

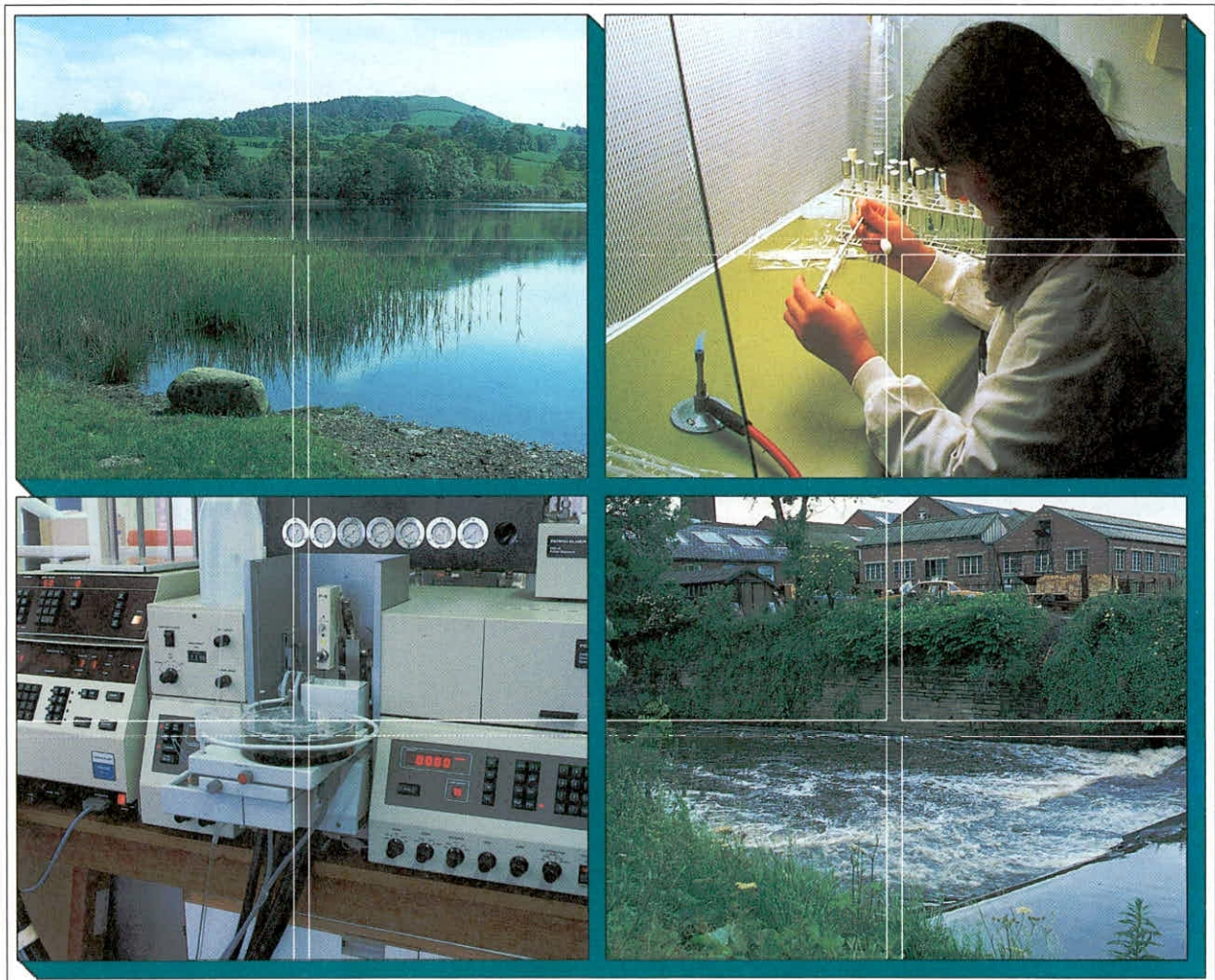
An audit of performance in the analysis of biological samples in 1995 NRA Severn-Trent: Primary Audit

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1. INTRODUCTION

The 1995 General Quality Assessment (GQA) Survey included the sampling of aquatic macro-invertebrates for biological assessment of river quality throughout the United Kingdom. In England and Wales the survey was undertaken by the National Rivers Authority (NRA), the River Purification Boards (RPBs) sampled in Scotland, the Industrial Research and Technology Unit (IRTU) undertook the work in Northern Ireland and the Government Laboratory covered the Isle of Man (IOM).

The majority of sites surveyed were sampled in two seasons, spring and autumn. Standard collection procedures were used and the sampling strategy was compatible with RIVPACS (River InVertebrate Prediction And Classification System), a computer model developed by the Institute of Freshwater Ecology (IFE).

Samples were sorted for the families of macro-invertebrates included in the Biological Monitoring Working Party (BMWP) system. Taxa present were recorded on site data sheets. Although attempts had been made to standardise sample processing and recording techniques, these did vary somewhat from region to region.

In order to undertake this massive programme of fieldwork and sample processing, a large number of staff, many of whom were relatively inexperienced, were employed by the surveying agencies. In view of the number of staff involved and the variability of sample processing techniques, it was recognised that a quality assurance exercise was necessary to minimise and quantify errors. Each laboratory appointed at least one experienced analyst to act as an internal analytical quality control (AQC) checker. For most agencies, these checkers re-sorted about 10% of the laboratory's samples, those samples chosen for re-sorting being selected at random. In addition, IFE was contracted to undertake an independent, external audit of the quality of the laboratory analysis of biological samples for each NRA region, each RPB, IRTU and IOM. This commission was consistent with the audit performed by IFE for the National River Quality Survey in 1990 and for the routine biological monitoring of river sites each year between 1991 and 1994. This audit was originally intended as a measure of the quality of the AQC analyses and is termed the main audit or AQC audit. The data collected for the 1995 GQA Survey was not adjusted for errors identified by either of the quality assurance procedures. Therefore the NRA contracted IFE to subject their samples to a further audit of the primary analysis (the primary audit) to provide an independent assessment of the quality of the Survey data .

This report presents the results of the 61 samples audited for NRA Severn-Trent Region and represents a measure of the performance of the primary analyst rather than that of the AQC analyst. The results of the AQC Audit, detailing the performance of the biologists who analysed the 48 AQC'd samples for the Region, are reported separately.

2. SAMPLE SELECTION

Samples for audit were selected internally by each of the agencies being monitored. The number of samples selected for audit varied between the different agencies and the biologists processing these samples had no prior knowledge of which samples were to be audited. Some agencies only sent to IFE samples that had been processed twice. Others adopted a random selection process, whereby some samples had been analysed just once and some had been re-sorted. The manner of sample selection, which biologists would be monitored and the number of audit samples from each season, were left to the discretion of the agency, within the limits of the total number of samples that IFE was contracted to audit.

