

Environmental Protection Internal Report

REGIONAL WATER QUALITY MONITORING AND SURVEILLANCE PROGRAMME FOR 1992 QUALITY ASSESSMENT OF ENCLOSED WATERS

January 1992

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REGIONAL WATER QUALITY MONITORING AND SURVEILLANCE PROGRAMME, 1992

QUALITY ASSESSMENT OF ENCLOSED WATERS

TECHNICAL REPORT No. FWS/92/005

SUMMARY

The Controlled Waters (Lakes and Ponds) Order, 1989, for purposes of the Water Act 1989, defines certain reservoirs as relevant lakes and ponds. This monitoring programme enables the quality of such reservoirs and other enclosed waters to be assessed.

28 reservoirs are monitored monthly to assess water quality in standing waters. Samples are analysed from three depths (surface, 0-5 m composite, bottom + 1 m). A total of 200 sites are visited each month and these are divided into 84 river sites (inflow or outflow streams) and 116 sites located in reservoirs and sampled from a small boat. This programme produces 2400 samples for analysis.

At each site 52 standard sanitary, metals and bacteriological determinands are analysed monthly, and 31 pesticide determinands are analysed quarterly and an assessment of the phytoplankton is made each month. Temperature and dissolved oxygen profiles of the water column are obtained each month by measuring values at 1 m intervals. The major feeder (inflow) and outflow streams are also monitored chemically.

The identification of monitoring points began in September 1991, although it was not until January 1992 that all reservoirs were visited following an increase in sampling resources. Sample locations have now been identified for all reservoirs and feeder streams.

All monitoring points have been plotted onto maps contained in Technical Report No. FWP/92/001, Water Quality Monitoring Locations, 1992.

PROGRAMME SUMMARY

No. of Sampling Locations	No. of Samples	No. of Determinands
200	2400	149,600

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ENVIRONMENT AGENCY



110250

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INTRODUCTION

The Surface Waters (Classification) Programme monitors the quality of the region's standing waters. Most of the standing waters are reservoirs and there are only two natural standing waters of any size (Slapton Ley and Loe Pool) in the region.

Not all the reservoirs in the region are monitored. Owing to limited resources, a priority list of the most important sites was drawn up; public water supply (PWS) reservoirs are included, but some of the standby or decommissioned reservoirs are not sampled (see Table 1).

TABLE 1

Reservoirs sampled by Enclosed Waters Programme

Otterhead
Squabmoor
Kennick
Trenchford
Fernworthy
Butterbrook
Avon
Old Mill
Upper Tamar Lake
Lower Tamar Lake
Burrator
Porth
Venford
Wimbleball
Colliford
Crowdy
Wistlandpound
Stithians
Drift
Bussow
Boswyn
Roadford
Argal
College 4
Meldon
Lower Slade
Melbury
Siblyback

Reservoirs NOT sampled by Enclosed Waters Programme

Jennetts
Darracott
Cargenwen
Challacombe
Gammaton, Upper and Lower
Holywell
Tregatheran
Boscathnoe
West Ilkerton
Red Lake
Left Lake
Holyford Ponds
Leswidden Pit
Meldon Pool
Tottiford
Lopwell

The first samples were collected in September 1991 and it was envisaged that reservoirs would be sampled on a rolling five year programme. However more resources became available and this has enabled the programme to be modified to allow each reservoir to be visited monthly. The revised programme commenced in April 1992.

Samples are collected from three depths on each reservoir in order to monitor water quality within the water column. This is particularly important in the summer when thermoclines develop and there may be a significant difference between surface water quality (from the epilimnion) and bottom water quality (from the hypolimnion). Feeder streams and outflows are also monitored so that the effect of impoundments on the river system can be assessed. In addition, when combined with hydrometric data, the loading of critical elements (eg phosphorus) flowing into a reservoir can be calculated. This information is very useful when planning possible management strategies to control algal blooms.

Sampling buoys are currently being deployed in reservoirs in order to establish fixed sampling stations. New User Reference Numbers (URNs) have been created to accommodate new sample sites.

DESCRIPTION OF PROGRAMME

The principal reason for the programme is to classify inland waters as prescribed by Statutory Instrument 1989 No. 1148. The feeder streams have been added to the programme in order to establish whence, and in what quantities, nutrients and pollutants are entering the standing waters.

