

METHOD STATEMENT



Determinand:

The determination of selected of triazine, conazole, phenyl urea, carbamate, organophosphorus and neutral compounds

Matrix:

Sample Type: Treated and Raw Waters

Principle of Method:

A direct aqueous large volume injection (LVI) on-line solid phase extraction procedure. Samples are analysed by high performance liquid chromatography with a triple quadrupole mass spectrometer detector. Samples are injected by large volume injection onto an enrichment column, the enrichment column is back flushed on to the analytical column. Organic compounds are separated and then identified and quantified with mass spectrometric detection in selected reaction monitoring (SRM) mode. Quantitation is based on an internal standardisation procedure.

Sampling and Sample Preparation:

Sampling, samples should be collected in 500mL coloured glass which has been proven to be suitable for this analysis, with PTFE lined screw caps and contain 0.500mL of sample preservative, 30g L⁻¹ w/v ascorbic acid.

Storage - samples should be analysed as soon as possible after collection. When this is not possible, they should be stored under refrigeration at 1-5°C in the dark, until analysis can begin.

The maximum permissible storage time prior to analysis is given below:

Determinand	Maximum period of analyte stability prior to any extraction step (days)	Maximum period of analyte stability after to any extraction step (days)	Data is quoted from BS EN ISO 5667-3: 2018 ["ISO"] or ALS in-house data ["ALS-AS IHD"]
ATRAZINE	21	N/A	ALS IHD
ATRAZINE-DESETHYL	21	N/A	ALS IHD
ATRAZINE-DESIISOPROPYL	21	N/A	ALS IHD
AZINPHOS-METHYL	21	N/A	ALS IHD
AZOXYSTROBIN	22	N/A	ALS IHD
BENZOVINDIFLUPYR	21	N/A	ALS IHD
BIXAFEN	22	N/A	ALS IHD
BOSCALID	21	N/A	ALS IHD
BROMACIL	21	N/A	ALS IHD
CARBENDAZIM	21	N/A	ALS IHD
CARBETAMIDE	21	N/A	ALS IHD
CHLORFENVINPHOS	21	N/A	ALS IHD
CHLORTOLURON	21	N/A	ALS IHD
CYANAZINE	21	N/A	ALS IHD
CYPROCONAZOLE	21	N/A	ALS IHD
DICHLORVOS	21	N/A	ALS IHD
DICLOFENAC	21	N/A	ALS IHD
DIFENOCONAZOLE	21	N/A	ALS IHD
DIMETHENAMID-P	21	N/A	ALS IHD
DIMETHOATE	21	N/A	ALS IHD
DIURON	21	N/A	ALS IHD
EPTC	21	N/A	ALS IHD
EPOXICONAZOLE	21	N/A	ALS IHD
FLUFENACET	21	N/A	ALS IHD

METHOD STATEMENT



Determinand	Maximum period of analyte stability prior to any extraction step (days)	Maximum period of analyte stability after to any extraction step (days)	Data is quoted from BS EN ISO 5667-3: 2018 ["ISO"] or ALS in-house data ["ALS-AS IHD"]
FLUOPYRAM	21	N/A	ALS IHD
FLURTAMONE	21	N/A	ALS IHD
FLUSILAZOLE	21	N/A	ALS IHD
FLUTRIFOL	21	N/A	ALS IHD
FLUXAPYROXAD	21	N/A	ALS IHD
ISOPROTURON	21	N/A	ALS IHD
LENACIL	21	N/A	ALS IHD
LINURON	21	N/A	ALS IHD
MALATHION	21	N/A	ALS IHD
MEFENTRIFLUCONAZOLE	21	N/A	ALS IHD
METAMITRON	21	N/A	ALS IHD
METAZACHLOR	21	N/A	ALS IHD
METCONAZOLE	22	N/A	ALS IHD
METHABENZTHIAZURON	21	N/A	ALS IHD
METHIOCARB	21	N/A	ALS IHD
METOBROMURON	21	N/A	ALS IHD
METOXURON	21	N/A	ALS IHD
METRIBUZIN	21	N/A	ALS IHD
METSULFURON-METHYL	14	N/A	ALS IHD
MEVINPHOS	21	N/A	ALS IHD
MONURON	21	N/A	ALS IHD
OXADIXYL	21	N/A	ALS IHD
OXAMYL	21	N/A	ALS IHD
PROCHLORAZ	22	N/A	ALS IHD
PROMETRYN	21	N/A	ALS IHD
PROPACHLOR	21	N/A	ALS IHD
PROPAZINE	21	N/A	ALS IHD
PROPETAMPHOS	21	N/A	ALS IHD
PROPICONAZOLE	21	N/A	ALS IHD
PROSULFOCARB	21	N/A	ALS IHD
PROTHIOCONAZOLE-DESTHIO	22	N/A	ALS IHD
PYRACLOSTROBIN	21	N/A	ALS IHD
QUINMERAC	21	N/A	ALS IHD
SIMAZINE	21	N/A	ALS IHD
SPIROXAMINE	21	N/A	ALS IHD
TEBUCONAZOLE	21	N/A	ALS IHD
TERBUTHYLAZINE	21	N/A	ALS IHD
TERBUTRYN	21	N/A	ALS IHD
THIFENSULFURON-METHYL	21	N/A	ALS IHD
TRIAZOPHOS	21	N/A	ALS IHD
TRIETAZINE	21	N/A	ALS IHD
TRIFLOXYSTROBIN	21	N/A	ALS IHD
TRINEXAPAC-ETHYL	22	N/A	ALS IHD

Interferences

HPLC-MS/MS is an extremely selective technique and interferences should only be encountered very rarely. Any interfering compounds would have to display the identical SRM transition at the same

METHOD STATEMENT



retention time, this is extremely unlikely in potable water samples. However, any compound, which passes through the extraction procedure, and has a similar liquid chromatographic retention time and mass spectrometric properties to the compound of interest, will cause interference. Samples containing high humic or fulvic loading have been demonstrated to not cause significant ion suppression for the compounds.

