NRA

National Rivers Authority

South West Region

ENVIRONMENTAL PROTECTION

River Axe Catchment

River Water Quality

Classification 1990

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WQP/91/002
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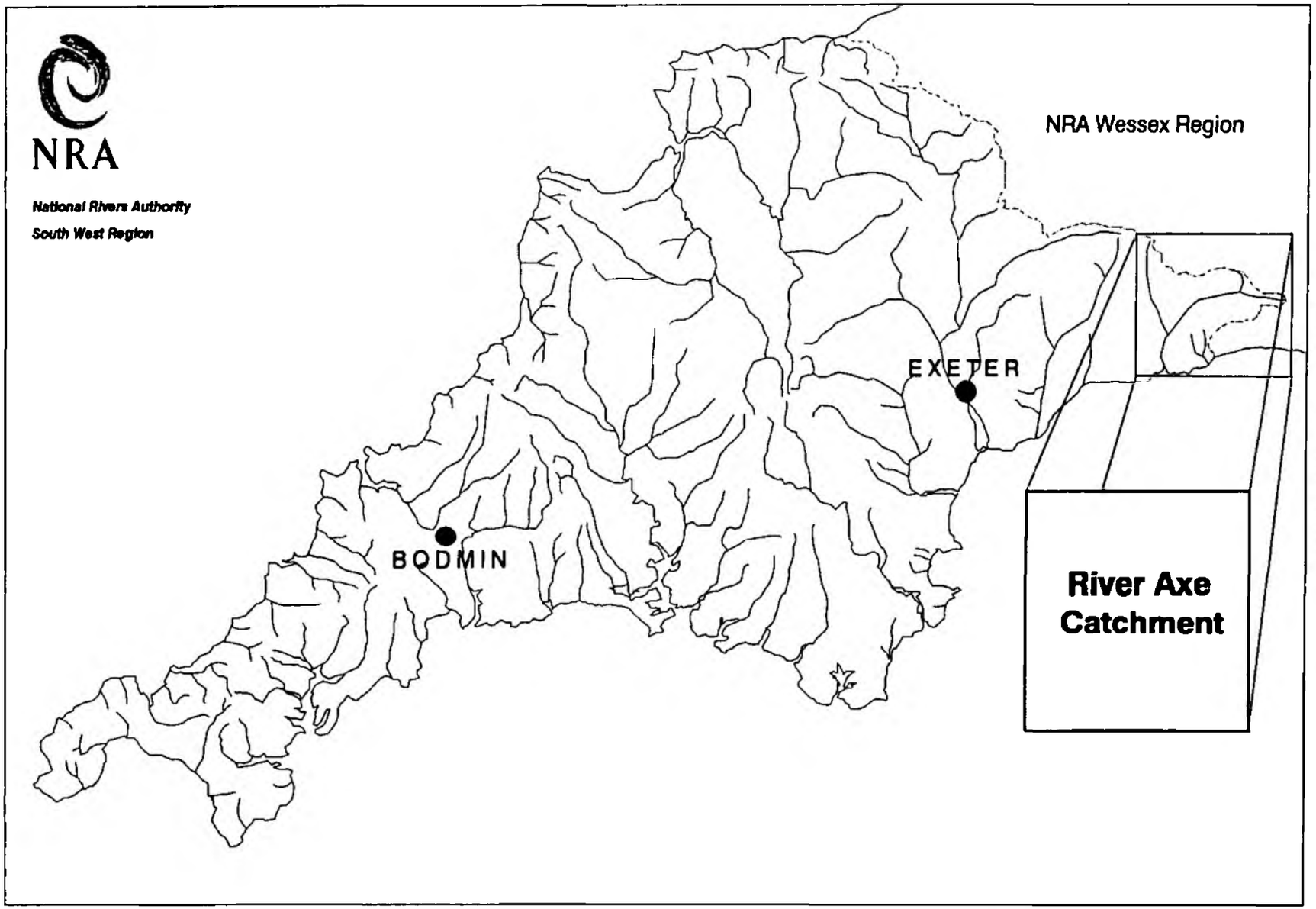

RIVER WATER QUALITY IN THE RIVER AXE CATCHMENT

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1. INTRODUCTION

Monitoring to assess the quality of river waters is undertaken in thirty-two catchments within the region. As part of this monitoring programme samples are collected routinely from selected monitoring points at a pre-determined frequency per year, usually twelve spaced at monthly intervals. Each monitoring point provides data for the water quality of a river reach (in kilometres) upstream of the monitoring point.

River lengths have been re-measured and variations exist over those recorded previously.

Each water sample collected from each monitoring point is analysed for a range of chemical and physical constituents or properties known as determinands. The analytical results for each sample are entered into a computer database called the Water Quality Archive.

Selected data are accessed from the Archive so that the quality of each river reach can be determined based on a River Classification System developed by the National Water Council (NWC), (9.1).

This report presents the river water quality classification for 1990 for monitored river reaches in the River Axe catchment.

2. RIVER AXE CATCHMENT

The River Axe flows over a distance of 44.1 km from its source to the tidal limit, (Appendix 10.1). Water quality was monitored at ten locations on the main river; eight of these sites were sampled at approximately monthly intervals. The site at Whitford Bridge, which is a national water quality monitoring point, was sampled fortnightly. The site at Slymlakes was sampled on twenty occasions during 1990 because of no recent water quality data.

Branscombe Stream flows over a distance of 5.2 km from its source to the tidal limit, (Appendix 10.1) and was monitored at one site at approximately monthly intervals.

The River Coly flows over a distance of 13.8 km from its source to the tidal limit in the Axe Estuary, (Appendix 10.1) and monitored at four locations.

Throughout the Axe catchment eleven secondary and one tertiary tributaries were monitored at monthly intervals. One secondary stream (Temple Brook) was sampled on twenty occasions during 1990 because of no recent water quality data.

2.1 SECONDARY TRIBUTARIES

The River Yarty flows over a distance of 24 km from its source to the confluence with the River Axe, (Appendix 10.1) and was monitored at four locations.

The Umborne and Offwell Brooks flow over a distance of 14.6 km and 6.8 km respectively before joining the River Coly. Each of these tributaries was monitored at two locations.

The Kit Brook and Forton Brook flow over a distance of 9.4 km and 5.5 km respectively before joining the main River Axe. Each of these tributaries was monitored at two locations.

Temple Brook (4.7 km), Whatley Stream (5.4 km), River Synderford (7.2 km), Drimpton Stream (5.6 km), Whetley Stream (4.4 km) and Blackwater River (7.5 km) were all monitored at one location. Monitoring points are all located in the lower reaches of these streams.

2.2 TERTIARY STREAMS

The Corry Brook flows over a distance of 12.7 km before joining the River Yarty and was monitored at two locations.

Each sample was analysed for a minimum number of determinands (Appendix 10.2) plus additional determinands based on local knowledge of the catchment. In addition, at selected sites, certain metal analyses were carried out.

The analytical results from all of these samples have been entered into the Water Quality Archive and can be accessed through the Water Act Register, (9.2).

3. NATIONAL WATER COUNCIL'S RIVER CLASSIFICATION SYSTEM

3.1 River Quality Objectives

In 1978 river quality objectives (RQOs) were assigned to all river lengths that were part of the routine monitoring network and to those additional watercourses, which were not part of the routine network, but which received discharges of effluents.

For the majority of watercourses long term objectives were identified based on existing and assumed adequate quality for the long term protection of the watercourse. In a few instances short term objectives were identified but no timetable for the achievement of the associated long term objective was set.

The RQOs currently in use in the River Axe catchment are identified in Appendix 10.1.

3.2 River Quality Classification

River water quality is classified using the National Water Council's (NWC) River Classification System (see Appendix 10.3), which identifies river water quality as being one of five quality classes as shown in Table 1 below:

Table 1 - National Water Council - River Classification System

Class	Description
1A	Good quality
1B	Lesser good quality
2	Fair quality
3	Poor quality
4	Bad quality

Using the NWC system, the classification of river water quality is based on the values of certain determinands as arithmetic means or as 95 percentiles (5 percentiles are used for pH and dissolved oxygen) as indicated in Appendices 10.4.1 and 10.4.2.

