RB5-SCCWRP-GC-rev1 Standard Operating Procedures: Extraction and Analysis of a Suite of Pesticide Analytes at Trace Levels in Aqueous Samples and Aqueous Passive Sampler Media by Gas Chromatography/Mass Spectrometry (GC/MS)

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1. Scope and Application

1.1

This Standard Operating Procedure (SOP) is for determining a broad suite of pesticide analytes at trace levels in surface water samples by gas chromatography-mass spectrometry (GC/MS).

1.2

This Method is validated for the measurement of pesticide analytes extracted from environmental surface waters by Hydrophilic-Lipophilic Balanced (HLB) Solid Phase Extraction (SPE) cartridges (Oasis HLB 6 cc Vac Cartridge, 500 mg sorbent) and from Chemcatcher passive sampler sequestration media (Attract SPE Disk with HLB sorbent, 47 mm diameter) deployed in surface waters.

The 110 pesticide analytes that have been evaluated with this Method are in Table 1, with calibration data (Tables 3 and 4). Precision and accuracy data for the aqueous matrix are provided in Tables 5A-D and 5X and Tables 9A-D and 9X, and that data for passive sampler sequestration media are provided in Tables 6A-D and 6X, and Tables 10A-D and 10X. This Method may also be expanded to other pesticide analytes, provided that the laboratory demonstrates and documents performance (refer to Section 11).

1.3

This Method is intended for measuring a wide range of analytes and therefore is not specifically optimized for any specific analytes. The detection limits and quantitation levels in this method are generally dependent on the level of interferences rather than on instrumental limitations. Method Detection Limits (MDLs) in the presence of typical interferences from surface water and the Chemcatcher media are present in Tables 7-8, respectively.

1.4

This Method is intended for use by analysts appropriately trained and experienced in GC/MS or under the close supervision of such qualified persons. Each laboratory that uses this SOP must demonstrate the ability to generate acceptable results using the procedure in Section 9.

1.5

This Method is performance-based, in that the SOP may be modified to improve performance (e.g., to overcome interferences or improve the accuracy or precision of the results) provided that all performance requirements in this SOP are met.

1.6

The Method was developed at the Southern California Coastal Water Research Project (SCCWRP). It is based on the existing methods of Hladik and Calhoun (2012), Hladik and McWayne (2012), and Sanders et al. (2018) for analyte extraction, Hladik and McWayne (2012) for choosing isotopically labeled standards of analytes and for instrumental analysis, and Vermeirssen et al. (2012) and De Parsia et al. (2018-2019) for generating spiked samples on Chemcatcher disks (References 1-5).

1.7

The Method has been evaluated by 4 laboratories following initial single-laboratory development. Based on the results of multi-laboratory validation, quality assurance/quality control (QA/QC) requirements have been updated in this version. Instrumental conditions and performance data from individual laboratories, as well as summaries of results across all participating laboratories, are present in Tables 2-10.

2. DEFINITIONS (IN ALPHABETICAL ORDER)

Analyte

A pesticide or pesticide degradate tested for by this Method. The analytes are listed in Table 1.

Calibration standard

A solution prepared from a secondary standard and/or stock solution and used to calibrate the response of the GC/MS instrument.

Continuous Calibration Verification (CCV)

The calibration verification standard solutions that are used to monitor the method stability in comparison to the initial calibration curve.

CFR

Code of Federal Regulations.

Confirmation Ion

For the purpose of this Method, the confirmation ion is used to confirm the identity of the analyte.

Instrumental Detection Limit (IDL)

The minimum concentration of an analyte that can be identified, but not necessarily quantified, under the stated conditions of a test. IDLs are listed in Table 3.

Internal Standard (IS)

An analyte, not present natively in a sample, used as a reference for quantitation of other analytes used for standards and for quantitation of naturally occurring (native) analytes in a sample.

Internal standard quantitation

A means of determining the concentration of a native analyte or standard analyte by reference to another analyte.

Initial Demonstration of Capability (IDC)

An IDC is performed prior to the first time this Method is used and any time the Method or instrumentation is modified.

Initial Precision and Recovery standard (IPR)

A clean matrix (i.e., reagent water for an aqueous matrix, Attract SPE disk for the Chemcatcher matrix) spiked with the method analytes and labeled compounds and analyzed to establish the initial ability of the laboratory to generate acceptable precision and recovery. An IPR is performed prior to the first time this Method is used, including by a new analyst, and any time the Method or instrumentation is modified.