Surveys in 1989 and 1990 revealed that many standing waters in the region suffered from blooms of blue-green algae. The algal information from this programme allows algal blooms to be monitored.

Where a Sewage Treatment Works is situated upstream of a waterbody and is supplying a nutrient load which is accelerating eutrophication, the information from this programme will help to support the case for designating the waterbody a sensitive site under the Urban Waste Water Directive.

The information from this programme will provide a scientific basis on which to base reservoir management strategies in waterbodies where the NRA is responsible for ensuring that water quality is suitable for treatment and subsequent public water supply.

The programme provides, in some cases, new information on waterbodies which have not previously been investigated.

PROGRAMME INFORMATION

Numbers of:		
Sampling points	Samples	Determinands
200	2400/ year	149,600 /year

EXPLANATION OF SCHEDULE CONTENTS

The sampling schedule is presented in Table 2. The water bodies are grouped into those sampled by the East Area (Avon to Wistlandpound), followed by those sampled by West Area staff (Argal to Upper Tamar Lake). 'SRRM' in the second column of the programme refers to the Route Code on the MENSAR computer system, and allows samples from the relevant group of sites (third column) to be pre-registered by the laboratory system. NGR is the six figure national grid reference for the sampling site. For the sampling sites on the reservoir, three of the NGRs are identical as the location of the sampling point is the same on the map, the difference between the sites is the depth at which the sample is collected. A URN (User Reference Number) is a unique reference for a particular sampling point. Not all the URNs have been set up yet by South West Water and the gaps in this column are filled in as the new URNs are confirmed. ARG (Analysis Required Group) is the suite of determinands which will be analysed by the laboratory. ARGs S355 and S371 are suites for insecticides and herbicides respectively; each is analysed quarterly. ARGs S319 and S477 contain standard sanitary and metals determinands and are analysed monthly. In addition, S319 contains bacteriological determinands whereas S477 does not; this is because bacteriological analysis of waterbodies sampled in the west area is carried out by the South West Water Services Ltd laboratory in Truro, as samples could not always be ready for analysis within the six hour limit (from the time of collection) if they were sent by courier to the laboratory at Manley House.

ENDORSEMENT

The contents of this programme have been agreed by the Water Quality Planner, Field Controller and Laboratory Controller.

1993 PROGRAMME

The 1992 programme will be reviewed at the end of the calendar year and recommendations will be made about the frequency of sample collection and determinand suites. If sufficient resources are available, the programme will be increased to include the reservoirs not currently monitored in the 1992 programme (see Table 1).

Table 2.