The quality classification system incorporates some of the European Inland Fisheries Advisory Commission (EIFAC) criteria (Appendix 10.3) recommended for use by the NWC system.

4. 1990 RIVER WATER QUALITY SURVEY

The 1990 regional classification of river water quality also includes the requirements of the Department of the Environment quinquennial national river quality survey. The objectives for the Department of the Environment 1990 River Quality Survey are given below:

1) To carry out a National Classification Survey based on procedures used in the 1985 National Classification Survey, including all regional differences.

2) To classify all rivers and canals included in the 1985 National Classification Survey.

3) To compare the 1990 Classification with those obtained in 1985.

In addition, those watercourses, which were not part of the 1985 Survey and have been monitored since that date, are included in the 1990 regional classification of river water quality.

5. 1990 RIVER WATER QUALITY CLASSIFICATION

Analytical data collected from monitoring during 1988, 1989 and 1990 were processed through a computerised river water quality classification programme. This resulted in a quality class being assigned to each monitored river reach as indicated in Appendix 10.5.

The quality class for 1990 can be compared against the appropriate River Quality Objective and previous annual quality classes (1985-1989) also based on three years combined data, for each river reach in Appendix 10.5.

The river water classification system used to classify each river length is identical to the system used in 1985 for the Department of the Environment's 1985 River Quality Survey. The determinand classification criteria used to determine the annual quality classes in 1985, subsequent years and for 1990 are indicated in Appendices 10.4 and 10.4.1.

Improvements to this classification system could have been made, particularly in the use of a different suspended solids standard for Class 2 waters. As the National Rivers Authority will be proposing new classification systems to the Secretary of State in the near future, it was decided to classify river lengths in 1990 with the classification used for the 1985-1989 classification period.

The adoption of the revised criteria for suspended solids in Class 2 waters would not have affected the classification of river reaches.

The river quality classes for 1990 of monitored river reaches in the catchment are shown in map form in Appendix 10.6.

The calculated determinand statistics for pH, temperature, dissolved oxygen, biochemical oxygen demand (BOD), total ammonia, un-ionised ammonia, suspended solids, copper and zinc from which the quality class was determined for each river reach, are indicated in Appendix 10.7.

6. NON-COMPLIANCE WITH QUALITY OBJECTIVES

Those monitored river reaches within the catchment, which do not comply with their assigned (RQO), are shown in map form in Appendix 10.8.

Appendix 10.9 indicates the number of samples analysed for each determinand over the period 1988 to 1990 and the number of sample results per determinand, which exceed the determinand quality standard.

For those non-compliant river reaches in the catchment, the extent of exceedance of the calculated determinand statistic with relevant quality standard (represented as a percentage), is indicated in Appendix 10.10.

7. CAUSES OF NON-COMPLIANCE

For those river reaches, which did not comply with their assigned RQOs, the cause of non-compliance (where possible to identify) is indicated in Appendix 10.11.

8. GLOSSARY OF TERMS

RIVER REACH	A segment of water, upstream from sampling point to the next sampling point.
RIVER LENGTH	River distance in kilometres.
RIVER QUALITY OBJECTIVE	That NWC class,which protects the most sensitive use of the water.
95 percentiles	Maximum limits, which must be met for at least 95% of the time.
5 percentiles	Minimum limits, which must be met for at least 95% of the time.
BIOLOGICAL OXYGEN DEMAND (5 day carbonaceous ATU)	A standard test measuring the microbial uptake of oxygen - an estimate of organic pollution.
pH	A scale of acid to alkali.
UN-IONISED AMMONIA	Fraction of ammonia poisonous to fish, NH^3.
SUSPENDED SOLIDS	Solids removed by filtration or centrifuge under specific conditions.
USER REFERENCE NUMBER	Reference number allocated to a sampling point.
INFERRED STRETCH	Segment of water, which is not monitored and whose water quality classification is assigned from the monitored reach upstream.

9. REFERENCES

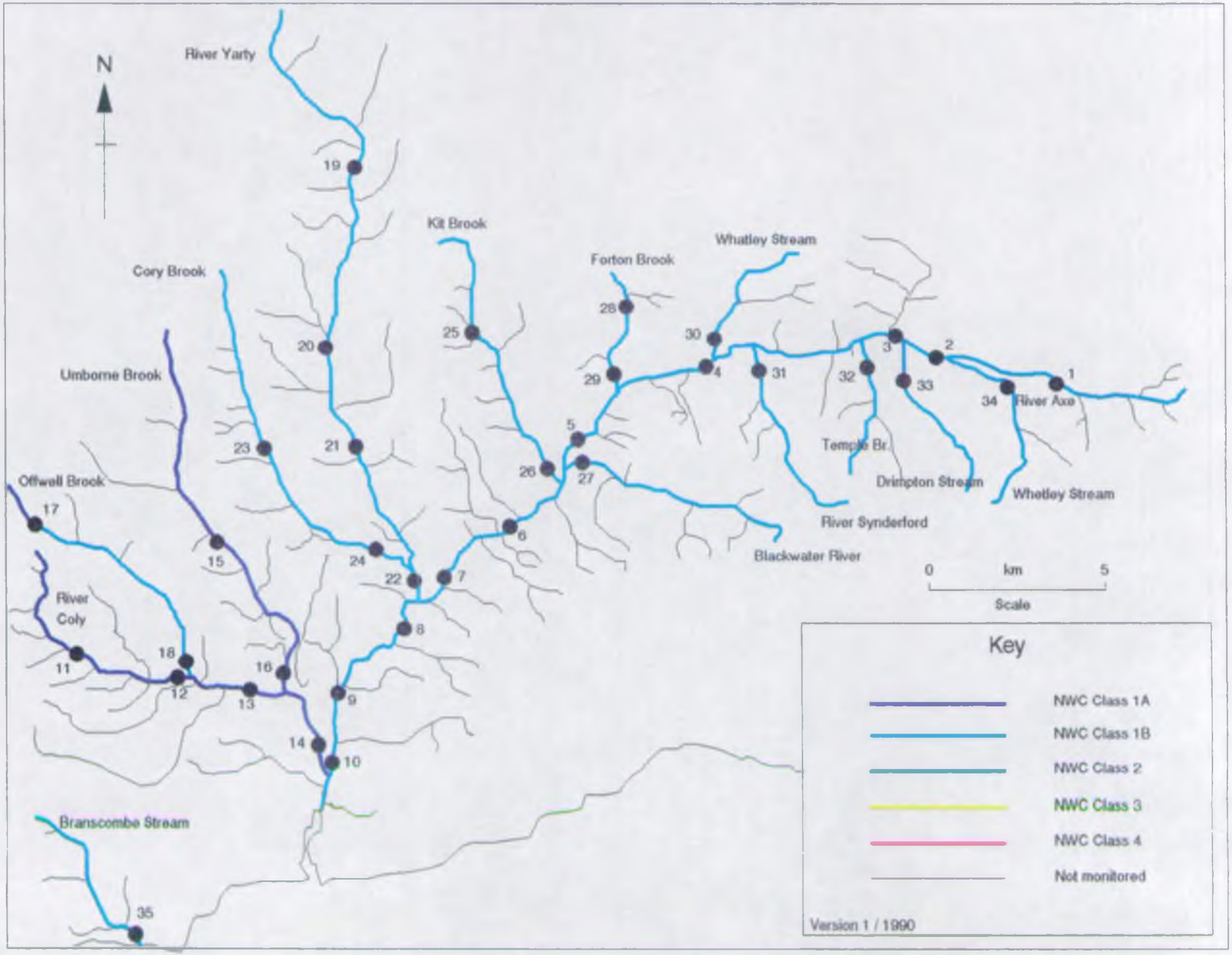
Reference

9.1 National Water Council (1977). River Water Quality: The Next Stage. Review of Discharge Consent Conditions. London.

9.2 Water Act 1989 Section 117

9.3 Alabaster J. S. and Lloyd R. Water Quality Criteria for Freshwater Fish, 2nd edition, 1982. Butterworths.

Axe Catchment
River Quality Objectives



Appendix 10.1

BASIC DETERMINAND ANALYTICAL SUITE FOR ALL CLASSIFIED RIVER SITES

pH as pH Units

Conductivity at 20 C as uS/cm

Water temperature (Cel)

