Environmental Protection Internal Report

REGIONAL WATER QUALITY MONITORING AND SURVEILLANCE PROGRAMME FOR 1993

EC SURFACE WATER ABSTRACTION DIRECTIVE

November 1992
FWS/92/023
Author: K M Lee
Assistant Scientist (Freshwaters)

C.V.M. Davies
Environmental Protection Manager

NRA
National Rivers Authority
South West Region

FRESHWATER SECTION TECHNICAL REPORT AUDIT

REPORT NO: FWS/92/023

REPORT TITLE: Regional Water Quality monitoring and Surveillance Programme for 1993

I have read the above report and I am satisfied with its written scientific and technical content. I have checked all Tables, Figures and calculations for numerical accuracy and verify them to be correct.

DATE: 16-11-92

SIGNATURE OF RESPONSIBLE OFFICER Kia Ming Lee

I recommend acceptance of this Report/Note

M.R.N. Nook Freshwater Officer 23/11/92 Date

Passed for Release

M.R.N. Nook pp Water Quality Planner 23/11/92 Date

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SUMMARY

The water quality monitoring programme described in this technical note was established by the National Rivers Authority (South West) in February 1991 to fulfil the legal requirements under the EC Surface Water Abstraction Directives 75/440/EEC and 79/869/EEC, and the UK Surface Waters (Classification) Regulations 1989, Statutory Instrument 1989/1148.

The programme is carried out, also, to fulfil the current initial monitoring requirements under the EC Nitrate Directive.

The 1993 monitoring programme is a continuation of the 1992 programme. Fifty four abstraction intakes operated by South West Water Services Limited, and two operated by Wessex Water Services Limited, for public drinking water supply in the South West Region are monitored in 1993. The 1993 programme complies with the requirements of the two Directives concerning the determinands monitored, methods of measurement and frequencies of sampling and analysis.

All abstraction intakes are sampled routinely and evenly over a year. The data generated from this programme can be used to provide additional information to support the routine river chemical programme.

1993 PROGRAMME SUMMARY

Number of Sampling Locations	Number of Samples	Number of Determinands
56	672	28,112

K.M. Lee
Assistant Scientist (Freshwaters)

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1. INTRODUCTION

1.1 This is a water quality monitoring programme established by the National Rivers Authority (South West) in 1991 to fulfil the legal requirements under the EC Surface Water Abstraction Directives.

1.2 It is carried out, also, to fulfil the current initial monitoring requirements under the EC Nitrate Directive in respect of surfacewaters used for potable abstraction.

1.3 Sampling was commenced in February 1991 after receiving a definitive and agreed list of abstraction intakes from the South West Water Services Ltd.

1.4 The 1993 monitoring programme is developed from the 1992 programme with two additional intakes monitored. They are the Holyford Intake on the Holyford Brook, and Otterhead Reservoir. The sampling frequencies and determinands analysed remain the same as the 1992 programme.

1.5 There are two EC Directives which apply to the water quality requirements for the uses of surface water for potable supply.

1.6 The first Directive, 75/440/EEC, concerning the "quality required of surface water intended for the abstraction of drinking water", gives a list of determinands which must be measured and standards which must be met according to the specified level of drinking water treatment. The three categories of treatment methods and the list of associated parameters and standards are given in Annex I and II of the Directive and Annex II is reproduced in Appendix 1 of this report.

1.7 The second Directive, 79/869/EEC, establishes the methods of measurement and the frequencies of sampling and analysis of surface water abstracted for potable supply. The minimum annual sampling frequencies for each of the determinands given in 75/440/EEC are set with respect to both the level of treatment and the size of the population served. These are reproduced in Appendix 2.

1.8 The requirements of Directive 75/440/EEC were translated into UK legislation via Section 104(i) of the 1989 Water Act (now Section 82 of the 1991 Water Resources Act) by the Surface Waters (Classification) Regulations 1989, Statutory Instrument (SI)

2. THE 1993 MONITORING PROGRAMME

2.1 The 1993 programme is a continuation of the 1992 programme and is designed to comply with the requirements of the EC Directives (75/440/EEC and 79/869/EEC) and the UK Regulations.

2.2 The Holyford Intake and Otterhead Reservoir, which were not monitored in 1992, will be monitored in 1993.

2.3 Locations Monitored

2.3.1 The NRA monitors 54 surface water abstraction intakes operated by the South West Water Services Ltd in the South West Region. Fifty of them are "permanent" sources and four are "seasonal".