Enclosed Waters Quality Assessment Programme 1992

Reservoir	SRRM	Sites	NGR	URN	Sample				Frequency(per year)			
					ARG S319	ARG S477	ARG S355	ARG S371				
Avon Dam Reservoir	11	surface	SX 679 653	R08B031	12	-	4	4				
		composite (0-5 m)	SX 679 653	R08B032	12	-	4	4				
		Bottom + 1 m	SX 679 653	R08B033	12	-	4	4				
		Brockhill Stream	SX 678 655	R08B035	12	-	4	4				
		R. Avon u/s dam	SX 671 658	R08B034	12	-	4	4				
		R. Avon d/s dam	SX 679 649	R08B030	12	-	4	4				
Butterbrook Reservoir	22	surface	SX 6456 5928	R09B028	12	-	4	4				
		composite (0-5 m)	SX 6456 5928	R09B030	12	-	4	4				
		Bottom + 1 m	SX 6456 5928	R09B029	12	-	4	4				
		Butter Brook u/s reservoir	SX 6462 5933	R09B031	12	-	4	4				
		Butter Brook at outflow	SX 6460 5930	R09B032	12	-	4	4				
Fernworthy Reservoir	1	surface	SX 667 842	R06C079	12	-	4	4				
		composite (0-5 m)	SX 667 842	R06C077	12	-	4	4				
		Bottom + 1 m	SX 667 842	R06C078	12	-	4	4				
		Lowton Brook	SX 663 837	R06C083	12	-	4	4				
		Assycombe Brook	SX 658 836	R06C082	12	-	4	4				
		Thornworthy inflow	SX 665 844	R06C081	12	-	4	4				
		South Teign River d/s Fernworthy	SX 672 843	R06C080	12	-	4	4				
Kennick Reservoir	7	surface	SX 805 840	R06C092	12	-	4	4				
		composite (0-5 m)	SX 805 840	R06C093	12	-	4	4				
		Bottom + 1 m	SX 805 840	R06C091	12	-	4	4				
		Dam inflow	SX 808 838	R06C095	12	-	4	4				
		Clampitt inflow	SX 806 845	R06C094	12	-	4	4				
		Blackingstone inflow	SX 801 850	R06C090	12	-	4	4				
		d/s Kennick dam	SX 807 837	R06C096	12	-	4	4				
Melbury Reservoir		surface	SS 387 201	R29C059	12	-	4	4				
		composite (0-5 m)	SS 387 201	R29C058	12	-	4	4				
		Bottom + 1 m	SS 387 201	R29C060	12	-	4	4				
		Inflow to Melbury Reservoir	SS 384 201	R29C062	12	-	4	4				
		Outflow from Melbury Reservoir	SS 388 202	R29C061	12	-	4	4				
Meldon Reservoir	9	surface	SX 563 917	R29D064	12	-	4	4				
		composite (0-5 m)	SX 563 917	R29D065	12	-	4	4				
		Bottom + 1 m	SX 563 917	R29D063	12	-	4	4				
		Homerton Hill inflow	SX 563 909	R29D062	12	-	4	4				
		R. West Okement u/s Meldon Dam	SX 556 906	R29D225	12	-	4	4				
		R. West Okement d/s Meldon Dam	SX 563 917	R29D027	12	-	4	4				
Old Mill Reservoir	27	surface	SX 851 522	R07A020	12	-	4	4				
		composite (0-5 m)	SX 851 522	R07A021	12	-	4	4				
		Bottom + 1 m	SX 851 522	R07A019	12	-	4	4				
		Old Mill Creek u/s Dam	SX 845 522	R07A024	12	-	4	4				
		Bruckton inflow	SX 848 523	R07A023	12	-	4	4				
		Old Mill Creek d/s Dam	SX 853 522	R07A022	12	-	4	4				

Enclosed Waters Quality Assessment Programme 1992

Reservoir	SRRM	Sites	NGR	URN	Sample				Frequency (per year)			
					ARG S319	ARG S477	ARG S355	ARG S371				
Otterhead		surface	ST 226 132		12	-	4	4				
		composite (0-2 m)	ST 226 132		12	-	4	4				
		Bottom + 1 m	ST 226 132		12	-	4	4				
		Inflow	ST 226 135		12	-	4	4				
		Outflow	ST 226 132		12	-	4	4				
Lower Slade Reservoir	20	surface	SS 506 457	R31A027	12	-	4	4				
		composite (0-5 m)	SS 506 457	R31A028	12	-	4	4				
		Bottom + 1 m	SS 506 457	R31A029	12	-	4	4				
		Inflow into Lower Slade Reservoir	SS 505 453	R31A025	12	-	4	4				
		Outflow from Lower Slade Reservoir	SS 506 458	R31A026	12	-	4	4				
Squabmoor Reservoir	12	surface	SY 040 839	R04A007	12	-	4	4				
		composite (0-5 m)	SY 040 839	R04A006	12	-	4	4				
		Bottom + 1 m	SY 040 839	R04A008	12	-	4	4				
		Inflow to Squabmoor	SY 039 843	R04A004	12	-	4	4				
		Dalditch plantation inflow	SY 039 841	R04A003	12	-	4	4				
		Budleigh Common inflow		R04A002	12	-	4	4				
		Outflow from Squabmoor	SY 041 838	R04A005	12	-	4	4				
Trenchford Reservoir	10	surface	SX 806 824	R06C088	12	-	4	4				
		composite (0-5 m)	SX 806 824	R06C087	12	-	4	4				
		Bottom + 1 m	SX 806 824	R06C086	12	-	4	4				
		Mardon Cross inflow	SX 803 828	R06C085	12	-	4	4				
		Bullaton Cross inflow	SX 806 824	R06C089	12	-	4	4				
		Beadon Brook at outflow from Trenchford	SX 807 824	R06C084	12	-	4	4				
Venford Reservoir	3	surface	SX 687 712	R07B073	12	-	4	4				
		composite (0-5 m)	SX 687 712	R07B074	12	-	4	4				
		Bottom + 1 m	SX 687 712	R07B075	12	-	4	4				
		Venford Brook u/s dam at inflow	SX 683 705	R07B072	12	-	4	4				
		Venford Brook d/s dam at outflow	SX 687 714	R07B076	12	-	4	4				
Wimbleball Reservoir	2	surface	SS 967 293	R05G023	12	-	4	4				
		composite (0-5 m)	SS 967 293	R05G024	12	-	4	4				
		Bottom + 1 m	SS 967 293	R05G022	12	-	4	4				
		Feeder into Upton Arm	SS 987 288	R05G020	12	-	4	4				
		Feeder into Lydon Arm	SS 982 304	R05G019	12	-	4	4				
		Feeder from quarry	SS 978 318	R05G025	12	-	4	4				
		Withiel feeder	SS 979 324	R05G026	12	-	4	4				
		Woolcotte feeder	SS 971 316	R05G021	12	-	4	4				
		River Haddeo - Wimbleball outflow	SS 964 294	R05G018	12	-	4	4				