3. SAMPLE PROCESSING

The normal protocol for NRA, RPB, IRTU and IOM biologists was to sort their samples within the laboratory and to select examples of each scoring taxon within the BMWP system. In most cases, the invertebrates were placed in a vial of preservative (4% formaldehyde solution or 70% industrial alcohol) and the BMWP taxa were listed on a data sheet. The vial of animals and the sorted material were then returned to the sample container and preservative added. Thus, each sample available to IFE for audit should have included:

- i) a data sheet containing a list of the BMWP families found in the sample.
- ii) a vial containing representatives from each family.
- iii) the preserved sample.

When these three elements were present, the sequence of operations at IFE was as follows:

- a) The remainder of the sample was sorted, without reference to the data sheet or to the vial of animals, and the BMWP families identified.
- b) The families contained within the vial were identified.
- c) A comparison was made between the listing of families and those found in the sample by IFE.
- d) A comparison was made between the listing of families and those identified from the vial by IFE.
- e) "Losses" or "gains" from the original listing of families were noted. In the case of "gains", each additional family was identified, where possible, to species level, in order to clarify any specific repetitive errors. Single representatives of a "gained" taxon were noted as such.
- f) An error code, selected from a list on the result sheet, was assigned by the IFE auditor for each "loss" or "gain".

Occasionally a sample did not include a vial containing representative examples of the families listed on the data sheet, while some arrived with the vial damaged in transit such that the representative specimens were no longer separated. For these samples, only operations a), c), e) and f) above were appropriate.

Several directives were issued to IFE relating to the treatment of BMWP taxa. Every taxon recorded on the data sheet must be supported by a voucher specimen of that family in the vial (or, for very large specimens, left in the sample). The only exceptions to this rule were the native crayfish, *Austropotamobius pallipes*, the medicinal leech, *Hirudo medicinalis* and the pearl mussel, *Margaritifera margaritifera* (which does not belong to a BMWP family), all of which are protected species. Where possible, IFE gave the benefit of doubt to the analyst in cases of the "loss" of Planariidae, specimens of which have been known to disintegrate in preservative. Animals deemed to have been dead at the time of sampling, cast insect skins, pupal exuviae and empty mollusc shells were to be excluded from the listing of families present. Isolated posterior ends of "living" specimens were not acceptable as records of a taxon. In these cases, thorax plus abdomen was deemed acceptable but abdomen only was deemed unacceptable. Terrestrial representatives of BMWP scoring families were also to be excluded from the audit. For this reason, Clambidae, Chrysomelidae and Curculionidae, which appear in the BMWP list, were excluded for the purposes of the audit since most representatives of these families are, at best, only semi-aquatic. Trichopteran pupae, although not routinely identified by many biologists, were to be included in the listing of families.

4. REPORTING

The results of each sample audit were recorded on a standard report form and sent to the Regional Biologist. Copies of these report forms are presented in the Appendix. For audit samples where a vial of animals was included, the comparison between the listing of families and the taxa found in the vial by IFE was shown in the section of the report form headed "VIAL". Discrepancies could be due to carelessness, misidentifications or errors in completing the data sheet listing the families present. Families not on the listing but found by IFE in the remainder of the sample were entered in the section of the report form headed "SAMPLE" under "Additional BMWP taxa found by IFE". Taxa recorded here represent families missed by the analyst(s) on sorting the sample. When the families listed as "losses" in the first section of the report form were compared with the full list of families recorded in the sample by IFE, some apparent losses from the vial were offset by the presence of those families in the remainder of the sample. These taxa were therefore listed both as "losses" from the vial and as "gains" from the sample and were neither a net loss nor a net gain. In these cases, the families were marked with an asterisk in both boxes. Such errors are noted as "omissions".

Species identifications, state of development (eg adult or larval coleopterans) and the presence of a single representative of a family within the remainder of the sample were recorded in the centre section of the report form under "species name".

IFE was asked to interpret each error to provide a possible cause. An error code, selected from a list of options at the foot of each result sheet, was entered against each taxon in the column headed "Presumed cause of error".

For those samples in which the vial of animals was damaged or missing, the "VIAL" sections of the report form were not applicable (N/a). Families not on the list but present in the sample were entered in the section under "SAMPLE" : "Additional taxa" as before. Families recorded on the list but not found by IFE were indicated in the section above this. If the vial of animals was retained by the sorter, entries in this box could include the sole representative of a family which was removed, a family seen at the site which escaped or was released (without mention being made on the data sheet), inaccurate identification, the wrong family box being ticked on the data sheet or the family being present in the sample but missed by IFE.

The final section of the result sheet summarises the audit, giving details of the numbers of "losses", "gains" and "omissions", together with the net effects on BMWP score and the number of scoring taxa.

5. RESULTS

The results of the Primary audit for Severn-Trent Region are summarised by area in Tables 1 to 4. Table 5 displays the statistics of these regional audit results centered around the target of acceptability of no more than two missed taxa per sample. These data are presented for each analyst, for their Area laboratories and for the Region as a whole. Table 6 compares these results for each NRA Region and Area laboratory. Table 7 presents data for Severn-Trent Region for the net effects of the Primary audit on the BMWP score and number of taxa. This table is again based on the target of no more than two missed taxa per sample. The figure of 13 for an acceptable underestimate of BMWP score is based on twice the average score of all taxa in the BMWP listing (excluding Clambidae, Chrysomelidae and Curculionidae, which are excluded from the audit). This average score is 6.57. Table 8 compares this BMWP data for each NRA Region and Area laboratory. Table 9 lists the taxa missed in sorting by Severn-Trent Region's primary analysts in the 1995 audit. A listing of all such taxa for the entire 1995 audit (Primary and AQC Audits for NRA regions and Main Audit for other organisations) for the whole of the UK is presented in the AQC audit report.

6. ACKNOWLEDGEMENTS

Grateful thanks to John Murray-Bligh of NRA Thames Region, who provided an invaluable service in the development and implementation of improved methodology and in providing helpful advice throughout.