In addition, two "permanent" surface water abstraction intakes operated by the Wessex Water Services Ltd. in the South West Region are monitored. They are Wimbleball and Otterhead Reservoir.

2.3.2 There are, therefore, a total of 56 intakes monitored in the South West Region, which include 24 reservoir intakes and 32 river intakes.

2.3.3 In the case of river abstractions, water quality is monitored at the river intakes. In the case of reservoir abstractions, water quality is monitored at the depth(s) where water is abstracted.

2.4 Determinands Monitored

2.4.1 All the determinands given by the Directive 75/440/EEC are monitored in 1992, except:

1. Nitrogen by Kjeldahl method, Substances extractable with chloroform and Odour. This is because of the methodology is not currently available in NRA (SW) laboratory, and also the standards are not mandatory for these determinands;

2. Total extractable organic chlorine, Beryllium, Cobalt, Nickel and Vanadium. This is because no standards for these determinands are given in the Directive.

2.4.2 In addition to those determinands dictated by the Directive, the following determinands are monitored:

3. PROGRAMME INFORMATION

3.1 Number of Samples Scheduled in 1993 - by Determinand Category

3.1.1 Table 3.1 summarises the number of samples scheduled in the 1992 programme for the three determinand categories (79/860/EEC Annex II, appendix 2).

3.1.2 The total number of samples is 672 and by determinand category 952.

Table 3.1 Number of Samples for Three Determinand Categories.

	CATEGORY		
	I	II	III
Number of locations	56	56	56
Annual sampling frequencies	12	4	1
Number of samples per category	672	224	56

TOTAL number of samples by determinand category	=	952
TOTAL number of samples p.a.	=	672
TOTAL number of determinands p.a. (see Appendix 3)	=	28,112

3.2 Number of Samples Scheduled in 1992 - by Analysis Required Groups (ARGs)

(see Appendix 3)

3.3 Number of Samples Scheduled in 1992 - by Individual Determinands

(see Appendix 3)

01 to 32) defining the river catchment, and a letter defining the sub-catchment (a conveniently sized area which may be the catchment of a tributary, or merely a conveniently sized portion of a large catchment). The final three-digit code defines a particular site in the sub-catchment.

4.2.4.2 An URN is assigned to each river intake sampling site, the location of which is given by its NGR.

4.2.4.3 In the case of reservoir intakes, an URN is assigned to each water draw-off depth at the abstraction site (e.g. draw-off tower), the location of which is given by its NGR.

4.2.5 ARG

4.2.5.1 Analysis Required Group. It is a suite of Determinand/Method used to request a particular set of analyses for a Sample. e.g. an ARG for pesticides will contain Determinand/Methods that measure a set of individual pesticides.

4.2.5.2 The ARGs used in this programme are:

1. Exeter Office Survey Team

   S091 : Category I determinands,
   S092 : Category I and II determinands,
   S093 : Category I, II and III determinands (exclude herbicides)
   S355 : Insecticides
   S371 : Herbicides

2. Bodmin Office Survey Team

   S091 : Category I determinands,
   S367 : Category I and II determinands (exclude bacteriological determinands),
   S374 : Category I, II and III determinands (exclude herbicides and bacteriological determinands),
   S368 : Bacteriological determinands only,
   S355 : Insecticides,
   S371 : Herbicides.

4.2.5.3 Since bacteriological samples collected in the West (by Bodmin Office) are unable to be analysed by the Exeter Laboratory within six hours of collection, a separate ARG for bacteriological determinands is used by the Bodmin Office for the samples to be analysed in a

5. ENDORSEMENT

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

Table 6.1 EC Surface Water Abstraction Directive Sampling and Analysis Schedule 1993.