Oxygen dissolved % saturation

Oxygen dissolved as mg/l O

Biochemical oxygen demand (5 day total ATU) as mg/l O

Total organic carbon as mg/l C

Nitrogen ammoniacal as mg/l N

Ammonia un-ionised as mg/l N

Nitrate as mg/l N

Nitrite as mg/l N

Suspended solids at 105 C as mg/l

Total hardness as mg/l CaCO3

Chloride as mg/l Cl

Orthophosphate (total) as mg/l P

Silicate reactive dissolved as mg/l SiO2

Sulphate (dissolved) as mg/l SO4

Sodium (total) as mg/l Na

Potassium (total) as mg/l K

Magnesium (total) as mg/l Mg

Calcium (total) as mg/l Ca

Alkalinity as pH 4.5 as mg/l CaCO3

NWC RIVER QUALITY CLASSIFICATION SYSTEM

River Class	Quality criteria	Remarks	Current potential uses
	Class limiting criteria (95 percentile)		
1A Good Quality	(i) Dissolved oxygen saturation greater than 80% (ii) Biochemical oxygen demand not greater than 3 mg/l (iii) Ammonia not greater than 0.4 mg/l (iv) Where the water is abstracted for drinking water, it complies with requirements for A2* water (v) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)	(i) Average BOD probably not greater than 1.5 mg/l (ii) Visible evidence of pollution should be absent	(i) Water of high quality suitable for potable supply abstractions and for all abstractions (ii) Game or other high class fisheries (iii) High amenity value
1B Good Quality	(i) DO greater than 60% saturation (ii) BOD not greater than 5 mg/l (iii) Ammonia not greater than 0.9 mg/l (iv) Where water is abstracted for drinking water, it complies with the requirements for A2* water (v) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)	(i) Average BOD probably not greater than 2 mg/l (ii) Average ammonia probably not greater than 0.5 mg/l (iii) Visible evidence of pollution should be absent (iv) Waters of high quality which cannot be placed in Class 1A because of the high proportion of high quality effluent present or because of the effect of physical factors such as canalisation, low gradient or eutrophication (v) Class 1A and Class 1B together are essentially the Class 1 of the River Pollution Survey (RPS)	Water of less high quality than Class 1A but usable for substantially the same purposes
2 Fair Quality	(i) DO greater than 40% saturation (ii) BOD not greater than 9 mg/l (iii) Where water is abstracted for drinking water it complies with the requirements for A3* water (iv) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)	(i) Average BOD probably not greater than 5 mg/l (ii) Similar to Class 2 of RPS (iii) Water not showing physical signs of pollution other than humic colouration and a little foaming below weirs	(i) Waters suitable for potable supply after advanced treatment (ii) Supporting reasonably good coarse fisheries (iii) Moderate amenity value

3 Poor Quality	(i) DO greater than 10% saturation (ii) Not likely to be anaerobic (iii) BOD not greater than 17 mg/l. This may not apply if there is a high degree of re-aeration		Similar to Class 3 of RPS	Waters which are polluted to an extent that fish are absent only sporadically present. May be used for low grade industrial abstraction purposes. Considerable potential for further use if cleaned up
4 Bad Quality	Waters which are inferior to Class 3 in terms of dissolved oxygen and likely to be anaerobic at times		Similar to Class 4 of RPS	Waters which are grossly polluted and are likely to cause nuisance
X	DO greater than 10% saturation			Insignificant watercourses and ditches not usable, where the objective is simply to prevent nuisance developing

Notes (a) Under extreme weather conditions (eg flood, drought, freeze-up), or when dominated by plant growth, or by aquatic plant decay, rivers usually in Class 1, 2, and 3 may have BODs and dissolved oxygen levels, or ammonia content outside the stated levels for those Classes. When this occurs the cause should be stated along with analytical results.

(b) The BOD determinations refer to 5 day carbonaceous BOD (ATU). Ammonia figures are expressed as NH_4. **

(c) In most instances the chemical classification given above will be suitable. However, the basis of the classification is restricted to a finite number of chemical determinands and there may be a few cases where the presence of a chemical substance other than those used in the classification markedly reduces the quality of the water. In such cases, the quality classification of the water should be down-graded on the basis of biota actually present, and the reasons statec.

(d) EIFAC (European Inland Fisheries Advisory Commission) limits should be expressed as 95 percentile limits.

* EEC category A2 and A3 requirements are those specified in the EEC Council directive of 16 June 1975 concerning the Quality of Surface Water intended for Abstraction of Drinking Water in the Member State.

** Ammonia Conversion Factors

($mg\ NH_4/l$ to $mg\ N/l$)

Class 1A 0.4 $mg\ NH_4/l = 0.31\ mg\ N/l$

Class 1B 0.9 $mg\ NH_4/l = 0.70\ mg\ N/l$

0.5 $mg\ NH_4/l = 0.39\ mg\ N/l$

NWC RIVER CLASSIFICATION SYSTEM

CRITERIA USED BY NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION FOR NON-METALLIC DETERMINANDS

River Class	Quality Criteria
1A	Dissolved oxygen % saturation greater than 80% BOD (ATU) not greater than 3 mg/l O Total ammonia not greater than 0.31 mg/l N Non-ionised ammonia not greater than 0.021 mg/l N Temperature not greater than 21.5 C pH greater than 5.0 and less than 9.0 Suspended solids not greater than 25 mg/l
1B	Dissolved oxygen % saturation greater than 60% BOD (ATU) not greater than 5 mg/l O Total ammonia not greater than 0.70 mg/l N Non-ionised ammonia not greater than 0.021 mg/l N Temperature not greater than 21.5 C pH greater than 5.0 and less than 9.0 Suspended solids not greater than 25 mg/l
2	Dissolved oxygen & saturation greater than 40% BOD (ATU) not greater than 9 mg/l O Total ammonia not greater than 1.56 mg/l N Non-ionised ammonia not greater than 0.021 mg/l N Temperature not greater than 28 C pH greater than 5.0 and less than 9.0 Suspended solids not greater than 25 mg/l
3	Dissolved oxygen % saturation greater than 10% BOD (ATU) not greater than 17 mg/l O
4	Dissolved oxygen % saturation not greater than 10% BOD (ATU) greater than 17 mg/l O

STATISTICS USED BY NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION

Determinand	Statistic
Dissolved oxygen	5 percentile
BOD (ATU)	95 percentile
Total ammonia	95 percentile
Non-ionised ammonia	95 percentile
Temperature	95 percentile
pH	5 percentile
	95 percentile
Suspended solids	arithmetic mean

NWC RIVER CLASSIFICATION SYSTEM

CRITERIA USED BY NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION FOR METALLIC DETERMINANDS

SOLUBLE COPPER

Total Hardness (mean) mg/l CaCO3	Statistic	Soluble Copper* ug/l Cu	
		Class 1	Class 2
0 - 10	95 percentile	< = 5	> 5
10 - 50	95 percentile	< = 22	> 22
50 - 100	95 percentile	< = 40	> 40
100 - 300	95 percentile	< = 112	> 112

* Total copper is used for classification until sufficient data on soluble copper can be obtained.