Reservoir	SRRM	Sites	NGR	URN	Sample		Frequency (per year)	
					ARG S319	ARG S477	ARG S355	ARG S371
Wistlandpound Reservoir	6	surface	SS 644 415	R30H024	12	-	4	4
		composite 0-5 m	SS 644 415	R30H025	12	-	4	4
		Bottom + 1 m	SS 644 415	R30H026	12	-	4	4
		West Ridge feeder	SS 648 417	R30H028	12	-	4	4
		Westland feeder	SS 647 422	R30H029	12	-	4	4
		Rye Stream at outflow from dam	SS 644 413	R30H027	12	-	4	4
Argal Reservoir	21	surface	SW 763 328	R19A062	-	12	4	4
		composite 0-5 m	SW 763 328	R19A061	-	12	4	4
		Bottom + 1 m	SW 763 328	R19A064	-	12	4	4
		Treverva inflow	SW 758 318	R19A063	-	12	4	4
		Lower Spargo inflow	SW 761 327	R19A060	-	12	4	4
Boswyn Reservoir	24	Dam site	SW 658 363	R23A063	-	12	4	4
		Dam steps	SW 659 363	R23A060	-	12	4	4
		Botetoe Br. abstraction	SW 641 377	R23A038	-	12	4	4
Burrator Reservoir	30	surface	SX 552 680	R11B039	-	12	4	4
		composite 0-5 m	SX 552 680	R11B038	-	12	4	4
		Bottom + 1 m	SX 552 680	R11B037	-	12	4	4
		Devonport leat	SX 563 694	R11B040	-	12	4	4
		R. Meavy u/s dam	SX 566 692	R11B008	-	12	4	4
		R. Meavy d/s dam	SX 552 679	R11B009	-	12	4	4
Bussow Reservoir	23	surface	SW 502 393	R22A020	-	12	4	4
		composite 0-5 m	SW 502 393	R22A019	-	12	4	4
		Bottom + 1 m	SW 502 393	R22A018	-	12	4	4
		Pipe input (right)	SW 502 390	R22A021	-	12	4	4
		Dam top end (left)	SW 501 391	R22A023	-	12	4	4
College 4 Reservoir		surface	SW 773 335	R19A059	-	12	4	4
		composite 0-5 m	SW 773 335	R19A058	-	12	4	4
		Bottom + 1 m	SW 773 335	R19A057	-	12	4	4
		Mabe feeder	SW 768 337	R19A056	-	12	4	4
		u/s dam feeder	SW 765 331	R19A055	-	12	4	4
Colliford Lake	16	Dam - surface	SX 178 712	R15B058	-	12	4	4
		Dam - composite 0-5 m	SX 178 712	R15B059	-	12	4	4
		Dam - Bottom + 1 m	SX 178 712	R15B057	-	12	4	4
		Dozmary input	SX 188 738	R15B069	-	12	4	4
		Sprey Moor feeder	SX 181 746	R15B068	-	12	4	4
		Bolventor feeder	SX 184 756	R15B060	-	12	4	4
		Simonstone Arm - surface	SX 165 727	R15B063	-	12	4	4
		Simonstone Arm - composite 0-5 m	SX 165 727	R15B062	-	12	4	4
		Simonstone Arm - bottom + 1 m	SX 165 727	R15B061	-	12	4	4
		Lord's Waste Arm - surface	SX 176 733	R15B065	-	12	4	4
		Lord's Waste Arm - composite 0-5 m	SX 176 733	R15B064	-	12	4	4
		Lord's Waste Arm - bottom + 1 m	SX 176 733	R15B066	-	12	4	4
		St Neot River at outflow from Colliford	SX 179 709	R15B067	-	12	4	4

