERAGE RESULTS PER DAY.

DATE	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994	1500	510	190
08 /12 /1994	51,500	26,000	21,000
09 /03 /1995	673	367	32
17 /03 /1995	3533	3033	510
24 /03 /1995	600	303	106



Appendix 3:4

RIVER SEATON BACTERIOLOGICAL SURVEY RESULTS

SITE 4 :- UPSTREAM OF HESSENFORD.

DATE	TIME	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
08 /12 /1994	10 20	52,000	46,000	24,000
08 /12 /1994	12 00	63,000	42,000	22,000
09 /03 /1995	9 40	360	280	34
09 /03 /1995	11 15	480	380	28
09 /03 /1995	12 35	920	320	34
17 /03 /1995	10 05	8,000	3000	800
17 /03 /1995	11 10	2600	2300	240
17 /03 /1995	12 15	2600	2300	360
24 /03 /1995	10 55	169	108	104
24 /03 /1995		132	80	<1
24 /03 /1995		230	180	67

Appendix 3:4;a

Figure 4 : 1

SITE 4:- AVERAGE RESULT PER DAY

DATE	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
08 /12 /1994	57,500	44,000	23,000
09 /03 /1995	587	327	32
17 /03 /1995	4400	2533	467
24 /03 /1995	117	123	57

Appendix 3:5

RIVER SEATON BACTERIOLOGICAL SURVEY RESULTS.

SITE 5:- RIVER SEATON AT A38 ROAD BRIDGE

DATE	TIME	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
08 /12 /1994	10 40	62,000	44,000	22,000
08 /12 /1994	12 15	62,000	39,000	18,000
09 /03 /1995	10 00	620	180	36
09 /03 /1995	11 30	720	280	33
09 /03 /1995	12 30	1500	650	37
17 /03 /1995	10 15	2800	2700	880
17 /03 /1995	11 20	2800	2000	400
17 /03 /1995	12 25	2800	2200	400
24 /03 /1995	11 05	540	340	116
24 /03 /1995		330	240	120
24 /03 /1995		460	230	280

Figure 5 : 1  
SITE 5:- AVERAGE RESULT PER DAY

DATE	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
08 /12 /1994	62,000	31,500	20,000
09 /03 /1995	947	370	35
17 /03 /1995	2800	2300	403
24 /03 /1995	443	270	172

Appendix 3:6

RIVER SEATON BACTERIOLOGICAL SURVEY RESULTS

DOWNSTREAM OF WIDEGATES WWTW (not discharging)

DATE	TIME	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994	12 25	120	60	50

DOWNSTREAM OF NOMANSLAND WWTW

DATE	TIME	COLIFORM	FAECAL COLIFORM	FAECAL STREP.
24 /11 /1994.	12 50	25,000	21,000	3500

## Appendix 3:7

## RAINFALL FOR TREGASTICK STATION NOV'94 , DEC'94 , MAR'95 (mm) [ T=trace]

DATE	NOVEMBER '94	DECEMBER '94	MARCH '95
1	-	-	6.7
2	13.3	11.5	14.6
3	6	7.3	2.6
4	T	0.8	7.9
5	0.2	8.9	5.0
6	0.5	15.6	7.0
7	6.5	21.3	3.2
8	19.3	6.9	1.2
9	8.4	1	0.4
10	T	0.9	2.4
11	49.4	T	0.9
12	1.4	-	-
13	12.3	0.6	T
14	2	-	1.6
15	1.4	2.5	0.8
16	1.9	0.5	14.4
17	10.9	16.5	2.4
18	5.3	4.7	1.2
19	1.1	3.3	0.1
20	2	1.3	-
21	2.6	-	-
22	0.7	T	-
23	T	T	-
24	-	3.6	-
25	T	4.8	-
26	T	21.9	0.8
27	-	29.2	5.7
28	-	16.2	15.6
29	-	9.9	-
30	-	11.8	0.2
31		3.4	0.2



# RAINFALL AT TREGASTICK

NOV'94 , DEC'94 , MAR'95