TOTAL ZINC

Total Hardness (mean) mg/l CaCO3	Statistic	Total Zinc ug/l Zn		
		Class 1	Class 2	Class 3
0 - 10	95 percentile	< = 30	< = 300	> 300
10 - 50	95 percentile	< = 200	< = 700	> 700
50 - 100	95 percentile	< = 300	< = 1000	> 1000
100 - 300	95 percentile	< = 500	< = 2000	> 2000

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
CATCHMENT : AXE (02)

1990 Map Position Number	River	Reach upstream of	User Reference Number	National Grid Reference
1	AXE	A3066 BRIDGE MOSTERTON	R02C001	ST 4573 0526
2	AXE	SEABOROUGH	R02C002	ST 4296 0574
3	AXE	OATHILL FARM WAYFORD	R02C003	ST 4048 0605
4	AXE	FORDE BRIDGE	R02C004	ST 3622 0535
5	AXE	BROOM	R02C005	ST 3263 0248
6	AXE	A358 BRIDGE WEYCROFT	R02C006	ST 3073 0001
7	AXE	BOW BRIDGE	R02C007	SY 2901 9823
8	AXE	SLYMLAKES	R02B021	SY 2800 9670
9	AXE	WHITFORD BRIDGE	R02B001	SY 2623 9538
10	AXE	AXE BRIDGE	R02B002	SY 2593 9269
	AXE	NORMAL TIDAL LIMIT (INFERRED STRETCH)		
11	COLY	WOODBRIDGE	R02B003	SY 1888 9563
12	COLY	BRINKLEY BRIDGE	R02B004	SY 2135 9515
13	COLY	HEATHAYNE FARM	R02B005	SY 2355 9430
14	COLY	COLYFORD	R02B006	SY 2535 9270
	COLY	NORMAL TIDAL LIMIT (INFERRED STRETCH)		
15	UMBORNE BROOK	TRIFFORDS FARM	R02B007	SY 2238 9943
16	UMBORNE BROOK	UMBORNE BRIDGE	R02B008	SY 2485 9425
17	OFFWELL BROOK	WEST COLWELL	R02B009	SY 1938 9923
18	OFFWELL BROOK	ROADPITT FARM	R02B010	SY 2150 9532
	OFFWELL BROOK	COLY CONFLUENCE (INFERRED STRETCH)		
19	YARTY	NEWHAVEN BRIDGE	R02D003	ST 2588 1098
20	YARTY	LONGBRIDGE	R02D004	ST 2551 0551
21	YARTY	BECKFORD BRIDGE	R02D005	ST 2652 0150
22	YARTY	A35 BRIDGE GAMMONS HILL	R02D006	SY 2815 9801
	YARTY	AXE CONFLUENCE (INFERRED STRETCH)		
23	CORRY BROOK	ROSE FARM	R02D001	ST 2420 0239
24	CORRY BROOK	PRIOR TO RIVER YARTY	R02D002	SY 2808 9820
25	KIT BROOK	NARFORDS	R02C012	ST 2961 0629
26	KIT BROOK	AXE FARM	R02C013	ST 3199 0162
	KIT BROOK	AXE CONFLUENCE (INFERRED STRETCH)		
27	BLACKWATER RIVER	BUDDLEWALL	R02C008	ST 3308 0220
	BLACKWATER RIVER	AXE CONFLUENCE (INFERRED STRETCH)		
28	FORTON BROOK	B3162 BRIDGE FORTON	R02C010	ST 3401 0730
29	FORTON BROOK	TATWORTH	R02C011	ST 3368 0485
	FORTON BROOK	AXE CONFLUENCE (INFERRED STRETCH)		
30	WHATLEY STREAM	AMMERHAM	R02C015	ST 3650 0556

Reach Length (km)	Distance from source (km)	River Quality Objective	85 NWC Class	86 NWC Class	87 NWC Class	88 NWC Class	89 NWC Class	90 NWC Class
4.5	4.5	1B	3	3	2	2	1B	3
3.0	7.5	1B	3	3	3	3	3	2
3.8	11.3	1B	2	2	2	2	2	2
6.3	17.6	1B	2	2	1B	2	2	2
7.0	24.6	1B	2	3	2	2	2	3
4.3	28.9	1B	2	3	2	2	1B	1B
3.3	32.2	1B	2	3	2	2	2	2
3.8	36.0	1B	2	2	2	1B	1B	1B
3.8	39.8	1B	2	2	2	1B	1B	2
4.0	43.8	1B	1B	2	2	2	2	2
0.3	44.1	1B	1B	2	2	2	2	2
4.3	4.3	1A	2	3	3	3	3	2
2.8	7.1	1A	1B	1B	1B	1B	1B	1B
2.8	9.9	1A	1B	2	2	1B	1B	2
3.3	13.2	1A	2	3	3	1B	1B	1B
0.6	13.8	1A	2	3	3	1B	1B	1B
7.8	7.8	1A	1B	1B	1B	1B	1B	1B
6.8	14.6	1A	1B	1B	1B	1B	1A	1A
2.0	2.0	1A	1B	1B	1B	2	3	3
4.5	6.5	1B	1B	2	2	1B	1B	1B
0.3	6.8	1B	1B	2	2	1B	1B	1B
7.3	7.3	1B	1B	2	2	2	1B	1B
6.2	13.5	1B	2	3	3	2	2	1B
4.9	18.4	1B	2	3	3	2	2	2
4.4	22.8	1B	2	2	2	1B	2	2
1.2	24.0	1B	2	2	2	1B	2	2
5.9	5.9	1B	2	1B	3	3	2	1B
6.8	12.7	1B	1B	1B	1B	1B	2	2
3.3	3.3	1B	1A	1B	1B	1A	1A	3
5.8	9.1	1B	1B	2	1B	1B	2	2
0.3	9.4	1B	1B	2	1B	1B	2	2
6.8	6.8	1B	2	3	3	1B	2	2
0.7	7.5	1B	2	3	3	1B	2	2
2.3	2.3	1B	2	3	3	3	2	1B
2.5	4.8	1B	1B	1B	1B	1B	1B	1B
0.7	5.5	1B	1B	1B	1B	1B	1B	1B
5.3	5.3	1B	2	2	2	2	2	3