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Reservoir	SRRM	Sites	NGR	URN	Sample Frequency (per year)			
					ARG S319	ARG S477	ARG S355	ARG S371
Crowdy Reservoir	18	surface	SX 139 834	R25B064	-	12	4	4
		Composite 0 -5 m	SX 139 834	R25B063	-	12	4	4
		Bottom + 1 m	SX 139 834	R25B065	-	12	4	4
		Crowdy Stream at outflow from Crowdy	SX 138 833	R25B031	-	12	4	4
Drift Reservoir	19	surface	SW 437 289	R21A038	-	12	4	4
		composite 0-5 m	SW 437 289	R21A037	-	12	4	4
		Bottom + 1 m	SW 437 289	R21A036	-	12	4	4
		R. Newlyn u/s dam	SW 434 299	R21A039	-	12	4	4
		Sancreed Brook u/s dam	SW 431 296	R21A017	-	12	4	4
		R. Newlyn d/s dam	SW 437 288	R21A018	-	12	4	4
Loe Pool		Bar - surface	SW 645 243	R20A026	-	12	4	4
		Bar - composite 0-2 m	SW 645 243	R20A027	-	12	4	4
		Bar - Bottom + 1 m	SW 645 243	R20A028	-	12	4	4
		Loe Valley - surface	SW 648 255	R20A025	-	12	4	4
		Loe Valley - composite 0-2 m	SW 648 255	R20A024	-	12	4	4
		Loe Valley - bottom + 1 m	SW 648 255	R20A023	-	12	4	4
		Plantation - surface	SW 648 248	R20A020	-	12	4	4
		Plantation - composite 0-2 m	SW 648 248	R20A021	-	12	4	4
		Plantation - bottom + 1 m	SW 648 248	R20A022	-	12	4	4
		Carminowe Creek feeder	SW 654 244	R20A019	-	12	4	4
		Penrose feeder	SW 644 256	R20A018	-	12	4	4
		R. Cober u/s Pool	SW 650 257	R20A017	-	12	4	4
		Loe Pool at Bar outfall	SW 642 242	R20A005	-	12	4	4
		Lower Tamar Lake	5	surface	SS 296 108	R12L024	-	12
composite 0-2 m	SS 296 108			R12L026	-	12	4	4
Bottom + 1 m	SS 296 108			R12L025	-	12	4	4
Newlands feeder	SS 298 112			R12L023	-	12	4	4
R. Tamar u/s dam	SS 293 114			R12L027	-	12	4	4
R. Tamar d/s dam at outflow	SS 295 107			R12L009	-	12	4	4
Porth Reservoir	25	surface	SW 864 622	R25A027	-	12	4	4
		composite 0-5 m	SW 864 622	R25A028	-	12	4	4
		bottom + 1 m	SW 864 622	R25A029	-	12	4	4
		Porth stream u/s dam	SW 874 623	R25A030	-	12	4	4
		Porth stream d/s dam	SW 863 622	R25A031	-	12	4	4