EC SURFACE WATER ABSTRACTION DIRECTIVE SAMPLING PROGRAMME 1993 (ABS_MON_PROG_1993) LAST UPDATE : 9-11-1992

PREPARED BY : K. LEE

* REFER TO RESERVOIR SAMPLING INFORMATION

DISTRICT	ABSTRACTION POINTS	NGR	URN	SAMPLING FREQUENCY (PER YEAR)							
				ARG S091	ARG S092	ARG S093	ARG S367	ARG S374	ARG S368	ARG S355	ARG S371
FAL	College Reservoir	SW 773 335	*	8			3	1	4	3	4
	Argal Reservoir	SW 763 328	*	8			3	1	4	3	4
	Stithians Reservoir	SW 7190 3639	*	8			3	1	4	3	4
	Drift Reservoir	SW 4399 2873	*	8			3	1	4	3	4
	Boswyn Reservoir	SW 6592 3629	*	8			3	1	4	3	4
	R Hayle	SW 5495 3490	R22B023	8			3	1	4	3	4
	R Cober(Wendron)	SW 6752 3104	R20A016	8			3	1	4	3	4
FOWEY	Colliford Reservoir	SX 179 711	*	8			3	1	4	3	4
	Crowdy Reservoir	SX 1397 8327	*	8			3	1	4	3	4
	Delank R	SX 1358 7655	R25C003	8			3	1	4	3	4
	R.Fowey @Trekeivesteps	SX 2272 6986	R15B053	8			3	1	4	3	4
	R.Fowey @Restomel	SX 0971 6247	R15B054	8			3	1	4	3	4
	R.Porth @Rialton	SX 8487 6230	R25A025	8			3	1	4	3	4
TAMAR	Butterbrook Reservoir	SX 6456 5930	*	8	3	1				3	4
	Burrator Reservoir	SX 5513 6803	*	8			3	1	4	3	4
	Upper Tamar Lake	SS 289 118	*	8			3	1	4	3	4
	R.Erme	SX 6403 6317	R09B025	8	3	1				3	4
	R.Yealm	SX 6170 6202	R10B025	8			3	1	4	3	4
	Ford Brook	SX 6123 6184	R10B027	8			3	1	4	3	4
	Deavonport leat(Dousland)	SX 5500 6837	R11B032	8			3	1	4	3	4
	R.Tavy @Lopwell	SX 4751 6503	R12C027	8			3	1	4	3	4
	R.Tamar @Gunnislake	SX 4337 7235	R12E035	8			3	1	4	3	4
	Broadall Lake(R.Yealm)	SX 6128 6196	R10B026	8			3	1	4	3	4
TAW	Meldon Reservoir	SX 5636 9169	*	8	3	1				3	4
	Wistlandpound Reservoir	SS 6436 4148	*	8	3	1				3	4
	Lower Slade Reservoir	SS 5063 4574	*	8	3	1				3	4
	Roadford Reservoir	SX 425 901	*	8			3	1	4	3	4
	Melbury Reservoir	SS 3864 2015	*	8	3	1				3	4
	West Okement River	SX 5604 8983	R29D054	8	3	1				3	4
	R. Torridge	SS 4821 1911	R29B043	8	3	1				3	4
	R. Yeo (Bideford)	SS 4478 2281	R29A025	8	3	1				3	4
	Loxhore R.Yeo	SS 6096 3658	R30H018	8	3	1				3	4
	Bratton Str	SS 6131 3666	R30H017	8	3	1				3	4
	R.Bray @Leehamford	SS 6774 3992	R30G016	8	3	1				3	4
	Brockemburrow Intake	SS 6629 4175	R30G017	8	3	1				3	4
	R.Taw @NewBridge	SS 5823 2613	R30B017	8	3	1				3	4
	West (Lyn) Ilkerton R.	SS 7047 4759	R32A011	8	3	1				3	4
	Spreycott spring	SS 6537 3974	R30H016	8	3	1				3	4
DART	Avon Dam	SX 679 651	*	8	3	1				3	4
	Fernworthy Reservoir	SX 6706 8430	*	8	3	1				3	4
	Kennick Reservoir	SX 8067 8386	*	8	3	1				3	4

Continued..

Table 6.2 EC Surface Water Abstraction Directive - Reservoir Sampling Information.