Table 1. The 16 samples audited for Upper Severn Area

River	Site	Primary Analyst	Losses	Gains	Omissions
SPRING					
Battlefield Brook	Fockbury	LM	0	1	0
Merryhill Brook	Bratch	LM	0	0	0
Blakedown Brook	Viaduct	LM	0	0	0
Blakedown Brook	u/s Blakedown WRW	LM	1	3	0
Severn	Montford Bridge	LM	0	0	0
Coal Brook	Old Mill	LM	0	3	0
Bobs Brook	u/s Lower Gornal WRW	PW	0	0	0
Morda	d/s Mile Oak WRW	PW	1	1	0
AUTUMN					
Hampton Loade	Severn confluence	ADG	0	0	0
Tern	Longdon	ADG	0	4	0
Barbourne	Blackpole	PW	0	1	0
Stour	Dog Kennel Lane	PW	0	2	0
Stratford Brook	Wyken Wheel	PW	1	5	3
Kemp	u/s Minor Rd Bridge	PW	0	1	0
Onny	Wistanstow	TPE	0	0	0
Onny	d/s CA WRW	TPE	0	3	0

Table 2. The 13 samples audited for Lower Severn Area

River	Site	Primary Analyst	Losses	Gains	Omissions
SPRING					
Isbourne	A46 Bridge	ADC	1	4	0
Cinderford Brook	Upper Soudley	ADC	0	5	0
Hyde Brook	u/s Brockhampton WRW	APH	0	0	0
Wymans Brook	d/s Pitteville Lakes	APH	0	1	0
Hatfield Brook	Kempsey	APH	0	0	0
Badsey Brook	d/s Childswickham	HWY	0	0	0
AUTUMN					
Leadon	New Mills	ADC	0	2	0
Itchen	Deppers Bridge	ADC	1	5	1
Ell Brook	Brass Mill	ADC	1	1	2
Frome	Beards Mill	HW	1	2	0
Canley Brook	Sir Henry Parkes Road	HW	0	1	0
Harvington Brook	d/s Harvington WRW	HW	0	0	1
Carrant Brook	Tewkesbury	KH	0	3	0

Table 3. The 13 samples audited for Upper Trent Area

River	Site	Primary Analyst	Losses	Gains	Omissions
SPRING					
Dove	d/s Rocester	CAS	0	5	0
Marchington Brook	Marchington	CAS	0	3	0
Anker	Leathermill Bridge	CAS	1	2	0
Hooborough Brook	Acresford	LB	0	2	0
Carlton Brook	Carlton Bridge	REM	0	3	0
Black Brook	Thickbroom Farm	REM	0	2	0
Tame	Lea Marston	REM	0	0	0
Trent	Colwich	REM	0	0	0
AUTUMN					
Tame	Fazeley	CAS	0	2	0
Chitlings Brook	Trent Vale	CAS	0	2	1
Saredon Brook	Cannock	CAS	0	0	0
Hamps	Waterhouses	GF	0	0	1
Rough Brook	Rushall	REM	0	1	0

Table 4. The 19 samples audited for Lower Trent Area

River	Site	Primary Analyst	Losses	Gains	Omissions
SPRING					
Wood Brook	d/s Loughborough WRW	BF	1	8	1
North Beck	u/s Tuxford Beck	BF	0	1	0
Sence	Newton Harcourt	BF	0	3	1
Pickwell Brook	Whissendine Road Bridge	BF	0	4	0
Willow Brook	Humberstone	PH	1	1	1
Twyford Brook	d/s Findern WRW	PH	0	4	0
Eye	Saxby	PH	0	4	0
Ashop	Ashop	PS	0	3	0
South Soak Drain	Crowle Station	PS	0	1	0
Anston Brook	B6463 Bridge	REM	0	1	0
AUTUMN					
Erewash	Shipleigh Gate	LTB	0	1	0
Erewash	Trowell	LTB	1	0	0
Nethergreen Brook	Eastwood	LTB	0	2	0
Cauldwell Brook	Confluence	LTB	0	2	0
Ryton	Worksop	LTB	0	2	0
Alfreton Brook	Parkmill Drive	PH	0	2	0
Amber	Buckland Hollow	PS	1	1	0
Mackworth Brook	Kirk Langley	PS	0	0	0
Dover Beck	Epperstone	PS	0	2	0

Table 5. Statistics of 1995 Primary Audit for Severn-Trent Region

Analyst/Group	n	Mean gains	Standard error	No. samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
Upper Severn	16	1.50	0.41	5	31.25	5	1.88	0.60
ADG	2	2.00	2.00	1	50.00	4	2.00	2.00
LM	6	1.17	0.60	2	33.33	3	1.33	0.71
PW	6	1.67	0.71	1	16.67	5	2.50	1.34
TPE	2	1.50	1.50	1	50.00	3	1.50	1.50
Lower Severn	13	1.85	0.52	4	30.77	5	2.46	0.63
ADC	5	3.40	0.81	3	60.00	5	4.60	0.81
APH	3	0.33	0.33	0	0.00	1	0.33	0.33
HW	3	1.00	0.56	0	0.00	2	1.67	0.67
HWY	1	0.00	n/a	0	0.00	0	0.00	n/a
KH	1	3.00	n/a	1	100.00	3	3.00	n/a
Upper Trent	13	1.69	0.41	3	23.08	5	1.92	0.42
CAS	6	2.33	0.67	2	33.33	5	2.67	0.67
GF	1	0.00	n/a	0	0.00	0	1.00	n/a
LB	1	2.00	n/a	0	0.00	2	2.00	n/a
REM*	5	1.20	0.58	1	20.00	3	1.20	0.58
Lower Trent	19	2.21	0.43	6	31.58	8	2.58	0.50
BF	4	4.00	1.47	3	75.00	8	4.75	1.89
LTB	5	1.40	0.40	0	0.00	2	1.60	0.24
PH	4	2.75	0.75	2	50.00	4	3.25	0.48
PS	5	1.40	0.51	1	20.00	3	1.60	0.51
REM*	1	1.00	n/a	0	0.00	1	1.00	n/a
*REM sorted samples for Upper and Lower Trent Areas								
REM combined data	6	1.17	0.48	1	16.67	3	1.17	0.48
Severn-Trent Region	61	1.84	0.22	18	29.51	8	1.23	0.27
Whole of NRA	481	1.88	0.08	150	31.19	8	2.21	0.09