Appendix 10.5

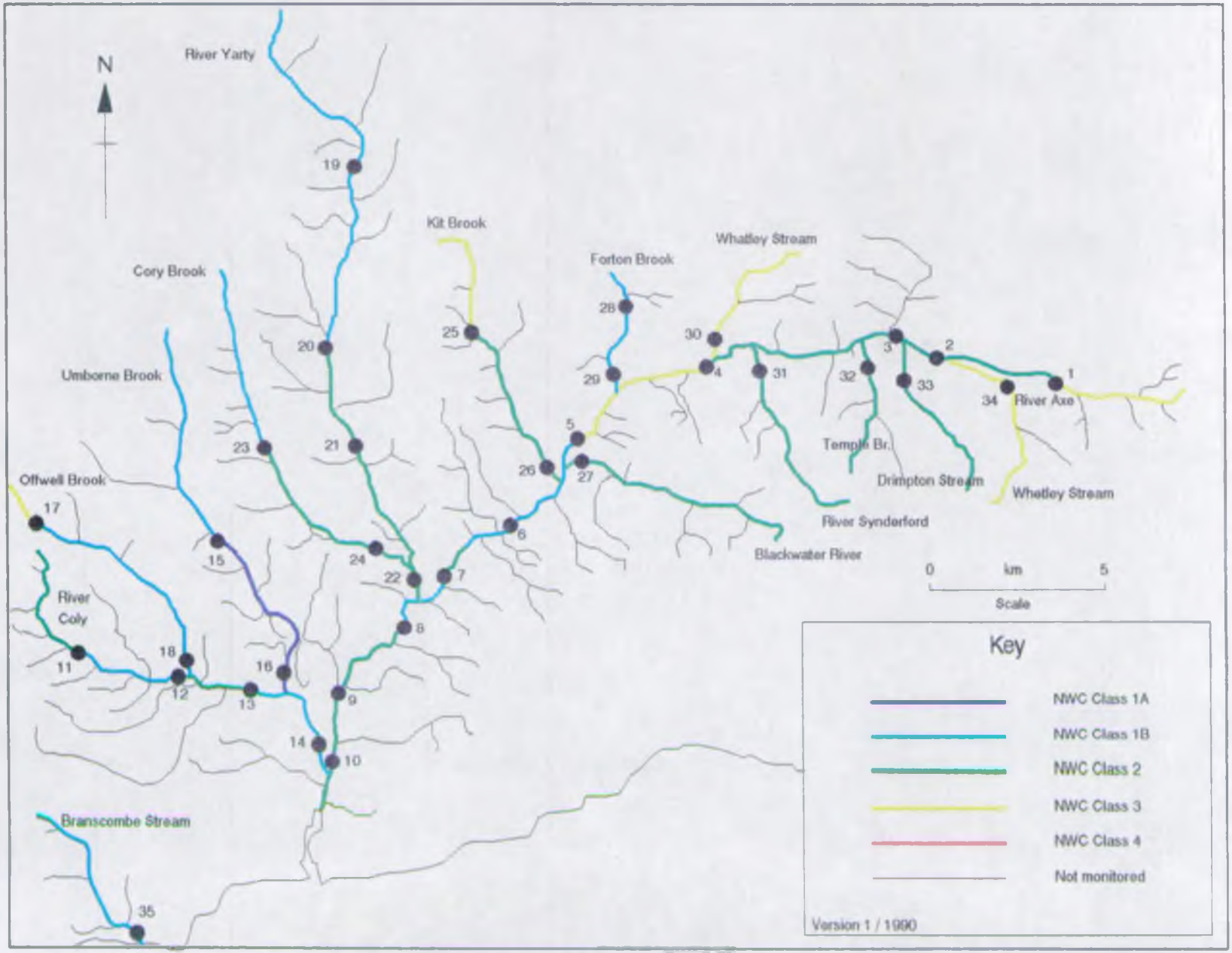
NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
CATCHMENT : AXE (02)

1990 Map Position Number	River	Reach upstream of	User Reference Number	National Grid Reference
	WHATLEY STREAM	AXE CONFLUENCE (INFERRED STRETCH)		
31	SYNDERFORD SYNDERFORD	BEERE FARM AXE CONFLUENCE (INFERRED STRETCH)	R02C014	ST 3775 0573
32	TEMPLE BROOK TEMPLE BROOK	OATHILL BRIDGE AXE CONFLUENCE (INFERRED STRETCH)	R02C018	ST 4072 0590
33	DRIMPTON STREAM DRIMPTON STREAM	NETHERHAY AXE CONFLUENCE (INFERRED STRETCH)	R02C009	ST 4170 0573
34	WHETLEY STREAM WHETLEY STREAM	POTWELL FARM AXE CONFLUENCE (INFERRED STRETCH)	R02C016	ST 4474 0487
35	BRANSCOMBE STREAM BRANSCOMBE STREAM	BRANSCOMBE MOUTH MEAN HIGH WATER (INFERRED STRETCH)	R02A001	SY 2070 8819

Reach Length (km)	Distance from source (km)	River Quality Objective	85 NWC Class	86 NWC Class	87 NWC Class	88 NWC Class	89 NWC Class	90 NWC Class
0.1	5.4	1B	2	2	2	2	2	3
6.9	6.9	1B	2	2	2	1B	2	2
0.3	7.2	1B	2	2	2	1B	2	2
4.3	4.3	1B						2
0.4	4.7	1B						2
5.1	5.1	1B	4	3	3	1B	2	2
0.5	5.6	1B	4	3	3	1B	2	2
3.5	3.5	1B	2	2	2	3	3	3
0.9	4.4	1B	2	2	2	3	3	3
5.0	5.0	1B						1B
0.2	5.2	1B						1B

Appendix 10.5

Axe Catchment
Water Quality - 1990



Appendix 10.6

NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
CALCULATED DETERMINAND STATISTICS USED FOR QUALITY ASSESSMENT
CATCHMENT : AXE (02)