EC SURFACE WATER ABSTRACTION DIRECTIVE SAMPLING, PROGRAMME 1993
RESERVOIR SAMPLING ABS_MON_RESERVOIR

RESERVOIR SAMPLE SHOULD BE TAKEN AT THE CURRENT DRAW OFF LEVEL

* PERSON TO MAKE FIRST CONTACT

DISTRICT	ABSTRACTION POINT	NGR		DRAW OFF LEVEL m A.O.D.	DRAW OFF LEVEL m BELOW OVERFLOW WEIR	URN	SAMPLING LOCATION	CONTACT PERSON
FAL	ARGAL	SW 763 328	OVERFLOW	82.30	0.00	-	SAMPLES CAN BE	WATER TREATMENT WORKS OPERATOR * :
			FIRST	79.55	2.75	R19A044	TAKEN FROM THE	
			SECOND	76.20	6.10	R19A045	WALKWAY ALONG	COLLEGE/ARGAL:
			THIRD	73.76	8.54	R19A046	THE TOP OF	0326-73515
							THE DAMS OF	
							THE FOUR	
	COLLEGE RESERVOIR	SW 773 335	OVERFLOW	69.98	0.00	-	RESERVOIRS	
			FIRST	69.07	0.91	R19A047		
			SECOND	67.85	2.13	R19A048		
	STITHIANS RESERVOIR	SW 719 363	OVERFLOW	162.15	0.00	-		STITHIANS:
			FIRST	156.97	5.18	R19E024		0209-860457
			SECOND	150.88	11.27	R19E025		
	DRIFT RESERVOIR	SW 439 287	OVERFLOW	83.82	0.00	-		DRIFT:
			FIRST	79.55	4.27	R21A032		0736-63597 OR 50069
			SECOND	74.68	9.14	R21A033		
	BOSWIN	SW 659 363	OVERFLOW	160.93	0.00	-		BOSWIN:
			FIRST	154.84	6.09	R23A060		0209-831316
								FURTHER ASSISTANCE CONTACT
								MR. MARK ANDREW
								0872-76131 EXT.217
FOWEY	COLLIFORD RESERVOIR	SX 179 711	OVERFLOW	254.00	0.00	-	COLLIFORD:	MR. ELLACOTT *
			FIRST	250.00	4.00	R15B050	FROM DRAW OFF	0726 - 626249
			SECOND	245.00	9.00	R15B051	TOWER	OR
			THIRD	237.00	17.00	R15B052		MR. D. DUNSWORTH
								WATER OPERATION CONTROLLER
	CROWDY RESERVOIR	SX 128 832	OVERFLOW	-	0.00	-	CROWDY:	0726 - 66766 EXT. 240
			FIRST	-	4.80	R25B056	FROM DAM WALL	
			SECOND	-	7.77	R25B055		
EXE	SQUABMOOR RESERVOIR	SY 040 839	OVERFLOW	80.41	0.00	-	SQUABMOOR:	MR. MARSHALL *
			FIRST	75.53	4.88	R04B045	BOAT NEEDED	0392 - 445544 EXT 2847
								OR
	HOLLYFORD POND	ST 2350 9220	SURFACE		0.5	NOT READ	FROM DAM	MR. K.A. BARRETT
								TREATMENT WORKS CONTROLLER
WESSEX PLC	WIMBLEBALL RESERVOIR	SS 965 293	OVERFLOW	235.61	0.00	-	WIMBLEBALL:	0392 - 445544 EXT 2189
			FIRST	229.30	6.31	R05G017	FROM VALVE	
			SECOND	220.90	14.71	R05G016	TOWER BRIDGE	

Continued..

Table 6.2 Continue.

EC SURFACE WATER ABSTRACTION DIRECTIVE SAMPLING PROGRAMME 1993
RESERVOIR SAMPLING ABS_MON_RESERVOIR

RESERVOIR SAMPLE SHOULD BE TAKEN AT THE CURRENT DRAW OFF LEVEL

* PERSON TO MAKE FIRST CONTACT

DISTRICT	ABSTRACTION POINT	NGR	DRAW OFF LEVEL		m A.O.D. m BELOW OVERFLOW WEIR	URN	SAMPLING LOCATION	CONTACT PERSON
								OR WATER OPERATION CONTROLLER MR. J. PITT 0752-225241
DART	AVON DAM	SX 679 651	OVERFLOW	-	0.00	-	FROM BOAT	SUPERINTENDENT *
			FIRST	-	6.10	R08B022		COLIN HAWKINS
			SECOND	-	12.19	R08B023		0364-73119
			THIRD	-	18.29	R08B024		
	VENFORD RESERVOIR	SX 686 711	OVERFLOW	-	0.00	-	POSSIBLE FROM	SUPERINTENDENT *
			FIRST	-	3.05	R07B059	DAM	BILL FICE
			SECOND	-	6.10	R07B060	EASIER FROM	0364 - 3207
			THIRD	-	9.14	R07B061	BOAT	
			FOURTH	-	12.19	R07B062		
	FERNWORTHY RESERVOIR	SX 670 843	OVERFLOW	-	0.00	-	FROM BOAT	SUPERINTENDENT *
			FIRST	-	4.57	R06C063		JOHN STEVENS
			SECOND	-	7.92	R06C064		0647-7504
			THIRD	-	14.63	R06C065		
	TRENCHFORD RESERVOIR	SX 806 823	OVERFLOW	-	0.00	-	POSSIBLE FROM	SUPERINTENDENT *
			FIRST	-	4.57	R06C060	VALVE TOWER	JOHN STEVENS
			SECOND	-	8.84	R06C061		0647-7504
			THIRD	-	13.11	R06C062		
	KENNICK RESERVOIR	SX 807 838	OVERFLOW	-	0.00	-	POSSIBLE FROM	SUPERINTENDENT *
			FIRST	-	2.44	R06C066	VALVE TOWER	JOHN STEVENS
			SECOND	-	4.88	R06C067		0647-7504
			THIRD	-	7.32	R06C068		
								FOR FURTHER ASSISTANCE MR. BEIGHTON 0803-556281