Table 6. Summary of errors found in 1995 Primary Audit for each NRA Laboratory

Region/Lab.	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (I+g+o)	Standard error
Anglian	60	2.25	0.20	24	40.00	6	2.63	0.22
Central	20	2.25	0.35	6	30.00	5	3.00	0.42
Eastern	20	2.85	0.39	11	50.00	6	3.05	0.38
Northern	20	1.65	0.27	7	35.00	3	1.85	0.27
N'umb & Yorks	60	1.52	0.20	12	20.00	6	1.68	0.21
South Yorkshire	27	1.44	0.28	5	18.52	6	1.63	0.29
Northumbria	17	1.12	0.26	2	11.76	3	1.29	0.31
Dales	16	2.06	0.50	5	31.25	6	2.19	0.51
North West	60	2.52	0.27	26	43.33	8	2.98	0.30
Northern	18	2.22	0.45	6	33.33	7	2.89	0.57
Central	20	2.35	0.44	8	40.00	7	2.70	0.51
Southern	22	2.91	0.51	12	54.55	8	3.32	0.51
Severn-Trent	61	1.84	0.22	18	29.51	8	1.23	0.27
Upper Severn	16	1.50	0.41	5	31.25	5	1.88	0.60
Lower Severn	13	1.85	0.52	4	30.77	5	2.46	0.63
Upper Trent	13	1.69	0.41	3	23.08	5	1.92	0.42
Lower Trent	19	2.21	0.43	6	31.58	8	2.58	0.50
Southern	60	1.33	0.19	10	16.67	7	1.77	0.21
Western	30	1.20	0.26	5	16.67	6	1.60	0.27
Eastern	30	1.47	0.28	5	16.67	7	1.93	0.33
South Western	60	1.52	0.21	16	26.67	6	1.63	0.23
Devon	16	1.56	0.33	5	31.25	4	1.63	0.35
Cornwall	15	1.27	0.42	3	20.00	5	1.33	0.45
North Wessex	13	0.92	0.29	1	7.69	3	0.92	0.29
South Wessex	16	2.19	0.52	7	43.75	6	2.50	0.58
Thames	60	2.05	0.22	22	36.67	7	2.43	0.24
Fobney Mead	30	2.43	0.32	16	53.33	6	2.97	0.35
Waltham Cross	30	1.67	0.29	6	20.00	7	1.90	0.29
Welsh	60	1.98	0.22	22	36.67	6	2.30	0.23
Northern	20	2.20	0.40	9	45.00	6	2.65	0.39
South Western	20	1.75	0.40	5	25.00	6	2.10	0.41
South Eastern	20	2.00	0.37	8	40.00	5	2.15	0.39
Whole of NRA	481	1.88	0.08	150	31.19	8	2.21	0.09

Table 7. Net effects of the Primary Audit on BMWP score and number of scoring taxa

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Upper Severn	16	8.44	25.00	33	1.31	25.00	4
ADG	2	13.00	50.00	26	2.00	50.00	4
LM	6	6.33	16.67	25	1.00	16.67	3
PW	6	8.67	16.67	33	1.33	16.67	4
TPE	2	9.50	50.00	19	1.50	50.00	3
Lower Severn	13	6.77	23.08	30	1.54	30.77	5
ADC	5	12.80	40.00	30	2.80	60.00	5
APH	3	1.00	0.00	3	0.33	0.00	1
HW	3	1.67	0.00	3	0.67	0.00	1
HWY	1	0.00	0.00	0	0.00	0.00	0
KH	1	16.00	100.00	16	3.00	100.00	3
Upper Trent	13	9.23	23.08	41	1.62	23.08	5
CAS	6	13.50	33.33	41	2.17	16.67	5
GF	1	0.00	0.00	0	0.00	0.00	0
LB	1	10.00	0.00	10	2.00	0.00	2
REM*	5	5.80	20.00	16	1.20	20.00	3
Lower Trent	19	9.84	36.84	36	2.00	31.58	7
BF	4	19.25	75.00	36	3.75	75.00	7
LTB	5	7.40	20.00	15	1.20	0.00	2
PH	4	9.50	50.00	21	2.50	50.00	4
PS	5	6.20	20.00	20	1.20	20.00	3
REM*	1	4.00	0.00	4	1.00	0.00	1
REM combined data	6	5.50	16.67	16	1.17	16.67	3
S-T Region	61	8.69	27.87	41	1.64	27.87	7
Whole of NRA	481	9.56	28.90	52	1.65	27.86	8

Table 8. Net effects of the Primary Audit on BMWP score and number of scoring taxa for each NRA Area

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Anglian Region	60	10.32	35.00	37	1.98	35.00	6
Central	20	9.45	30.00	24	1.85	25.00	5
Eastern	20	14.35	55.00	37	2.65	55.00	6
Northern	20	7.15	20.00	18	1.45	30.00	3
N & Y Region	60	8.35	16.67	40	1.45	18.33	6
S. Yorkshire	27	7.33	14.81	35	1.37	18.52	6
Northumbria	17	5.41	5.88	20	1.00	5.88	3
Dales	16	13.19	31.25	40	2.06	31.25	6
N. West Region	60	13.03	41.67	49	2.18	40.00	8
Northern	18	12.50	44.44	33	1.83	33.33	5
Central	20	13.00	35.00	39	2.10	40.00	6
Southern	22	13.50	45.45	49	2.55	45.45	8
S-T Region	61	8.69	27.87	41	1.64	27.87	7
Upper Severn	16	8.44	25.00	33	1.31	25.00	4
Lower Severn	13	6.77	23.08	30	1.54	30.77	5
Upper Trent	13	9.23	23.08	41	1.62	23.08	5
Lower Trent	19	9.84	36.84	36	2.00	31.58	7
Southern Region	60	6.62	20.00	52	1.02	15.00	6
Western	30	5.33	13.33	32	0.90	13.33	6
Eastern	30	7.90	40.00	52	1.13	16.67	6
S.W. Region	60	8.43	30.00	35	1.42	23.33	6
Devon	16	9.25	37.50	28	1.50	25.00	4
Cornwall	15	7.87	26.67	35	1.20	30.00	5
N. Wessex	13	4.54	15.38	16	0.85	6.25	3
S. Wessex	16	11.31	37.50	33	2.00	37.50	6
Thames Region	60	9.18	26.67	47	1.78	31.67	7
Fobney Mead	30	11.00	40.00	47	2.10	46.67	6
Waltham Cross	30	7.37	13.33	42	1.47	16.67	7
Welsh Region	60	11.87	33.33	43	1.73	31.67	6
Northern	20	12.45	45.00	43	1.85	35.00	6
S. Western	20	9.45	20.00	37	1.40	20.00	6
S. Eastern	20	13.70	35.00	38	1.95	40.00	5
Whole of NRA	481	9.56	28.90	52	1.65	27.86	8