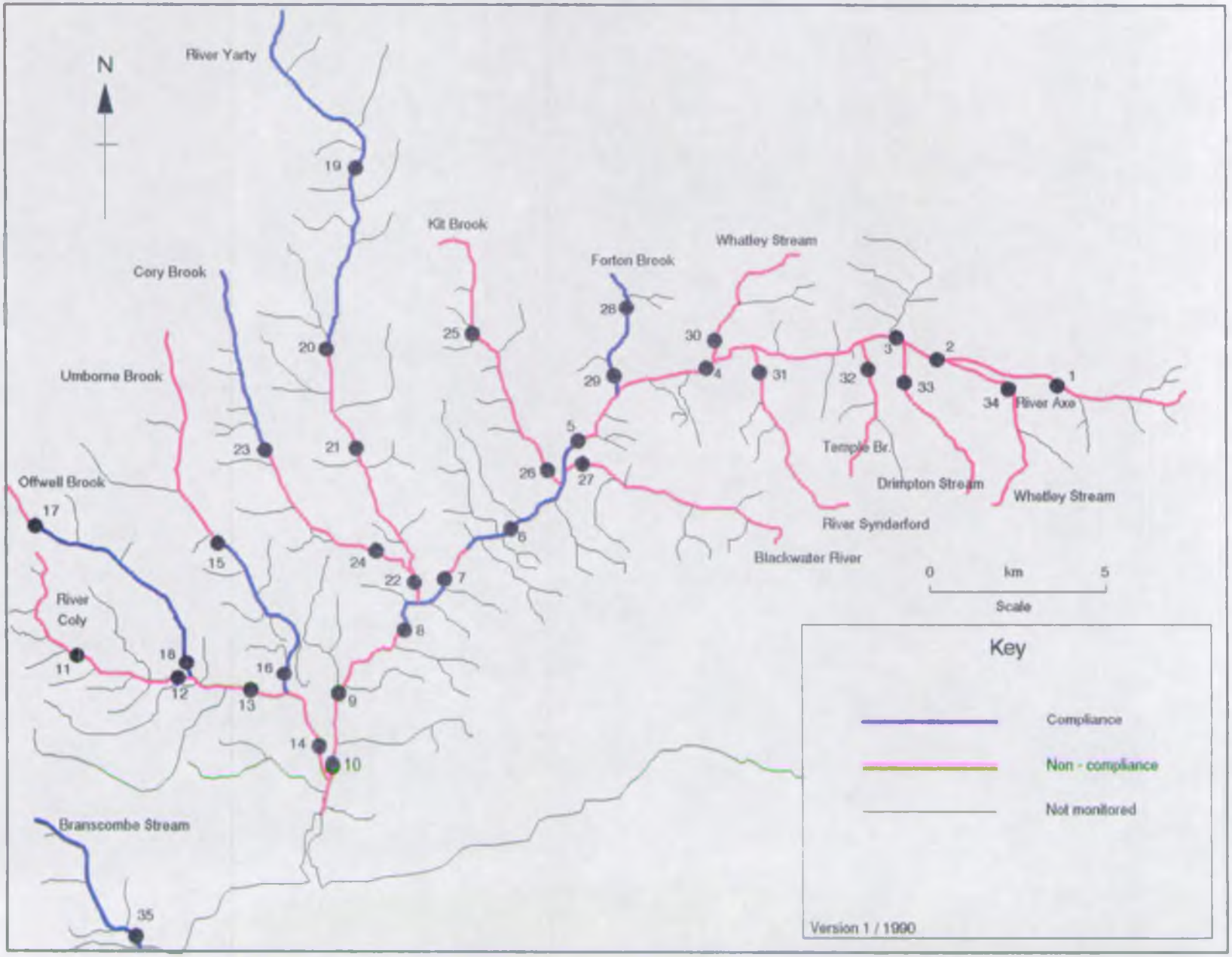
River	Reach upstream of	User Ref. Number	90 NAC Class	Calculated Determinand Statistics used for Quality Assessment																			
				pH Lower		pH Upper		Temperature		DO (%)		BOD (ATU)		Total Ammonia		Union. Ammonia		S.Solids		Total Copper		Total Zinc	
				Class	5%ile	Class	95%ile	Class	95%ile	Class	5%ile	Class	95%ile	Class	95%ile	Class	95%ile	Class	Mean	Class	95%ile	Class	95%ile
AXE	A3066 BRIDGE MODBURY	R02C001	3	1A	7.9	1A	8.4	1A	18.5	1A	80.9	2	7.3	2	0.831	3	0.023	1A	16.8	-	-	-	-
AXE	SEABOROUGH	R02C002	2	1A	7.7	1A	8.4	1A	19.0	1A	82.0	2	6.0	1B	0.482	1A	0.021	1A	9.1	-	-	-	-
AXE	ORTHILL FARM WAYFORD	R02C003	2	1A	7.7	1A	8.3	1A	17.0	1B	73.0	2	7.9	2	0.760	1A	0.010	1A	7.5	-	-	-	-
AXE	FORDE BRIDGE	R02C004	2	1A	7.7	1A	8.3	1A	17.5	1B	78.2	2	5.3	2	0.756	1A	0.010	1A	19.7	-	-	-	-
AXE	BROOM	R02C005	3	1A	7.8	1A	8.4	1A	17.0	1B	79.9	2	7.3	1B	0.520	1A	0.010	3	33.9	1A	17.0	1A	50.0
AXE	A358 BRIDGE WESTCROFT	R02C006	1B	1A	7.7	1A	8.3	1A	17.2	1A	83.8	1B	4.9	1B	0.511	1A	0.011	1A	16.0	-	-	-	-
AXE	BOW BRIDGE	R02C007	2	1A	7.7	1A	8.5	1A	19.2	1A	85.7	2	5.9	1B	0.475	1A	0.010	1A	17.9	-	-	-	-
AXE	SLAPLAKES	R02B021	1B	1A	7.7	1A	8.7	1A	18.0	1B	75.0	1B	4.8	1A	0.220	1A	0.010	1A	11.7	1A	5.0	1A	34.0
AXE	WILLFORD BRIDGE	R02B001	2	1A	7.7	1A	8.4	1A	19.0	1B	77.0	2	5.1	1B	0.353	1A	0.010	1A	12.4	1A	7.0	1A	17.9
AXE	AXE BRIDGE	R02B002	2	1A	7.6	1A	8.4	1A	18.6	1B	70.9	2	5.2	1B	0.389	1A	0.010	1A	13.0	1A	7.0	1A	10.0
COLY	WOODBRIDGE	R02B003	2	1A	7.2	1A	8.3	1A	16.7	1B	69.8	2	7.8	1A	0.291	1A	0.010	1A	7.2	-	-	-	-
COLY	BRINKLEY BRIDGE	R02B004	1B	1A	7.4	1A	8.4	1A	16.5	1B	74.4	1A	2.9	1A	0.201	1A	0.010	1A	8.3	-	-	-	-
COLY	HEATHAYNE FARM	R02B005	2	1A	7.4	1A	8.5	1A	16.9	1A	80.3	2	7.6	1B	0.341	1A	0.010	1A	6.4	-	-	-	-
COLY	COLYFORD	R02B006	1B	1A	7.3	1A	8.5	1A	17.2	1B	73.2	1B	3.9	1A	0.188	1A	0.010	1A	6.0	1A	15.1	1A	14.9
UMBORNE BROOK	DRIFFORDS FARM	R02B007	1B	1A	7.5	1A	8.2	1A	16.0	1B	74.2	1B	3.8	1B	0.367	1A	0.010	1A	5.9	-	-	-	-
UMBORNE BROOK	UMBORNE BRIDGE	R02B008	1A	1A	7.5	1A	8.5	1A	16.4	1A	86.2	1A	2.9	1A	0.178	1A	0.010	1A	6.5	1A	7.4	1A	11.8
OFFWELL BROOK	WEST COMBELL	R02B009	3	1A	7.0	1A	7.6	1A	17.1	1B	73.5	2	5.2	3	2.198	1A	0.019	1A	7.0	-	-	-	-
OFFWELL BROOK	ROWDITCH FARM	R02B010	1B	1A	7.5	1A	8.3	1A	16.4	1A	82.0	1A	2.5	1B	0.512	1A	0.010	1A	5.3	1A	14.3	1A	17.5
YARTY	NEWTOWN BRIDGE	R02C003	1B	1A	7.5	1A	8.4	1A	18.7	1B	78.4	1B	3.9	1B	0.335	1A	0.010	1A	10.1	-	-	-	-
YARTY	LONGBRIDGE	R02C004	1B	1A	7.4	1A	8.5	1A	19.8	1A	83.7	1B	4.8	1B	0.511	1A	0.010	1A	10.4	-	-	-	-
YARTY	BECKFORD BRIDGE	R02C005	2	1A	7.4	1A	8.3	1A	19.4	1A	81.0	2	5.8	1B	0.618	1A	0.010	1A	9.6	-	-	-	-
YARTY	A35 BRIDGE GAMMONS HILL	R02C006	2	1A	7.4	1A	8.4	1A	19.0	1A	83.0	2	5.7	1B	0.636	1A	0.014	1A	12.1	1A	16.0	1A	17.1
CORRY BROOK	ROSE FARM	R02C001	1B	1A	7.2	1A	8.0	1A	18.3	1B	78.4	1A	2.5	1A	0.296	1A	0.010	1A	9.3	-	-	-	-
CORRY BROOK	PRIOR TO RIVER YARTY	R02C002	2	1A	7.2	1A	8.6	1A	19.0	1B	75.1	1B	3.9	2	0.876	1A	0.010	1A	12.7	1A	7.7	1A	12.7
KIT BROOK	MARFORDS	R02C012	3	1A	7.7	1A	8.3	1A	16.6	1A	83.1	3	14.2	1A	0.079	1A	0.010	1A	5.4	-	-	-	-
KIT BROOK	AXE FARM	R02C013	2	1A	7.7	1A	8.6	1A	17.6	1A	85.4	2	6.7	1B	0.604	1A	0.018	1A	17.3	1A	37.1	1A	36.7
BLACKWATER RIVER	HUDDENHALL	R02C008	2	1A	7.1	1A	8.0	1A	18.7	1A	82.2	2	6.4	1B	0.570	1A	0.010	1A	12.4	1A	32.8	1A	66.8
FORTON BROOK	B3162 BRIDGE FORTON	R02C010	1B	1A	7.6	1A	8.4	1A	18.0	1A	85.0	1B	3.5	1B	0.330	1A	0.010	1A	13.1	-	-	-	-
FORTON BROOK	DOWNTON	R02C011	1B	1A	7.8	1A	8.5	1A	17.0	1A	88.0	1B	4.5	1B	0.395	1A	0.010	1A	12.6	1A	33.6	1A	40.0
WHITLEY STREAM	AMMERHAM	R02C015	3	1A	7.9	1A	8.5	1A	18.2	1B	65.0	2	6.9	2	1.022	1A	0.020	3	27.6	1A	23.2	1A	140.5
SYNDERFORD	BEERE FARM	R02C014	2	1A	7.3	1A	8.3	1A	17.4	1A	83.4	2	5.2	1B	0.446	1A	0.010	1A	12.5	1A	5.0	1A	10.7
TEMPLE BROOK	ORTHILL BRIDGE	R02C018	2	1A	7.6	1A	8.2	1A	16.0	1B	74.0	2	7.4	1B	0.670	1A	0.010	1A	10.7	-	-	-	-

NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
CALCULATED DETERMINAND STATISTICS USED FOR QUALITY ASSESSMENT
CATCHMENT : AXE (02)