APPENDIX 1

75/440/EEC ANNEX II

ANNEX II

Characteristics of surface water intended for the abstraction of drinking water (Continued)

	Parameters		A1 G	A1 I	A2 G	A2 I	A3 G	A3 I
27	Sulphates	mg/l SO_4	150	250	150	250 (O)	150	250 (O)
28	Chlorides	mg/l Cl	200		200		200	
29	Surfactants (reacting with methyl blue)	mg/l (laurylsulphate)	0.2		0.2		0.5	
30*	Phosphates	mg/l P_2O_5	0.4		0.7		0.7	
31	Phenols (phenol index) paranitraniline 4 aminoantipyrine	mg/l C_6H_5OH		0.001	0.001	0.005	0.001	0.1
32	Dissolved or emulsified hydrocarbons (after extraction by petroleum ether)	mg/l		0.05		0.2	0.5	1
33	Polycyclic aromatic hydrocarbons	mg/l		0.0002		0.0002		0.0001
34	Total pesticides (parathion, BHC, dieldrin)	mg/l		0.001		0.0025		0.005
35*	Chemical oxygen demand (COD)	mg/l O_2					30	
36*	Dissolved oxygen saturation rate	% O_2	>70		>50		>30	
37*	Biochemical oxygen demand (BOD_5) (at 20°C without nitrification)	mg/l O_2	<3		<5		<7	
38	Nitrogen by Kjeldahl method (except NO_3)	mg/l N	1		2		3	
39	Ammonia	mg/l NH_4	0.05		1	1.5	2	4 (O)
40	Substances extractable with chloroform	mg/l SEC	0.1		0.2		0.5	
41	Total organic carbon	mg/l C						
42	Residual organic carbon after flocculation and membrane filtrations (5 µ)TOC	mg/l C						
43	Total coliforms 37°C	/100 ml	50		5000		50000	
44	Faecal coliforms	/100 ml	20		2000		20000	
45	Faecal streptococci	/100 ml	20		1000		10000	
46	Salmonella		Not present in 5000 ml		Not present in 1000 ml			

I = mandatory
G = guide
O = exceptional climatic or geographical conditions
* = see Article 8 (d)

APPENDIX 2

79/869/EEC ANNEX II

APPENDIX 3

NUMBER OF ARG AND DETERMINAND SAMPLES IN 1992

Table 3.2b Number of ARG Samples Scheduled for the Bodmin Office Survey Team of the NRA (South West)

	ARG					
	S091	S367	S374	S368	S355	S371
Number of location	22	22	22	22	22	22
Annual sampling frequencies	8	3	1	4	3	4
Number of samples per annum	176	66	22	88	66	88
TOTAL number of samples p.a. =	**506**					

NOTE :

1. Total Pesticides is removed from category III and is split into two ARGs,
   S355 : Insecticides
   S371 : Herbicides

2. ARG S091 includes category I determinands.
   ARG S367 includes category I and II determinands.
   (bacteriology determinands excluded)
   ARG S374 includes category I, II, III and Insecticides.
   (bacteriology determinands excluded)
   ARG S368 Includes bacteriology determinands only.

Table 3.3 Continue.