Reservoir	SRRM	Sites	NGR	URN	Sample		Frequency (per year)	
					ARG S319	ARG S477	ARG S355	ARG S371
Roadford Reservoir	14	Dam - surface	SX 422 901	R12G100	-	12	4	4
		Dam - composite 0-5 m	SX 422 901	R12G099	-	12	4	4
		Dam - bottom + 1 m	SX 422 901	R12G098	-	12	4	4
		Grinnacombe Moor - surface	SX 425 915	R12G103	-	12	4	4
		Grinnacombe Moor - composite 0-5 m	SX 425 915	R12G102	-	12	4	4
		Grinnacombe Moor - bottom + 1 m	SX 425 915	R12G101	-	12	4	4
		Southweek - surface	SX 426 924	R12G104	-	12	4	4
		Southweek - composite 0-5 m	SX 426 924	R12G105	-	12	4	4
		Southweek - bottom + 1 m	SX 426 924	R12G106	-	12	4	4
		Witherdon feeder	SX 425 934	R12G108	-	12	4	4
		R. Wolf u/s dam	SX 435 934	R12G107	-	12	4	4
		R. Wolf d/s dam	SX 421 900	R12G097	-	12	4	4
Siblyback Lake		surface	SX 233 704	R15B070	-	12	4	4
		composite 0-5 m	SX 233 704	R15B071	-	12	4	4
		Bottom + 1 m	SX 233 704	R15B072	-	12	4	4
		Trewalla feeder	SX 237 707	R15B074	-	12	4	4
		Siblyback stream u/s dam	SX 235 717	R15B073	-	12	4	4
		Siblyback stream d/s dam	SX 232 703	R15B033	-	12	4	4
Stithians Reservoir	17	Dam - surface	SW 719 364	R19E034	-	12	4	4
		Dam - composite 0-5 m	SW 719 364	R19E035	-	12	4	4
		Dam - bottom + 1 m	SW 719 364	R19E036	-	12	4	4
		Carmenellis - surface	SW 715 354	R19E031	-	12	4	4
		Carmenellis - composite 0-5 m	SW 715 354	R19E033	-	12	4	4
		Carmenellis - bottom + 1 m	SW 715 354	R19E032	-	12	4	4
		Penhalveor - surface	SW 712 371	R19E030	-	12	4	4
		Penhalveor - composite 0-5 m	SW 712 371	R19E028	-	12	4	4
		Penhalveor - bottom + 1 m	SW 712 371	R19E029	-	12	4	4
		Penhalveor feeder	SW 706 373	R19E037	-	12	4	4
		Polmarth feeder	SW 707 364	R19E038	-	12	4	4
		Carmenellis feeder	SW 712 352	R19E039	-	12	4	4
		R. Kennall d/s Stithians dam	SW 718 363	R19E040	-	12	4	4
Upper Tamar Lake	4	Dam - surface	SS 288 118	R12L030	-	12	4	4
		Dam - composite 0-5 m	SS 288 118	R12L029	-	12	4	4
		Dam - bottom + 1 m	SS 288 118	R12L028	-	12	4	4
		Lympscott - surface	SS 287 122	R12L034	-	12	4	4
		Lympscott - composite 0-5 m	SS 287 122	R12L033	-	12	4	4
		Lympscott - bottom + 1 m	SS 287 122	R12L032	-	12	4	4
		Brexworthy - surface	SS 286 128	R12L037	-	12	4	4
		Brexworthy - composite 0-5 m	SS 286 128	R12L038	-	12	4	4
		Brexworthy - bottom + 1 m	SS 286 128	R12L036	-	12	4	4
		Lympscott feeder	SS 292 124	R12L031	-	12	4	4
		Brexworthy feeder	SS 286 127	R12L035	-	12	4	4
		R. Tamar u/s dam at inflow	SS 281 132	R12L039	-	12	4	4
		R. Tamar d/s dam at outflow	SS 289 118	R12L040	-	12	4	4

APPENDIX I

Analysis Required Group (ARG) S319: Determinands, units and analytical method

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method Code</u>	<u>Method Description</u>
61	pH	pH	1	SKALAR PH SYSTEM RIVERS - LOW LEVEL
62	CONDUCTIV	Microsiemens/cm	1	SKALAR PH SYSTEM RIVERS LOW LEVEL
68	TURBIDITY	Turbidity FTU	1	SKALAR PH SYSTEM RIVERS LOW LEVEL
72	COLOUR FIL	Colour	1	COLOUR BY UV-VIS RIVERS LOW LEVEL
76	TEMP	Celsius	1	IN SITU IN SITU
81	D.O. %	%	2	IN SITU IN SITU
82	D.O.MG/L	mg/l	2	CALCULATION CALCULATION
85	BOD ATU	mg/l	1	BOD ATU ROUTINE
92	COD	mg/l	1	UV/VIS C.O.D.
99	C ORG TOT	mg/l	1	SKALAR ROUTINE
106	CADMIUM D	ug/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
108	CADMIUM	ug/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
111	AMMONIA	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
116	T.O.N	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
117	NITRATE	mg/l	1	CALCULATED CALCULATED
118	NITRITE	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
135	SS 105 C	mg/l	1	SUSP SOLIDS (NO MINERAL) LOW SUSP SOLIDS (NO MINERAL) LOW
158	HARD TOTAL	mg/l	1	CALCULATION CALCULATION
162	ALK 4.5	mg/l	1	SKALAR ROUTINE
172	CHLOR-ION	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
180	ORTHO-PHOS	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL

Contd..