River	Reach upstream of	User Ref. Number	90 NWC Class	Calculated Determinand Statistics used for Quality Assessment																			
				pH Lower		pH Upper		Temperature		DO (%)		BOD (ATU)		Total Ammonia		Union. Ammonia		S.Solids		Total Copper		Total Zinc	
				Class	5%ile	Class	95%ile	Class	95%ile	Class	5%ile	Class	95%ile	Class	95%ile	Class	95%ile	Class	Mean	Class	95%ile	Class	95%ile
CRIMPTON STREAM	NETHERWAY	R02C009	2	1A	7.7	1A	8.3	1A	17.3	1B	73.4	2	6.5	1B	0.597	1A	0.010	1A	8.5	-	-	-	-
WHITLEY STREAM	FOXWELL FARM	R02C016	3	1A	7.6	1A	8.3	1A	17.5	1B	68.9	3	9.1	1B	0.640	1A	0.017	1A	9.5	1A	5.7	1A	12.0
BRANSCOMBE STREAM	BRANSCOMBE MOUTH	R02A001	1B	1A	8.0	1A	8.3	1A	15.0	1A	85.0	1B	4.2	1A	0.120	1A	0.010	1A	14.8	-	-	-	-

Appendix 10.7

Axe Catchment
Compliance - 1990



Appendix 10.8

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
NUMBER OF SAMPLES (N) AND NUMBER OF SAMPLES EXCEEDING QUALITY STANDARD (F)
CATCHMENT : AXE (02)

River	Reach upstream of	User Ref. Number	pH Lower		pH Upper		Temperature		DO (%)		BOD (ATU)		Total Ammonia		Union. Ammonia		S.Solids		Total Copper		Total Zinc	
			N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F
AXE	A3066 BRIDGE FOXDENTON	R02C001	38	-	38	-	38	-	38	1	38	3	38	1	37	1	38	6	0	-	0	-
AXE	SIDMOUTH	R02C002	38	-	38	-	38	-	38	-	38	2	38	-	38	1	38	1	0	-	0	-
AXE	ORCHILL FARM WOLFORD	R02C003	39	-	39	-	39	-	39	-	39	2	39	2	39	-	39	1	1	-	1	-
AXE	FORDE BRIDGE	R02C004	40	-	40	-	40	-	40	-	40	3	40	2	39	-	40	4	0	-	0	-
AXE	BROOM	R02C005	39	-	39	-	39	-	39	-	39	3	39	1	38	-	39	5	39	-	39	-
AXE	A358 BRIDGE WESCROFT	R02C006	38	-	38	-	38	-	38	-	38	1	38	-	37	-	38	3	0	-	0	-
AXE	BOW BRIDGE	R02C007	37	-	37	-	37	-	37	-	37	2	37	-	35	-	37	4	0	-	0	-
AXE	SLIPLANES	R02B021	19	-	19	-	19	-	19	-	19	-	19	-	19	-	19	2	19	-	19	-
AXE	MILLFORD BRIDGE	R02B001	80	-	80	-	80	-	80	-	80	4	80	-	76	-	80	9	80	-	80	-
AXE	AXE BRIDGE	R02B002	38	-	38	-	38	-	38	-	38	2	38	-	38	-	38	5	12	-	12	-
COLY	WOODBRIDGE	R02B003	25	-	25	-	25	-	25	3	25	2	25	-	24	-	25	-	0	-	0	-
COLY	BROADLEY BRIDGE	R02B004	25	-	25	-	25	-	25	2	25	1	25	-	23	-	25	2	0	-	0	-
COLY	HEADWAINE FARM	R02B005	25	-	25	-	25	-	25	1	25	4	25	1	24	-	25	-	0	-	0	-
COLY	COLYFORD	R02B006	32	-	32	-	32	-	32	2	32	2	32	-	30	-	32	1	32	-	32	-
UMBORNE BROOK	[illegible] FARM	R02B007	25	-	25	-	25	-	25	2	25	3	25	3	25	-	25	-	1	-	1	-
UMBORNE BROOK	UMBORNE BRIDGE	R02B008	25	-	25	-	25	-	25	-	25	-	25	-	22	-	25	-	25	-	25	-
OFFWELL BROOK	WEST COMBELL	R02B009	25	-	25	-	25	-	25	1	25	2	25	1	22	-	25	-	0	-	0	-
OFFWELL BROOK	RONDETT FARM	R02B010	25	-	25	-	25	-	25	-	25	-	25	-	23	-	25	-	25	-	25	-
YARTY	[illegible] BRIDGE	R02C003	26	-	26	-	26	-	26	-	26	-	26	-	25	-	26	2	0	-	0	-
YARTY	LOWERIDGE	R02C004	26	-	26	-	26	-	26	-	26	1	26	-	26	-	26	2	0	-	0	-
YARTY	[illegible] BRIDGE	R02C005	25	-	25	-	25	-	25	-	25	1	25	1	21	-	25	2	0	-	0	-
YARTY	A35 BRIDGE [illegible] HILL	R02C006	32	-	32	-	32	-	32	-	32	1	32	1	32	-	32	4	32	-	32	-
CORRY BROOK	ROSE FARM	R02C001	28	-	28	-	28	-	28	-	28	-	28	-	27	-	28	1	0	-	0	-
CORRY BROOK	PRIOR TO RIVER YARTY	R02C002	36	-	36	-	36	-	36	-	36	-	36	2	34	-	35	4	22	-	22	-
KIT BROOK	RAWFORDS	R02C012	26	-	26	-	26	-	26	-	26	1	26	-	21	-	26	1	0	-	0	-
KIT BROOK	AXE FARM	R02C013	27	-	27	-	27	-	27	-	27	1	27	1	24	-	27	2	26	-	26	-
BLACKWATER RIVER	[illegible]HALL	R02C008	27	-	27	-	27	-	27	-	27	1	27	-	26	-	27	1	27	1	27	-
FORDEN BROOK	B3162 BRIDGE FORDEN	R02C010	26	-	26	-	26	-	26	-	26	-	26	-	26	-	26	4	5	-	5	-
FORDEN BROOK	[illegible]MORTH	R02C011	28	-	28	-	28	-	27	-	28	-	28	-	27	-	28	2	27	-	27	-
MARLEY STREAM	[illegible]	R02C015	27	-	27	-	27	-	27	1	27	2	27	2	26	-	27	4	26	-	26	-
SIDBROOK	[illegible] FARM	R02C014	27	-	27	-	27	-	27	-	27	1	27	-	26	-	27	1	26	-	26	-
TEMPLE BROOK	ORCHILL BRIDGE	R02C018	19	-	19	-	18	-	18	-	19	4	19	-	18	-	19	1	0	-	0	-
CLAPTON STREAM	CLAPTON DAIRY FARM	R02C017	23	-	23	-	23	-	23	-	23	1	23	-	22	-	23	1	0	-	0	-

Appendix 10.9

NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
NUMBER OF SAMPLES (N) AND NUMBER OF SAMPLES EXCEEDING QUALITY STANDARD (F)
CATCHMENT : AXE (02)

River	Reach upstream of	User Ref. Number	pH Lower		pH Upper		Temperature		DO (%)		BOD (ATU)		Total Ammonia		Union. Ammonia		S.Solids		Total Copper		Total Zinc	
			N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F
CREMPTON STREAM	NETHERWAY	R02C009	26	–	26	–	26	–	26	–	26	2	26	–	26	–	26	–	26	–	26	–
MARTLAW STREAM	FOXHILL FARM	R02C016	26	–	26	–	26	–	26	–	26	2	26	1	25	–	26	1	26	–	26	–
BRANSCOMBE STREAM	BRANSCOMBE MOUTH	R02A001	10	–	10	–	10	–	10	–	10	–	10	–	10	–	10	1	0	–	0	–

Appendix 10.9

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
PERCENTAGE EXCEEDENCE OF DETERMINAND STATISTICS FROM QUALITY STANDARDS
CATCHMENT : AXE (02)