Table 9. Taxa missed by Severn-Trent Region's primary analysts

Family	n	% of S-T Region's missed taxa in Primary Audit	% of missed taxa in Primary Audit for all NRA Regions
Hydrophilidae (incl. Hydraenidae)	8	7.55	5.46
Simuliidae	7	6.60	2.73
Elmidae	6	5.66	4.03
Hydroptilidae	6	5.66	5.93
Baetidae	5	4.72	2.25
Caenidae	5	4.72	3.56
Hydrobiidae (incl. Bithyniidae)	5	4.72	4.98
Leptoceridae	5	4.72	3.68
Asellidae	4	3.77	1.66
Planariidae (incl. Dugesiiidae)	4	3.77	4.27
Planorbidae	4	3.77	2.85
Lymnaeidae	3	2.83	2.49
Nemouridae	3	2.83	2.25
Sphaeriidae	3	2.83	4.63
Corophiidae	2	1.89	0.47
Dytiscidae (incl. Noteridae)	2	1.89	1.90
Ephemerellidae	2	1.89	1.54
Gammaridae (incl. Crangonyctidae)	2	1.89	0.95
Glossiphoniidae	2	1.89	1.66
Goeridae	2	1.89	1.78
Gyrinidae	2	1.89	1.19
Hydropsychidae	2	1.89	1.66
Limnephilidae	2	1.89	2.61
Physidae	2	1.89	0.83
Valvatidae	2	1.89	2.14
Ancylidae (incl. Acroloxidae)	1	0.94	1.66
Brachycentridae	1	0.94	0.24
Calopterygidae	1	0.94	0.47
Chironomidae	1	0.94	0.59
Dendrocoelidae	1	0.94	1.07
Erpobdellidae	1	0.94	1.42
Haliplidae	1	0.94	2.02
Heptageniidae	1	0.94	0.83

Table 9. (cont.)

Family	n	% of S-T Region's missed taxa in Primary Audit	% of missed taxa in Primary Audit for all NRA Regions
Leptophlebiidae	1	0.94	1.54
Oligochaeta	1	0.94	0.71
Piscicolidae	1	0.94	1.90
Psychomyiidae (incl. Ecnomidae)	1	0.94	2.85
Rhyacophilidae (incl. Glossosomatidae)	1	0.94	0.83
Sialidae	1	0.94	0.36
Siphonuridae	1	0.94	0.24
Tipulidae	1	0.94	2.25

APPENDIX

Results of individual sample audits

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 6.3.95

WATER-COURSE: Battlefield Brook

PRIMARY ANALYST: LM

AQC ANALYST: ADG

SITE: Fockbury

CODE: 113813

SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Simuliidae	Simulium ornatum group (larvae + pupa)	8
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SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0 GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 5

ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 8.3.95

WATER-COURSE: Merryhill Brook

PRIMARY ANALYST: LM

AQC ANALYST: ADG

SITE: Bratch

CODE: 113829

SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 13.3.95

WATER-
COURSE: Blakedown Brook

PRIMARY
ANALYST: LM

AQC
ANALYST: ADG

SITE: Viaduct

CODE: 113837

SORT/AQC
METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 13.3.95

WATER-COURSE: Blakedown Brook

PRIMARY ANALYST: LM

AQC ANALYST: ADG

SITE: u/s Blakedown WRW

CODE: 113839

SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Rhyacophilidae (incl. Glossosomatidae) 7

Additional BMWP taxa found by IFE

Limnephilidae 7

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae) Potamopyrgus jenkinsi 9

Elmidae Elmis aenea (larvae) 11

SUMMARY OF AUDIT

LOSSES 1

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 11.4.95

WATER-COURSE: Severn

PRIMARY ANALYST: LM

AQC ANALYST:

SITE: Montford Bridge

CODE: 113954

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 2.5.95

WATER-

PRIMARY

AQC

COURSE: Coal Brook

ANALYST: LM

ANALYST: ADG

SITE: Old Mill

CODE: 114023

SORT/AQC

METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Goeridae	Silo pallipes 1 only	11
Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	11
EphemereIIDae	EphemereIIa ignita 1 only	11

SUMMARY OF AUDIT

LOSSES 0 GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 25

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 27.3.95

WATER-COURSE: Bobs Brook

PRIMARY ANALYST: PW

AQC ANALYST:

SITE: u/s Lower Gornal WRW

CODE: 113899

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 6.4.95

WATER-
COURSE: Morda

PRIMARY
ANALYST: PW

AQC
ANALYST: ADG

SITE: d/s Mile Oak WRW

CODE: 113950

SORT/AQC
METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Physidae

8

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Oligochaeta

Tubificidae

11

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -2

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 20.11.95

WATER-COURSE: Hampton Loade

PRIMARY ANALYST: ADG

AQC ANALYST:

SITE: Severn confluence

CODE: 114669

SORT/AQC METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 15.11.95

WATER-COURSE: Tern

PRIMARY ANALYST: ADG

AQC ANALYST: ADG

SITE: Longdon

CODE: 114645

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Leptoceridae	Mystacides sp. (juvenile) 1 only	9
Planariidae (incl. Dugesiidae)	Polycelis nigra/tenuis 1 only	11
Hydroptilidae	Hydroptila sp. (pupa) 1 only	9
Tipulidae	Antocha vitripennis 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 26

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 11.9.95

WATER-COURSE: Barbourne

PRIMARY ANALYST: PW

AQC ANALYST: ADG

SITE: Blackpole

CODE: 114413

SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Gyrinidae	Orectochilus villosus (larva) 1 only	9
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 5

ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 19.9.95

WATER-COURSE: Stour

PRIMARY ANALYST: PW

AQC ANALYST: ADG

SITE: Dog Kennel Lane

CODE: 114442

SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Simuliidae	Simulium sp. 1 only	9
Limnephilidae	Indet Limnephilid (juvenile) 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 12

ON NO. OF TAXA 2

1 No representative of family in vial
2 Alternative terrestrial specimen in vial
3 Posterior end only in vial
4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling
6 Taxon in vial but not recorded
7 Mis-identification
8 Typographical error - wrong box ticked

9 Taxon missed in sorting
10 Unexplained error
11 Taxon added in internal AQC
12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent	LABORATORY: Upper Severn	DATE: 3.10.95
WATER-COURSE: Stratford Brook	PRIMARY ANALYST: PW	AQC ANALYST: ADG
SITE: Wyken Wheel	CODE: 114514	SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Gammaridae (incl. Crangonyctidae) *	1
Dytiscidae (incl. Noteridae)	4
Oligochaeta *	1
Chironomidae *	1

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydroptilidae	Ithytrichia sp.	9
Caenidae	Caenis rivulorum 1 only	11
Oligochaeta *	Tubificidae, Lumbriculidae	1
Chironomidae *	Orthocladiinae	1
Gammaridae (incl. Crangonyctidae) *	Gammarus pulex	1
Leptoceridae	Athripsodes sp. (juvenile) 1 only	11
Goeridae	Goera pilosa 1 only	11
Planariidae (incl. Dugesiidae)	Indet. Planariid (damaged) 1 only	11

SUMMARY OF AUDIT

LOSSES 1 GAINS 5

OMISSIONS: 3

NET EFFECTS:

ON BMWP SCORE 33

ON NO. OF TAXA 4

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 14.11.95

WATER-COURSE: Kemp

PRIMARY ANALYST: PW

AQC ANALYST: ADG

SITE: u/s Minor Road Bridge

CODE: 114639

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Piscicolidae	Piscicola geometra 1 only. Note on data sheet says "posterior". Record allowed since only the anterior sucker is missing	11
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 4

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 16.10.95

WATER-

PRIMARY

AQC

COURSE: Onny

ANALYST: TPE

ANALYST: ADG

SITE: Wistanstow

CODE: 114552

SORT/AQC

METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Severn

DATE: 16.10.95

WATER-COURSE: Onny

PRIMARY ANALYST: TPE

AQC ANALYST:

SITE: d/s CA WRW

CODE: 114554

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

N/a

No vial of animals present in sample.
Identification check not possible.