Performance of Method:

Range of Application:

Instrument WQQQ3, WQQQ4, WQQQ6 and WQQQ8

Determinand	Operational Calibration Range
ATRAZINE	LOQ - 0.150 µg L ⁻¹
ATRAZINE-DESETHYL	LOQ - 0.150 µg L ⁻¹
ATRAZINE-DEISOPROPYL	LOQ - 0.150 µg L ⁻¹
AZINPHOS-METHYL	LOQ - 0.150 µg L ⁻¹
AZOXYSTROBIN	LOQ - 0.150 µg L ⁻¹
BENZOVINDIFLUPYR	LOQ - 0.150 µg L ⁻¹
BIXAFEN	LOQ - 0.150 µg L ⁻¹
BOSCALID	LOQ - 0.150 µg L ⁻¹
BROMACIL	LOQ - 0.150 µg L ⁻¹
CARBENDAZIM	LOQ - 0.150 µg L ⁻¹
CARBETAMIDE	LOQ - 0.150 µg L ⁻¹
CHLORFENVINPHOS	LOQ - 0.150 µg L ⁻¹
CHLORTOLURON	LOQ - 0.150 µg L ⁻¹
CYANAZINE	LOQ - 0.150 µg L ⁻¹
CYPROCONAZOLE	LOQ - 0.150 µg L ⁻¹
DICHLORVOS	LOQ - 0.150 µg L ⁻¹
DICLOFENAC	LOQ - 0.150 µg L ⁻¹
DIFENOCONAZOLE	LOQ - 0.150 µg L ⁻¹
DIMETHENAMID-P	LOQ - 0.150 µg L ⁻¹
DIMETHOATE	LOQ - 0.150 µg L ⁻¹
DIURON	LOQ - 0.150 µg L ⁻¹
EPOXICONAZOLE	LOQ - 0.150 µg L ⁻¹
EPTC	LOQ - 0.150 µg L ⁻¹
FLUFENACET	LOQ - 0.150 µg L ⁻¹
FLUOPYRAM	LOQ - 0.150 µg L ⁻¹
FLURTAMONE	LOQ - 0.150 µg L ⁻¹
FLUSILAZOLE	LOQ - 0.150 µg L ⁻¹
FLUTRIFOL	LOQ - 0.150 µg L ⁻¹
FLUXAPYROXAD	LOQ - 0.150 µg L ⁻¹
ISOPROTURON	LOQ - 0.150 µg L ⁻¹
LENACIL	LOQ - 0.150 µg L ⁻¹
LINURON	LOQ - 0.150 µg L ⁻¹
MALATHION	LOQ - 0.150 µg L ⁻¹
MEFENTRIFLUCONAZOLE	LOQ - 0.150 µg L ⁻¹
METAMITRON	LOQ - 0.150 µg L ⁻¹
METAZACHLOR	LOQ - 0.150 µg L ⁻¹
METCONAZOLE	LOQ - 0.150 µg L ⁻¹
METHABENZTHIAZURON	LOQ - 0.150 µg L ⁻¹
METHIOCARB	LOQ - 0.150 µg L ⁻¹

METHOD STATEMENT



Determinand	Operational Calibration Range
METOBROMURON	LOQ - 0.150 µg L ⁻¹
METOXURON	LOQ - 0.150 µg L ⁻¹
METRIBUZIN	LOQ - 0.150 µg L ⁻¹
METSULFURON-METHYL	LOQ - 0.150 µg L ⁻¹
MEVINPHOS	LOQ - 0.150 µg L ⁻¹
MONURON	LOQ - 0.150 µg L ⁻¹
OXADIXYL	LOQ - 0.150 µg L ⁻¹
OXAMYL	LOQ - 0.150 µg L ⁻¹
PROCHLORAZ	LOQ - 0.150 µg L ⁻¹
PROMETRYN	LOQ - 0.150 µg L ⁻¹
PROPACHLOR	LOQ - 0.150 µg L ⁻¹
PROPAZINE	LOQ - 0.150 µg L ⁻¹
PROPETAMPHOS	LOQ - 0.150 µg L ⁻¹
PROPICONAZOLE	LOQ - 0.150 µg L ⁻¹
PROSULFOCARB	LOQ - 0.150 µg L ⁻¹
PROTHIOCONAZOLE-DESTHIO	LOQ - 0.150 µg L ⁻¹
PYRACLOSTROBIN	LOQ - 0.150 µg L ⁻¹
QUINMERAC	LOQ - 0.150 µg L ⁻¹
SIMAZINE	LOQ - 0.150 µg L ⁻¹
SPIROXAMINE	LOQ - 0.150 µg L ⁻¹
TEBUCONAZOLE	LOQ - 0.150 µg L ⁻¹
TERBUTHYLAZINE	LOQ - 0.150 µg L ⁻¹
TERBUTRYN	LOQ - 0.150 µg L ⁻¹
THIFENSULFURON-METHYL	LOQ - 0.150 µg L ⁻¹
TRIAZOPHOS	LOQ - 0.150 µg L ⁻¹
TRIETAZINE	LOQ - 0.150 µg L ⁻¹
TRIFLOXYSTROBIN	LOQ - 0.150 µg L ⁻¹
TRINEXAPAC-ETHYL	LOQ - 0.150 µg L ⁻¹

Limit of Quantification, Recoveries of Compounds, Bias and Uncertainty of Measurement: Instrument 1, WQQQ3:

Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		High Standard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Atrazine	± 6.55 %	98.9%	1.3%	100.2%	1.0%	98.6%	1.2%
Atrazine-desethyl	± 23.32 %	99.5%	2.8%	100.0%	1.9%	88.9%	2.6%
Atrazine-desisopropyl	± 20.64 %	98.8%	3.7%	100.2%	2.5%	90.3%	2.4%
Azinphos-methyl	± 5.93 %	99.3%	1.8%	99.7%	1.2%	99.9%	1.2%
Azoxystrobin	± 10.08 %	100.4%	4.6%	101.3%	3.1%	101.4%	3.8%
Benzovindiflupyr	± 21.40%	110.8%	14.3%	103.7%	5.3%	108.0%	8.7%
Bixafen	± 11.17 %	104.2%	8.7%	100.3%	4.3%	101.6%	4.0%
Boscalid	± 8.38 %	101.0%	5.3%	100.7%	3.0%	99.4%	2.4%
Bromacil	± 9.27 %	99.4%	6.4%	101.2%	2.0%	102.8%	3.5%
Carbendazim	± 8.07 %	98.1%	1.7%	100.1%	1.3%	98.8%	1.1%
Carbetamide	± 8.68 %	101.6%	4.5%	101.3%	2.4%	102.2%	2.3%
Chlorfenvinphos	± 13.75 %	101.4%	5.7%	101.5%	5.9%	104.3%	5.2%
Chlortoluron	± 7.67 %	100.1%	2.7%	99.9%	3.0%	99.4%	2.4%

METHOD STATEMENT



Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Cyanazine	± 6.38 %	99.1%	2.7%	100.3%	1.6%	100.5%	2.0%
Cyproconazole	± 8.62 %	101.3%	3.5%	99.7%	3.5%	100.6%	3.2%
Dichlorvos	± 7.80 %	99.5%	3.6%	101.6%	2.2%	100.7%	2.6%
Diclofenac	± 20.19%	103.6%	12.9%	99.1%	7.1%	102.5%	6.2%
Difenoconazole	± 10.10 %	98.6%	5.5%	101.1%	3.2%	100.7%	4.6%
Dimethenamid-P	± 10.27%	101.2%	5.2%	103.3%	3.1%	103.5%	3.2%
Dimethoate	± 6.94 %	99.9%	3.5%	100.2%	2.0%	100.1%	1.8%
Diuron	± 9.77 %	101.9%	5.0%	102.7%	2.0%	102.3%	2.9%
Epoxiconazole	± 7.70 %	98.4%	3.2%	99.8%	2.7%	100.3%	3.2%
EPTC	± 10.56 %	100.4%	7.8%	100.2%	2.8%	101.4%	3.6%
Flufenacet	± 13.31 %	100.6%	5.1%	102.5%	5.3%	102.7%	4.8%
Fluopyram	± 9.67 %	102.2%	5.9%	100.9%	3.3%	101.2%	2.8%
Flurtamone	± 7.15 %	99.2%	2.9%	100.6%	1.7%	99.7%	2.0%
Flusilazole	± 8.27 %	99.8%	3.0%	100.2%	3.7%	101.2%	2.8%
Flutriafol	± 9.50 %	98.9%	1.9%	100.5%	1.2%	103.5%	1.1%
Fluxapyroxad	± 10.10 %	103.3%	6.5%	100.5%	5.0%	100.8%	4.5%
Isoproturon	± 6.77 %	99.3%	2.5%	100.4%	1.5%	100.1%	1.6%
Lenacil	± 10.88 %	99.0%	4.1%	100.9%	2.8%	103.6%	2.5%
Linuron	± 10.43 %	100.5%	5.7%	101.5%	3.0%	102.6%	4.6%
Malathion	± 9.75 %	101.5%	3.9%	100.0%	3.0%	100.5%	3.0%
Mefentrifluconazole	± 14.85 %	95.3%	4.2%	101.3%	4.0%	100.3%	5.5%
Metamitron	± 21.67 %	103.5%	3.2%	105.3%	2.1%	103.2%	2.6%
Metazachlor	± 6.67 %	100.8%	3.4%	101.5%	1.7%	100.5%	2.0%
Metconazole	± 7.71 %	98.6%	2.4%	99.8%	1.8%	100.3%	2.4%
Methabenzthiazuron	± 7.16 %	99.6%	3.5%	99.6%	1.9%	99.8%	2.5%
Methiocarb	± 12.87 %	99.8%	4.2%	102.2%	2.9%	104.3%	2.5%
Metobromuron	± 10.77 %	99.7%	5.4%	100.5%	3.1%	100.1%	3.4%
Metoxuron	± 8.52 %	99.8%	3.7%	99.9%	3.4%	101.3%	2.9%
Metribuzin	± 6.74 %	100.9%	2.1%	100.2%	1.2%	99.0%	1.7%
Metsulfuron-methyl	± 15.26 %	108.9%	17.4%	100.4%	4.0%	95.5%	4.9%
Mevinphos	± 7.44 %	99.7%	4.9%	101.3%	2.0%	100.5%	2.1%
Monuron	± 6.84 %	98.8%	3.7%	100.1%	3.0%	100.1%	2.8%
Oxadixyl	± 8.66 %	100.8%	4.4%	102.2%	2.4%	102.1%	3.2%
Oxamyl	± 5.75 %	97.8%	3.1%	98.7%	2.0%	98.6%	1.2%
Prochloraz	± 12.52 %	99.5%	2.3%	101.3%	1.6%	105.3%	1.8%
Prometryn	± 5.92 %	99.8%	2.9%	99.8%	0.8%	99.1%	1.2%
Propachlor	± 7.06 %	100.9%	3.8%	102.0%	2.6%	100.5%	2.9%
Propazine	± 8.03 %	99.7%	1.9%	100.4%	1.2%	97.4%	1.6%
Propetamphos	± 11.08 %	103.5%	7.8%	100.6%	3.6%	101.4%	4.3%
Propiconazole	± 8.38 %	99.9%	4.5%	100.6%	2.6%	101.1%	2.9%
Prosulfocarb	± 17.62 %	97.7%	5.5%	99.0%	6.7%	101.9%	4.7%
Prothioconazole-desthio	± 8.48 %	98.5%	4.2%	99.1%	4.0%	99.0%	3.4%
Pyraclostrobin	± 12.78 %	96.9%	7.3%	101.9%	4.1%	100.2%	4.8%
Quinmerac	± 8.23 %	99.4%	3.3%	99.2%	2.3%	98.8%	4.0%
Simazine	± 5.94 %	98.6%	2.1%	100.0%	1.1%	99.5%	1.6%