River	Reach upstream of	User Ref. Number	PERCENTAGE EXCEEDENCE OF STATISTIC FROM QUALITY STANDARD									
			pH Lower	pH Upper	Temperature	DO (%)	BOD (ATU)	Total Ammonia	Un-ionised Ammonia	Suspended Solids	Total Copper	Total Zinc
AXE	A3066 BRIDGE MOSTERTON	R02C001	-	-	-	-	45	19	10	-	-	-
AXE	SEABOROUGH	R02C002	-	-	-	-	20	-	-	-	-	-
AXE	OATHILL FARM WAYFORD	R02C003	-	-	-	-	58	9	-	-	-	-
AXE	FORDE BRIDGE	R02C004	-	-	-	-	6	8	-	-	-	-
AXE	BROOM	R02C005	-	-	-	-	46	-	-	36	-	-
AXE	A358 BRIDGE WEYCROFT	R02C006	-	-	-	-	-	-	-	-	-	-
AXE	BOW BRIDGE	R02C007	-	-	-	-	18	-	-	-	-	-
AXE	SLYMLAKES	R02B021	-	-	-	-	-	-	-	-	-	-
AXE	WHITFORD BRIDGE	R02B001	-	-	-	-	1	-	-	-	-	-
AXE	AXE BRIDGE	R02B002	-	-	-	-	5	-	-	-	-	-
COLY	WOODBRIDGE	R02B003	-	-	-	13	161	-	-	-	-	-
COLY	BRINKLEY BRIDGE	R02B004	-	-	-	7	-	-	-	-	-	-
COLY	HEATHAYNE FARM	R02B005	-	-	-	-	154	10	-	-	-	-
COLY	COLYFORD	R02B006	-	-	-	9	30	-	-	-	-	-
UMBORNE BROOK	TRIFFORDS FARM	R02B007	-	-	-	7	25	18	-	-	-	-
UMBORNE BROOK	UMBORNE BRIDGE	R02B008	-	-	-	-	-	-	-	-	-	-
OFFWELL BROOK	OFFWELL 100m d/s CONFL	R02B009	-	-	-	8	75	609	-	-	-	-
OFFWELL BROOK	ROADPITT FARM	R02B010	-	-	-	-	-	-	-	-	-	-
YARTY	NEWHAVEN BRIDGE	R02D003	-	-	-	-	-	-	-	-	-	-
YARTY	LONGBRIDGE	R02D004	-	-	-	-	-	-	-	-	-	-
YARTY	BECKFORD BRIDGE	R02D005	-	-	-	-	15	-	-	-	-	-
YARTY	A35 BRIDGE GAMMONS HILL	R02D006	-	-	-	-	14	-	-	-	-	-
CORRY BROOK	ROSE FARM	R02D001	-	-	-	-	-	-	-	-	-	-
CORRY BROOK	PRIOR TO RIVER YARTY	R02D002	-	-	-	-	-	25	-	-	-	-
KIT BROOK	NARFORDS	R02C012	-	-	-	-	184	-	-	-	-	-
KIT BROOK	AXE FARM	R02C013	-	-	-	-	34	-	-	-	-	-
BLACKWATER RIVER	BUDDLEWALL	R02C008	-	-	-	-	28	-	-	-	-	-
FORTON BROOK	B3162 BRIDGE FORTON	R02C010	-	-	-	-	-	-	-	-	-	-
FORTON BROOK	TATWORTH	R02C011	-	-	-	-	-	-	-	-	-	-
WHATLEY STREAM	AMMERHAM	R02C015	-	-	-	-	38	46	-	11	-	-
SYNDERFORD	BEERE FARM	R02C014	-	-	-	-	4	-	-	-	-	-
TEMPLE BROOK	OATHILL BRIDGE	R02C018	-	-	-	-	48	-	-	-	-	-
CLAPTON STREAM	CLAPTON DAIRY FARM	R02C017	-	-	-	-	-	-	-	-	-	-

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1990 RIVER WATER QUALITY CLASSIFICATION
PERCENTAGE EXCEEDENCE OF DETERMINAND STATISTICS FROM QUALITY STANDARDS
CATCHMENT : AXE (02)

River	Reach upstream of	User Ref. Number	PERCENTAGE EXCEEDENCE OF STATISTIC FROM QUALITY STANDARD									
			pH Lower	pH Upper	Temperature	DO (%)	BOD (ATU)	Total Ammonia	Un-ionised Ammonia	Suspended Solids	Total Copper	Total Zinc
DRIMPTON STREAM	NETHERWAY	R02C009	-	-	-	-	31	-	-	-	-	-
WHETLEY STREAM	POTWELL FARM	R02C016	-	-	-	-	83	-	-	-	-	-
BRANSCOMBE STREAM	BRANSCOMBE MOUTH	R02A001	-	-	-	-	-	-	-	-	-	-

Appendix 10.10

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
IDENTIFICATION OF POSSIBLE CAUSES OF NON-COMPLIANCE WITH RQO
CATCHMENT : AXE (02)

* = WORK ALREADY IN HAND

1990 Map Position Number	River	Reach upstream of	User Reference Number	Reach Length (km)	Possible causes of non-compliance
1	AXE	A3066 BRIDGE MOSTERTON	R02C001	4.5	FARMING ACTIVITIES, UP-STREAM ABSTRACTIONS
2	AXE	* SEABOROUGH	R02C002	3.0	UP-STREAM ABSTRACTIONS, ON-GOING POLLUTION, FARMING ACTIVITIES
3	AXE	OATHILL FARM WAYFORD	R02C003	3.8	FARMING ACTIVITIES
4	AXE	* FORDE BRIDGE	R02C004	6.3	FARM DISCHARGE
5	AXE	BROOM	R02C005	7.0	
7	AXE	BOW BRIDGE	R02C007	3.3	
9	AXE	WHITFORD BRIDGE	R02B001	3.8	
10	AXE	AXE BRIDGE	R02B002	4.0	SEWAGE TREATMENT WORKS
11	COLY	* WOODBRIDGE	R02B003	4.3	FARMING ACTIVITIES
12	COLY	BRINKLEY BRIDGE	R02B004	2.8	
13	COLY	HEATHAYNE FARM	R02B005	2.8	FARMING ACTIVITIES
14	COLY	COLYFORD	R02B006	3.3	DROUGHT, UP-STREAM ABSTRACTIONS
15	UMBORNE BROOK	TRIFFORDS FARM	R02B007	7.8	DROUGHT, UP-STREAM ABSTRACTIONS
17	OFFWELL BROOK	WEST COLWELL	R02B009	2.0	SEWAGE TREATMENT WORKS
21	YARTY	BECKFORD BRIDGE	R02D005	4.9	
22	YARTY	A35 BRIDGE GAMMONS HILL	R02D006	4.4	
24	CORRY BROOK	* PRIOR TO RIVER YARTY	R02D002	6.8	FARMING ACTIVITIES
25	KIT BROOK	NARFORDS	R02C012	3.3	
26	KIT BROOK	AXE FARM	R02C013	5.8	FARMING ACTIVITIES, LAND RUN-OFF
27	BLACKWATER RIVER	BUDDLEWALL	R02C008	6.8	FARM ACTIVITIES
30	WHATLEY STREAM	* AMMERHAM	R02C015	5.3	SEWAGE TREATMENT WORKS
31	SYNDERFORD	BEERE FARM	R02C014	6.9	FARMING ACTIVITIES, POLLUTION (ONE OFF INCIDENT)
32	TEMPLE BROOK	* OATHILL BRIDGE	R02C018	4.3	FARM DISCHARGE
34	DRIMPTON STREAM	NETHERHAY	R02C009	5.1	DROUGHT, UP-STREAM ABSTRACTIONS
35	WHETLEY STREAM	POTWELL FARM	R02C016	3.5	FARMING ACTIVITIES