Additional BMWP taxa found by IFE

N/a

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

None

Additional BMWP taxa found by IFE

Physidae	Physa sp. (juvenile) 1 only	9
Heptageniidae	Rhithrogena sp.	9
Gammaridae (incl. Crangonyctidae)	Gammarus pulex	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 19

ON NO. OF TAXA 3

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 29.3.95

WATER-COURSE: Isbourne

PRIMARY ANALYST: ADC

AQC ANALYST: ADC

SITE: A46 Bridge

CODE: 137868

SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Lymnaeidae		8
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Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	8
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SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Ephemerellidae	Ephemerella ignita 1 only	9
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Nemouridae	Nemoura cambrica/erratica	9
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Sphaeriidae	Pisidium sp.	9
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SUMMARY OF AUDIT

LOSSES 1 GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 20

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 15.5.95

WATER-

PRIMARY

AQC

COURSE: Cinderford Brook

ANALYST: ADC

ANALYST: PJB

SITE: Upper Soudley

CODE: 127954

SORT/AQC

METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Rhyacophilidae (incl. Glossosomatidae)	Rhyacophila sp. (juveniles)	9
Limnephilidae	Chaetopteryx villosa 1 only	9
Hydroptilidae	Hydroptila sp.	9
Hydrophilidae (incl. Hydraenidae)	Helophorus brevipalpis (adult) 1 only	9
Elmidae	Elmis aenea (larvae)	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 5

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 30

ON NO. OF TAXA 5

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 3.4.95

WATER-COURSE: Hyde Brook

PRIMARY ANALYST: APH

AQC ANALYST:

SITE: u/s Brockhampton WRW

CODE: 137882

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 3.4.95

WATER-COURSE: Wymans Brook

PRIMARY ANALYST: APH

AQC ANALYST: ADC

SITE: d/s Pitteville Lakes

CODE: 137879

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Bithynia tentaculata	9
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SUMMARY OF AUDIT

LOSSES 0 GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 24.4.95

WATER-COURSE: Hatfield Brook

PRIMARY ANALYST: APH

AQC ANALYST: PJB

SITE: Kempsey

CODE: 127914

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 13.3.95

WATER-
COURSE: Badsey Brook

PRIMARY
ANALYST: HWY

AQC
ANALYST: ADC

SITE: d/s Childswickham

CODE: 04/3606

SORT/AQC
METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 16.10.95

WATER-COURSE: Leaddon

PRIMARY ANALYST: AC

AQC ANALYST: HW

SITE: New Mills

CODE: 04 2340/128427

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Planorbidae	Anisus vortex 1 only	11
Hydrophilidae (incl. Hydraenidae)	Hydraena rufipes (adult) 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 20.11.95

WATER-COURSE: Itchen

PRIMARY ANALYST: AC

AQC ANALYST: HW

SITE: Deppers Bridge

CODE: 04 3906/138543

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Leptoceridae	12
Dytiscidae (incl. Noteridae) *	1

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Planorbidae	Armiger crista	9
Erpobdellidae	Erpobdella octoculata 1 only	11
Lymnaeidae	Lymnaea stagnalis	9
Hydropsychidae	Hydropsyche angustipennis	11
Dytiscidae (incl. Noteridae) *	Platambus maculatus (larva) 1 only	1
Asellidae	Asellus meridianus 1 only	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 5

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 7

ON NO. OF TAXA 4

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 7.11.95

WATER-COURSE: Ell Brook

PRIMARY ANALYST: AC

AQC ANALYST:

SITE: Brass Mill

CODE: 04 2305/128506

SORT/AQC METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)	Sialis lutaria	7
Hydrobiidae (incl. Bithyniidae) *		1
Ancylidae (incl. Acroloxidae) *		4

Additional BMWP taxa found by IFE

Sialidae	Sialis lutaria	7
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SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae) *	Potamopyrgus jenkinsi	1
Ancylidae (incl. Acroloxidae) *	Ancylus fluviatilis	1

SUMMARY OF AUDIT

LOSSES 1 GAINS 1

OMISSIONS: 2

NET EFFECTS:

ON BMWP SCORE -1

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 7.9.95

WATER-COURSE: Frome

PRIMARY ANALYST: HW

AQC ANALYST: HW

SITE: Beards Mill

CODE: 04 2230

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Leptoceridae	Sericotoma personatum	7
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Additional BMWP taxa found by IFE

Sericotomatidae	Sericotoma personatum	7
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SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Chironomidae	Brillia longifurca 1 only	11
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SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 2

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 21.9.95

WATER-COURSE: Canley Brook

PRIMARY ANALYST: HW

AQC ANALYST: HW

SITE: Sir Henry Parkes Road

CODE: 04 3830/138372

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Sphaeriidae	Pisidium sp. 1 only	11
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SUMMARY OF AUDIT

LOSSES 0 GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent	LABORATORY: Lower Severn	DATE: 31.10.95
WATER-COURSE: Harvington Brook	PRIMARY ANALYST: HW	AQC ANALYST: HW
SITE: d/s Harvington WRW	CODE: 04 3720/138479	SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Erpobdellidae *	1
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Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Erpobdellidae *	Erpobdella octoculata	1
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SUMMARY OF AUDIT

LOSSES 0 GAINS 0 OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 0
ON NO. OF TAXA 0

- | | | |
|--|--|--|
| 1 No representative of family in vial | 5 Specimen dead at time of sampling | 9 Taxon missed in sorting |
| 2 Alternative terrestrial specimen in vial | 6 Taxon in vial but not recorded | 10 Unexplained error |
| 3 Posterior end only in vial | 7 Mis-identification | 11 Taxon added in internal AQC |
| 4 Empty shell or case or cast skin in vial | 8 Typographical error - wrong box ticked | 12 Recorded taxon that was rejected by AQC analyst |