METHOD STATEMENT



Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Spiroxamine	± 9.51 %	98.7%	3.7%	101.4%	4.9%	101.8%	3.5%
Tebuconazole	± 6.69 %	99.2%	2.3%	99.7%	2.3%	99.8%	2.6%
Terbutylazine	± 7.29 %	100.0%	1.6%	100.4%	1.2%	98.0%	2.0%
Terbutryn	± 5.76 %	99.2%	1.4%	100.1%	0.8%	99.7%	1.0%
Thifensulfuron-methyl	± 20.22 %	100.3%	5.5%	99.9%	3.8%	103.8%	4.0%
Triazophos	± 9.89 %	100.1%	5.4%	99.3%	3.1%	99.7%	3.7%
Trietazine	± 10.35 %	97.7%	2.6%	99.9%	1.7%	103.9%	1.7%
Trifloxystrobin	± 34.32 %	104.0%	11.3%	101.5%	7.5%	101.7%	7.8%
Trinexapac-ethyl	± 14.28 %	102.3%	7.9%	98.6%	5.7%	102.1%	5.0%

Instrument 2, WQQQ4:

Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Atrazine	± 6.32 %	99.9%	3.3%	99.7%	1.5%	99.9%	1.6%
Atrazine-desethyl	± 8.93 %	102.1%	2.7%	100.4%	3.0%	99.2%	3.3%
Atrazine-desisopropyl	± 21.78 %	100.6%	4.0%	98.1%	3.5%	90.5%	5.3%
Azinphos-methyl	± 6.89 %	101.1%	1.7%	99.8%	1.3%	100.8%	1.7%
Azoxystrobin	± 18.53 %	96.4%	8.6%	98.4%	7.4%	100.0%	8.8%
Benzovindiflupyr	± 27.50 %	103.6%	7.8%	102.2%	8.6%	106.9%	6.5%
Bixafen	± 10.61 %	100.7%	4.5%	101.5%	5.7%	100.7%	3.7%
Boscalid	± 10.37 %	98.0%	5.1%	99.0%	4.7%	98.8%	4.9%
Bromacil	± 18.54 %	96.8%	6.8%	97.7%	6.6%	99.1%	6.5%
Carbendazim	± 9.78 %	99.3%	1.5%	100.0%	0.7%	100.9%	1.3%
Carbetamide	± 6.82 %	102.8%	3.7%	99.4%	2.1%	100.1%	2.2%
Chlorfenvinphos	± 12.84 %	97.9%	4.6%	100.4%	5.7%	102.9%	3.8%
Chlortoluron	± 10.03 %	103.1%	3.9%	99.9%	3.7%	99.2%	5.0%
Cyanazine	± 6.79 %	99.7%	1.9%	99.2%	1.6%	99.8%	1.9%
Cyproconazole	± 9.09 %	100.5%	3.3%	100.6%	4.1%	100.8%	3.1%
Dichlorvos	± 8.34 %	100.5%	3.2%	99.2%	2.1%	100.4%	2.2%
Diclofenac	± 17.95 %	97.9%	4.8%	100.3%	5.1%	100.5%	5.6%
Difenoconazole	± 11.11 %	100.9%	3.0%	100.4%	2.6%	103.8%	2.3%
Dimethenamid-P	± 20.63 %	101.8%	6.3%	102.3%	6.1%	103.6%	6.1%
Dimethoate	± 11.03 %	100.8%	2.8%	100.4%	2.1%	102.2%	2.5%
Diuron	± 13.98 %	102.9%	6.9%	99.5%	5.8%	102.3%	6.0%
Epoxiconazole	± 8.53 %	99.9%	2.6%	100.0%	3.5%	101.0%	2.4%
EPTC	± 9.81 %	100.8%	4.9%	100.3%	2.8%	102.2%	3.3%
Flufenacet	± 23.32 %	96.8%	10.0%	95.6%	9.1%	96.3%	10.0%
Fluopyram	± 15.55 %	99.0%	4.1%	99.9%	3.8%	99.8%	6.3%
Flurtamone	± 7.19 %	99.3%	3.2%	98.6%	2.7%	99.7%	3.6%
Flusilazole	± 9.94 %	99.4%	3.2%	99.8%	3.2%	102.7%	2.4%
Flutriafol	± 10.32 %	100.3%	3.3%	99.5%	2.5%	103.0%	2.2%
Fluxapyroxad	± 10.46 %	101.3%	3.3%	101.1%	6.8%	99.6%	3.0%
Isoproturon	± 9.57 %	101.8%	4.3%	101.3%	3.7%	102.0%	3.8%