Det. Code	Determinand	Unit	Number of sites	Sampling Frequency (per annum)	Number of samples
245	Zinc	mg/l	56	4	224
403	Manganese	mg/l	56	4	224
419	Iron dissolved	mg/l	56	4	224
461	Detergent Anion	mg/l	56	4	224
9942	Faecal Strep.	No/100ml	56	4	224
9933	Pre. Coliforms	No/100ml	56	4	224
9935	Pre. E. Coli	No/100ml	56	4	224
3382	Salmonella	P/A	56	4	224
979	Phenol Total	µg/l	56	4	224
9813	Phenol HPLC	µg/l	56	4	224
3341	4C-2M Phenol	µg/l	56	4	224
3342	4C-3M Phenol	µg/l	56	4	224
3343	2,4-DiM Phenol	µg/l	56	4	224
9814	2-C Phenol	µg/l	56	4	224
9815	4-C Phenol	µg/l	56	4	224
3081	Isodrin	ng/l	56	4	224
3082	HCB Total	ng/l	56	4	224
3083	HCBD	ng/l	56	4	224
3125	Cyfluthrin	ng/l	56	4	224
3276	Aldrin	ng/l	56	4	224
3294	DDE-PP'	ng/l	56	4	224
3295	DDE-OP'	ng/l	56	4	224
3296	DDT-OP'	ng/l	56	4	224
3297	DDT-PP'	ng/l	56	4	224
3301	Dieldrin	ng/l	56	4	224
3306	Endrin	ng/l	56	4	224
3310	HCH-alpha	ng/l	56	4	224
3311	HCH-beta	ng/l	56	4	224
3312	HCH-delta	ng/l	56	4	224
3313	HCH-gamma	ng/l	56	4	224
3324	Parathion	ng/l	56	4	224
3329	TDE-OP'	ng/l	56	4	224
3330	TDE-PP'	ng/l	56	4	224
9823	Permethrin	µg/l	56	4	224
3114	Chlorotoluron	µg/l	56	4	224
3117	Isoproturon	µg/l	56	4	224
3118	Linuron	µg/l	56	4	224
3130	Metoxuron	µg/l	56	4	224

Continued..

Number of determinand samples Subtotal 2 = 8,512

APPENDIX 4

ANALYSIS REQUIRED GROUPS (ARGs)

Analysis Required Group (ARG) Dictionary Report

[redacted]t.	Desc.	(Units)	Method Code	Method Description	Active?
[redacted]81	D.O.%	%	2	IN SITU IN SITU	Y
[redacted]82	D.O.MG/L	mg/l	2	CALCULATION CALCULATION	Y
[redacted]85	BOD ATU	mg/l	1	BOD ATU ROUTINE	Y
92	COD	mg/l	1	UV/VIS C.O.D.	Y
[redacted]99	C ORG TOT	mg/l	1	SKALAR ROUTINE	Y
111	AMMONIA	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
[redacted]16	T.O.N	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
[redacted]17	NITRATE	mg/l	1	CALCULATED CALCULATED	Y
118	NITRITE	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
[redacted]35	SS 105 C	mg/l	1	SUSP SOLIDS (NO MINERAL) LOW SUSP SOLIDS (NO MINERAL) LOW	Y
158	HARD TOTAL	mg/l	1	CALCULATION CALCULATION	Y
[redacted]72	CHLOR-ION	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
180	ORTHO-PHOS	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
[redacted]82	SILICAT RD	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
[redacted]83	SULPHATE	mg/l	1	SKALAR ROUTINE	Y
192	PHOSPHATE	mg/l	1	TOTAL PHOS MEASURED PHOSPHATE TOTAL	Y
[redacted]07	SODIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
211	POTASSIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
[redacted]37	MG	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
241	CALCIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
[redacted]81	WEATH TEMP	Misc	1	IN SITU IN SITU	Y

Contd..

Analysis Required Group (ARG) Dictionary Report

[illegible].	Desc.	(Units)	Method Code	Method Description	Active?
[illegible]07	SODIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
211	POTASSIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
[illegible]15	COPPER	mg/l	1	PERKIN ELMER ELAN TOTAL ROUTINE COPPER	Y
237	MG	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
[illegible]41	CALCIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
245	ZINC	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
[illegible]03	MANGANESE	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
[illegible]19	IRON DISS	mg/l	1	PERKIN ELMER 2100 ROUTINE - DISSOLVED	Y
461	DET ANION	mg/l	1	FIASTAR ANIONIC DETERGENTS	Y
[illegible]42	FStrP100ml	No/100 ml	1	MICRO 1 FAECAL STREP/100MLS	Y
979	PHENOL TOT	ug/l	1	MANUALLY CALCULATED MANUALLY CALCULATED	Y
[illegible]81	WEATH TEMP	Misc	1	IN SITU IN SITU	Y
1183	WEATH PREC	Misc	1	IN SITU IN SITU	Y
[illegible]267	FLOW	Misc	1	IN SITU IN SITU	Y
[illegible]341	4C-2M PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
3342	4C-3M-PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
[illegible]343	2,4DiM PHE	ug/l	1	PHENOLS HPLC HPLC	Y
3382	SALMP/A 5L	Presence/Absence	1	SALM P/A PER 5L EEC DIR(SURFACE/ABSTR) SALM 5L	Y
[illegible]813	PHENOL HPL	ug/l	1	PHENOLS HPLC HPLC	Y
9814	2-CP	ug/l	1	PHENOLS HPLC HPLC	Y
[illegible]815	4-CP	ug/l	1	PHENOLS HPLC HPLC	Y

Contd..