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Severn

DATE: 20.11.95

WATER-COURSE: Carrant Brook

PRIMARY ANALYST: KH

AQC ANALYST:

SITE: Tewkesbury

CODE: 04 3512

SORT/AQC METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Caenidae	Caenis luctuosa/macrura	9
Elmidae	Elmis aenea (a+1), Oulimnius sp. (1)	9
Baetidae	Cloeon dipterum 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 16

ON NO. OF TAXA 3

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 14.3.95

WATER-COURSE: Dove

PRIMARY ANALYST: CAS

AQC ANALYST: GF

SITE: d/s Rocester

CODE: 173058

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Asellidae	Asellus aquaticus 1 only	11
Brachycentridae	Brachycentrus subnubilus (pupa) 1 only	9
Leptoceridae	Athripsodes sp.	11
Leptophlebiidae	Paraleptophlebia sp. 1 only	11
Psychomyiidae (incl. Ecnomidae)	Psychomyia pusilla 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 5

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 41

ON NO. OF TAXA 5

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 29.3.95

WATER-COURSE: Marchington Brook

PRIMARY ANALYST: CAS

AQC ANALYST: GF

SITE: Marchington

CODE: 173080

SORT/AQC METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Glossiphoniidae	Glossiphonia complanata	11
Nemouridae	Nemoura cambrica/erratica, Amphinemura sulcicollis	11
Halplidae	Brychius elevatus (adult) 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 15
ON NO. OF TAXA 3

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 10.4.95

WATER-COURSE: Anker

PRIMARY ANALYST: CAS

AQC ANALYST:

SITE: Leathermill Bridge

CODE: 173105

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Hydrophilidae (incl. Hydraenidae)	Aphodius sp. (Scarabaeidae) (adult)	2
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Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Baetidae	Baetis rhodani 1 only	9
Caenidae	Caenis luctuosa/macrura	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 10.4.95

WATER-COURSE: Hooborough Brook

PRIMARY ANALYST: LB

AQC ANALYST:

SITE: Acresford

CODE: 173096

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Baetidae	Baetis rhodani 1 only	9
Hydroptilidae	Hydroptila sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10
ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 28.3.95

WATER-COURSE: Carlton Brook

PRIMARY ANALYST: REM

AQC ANALYST: GF

SITE: Carlton Bridge

CODE: 173074

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Corophiidae	Corophium curvispinum	11
Hydropsychidae	Hydropsyche pellucidula 1 only	9
Gyrinidae	Orectochilus villosus (larva) 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 16

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 11.4.95

WATER-COURSE: Black Brook

PRIMARY ANALYST: REM

AQC ANALYST:

SITE: Thickbroom Farm

CODE: 173110

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Planorbidae	Bathymphalus contortus, Planorbis carinatus	9
Simuliidae	Simulium ornatum group (larvae + pupae)	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 25.4.95

WATER-
COURSE: Tame

PRIMARY
ANALYST: REM

AQC
ANALYST: GF

SITE: Lea Marston

CODE: 173128

SORT/AQC
METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

<u>Family name</u>	<u>Species name (where appropriate)</u>	<u>Presumed cause of error (see footnotes)</u>
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0 GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 9.5.95

WATER-COURSE: Trent

PRIMARY ANALYST: REM

AQC ANALYST: GF

SITE: Colwich

CODE: 173186

SORT/AQC METHOD: Live/Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 4.9.95

WATER-
COURSE: Tame

PRIMARY
ANALYST: CAS

AQC
ANALYST: GF

SITE: Two Gates, Fazeley

CODE: 04 8810

SORT/AQC
METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Simuliidae	Simulium erythrocephalum I only	9
Ancyliidae (incl. Acroloxidae)	Acroloxus lacustris I only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 11

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 6.11.95

WATER-

PRIMARY

AQC

COURSE: Chitlings Brook

ANALYST: CAS

ANALYST: GF

SITE: Trent Vale

CODE: 04 7241

SORT/AQC

METHOD: Live/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Gammaridae (incl. Crangonyctidae) * 3

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Gammaridae (incl. Crangonyctidae) * 3

Hydrophilidae (incl. Hydraenidae) 9

Sphaeriidae 11

Gammarus pulex

Helophorus grandis (adult) 1 only

Pisidium sp.

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 2

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 21.11.95

WATER-COURSE: Saredon Brook

PRIMARY ANALYST: CAS

AQC ANALYST: GF

SITE: Church Bridge, Cannock

CODE: 04 7015

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 13.9.95

WATER-COURSE: Hamps

PRIMARY ANALYST: GF

AQC ANALYST:

SITE: Waterhouses

CODE: 04 7701

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Hydroptilidae * 4

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydroptilidae * 4

Hydroptila sp.

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Upper Trent

DATE: 29.11.95

WATER-
COURSE: Rough Brook

PRIMARY
ANALYST: REM

AQC
ANALYST: GF

SITE: Rushall

CODE: 04 8776/173806

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)	Helophorus brevipalpis (adult) 1 only	9
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SUMMARY OF AUDIT

LOSSES 0 GAINS 1 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 5
ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 1.3.95

WATER-COURSE: Wood Brook

PRIMARY ANALYST: BF

AQC ANALYST: PH

SITE: d/s Loughborough WRW

CODE: 142788

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Tipulidae	7
Sphaeriidae *	4

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Valvatidae	Valvata piscinalis 1 only	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	9
Glossiphoniidae	Helobdella stagnalis	9
Corophiidae	Corophium curvispinum 1 only	11
Elmidae	Elmis aenea (larva) 1 only	9
Hydroptilidae	Hydroptila sp.	11
Leptoceridae	Athripsodes cinereus 1 only	9
Sphaeriidae *	Pisidium sp.	4
Dendrocoelidae	Dendrocoelum lacteum	11

SUMMARY OF AUDIT

LOSSES 1 GAINS 8

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 36

ON NO. OF TAXA 7

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 5.4.95

WATER-COURSE: North Beck

PRIMARY ANALYST: BF

AQC ANALYST:

SITE: u/s Tuxford Beck

CODE: 152493

SORT/AQC METHOD: Live

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Planorbidae

Armiger crista 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

ON NO. OF TAXA 1

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 9.4.95

WATER-
COURSE: Sence

PRIMARY
ANALYST: BF

AQC
ANALYST: PH

SITE: Newton Harcourt

CODE: 142881

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Ancylidae (incl. Acroloxidae) * 1