METHOD STATEMENT



Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Lenacil	± 11.63 %	98.2%	6.3%	98.8%	4.3%	102.3%	4.7%
Linuron	± 13.38 %	99.6%	5.5%	100.4%	5.4%	98.7%	6.2%
Malathion	± 8.78 %	101.6%	3.6%	99.8%	2.0%	101.6%	2.1%
Mefentrifluconazole	± 10.98%	94.8%	4.01	99.7%	2.56%	101.2%	4.9%
Metamitron	± 12.94 %	100.9%	5.2%	103.2%	5.5%	96.4%	7.3%
Metazachlor	± 10.38 %	98.2%	5.1%	98.6%	3.3%	100.8%	4.9%
Metconazole	± 9.32 %	98.2%	3.6%	99.5%	3.7%	99.5%	3.2%
Methabenzthiazuron	± 14.23 %	105.0%	3.9%	103.9%	3.6%	105.1%	3.7%
Methiocarb	± 15.37 %	102.3%	7.0%	101.6%	5.6%	102.2%	8.2%
Metobromuron	± 13.98 %	98.0%	6.0%	98.3%	5.5%	97.9%	5.9%
Metoxuron	± 19.59 %	101.5%	4.7%	100.2%	3.2%	108.0%	3.1%
Metribuzin	± 10.10 %	99.9%	2.0%	100.7%	1.9%	102.8%	2.3%
Metsulfuron-methyl	± 19.03 %	101.3%	8.9%	96.7%	3.8%	99.1%	4.6%
Mevinphos	± 9.03 %	101.0%	4.1%	99.9%	3.3%	102.3%	2.7%
Monuron	± 7.28 %	101.1%	2.7%	100.4%	2.6%	100.9%	2.0%
Oxadixyl	± 8.99 %	96.6%	4.5%	99.0%	5.0%	102.0%	3.2%
Oxamyl	± 5.32 %	98.0%	2.5%	100.1%	1.5%	100.0%	1.2%
Prochloraz	± 8.96 %	100.9%	3.7%	101.0%	2.2%	101.8%	3.1%
Prometryn	± 7.09 %	99.5%	1.8%	100.3%	1.5%	100.9%	1.1%
Propachlor	± 13.55 %	97.8%	7.4%	97.4%	4.5%	98.0%	5.8%
Propazine	± 6.88 %	99.8%	3.3%	99.7%	1.4%	99.7%	1.5%
Propetamphos	± 9.40 %	102.1%	5.7%	98.6%	2.5%	100.5%	5.0%
Propiconazole	± 6.98 %	99.2%	2.2%	98.5%	2.3%	99.7%	1.8%
Prosulfocarb	± 22.63 %	94.9%	10.0%	96.6%	6.5%	94.9%	8.6%
Prothioconazole-desthio	± 11.14 %	98.0%	4.7%	99.7%	5.7%	99.4%	4.0%
Pyraclostrobin	± 7.40 %	98.3%	2.5%	99.2%	2.4%	99.6%	2.4%
Quinmerac	± 30.88 %	102.8%	5.4%	100.9%	3.6%	114.3%	7.2%
Simazine	± 6.85 %	100.4%	2.8%	99.5%	1.4%	100.3%	1.7%
Spiroxamine	± 14.09 %	100.0%	5.0%	99.1%	5.7%	104.8%	5.5%
Tebuconazole	± 8.58 %	99.2%	2.8%	100.0%	2.1%	100.9%	2.3%
Terbutylazine	± 7.27 %	100.4%	2.2%	100.4%	1.8%	101.1%	1.6%
Terbutryn	± 7.66 %	100.1%	1.7%	100.2%	1.3%	100.8%	1.3%
Thifensulfuron-methyl	± 14.15 %	95.4%	6.3%	97.9%	4.8%	103.1%	4.0%
Triazophos	± 10.69 %	101.5%	4.5%	101.0%	3.0%	102.9%	2.2%
Trietazine	± 7.38 %	99.7%	2.7%	100.0%	3.4%	101.5%	1.9%
Trifloxystrobin	± 21.58 %	99.6%	10.0%	98.7%	7.9%	101.2%	6.2%
Trinexapac-ethyl	± 10.06 %	104.4%	6.1%	101.4%	6.2%	102.2%	3.3%

Instrument 3, WQQQ6:

Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Atrazine	6.408%	97.06%	1.48%	99.83%	1.04%	98.32%	1.70%
Atrazine-desethyl	19.769%	101.65%	9.04%	100.21%	2.47%	94.02%	8.93%

METHOD STATEMENT



Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Atrazine-desisopropyl	36.463%	97.45%	4.70%	98.08%	4.60%	82.03%	9.59%
Azinphos-methyl	6.513%	100.62%	2.19%	100.60%	1.42%	101.47%	1.78%
Azoxystrobin	7.793%	94.75%	4.56%	100.08%	2.15%	97.60%	3.63%
Benzovindiflupyr	18.479%	96.77%	8.29%	100.22%	6.39%	98.26%	7.57%
Bixafen	12.488%	98.70%	6.55%	100.42%	3.13%	100.80%	5.00%
Boscalid	8.993%	98.02%	4.85%	100.44%	3.02%	96.63%	2.99%
Bromacil	13.735%	97.28%	5.18%	99.66%	2.21%	96.85%	3.74%
Carbendazim	5.278%	95.73%	1.36%	100.13%	1.20%	99.18%	1.07%
Carbetamide	12.416%	97.69%	3.44%	100.26%	2.59%	99.69%	3.91%
Chlorfenvinphos	16.221%	97.53%	8.51%	100.46%	3.10%	100.64%	5.55%
Chlortoluron	10.338%	99.00%	3.42%	100.93%	2.77%	100.36%	4.27%
Cyanazine	6.737%	95.72%	2.06%	99.82%	1.70%	99.15%	2.57%
Cyproconazole	9.564%	96.74%	3.50%	99.66%	2.64%	98.70%	2.44%
Dichlorvos	9.387%	98.13%	3.88%	100.67%	3.10%	100.00%	2.64%
Diclofenac	21.689%	96.21%	9.96%	98.86%	8.80%	101.42%	6.14%
Difenoconazole	14.359%	93.98%	5.01%	98.21%	4.89%	102.39%	4.27%
Dimethenamid-P	10.896%	101.06%	4.54%	100.89%	3.85%	95.37%	6.60%
Dimethoate	12.393%	95.93%	4.50%	100.10%	2.67%	101.36%	5.74%
Diuron	10.074%	106.91%	4.50%	100.35%	3.49%	100.28%	3.52%
Epoxiconazole	11.551%	94.81%	4.97%	100.06%	3.71%	101.50%	3.94%
EPTC	15.069%	100.11%	5.66%	99.96%	4.77%	103.09%	4.39%
Flufenacet	17.417%	100.85%	7.92%	102.37%	7.30%	99.28%	6.91%
Fluopyram	6.654%	96.22%	2.71%	99.56%	2.18%	98.75%	2.26%
Flurtamone	6.844%	98.41%	2.80%	100.61%	1.55%	97.77%	2.19%
Flusilazole	15.084%	88.31%	4.72%	99.05%	3.33%	97.63%	3.29%
Flutriafol	9.184%	94.39%	2.39%	99.56%	1.95%	101.90%	2.38%
Fluxapyroxad	14.892%	102.33%	4.11%	100.18%	3.39%	97.80%	4.40%
Isoproturon	6.909%	100.17%	2.57%	100.04%	1.83%	100.56%	1.73%
Lenacil	9.758%	92.75%	3.51%	99.43%	2.02%	98.93%	1.61%
Linuron	10.295%	98.19%	5.32%	100.54%	2.28%	100.43%	2.52%
Malathion	8.845%	99.33%	3.23%	100.07%	2.94%	100.15%	3.06%
Mefentrifluconazole	10.336%	93.78%	5.09%	99.20%	3.15%	99.81%	3.71%
Metamitron	16.475%	95.45%	3.94%	99.72%	4.15%	98.67%	6.25%
Metazachlor	7.539%	100.11%	3.64%	100.62%	1.49%	97.60%	3.31%
Metconazole	10.094%	95.13%	2.94%	100.24%	2.37%	98.27%	1.94%
Methabenzthiazuron	9.993%	92.00%	2.82%	99.42%	2.42%	99.77%	2.73%
Methiocarb	16.958%	98.19%	4.91%	100.47%	4.41%	106.46%	5.54%
Metobromuron	14.92%	99.86%	5.60%	102.06%	4.44%	94.90%	3.89%
Metoxuron	9.409%	97.74%	2.56%	98.99%	2.66%	105.05%	2.74%
Metribuzin	14.286%	95.51%	3.66%	99.89%	2.99%	101.51%	4.76%
Metsulfuron-methyl	17.828%	96.38%	11.61%	101.38%	3.68%	100.07%	5.27%
Mevinphos	13.224%	96.12%	3.69%	99.14%	3.36%	103.72%	2.52%
Monuron	10.426%	101.01%	4.23%	101.27%	3.53%	101.56%	3.09%
Oxadixyl	11.819%	96.96%	4.16%	99.62%	3.84%	102.73%	2.74%
Oxamyl	4.643%	96.98%	1.19%	99.95%	1.05%	99.86%	1.02%