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method Code</u>	<u>Method Description</u>
182	SILICAT RD	mg/l	1	LACHAT NUTRIENTS
183	SULPHATE	mg/l	1	NUTRIENTS-RIVERS - LOW LEVEL SKALAR ROUTINE
207	SODIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
211	POTASSIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
213	COPPER DIS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
215	COPPER	mg/l	1	PERKIN ELMER ELAN TOTAL ROUTINE COPPER
237	MG	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
241	CALCIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
243	ZINC DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
245	ZINC	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
285	AL DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
287	ALUMINIUM	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
326	LEAD DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
328	LEAD	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
346	PHOS DISS	mg/l	1	PHOSPHORUS DISSOLVED PHOSPHORUS DISSOLVED
348	PHOSPHORUS	mg/l	1	DIGESTION FOLLOWED BY FIAS PHOSPHORUS TOTAL
373	CHROM DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
375	CHROMIUM	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
401	MANG DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
403	MANGANESE	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
419	IRON DISS	mg/l	1	PERKIN ELMER 2100 ROUTINE - DISSOLVED

Contd..

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method Code</u>	<u>Method Description</u>
421	IRON	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
427	NICKEL DIS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
429	NICKEL	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
461	DET ANION	mg/l	1	FIASTAR ANIONIC DETERGENTS
729	CHLOROPH-A	ug/l	1	UV/VIS CHLOROPHYLL
942	FStrP100ml	No/100 ml	1	MICRO 1 FAECAL STREP/100MLS
354	As DIS ppb	ug/l	1	PERKIN ELMER 4100 ROUTINE LOW LEVEL DISSOLVED
7356	ARSENIC	ug/l	1	PERKIN ELMER 4100 ROUTINE LOW LEVEL
9933	ColP100ml	No/100 ml	1	MICRO 1 TOTAL COLIFORMS/100MLS
9935	EColP100ml	No/100 ml	1	MICRO 1 E.COLI/100MLS

*** END OF REPORT ***

Analysis Required Group (ARG) S477: Determinands, units and analytical method

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method Code</u>	<u>Method Description</u>
61	pH	pH	1	SKALAR PH SYSTEM RIVERS - LOW LEVEL
62	CONDUCTIV	Microsiemens/cm	1	SKALAR PH SYSTEM RIVERS LOW LEVEL
68	TURBIDITY	Turbidity FTU	1	SKALAR PH SYSTEM RIVERS LOW LEVEL
72	COLOUR FIL	Colour	1	COLOUR BY UV-VIS RIVERS LOW LEVEL
76	TEMP	Celsius	1	IN SITU IN SITU
81	D.O. %	%	2	IN SITU IN SITU
82	D.O.MG/L	mg/l	2	CALCULATION CALCULATION
85	BOD ATU	mg/l	1	BOD ATU ROUTINE
92	COD	mg/l	1	UV/VIS C.O.D.
99	C ORG TOT	mg/l	1	SKALAR ROUTINE
106	CADMIUM D	ug/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
108	CADMIUM	ug/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
111	AMMONIA	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
116	T.O.N	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
117	NITRATE	mg/l	1	CALCULATED CALCULATED
118	NITRITE	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
135	SS 105 C	mg/l	1	SUSP SOLIDS (NO MINERAL) LOW SUSP SOLIDS (NO MINERAL) LOW
158	HARD TOTAL	mg/l	1	CALCULATION CALCULATION
162	ALK 4.5	mg/l	1	SKALAR ROUTINE
172	CHLOR-ION	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL
180	ORTHO-PHOS	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL

Contd..