Analysis Required Group (ARG) Dictionary Report

[illegible]	Desc.	(Units)	Method Code	Method Description	Active?
[illegible]0	ORTHO-PHOS	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
182	SILICAT RD	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
[illegible]3	SULPHATE	mg/l	1	SKALAR ROUTINE	Y
192	PHOSPHATE	mg/l	1	TOTAL PHOS MEASURED PHOSPHATE TOTAL	Y
[illegible]7	SODIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
211	POTASSIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
[illegible]5	COPPER	mg/l	1	PERKIN ELMER ELAN TOTAL ROUTINE COPPER	Y
[illegible]7	MG	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
241	CALCIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
[illegible]5	ZINC	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
257	BARIUM	mg/l	1	PERKIN ELMER ELAN GREY LIST TOTAL	Y
[illegible]3	BORON	mg/l	1	PERKIN ELMER ELAN GREY LIST TOTAL	Y
328	LEAD	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
[illegible]75	CHROMIUM	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
[illegible]79	SELENIUM	mg/l	1	PERKIN ELMER HYDRIDE ROUTINE	Y
403	MANGANESE	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
[illegible]19	IRON DISS	mg/l	1	PERKIN ELMER 2100 ROUTINE - DISSOLVED	Y
461	DET ANION	mg/l	1	FIASTAR ANIONIC DETERGENTS	Y
[illegible]18	BENZOA-P	ng/l	1	HPLC POLYAROMATIC HYDROCARBONS	Y
942	FStrP100ml	No/100 ml	1	MICRO 1 FAECAL STREP/100MLS	Y
[illegible]79	PHENOL TOT	ug/l	1	MANUALLY CALCULATED MANUALLY CALCULATED	Y

Contd..

Analysis Required Group (ARG) Dictionary Report

)et.	Desc.	(Units)	Method Code	Method Description	Active?
:297	DDT (PP')	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
:301	DIELDRIN	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
:306	ENDRIN	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
:309	FLUORANTH	ng/l	1	HPLC POLYAROMATIC HYDROCARBONS	Y
:310	HCH-ALPHA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
:311	HCH-BETA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3312	HCH-DELTA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3313	HCH-GAMMA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3316	INDENO-1,2	ng/l	1	HPLC POLYAROMATIC HYDROCARBONS	Y
3323	PCP	ng/l	1	MASS SPEC PCP IN RIVERS AND DISCHARGES	Y
3328	TCE	ug/l	1	PURGE & TRAP VOLATILES	Y
3329	TDE OP'	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS	Y
3330	TDE (PP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS	Y
3334	TRI-C-E	ug/l	1	PURGE & TRAP VOLATILES	Y
3341	4C-2M PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
3342	4C-3M-PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
3343	2,4DiM PHE	ug/l	1	PHENOLS HPLC HPLC	Y
3373	TRI-C-METH	ug/l	1	PURGE & TRAP VOLATILES	Y
3382	SALMP/A 5L	Presence/Absence	1	SALM P/A PER 5L EEC DIR(SURFACE/ABSTR) SALM 5L	Y
3429	PAH PREP	Misc	1	HPLC PAH PREP	Y
3437	PARATH-ETH	ng/l	1	NPD-GC ROUTINE OP/ON COMPOUNDS	Y

Contd..

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Analysis Required Group (ARG) Dictionary Report

)et.	Desc.	(Units)	Method Code	Method Description	Active?
207	SODIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
211	POTASSIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
237	MG	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
241	CALCIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
245	ZINC	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
403	MANGANESE	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
419	IRON DISS	mg/l	1	PERKIN ELMER 2100 ROUTINE - DISSOLVED	Y
461	DET ANION	mg/l	1	FIASTAR ANIONIC DETERGENTS	Y
979	PHENOL TOT	ug/l	1	MANUALLY CALCULATED MANUALLY CALCULATED	Y
1181	WEATH TEMP	Misc	1	IN SITU IN SITU	Y
1183	WEATH PREC	Misc	1	IN SITU IN SITU	Y
3267	FLOW	Misc	1	IN SITU IN SITU	Y
3341	4C-2M PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
3342	4C-3M-PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
3343	2,4DiM PHE	ug/l	1	PHENOLS HPLC HPLC	Y
9813	PHENOL HPL	ug/l	1	PHENOLS HPLC HPLC	Y
9814	2-CP	ug/l	1	PHENOLS HPLC HPLC	Y
9815	4-CP	ug/l	1	PHENOLS HPLC HPLC	Y