METHOD STATEMENT



Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Prochloraz	11.939%	92.16%	4.62%	100.52%	3.25%	99.46%	3.48%
Prometryn	5.58%	95.86%	2.08%	100.01%	1.36%	98.51%	1.28%
Propachlor	10.474%	101.40%	3.47%	100.38%	2.15%	94.80%	4.83%
Propazine	6.97%	96.13%	1.87%	99.85%	1.33%	101.91%	2.14%
Propetamphos	14.008%	102.98%	6.63%	101.45%	3.92%	97.77%	4.77%
Propiconazole	8.62%	94.46%	4.44%	99.22%	3.26%	99.81%	2.48%
Prosulfocarb	12.668%	100.66%	6.11%	100.71%	3.41%	99.98%	3.75%
Prothioconazole-desthio	10.018%	95.95%	4.36%	100.16%	3.94%	99.95%	3.62%
Pyraclostrobin	18.664%	96.04%	6.02%	99.47%	5.75%	99.03%	7.10%
Quinmerac	6.607%	95.11%	2.96%	100.25%	2.02%	101.19%	1.74%
Simazine	8.393%	96.25%	1.83%	99.82%	1.57%	99.56%	1.73%
Spiroxamine	10.417%	94.21%	4.31%	100.69%	3.88%	100.98%	3.08%
Tebuconazole	7.909%	95.81%	2.24%	99.60%	2.73%	98.32%	2.08%
Terbutylazine	9.379%	97.83%	1.69%	100.56%	1.38%	103.06%	2.87%
Terbutryn	4.752%	96.17%	1.40%	100.01%	1.07%	99.33%	1.20%
Thifensulfuron-methyl	21.343%	99.28%	5.59%	100.69%	3.40%	104.94%	4.42%
Triazophos	12.584%	97.80%	4.84%	100.65%	3.26%	104.52%	4.98%
Trietazine	15.575%	95.46%	1.65%	99.60%	1.56%	105.77%	4.53%
Trifloxystrobin	11.363%	95.00%	4.50%	98.29%	2.74%	100.09%	4.78%
Trinexapac-ethyl	10.15%	95.76%	7.34%	101.21%	2.86%	101.43%	3.75%

Instrument 4: WQQQ8

Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Atrazine	± 5.94 %	99.9%	1.0%	99.8%	0.8%	99.0%	1.3%
Atrazine-desethyl	± 9.85 %	100.8%	2.1%	99.9%	0.7%	96.1%	2.0%
Atrazine-desisopropyl	± 24.21 %	100.2%	2.3%	99.2%	2.6%	88.5%	4.8%
Azinphos-methyl	± 7.21 %	102.2%	2.1%	99.6%	1.5%	101.2%	2.0%
Azoxystrobin	± 11.58 %	99.0%	4.0%	100.2%	4.0%	101.0%	4.0%
Benzovindiflupyr	± 15.78 %	99.2%	8.3%	99.8%	7.3%	102.8%	7.5%
Bixafen	± 9.82 %	100.7%	5.3%	99.2%	2.6%	100.0%	4.6%
Boscalid	± 7.09 %	98.5%	3.1%	100.0%	1.4%	99.6%	2.9%
Bromacil	± 9.90 %	99.5%	2.4%	99.6%	2.8%	102.1%	3.5%
Carbendazim	± 6.03 %	100.6%	1.5%	100.0%	1.4%	100.2%	1.8%
Carbetamide	± 6.71 %	100.4%	3.4%	100.0%	1.7%	100.9%	1.7%
Chlorfenvinphos	± 11.50 %	99.3%	5.1%	97.8%	4.4%	97.9%	5.3%
Chlortoluron	± 6.21 %	99.0%	1.7%	99.8%	1.2%	99.7%	1.4%
Cyanazine	± 5.85 %	98.7%	1.8%	99.7%	1.0%	99.3%	1.3%
Cyproconazole	± 7.27 %	99.7%	2.1%	100.7%	1.9%	100.8%	2.2%
Dichlorvos	± 6.33 %	99.3%	2.9%	99.5%	1.7%	100.4%	1.6%
Diclofenac	± 25.14 %	105.5%	7.2%	102.3%	7.9%	103.0%	9.8%
Difenoconazole	± 8.36 %	98.7%	3.8%	99.5%	3.0%	100.2%	3.6%
Dimethenamid-P	± 9.54 %	100.9%	3.4%	101.1%	2.7%	102.8%	2.7%