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method Code</u>	<u>Method Description</u>
182	SILICAT RD	mg/l	1	LACHAT NUTRIENTS
183	SULPHATE	mg/l	1	NUTRIENTS-RIVERS - LOW LEVEL SKALAR ROUTINE
207	SODIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
211	POTASSIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
213	COPPER DIS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
215	COPPER	mg/l	1	PERKIN ELMER ELAN TOTAL ROUTINE COPPER
237	MG	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
241	CALCIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
243	ZINC DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
245	ZINC	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
285	AL DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
287	ALUMINIUM	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
326	LEAD DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
328	LEAD	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
346	PHOS DISS	mg/l	1	PHOSPHORUS DISSOLVED PHOSPHORUS DISSOLVED
348	PHOSPHORUS	mg/l	1	DIGESTION FOLLOWED BY FIAS PHOSPHORUS TOTAL
373	CHROM DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
375	CHROMIUM	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
401	MANG DISS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
403	MANGANESE	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
419	IRON DISS	mg/l	1	PERKIN ELMER 2100 ROUTINE - DISSOLVED

Contd..

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method Code</u>	<u>Method Description</u>
421	IRON	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL
427	NICKEL DIS	mg/l	1	PERKIN ELMER ELAN ROUTINE DISSOLVED
429	NICKEL	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES
461	DET ANION	mg/l	1	FIASTAR ANIONIC DETERGENTS
729	CHLOROPH-A	ug/l	1	UV/VIS CHLOROPHYLL
181	WEATH TEMP	Misc	1	IN SITU
183	WEATH PREC	Misc	1	IN SITU
7354	As DIS	ppb	1	PERKIN ELMER 4100 ROUTINE LOW LEVEL DISSOLVED
356	ARSENIC	ug/l	1	PERKIN ELMER 4100 ROUTINE LOW LEVEL

*** END OF REPORT ***

APPENDIX III

Analysis Required Group (ARG) S355 (Insecticides): Determinands, units and analytical method.

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method</u>	<u>Method Description</u>
			<u>Code</u>	
3081	ISODRIN	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3082	HCB TOTAL	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3083	HCBD	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3125	CYFLUTHRIN	ng/l	1	ECD-GC MOTHPROOFERS
3276	ALDRIN	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3294	DDE-(PP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3295	DDE-(OP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3296	DDT (OP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3297	DDT (PP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS

Contd..

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method</u>	<u>Method Description</u>
			<u>Code</u>	
3301	DIELDRIN	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3306	ENDRIN	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3310	HCH-ALPHA	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3311	HCH-BETA	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3312	HCH-DELTA	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3313	HCH-GAMMA	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3324	PARATHION	ng/l	1	NPD-GC ROUTINE OP/ON COMPOUNDS
3329	TDE OP'	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3330	TDE (PP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS
3440	PERM-TRANS	ng/l	1	ECD-GC MOTHPROOFERS BY GC
3441	PERM-CIS	ng/l	1	ECD-GC MOTHPROOFERS BY GC

*** END OF REPORT ***

APPENDIX IV

Analysis Required Group (ARG) S371 (Herbicides): Determinands, units and analytical method

<u>Det.</u>	<u>Desc.</u>	<u>(Units)</u>	<u>Method Code</u>	<u>Method Description</u>
3114	CHLTOLURON	ug/l	1	DIODE-ARRAY HPLC HERBICIDES
3117	ISOPRTURON	ug/l	1	ISOPROTURON HERBICIDES
3118	LINURON	ug/l	1	LINURON HERBICIDES
3130	METOXURON	ug/l	1	METOXURON HERBICIDES
3277	ATRAZINE	ng/l	1	NPD-GC LOW LEVEL OP/ON COMPOUNDS
3323	PCP	ng/l	1	MASS SPEC PCP IN RIVERS AND DISCHARGES
3327	SIMAZINE	ng/l	1	NPD-GC ROUTINE OP/ON COMPOUNDS
3376	ORGPB PREP	Misc	1	N/P PESTICIDE PREP PREP. DETERMINAND
3415	SPE PREP	Misc	1	PREP DETERMINAND SOLID PHASE PREP.
3425	ATRZ-ETHYL	ng/l	1	NPD-GC ROUTINE OP/ON COMPOUNDS
3427	ATRZ-ISOPR	ng/l	1	NPD-GC METABOLITE OF ATRAZINE