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Baetidae	Baetis rhodani	9
Ancylidae (incl. Acroloxidae) *	Ancylus fluviatilis	1
Calopterygidae	Calopteryx splendens	11
Gammaridae (incl. Crangonyctidae)	Gammarus pulex 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 3

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 18
ON NO. OF TAXA 3

1 No representative of family in vial
2 Alternative terrestrial specimen in vial
3 Posterior end only in vial
4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling
6 Taxon in vial but not recorded
7 Mis-identification
8 Typographical error - wrong box ticked

9 Taxon missed in sorting
10 Unexplained error
11 Taxon added in internal AQC
12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 27.4.95

WATER-COURSE: Pickwell Brook

PRIMARY ANALYST: BF

AQC ANALYST: PS

SITE: Whissendine Road Bridge

CODE: 142920

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Asellidae	Asellus meridianus 1 only	9
Caenidae	Caenis luctuosa/macrura	11
Hydrophilidae (incl. Hydraenidae)	Hydraena sp. (adult) 1 only	9
Simuliidae	Simulium venum/naturale 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 20

ON NO. OF TAXA 4

1 No representative of family in vial

2 Alternative terrestrial specimen in vial

3 Posterior end only in vial

4 Empty shell or case or cast skin in vial

5 Specimen dead at time of sampling

6 Taxon in vial but not recorded

7 Mis-identification

8 Typographical error - wrong box ticked

9 Taxon missed in sorting

10 Unexplained error

11 Taxon added in internal AQC

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 13.3.95

WATER-COURSE: Willow Brook

PRIMARY ANALYST: PH

AQC ANALYST: PH

SITE: Humberstone

CODE: 142828

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Leptophlebiidae	1
Sphaeriidae *	1

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Sphaeriidae *	Pisidium sp.	1
Asellidae	Asellus aquaticus 1 only	11

SUMMARY OF AUDIT

LOSSES 1 GAINS 1

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE -7

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 2.3.95

WATER-COURSE: Twyford Brook

PRIMARY ANALYST: PH

AQC ANALYST: PH

SITE: d/s Findern WRW

CODE: 142779

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Lymnaeidae	Lymnaea truncatula 1 only	9
Planariidae (incl. Dugesiidac)	Polycelis nigra/tenuis	11
Valvatidae	Valvata piscinalis 1 only	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 14

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 26.4.95

WATER-COURSE: Eye

PRIMARY ANALYST: PH

AQC ANALYST: PH

SITE: Saxby

CODE: 142903

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Baetidae	Baetis sp. (juveniles)	11
Simuliidae	Simulium ornatum group 1 only	9
Caenidae	Caenis luctuosa/macrura 1 only	11
Dytiscidae (incl. Noteridae)	Potamonectes depressus (adult) 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 21

ON NO. OF TAXA 4

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 10.5.95

WATER-COURSE: Ashop

PRIMARY ANALYST: PS

AQC ANALYST: PS

SITE: Ashop

CODE: 143053

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Siphonuridae	Siphonurus lacustris/armatus 1 only	9
Dytiscidae (incl. Noteridae)	Oreodytes sanmarkii (adults)	9
Simuliidae	Simulium sp. (argyreatum?)	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 20

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 29.5.95

WATER-COURSE: South Soak Drain

PRIMARY ANALYST: PS

AQC ANALYST: PS

SITE: Crowle Station

CODE: 143118

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

<u>Family name</u>	<u>Species name (where appropriate)</u>	<u>Presumed cause of error (see footnotes)</u>
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Lymnaeidae	Lymnaea peregra 1 only	9
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE 17.4.95

WATER-COURSE: Anston Brook

PRIMARY ANALYST: REM

AQC ANALYST: PH

SITE: B6463 Bridge

CODE: 152512

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

IFE cannot verify Dendrocoelidae from damaged remains in vial - benefit of doubt given to NRA analyst.

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Sialidae	Sialis lutaria	11
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SUMMARY OF AUDIT

LOSSES 0 GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 4

ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 11.10.95

WATER-COURSE: Erewash

PRIMARY ANALYST: LTB

AQC ANALYST: PS

SITE: Shipley Gate

CODE: 04 5304/143372

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Asellidae Asellus aquaticus 11

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 19.10.95

WATER-
COURSE: Erewash

PRIMARY
ANALYST: LTB

AQC
ANALYST: PS

SITE: Trowell

CODE: 04 5305/143446

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Hydrobiidae (incl. Bithyniidae)

Empty shell

12

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -3

ON NO. OF TAXA -1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 25.10.95

WATER-COURSE: Nethergreen Brook

PRIMARY ANALYST: LTB

AQC ANALYST: PS

SITE: Eastwood

CODE: 04 5309/143458

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Leptoceridae	Mystacides azurea	11
Simuliidae	Simulium erythrocephalum 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 15

ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 21.11.95

WATER-
COURSE: Cauldwell Brook

PRIMARY
ANALYST: LTB

AQC
ANALYST: PS

SITE: Confluence

CODE: 04 5414/143765

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Nemouridae	Nemoura cambrica/erratica 1 only	11
Hydrophilidae (incl. Hydraenidae)	Indet Hydrophilid (larva) 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 12

ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 17.11.95

WATER-COURSE: Ryton

PRIMARY ANALYST: LTB

AQC ANALYST: PS

SITE: High Hoe Road, Worksop

CODE: 04 5702

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Elmidae	Elmis aenea (larvae)	11
Planariidae (incl. Dugesiidae)	Dugesia polychroa/lugubris 1 only	11

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10
ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 12.10.95

WATER-COURSE: Alfreton Brook

PRIMARY ANALYST: PH

AQC ANALYST: PS

SITE: Parkmill Drive

CODE: 04 5225/143377

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Elmidae	Oulimnius sp. (larva) 1 only	9
Hydrophilidae (incl. Hydraenidae)	Helophorus brevipalpis (adult) 1 only	11

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10
ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 12.10.95

WATER-COURSE: Amber

PRIMARY ANALYST: PS

AQC ANALYST: PS

SITE: Buckland Hollow

CODE: 04 5218/143393

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Baetidae

12

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydroptilidae

Hydroptila sp. (pupae)

9

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 2

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 18.10.95

WATER-COURSE: Mackworth Brook

PRIMARY ANALYST: PS

AQC ANALYST:

SITE: Kirk Langley

CODE: 04 5042/143427

SORT/AQC METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0 GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Severn-Trent

LABORATORY: Lower Trent

DATE: 7.11.95

WATER-COURSE: Dover Beck

PRIMARY ANALYST: PS

AQC ANALYST: PS

SITE: Epperstone

CODE: 04 4056/143612

SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Physidae	Physa sp. (juveniles)	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 2 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6
ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)