*** END OF REPORT ***

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Analysis Required Group (ARG) Dictionary Report

.	Desc.	(Units)	Method Code	Method Description	Active?
0	ORTHO-PHOS	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
2	SILICAT RD	mg/l	1	LACHAT NUTRIENTS NUTRIENTS-RIVERS - LOW LEVEL	Y
3	SULPHATE	mg/l	1	SKALAR ROUTINE	Y
192	PHOSPHATE	mg/l	1	TOTAL PHOS MEASURED PHOSPHATE TOTAL	Y
7	SODIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
211	POTASSIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
5	COPPER	mg/l	1	PERKIN ELMER ELAN TOTAL ROUTINE COPPER	Y
7	MG	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
241	CALCIUM	mg/l	1	PERKIN ELMER 2100 ROUTINE - TOTAL	Y
5	ZINC	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
257	BARIUM	mg/l	1	PERKIN ELMER ELAN GREY LIST TOTAL	Y
3	BORON	mg/l	1	PERKIN ELMER ELAN GREY LIST TOTAL	Y
328	LEAD	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
5	CHROMIUM	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
9	SELENIUM	mg/l	1	PERKIN ELMER HYDRIDE ROUTINE	Y
403	MANGANESE	mg/l	1	PERKIN ELMER ELAN ROUTINE-RIVERS AND DISCHARGES	Y
9	IRON DISS	mg/l	1	PERKIN ELMER 2100 ROUTINE - DISSOLVED	Y
461	DET ANION	mg/l	1	FIASTAR ANIONIC DETERGENTS	Y
8	BENZOA-P	ng/l	1	HPLC POLYAROMATIC HYDROCARBONS	Y
979	PHENOL TOT	ug/l	1	MANUALLY CALCULATED MANUALLY CALCULATED	Y
9	CARBONTET	ug/l	1	PURGE + TRAP-GC VOLATILES	Y

Contd..

Analysis Required Group (ARG) Dictionary Report

;et.	Desc.	(Units)	Method Code	Method Description	Active?
:301	DIELDRIN	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
:306	ENDRIN	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3309	FLUORANTH	ng/l	1	HPLC POLYAROMATIC HYDROCARBONS	Y
3310	HCH-ALPHA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3311	HCH-BETA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3312	HCH-DELTA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3313	HCH-GAMMA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3316	INDENO-1,2	ng/l	1	HPLC POLYAROMATIC HYDROCARBONS	Y
3323	PCP	ng/l	1	MASS SPEC PCP IN RIVERS AND DISCHARGES	Y
3328	TCE	ug/l	1	PURGE & TRAP VOLATILES	Y
3329	TDE OP'	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS	Y
3330	TDE (PP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS	Y
3334	TRI-C-E	ug/l	1	PURGE & TRAP VOLATILES	Y
3341	4C-2M PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
3342	4C-3M-PHEN	ug/l	1	PHENOLS HPLC HPLC	Y
3343	2,4DiM PHE	ug/l	1	PHENOLS HPLC HPLC	Y
3373	TRI-C-METH	ug/l	1	PURGE & TRAP VOLATILES	Y
3429	PAH PREP	Misc	1	HPLC PAH PREP	Y
3437	PARATH-ETH	ng/l	1	NPD-GC ROUTINE OP/ON COMPOUNDS	Y
3440	PERM-TRANS	ng/l	1	ECD-GC MOTHPROOFERS BY GC	Y
3441	PERM-CIS	ng/l	1	ECD-GC MOTHPROOFERS BY GC	Y

Contd..

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Analysis Required Group (ARG) Dictionary Report

et.	Desc.	(Units)	Method Code	Method Description	Active?
3301	DIELDRIN	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3306	ENDRIN	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3310	HCH-ALPHA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3311	HCH-BETA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3312	HCH-DELTA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3313	HCH-GAMMA	ng/l	1	ECD-GC OCP's IN RIVERS AND EFFLUENTS	Y
3329	TDE OP'	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS	Y
3330	TDE (PP')	ng/l	1	ECD-GC OCP'S IN RIVERS AND EFFLUENTS	Y
3376	ORGPH PREP	Misc	1	N/P PESTICIDE PREP PREP. DETERMINAND	Y
3437	PARATH-ETH	ng/l	1	NPD-GC ROUTINE OP/ON COMPOUNDS	Y
3440	PERM-TRANS	ng/l	1	ECD-GC MOTHPROOFERS BY GC	Y
3441	PERM-CIS	ng/l	1	ECD-GC MOTHPROOFERS BY GC	Y

*** END OF REPORT ***

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