METHOD STATEMENT



Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		HighStandard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Dimethoate	± 6.65 %	99.7%	2.1%	100.1%	2.2%	101.2%	2.0%
Diuron	± 7.73 %	102.1%	2.4%	100.4%	2.7%	101.6%	2.7%
Epoxiconazole	± 6.65 %	99.5%	1.7%	99.9%	1.8%	100.1%	1.8%
EPTC	± 6.58 %	98.1%	1.8%	98.8%	1.5%	99.2%	2.2%
Flufenacet	± 11.22 %	99.4%	4.7%	100.1%	4.1%	100.4%	5.3%
Fluopyram	± 8.32 %	100.2%	3.5%	99.6%	2.9%	100.1%	3.4%
Flurtamone	± 7.03 %	100.6%	2.4%	99.9%	1.3%	100.9%	2.2%
Flusilazole	± 7.66 %	99.7%	2.7%	99.7%	2.0%	99.8%	2.3%
Flutriafol	± 6.39 %	99.4%	1.0%	100.2%	0.6%	101.4%	2.6%
Fluxapyroxad	± 9.70 %	101.7%	4.4%	100.0%	3.4%	100.3%	3.8%
Isoproturon	± 6.06 %	101.3%	1.0%	99.8%	1.2%	100.7%	1.7%
Lenacil	± 7.48 %	98.8%	2.9%	100.0%	1.7%	102.0%	2.8%
Linuron	± 8.52 %	100.8%	3.2%	100.7%	2.6%	99.5%	3.3%
Malathion	± 7.80 %	99.0%	2.5%	99.3%	1.4%	100.0%	5.3%
Mefentrifluconazole	± 11.93 %	95.2%	4.0%	99.2%	3.9%	102.2%	4.7%
Metamitron	± 13.06 %	101.8%	3.9%	104.8%	4.9%	105.0%	5.8%
Metazachlor	± 6.57 %	100.5%	1.9%	100.0%	1.1%	101.1%	2.3%
Metconazole	± 5.79 %	99.6%	1.2%	99.9%	1.2%	99.6%	1.7%
Methabenzthiazuron	± 5.99 %	100.0%	1.6%	99.8%	1.3%	99.3%	1.4%
Methiocarb	± 9.49 %	101.3%	4.2%	100.9%	3.1%	101.7%	3.3%
Metobromuron	± 8.35 %	101.1%	5.1%	101.4%	3.2%	101.8%	3.1%
Metoxuron	± 7.50 %	98.9%	1.5%	99.5%	1.3%	102.3%	1.6%
Metribuzin	± 7.17 %	100.9%	2.2%	101.1%	1.4%	102.1%	1.9%
Metsulfuron-methyl	± 11.35 %	101.7%	5.7%	99.2%	2.6%	97.9%	4.8%
Mevinphos	± 6.76 %	99.6%	2.0%	99.5%	1.7%	101.3%	1.4%
Monuron	± 6.01 %	99.0%	1.8%	99.8%	1.1%	99.4%	1.7%
Oxadixyl	± 6.52 %	98.3%	2.8%	99.3%	2.0%	99.6%	2.2%
Oxamyl	± 5.16 %	97.5%	2.6%	99.0%	1.1%	98.8%	1.0%
Prochloraz	± 14.01 %	101.9%	6.4%	101.9%	4.1%	104.0%	4.2%
Prometryn	± 5.99 %	98.8%	1.7%	99.3%	1.2%	99.1%	1.4%
Propachlor	± 6.79 %	100.7%	2.0%	100.3%	1.7%	100.7%	2.2%
Propazine	± 6.45 %	100.1%	1.5%	99.6%	1.3%	98.8%	1.5%
Propetamphos	± 9.41 %	98.6%	4.0%	97.9%	2.3%	97.1%	3.2%
Propiconazole	± 5.75 %	99.4%	1.4%	100.1%	1.3%	99.9%	1.2%
Prosulfocarb	± 13.91 %	100.5%	8.3%	101.3%	4.3%	100.9%	6.4%
Prothioconazole-desthio	± 7.93 %	99.5%	1.7%	100.2%	2.4%	100.5%	2.9%
Pyraclostrobin	± 13.58 %	102.9%	5.0%	102.1%	5.0%	102.0%	5.2%
Quinmerac	± 22.40 %	100.3%	1.7%	99.4%	1.5%	110.6%	6.4%
Simazine	± 5.99 %	99.4%	1.3%	99.6%	0.9%	99.9%	1.5%
Spiroxamine	± 8.77 %	100.9%	3.8%	98.4%	2.0%	100.1%	3.9%
Tebuconazole	± 6.10 %	100.1%	1.6%	100.6%	1.2%	100.9%	1.1%
Terbutylazine	± 6.50 %	100.1%	1.3%	99.6%	1.2%	99.0%	1.6%
Terbutryn	± 5.93 %	98.9%	1.6%	99.3%	1.1%	99.2%	1.1%
Thifensulfuron-methyl	± 13.50 %	99.8%	3.9%	99.7%	3.3%	105.2%	5.7%
Triazophos	± 8.15 %	99.0%	3.3%	98.9%	2.9%	101.1%	3.5%

METHOD STATEMENT



Determinand	UoM	Direct Standards				Elvington Treated Water (Hard Hardness)	
		Low Standard		High Standard		PCV Spike	
		Recovery	RSD	Recovery	RSD	Recovery	RSD
Trietazine	± 6.03 %	98.5%	1.5%	99.6%	0.9%	100.1%	2.2%
Trifloxystrobin	± 24.92 %	105.0%	8.7%	102.7%	10.4%	101.8%	12.4%
Trinexapac-ethyl	± 11.88 %	100.4%	3.0%	99.7%	4.0%	103.1%	4.5%

The highest LOQ has been applied across all instruments.

Determinand	WQQQ3 Limit of Quantification (µg L⁻¹)	WQQQ4 Limit of Quantification (µg L⁻¹)	WQQQ6 Limit of Quantification (µg L⁻¹)	WQQQ8 Limit of Quantification (µg L⁻¹)	METHOD (Standardised) LOQ (µg L⁻¹)
Atrazine	0.006	0.004	0.003	0.004	0.006
Atrazine-desethyl	0.005	0.005	0.004	0.005	0.005
Atrazine-desisopropyl	0.009	0.008	0.005	0.006	0.009
Azinphos-methyl	0.004	0.004	0.005	0.005	0.005
Azoxystrobin	0.004	0.005	0.005	0.006	0.006
Benzovindiflupyr	0.011	0.012	0.014	0.013	0.014
Bixafen	0.012	0.011	0.008	0.009	0.012
Boscalid	0.008	0.007	0.007	0.007	0.008
Bromacil	0.011	0.010	0.005	0.007	0.011
Carbendazim	0.004	0.004	0.004	0.005	0.005
Carbetamide	0.008	0.009	0.008	0.004	0.009
Chlorfenvinphos	0.013	0.011	0.007	0.007	0.013
Chlortoluron	0.005	0.005	0.004	0.005	0.005
Cyanazine	0.007	0.007	0.004	0.005	0.007
Cyproconazole	0.006	0.006	0.005	0.006	0.006
Dichlorvos	0.008	0.007	0.005	0.005	0.008
Diclofenac	0.019	0.013	0.015	0.008	0.019
Difenoconazole	0.009	0.005	0.008	0.007	0.009
Dimethenamid-P	0.006	0.009	0.008	0.004	0.009
Dimethoate	0.007	0.007	0.007	0.006	0.007
Diuron	0.009	0.009	0.007	0.006	0.009
Epoxiconazole	0.005	0.005	0.006	0.004	0.006
EPTC	0.011	0.022	0.010	0.012	0.022
Flufenacet	0.005	0.008	0.008	0.007	0.008
Fluopyram	0.004	0.004	0.005	0.005	0.005
Flurtamone	0.006	0.007	0.004	0.005	0.007
Flusilazole	0.007	0.006	0.009	0.004	0.009
Flutriafol	0.004	0.005	0.004	0.004	0.005
Fluxapyroxad	0.010	0.010	0.007	0.007	0.010
Isoproturon	0.004	0.004	0.004	0.005	0.005
Lenacil	0.006	0.010	0.004	0.005	0.010
Linuron	0.004	0.009	0.007	0.007	0.009
Malathion	0.009	0.010	0.006	0.006	0.010
Mefentrifluconazole	0.009	0.006	0.006	0.004	0.009
Metamitron	0.005	0.007	0.006	0.008	0.008
Metazachlor	0.005	0.005	0.004	0.005	0.005
Metconazole	0.006	0.004	0.003	0.004	0.006

METHOD STATEMENT



Determinand	WQQQ3 Limit of Quantification (µg L⁻¹)	WQQQ4 Limit of Quantification (µg L⁻¹)	WQQQ6 Limit of Quantification (µg L⁻¹)	WQQQ8 Limit of Quantification (µg L⁻¹)	METHOD (Standardised) LOQ (µg L⁻¹)
Methabenzthiazuron	0.006	0.003	0.004	0.005	0.006
Methiocarb	0.006	0.005	0.006	0.009	0.009
Metobromuron	0.007	0.010	0.010	0.007	0.010
Metoxuron	0.006	0.005	0.004	0.004	0.006
Metribuzin	0.005	0.005	0.006	0.006	0.006
Metsulfuron-methyl	0.018	0.016	0.008	0.009	0.018
Mevinphos	0.011	0.008	0.009	0.006	0.011
Monuron	0.005	0.005	0.004	0.005	0.005
Oxadixyl	0.012	0.010	0.012	0.007	0.012
Oxamyl	0.003	0.004	0.004	0.005	0.005
Prochloraz	0.006	0.007	0.010	0.007	0.010
Prometryn	0.004	0.005	0.004	0.004	0.005
Propachlor	0.005	0.007	0.005	0.004	0.007
Propazine	0.004	0.005	0.003	0.005	0.005
Propetamphos	0.007	0.009	0.006	0.007	0.009
Propiconazole	0.006	0.007	0.009	0.007	0.009
Prosulfocarb	0.006	0.005	0.006	0.004	0.006
Prothioconazole-desthio	0.007	0.005	0.004	0.006	0.007
Pyraclostrobin	0.009	0.008	0.009	0.007	0.009
Quinmerac	0.004	0.006	0.005	0.006	0.006
Simazine	0.005	0.005	0.004	0.004	0.005
Spiroxamine	0.006	0.009	0.004	0.003	0.009
Tebuconazole	0.006	0.003	0.004	0.004	0.006
Terbutylazine	0.005	0.005	0.004	0.004	0.005
Terbutryn	0.004	0.004	0.004	0.004	0.004
Thifensulfuron-methyl	0.009	0.013	0.008	0.007	0.013
Triazophos	0.009	0.005	0.006	0.006	0.009
Trietazine	0.004	0.005	0.003	0.004	0.005
Trifloxystrobin	0.007	0.007	0.006	0.006	0.007
Trinexapac-ethyl	0.009	0.010	0.005	0.007	0.010

References:

Determination of Phenyl Urea and Triazine Herbicides in Potable and Groundwater by LC/MS Using API-ESI Selective Ion Monitoring and Direct Large Volume Aqueous Injection, Agilent Technologies Application Note.

Agilent 6410 QQQ LC/MS Techniques and Operation, Agilent Technologies Course Number R1893A, Student Manuals Volumes 1 and 2.

Agilent 1200 Series, Reference Manuals

Agilent 6410 Triple Quad LC/MS, Maintenance and Familiarization Guides.

Transport of sulfonylureas from a barley field in Norway: Field and laboratory studies, Bioforsk Report Vol.3 Nr. 105 2008, ISBN-nr.:978-82-17-00409-7