Laboratory Control Sample (LCS)

An aliquot of reagent water (for aqueous matrices) or passive sampler sequestration media (for Chemcatcher matrices) to which known quantities of the method analytes and labeled

compounds are added. The results of the LCS verify method performance in the absence of sample matrix interference. Performance results are listed in Tables 5A-D for individual laboratories and Table 5X across laboratories for the aqueous matrix, and Tables 6A-D for individual laboratories and Table 6X across laboratories for the Chemcatcher matrix, as examples and guidance.

Limit of Quantification (LOQ)

The smallest concentration that produces a quantitative result with known and recorded precision and bias. The LOQ shall be set at or above the concentration of the lowest initial calibration standard.

Matrix Spike (MS)

An aliquot of field samples fortified with a known concentration of target compounds, prior to sample preparation and extraction, and analyzed to measure the effect of matrix interferences. Not to be confused with “mass spectrometer”, which is spelled out in this document.

Method blank

An aliquot of reagent water for the aqueous matrix, or cleaned and unexposed Attract SPE disk for the Chemcatcher matrix, that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and recovery standards that are used with samples. The method blank is used to determine if analytes or interferences are present in the laboratory environment, the reagents, or the apparatus.

Method Detection Limit (MDL)

The minimum measured concentration of a substance that can be reported with 99% confidence that the measured analyte concentration is indistinguishable from method blank results (see 40 CFR 136, appendix B). MDLs determined during Multi-Laboratory evaluation are listed in Tables 7-8.

Must

This action, activity, or procedural step is required.

m/z

mass-to-charge ratio.

Ongoing Precision and Recovery standard (OPR)

A method blank (i.e., reagent water for an aqueous matrix, Attract SPE disk for the Chemcatcher matrix) spiked with known quantities of analytes. The OPR is analyzed exactly like a sample. Its purpose is to ensure that the results produced by the laboratory remain within the limits specified in this method for precision and recovery.

Percent recovery (R%)

The recovery percentage for samples.

Quantification Ion

For the purpose of this Method, the quantification ion is the ion used to quantify (determine the concentration) of the analyte. It is usually, but not always, the most intense of the ions produced by the ionization source.

Reagent water

Water demonstrated to be free from the analytes of interest and potentially interfering substances at or above the MDL for the analyte.

Relative Standard Deviation (RSD)

The standard deviation (STD) times 100 divided by the mean. Also termed “coefficient of variation”.

Relative Response Factor (RRF)

See Section 10.1.

Retention Time (RT)

The time it takes for an analyte or labeled compound to elute off the GC column.

Signal-to-Noise ratio (S/N)

The height of the signal as measured from the mean of the noise to the peak maximum divided by the width of the noise.

Should

This action, activity, or procedural step is suggested but not required.

Solid-Phase Extraction (SPE)

An extraction technique in which an analyte is extracted from an aqueous sample by passage over or through a material capable of reversibly sorbing the analyte. Also termed liquid-solid extraction.

Solvent blank

An appropriate solvent is injected to determine if there is a carryover of target analytes between sample injections (See Sections 7.3.3 and 9.4.1.4).

Stock solution

A solution containing an analyte that is prepared using a reference material traceable to the Environmental Protection Agency (EPA), the National Institute of Science and Technology (NIST), or a source that will attest to the purity and authenticity of the reference material.

3. INTERFERENCES

This Method is intended for measuring a wide range of analytes. General sample extraction techniques are provided in this Method. Interferences co-extracted from the samples will vary considerably from matrix to matrix. Sources of interference in this Method can be grouped into three broad categories as follows:

First, contaminated solvents, reagents, or sample collecting and processing hardware.

Second, contaminated instrumental components (e.g., mobile phase, GC-MS inlet, column).

Third, compounds extracted from the sample matrix to which the detector will respond.

This Section discusses common issues with interferences and potential solutions.

3.1

Solvents, reagents, glassware, and other sample processing hardware may yield artifacts, elevated baselines, and/or lock-mass suppression causing misinterpretation of chromatograms.

Specific selection of reagents and purification of solvents by distillation in all-glass systems may be required. Where possible, reagents are cleaned by extraction or solvent rinse.

3.2

Proper cleaning of glassware is extremely important because interferences from glassware may contaminate the samples.

3.2.1

Wash glassware with a detergent solution as soon after use as is practical. Glassware with removable parts, particularly separatory funnels with fluoropolymer stopcocks, must be disassembled prior to detergent washing.

3.2.2

After detergent washing, rinse glassware immediately, first with tap water, and then with reagent water.

3.2.3

If it is possible, bake glassware at high temperatures (e.g., 500 °C) in a kiln or furnace for 2 to 4 h. The kiln or furnace must be vented to prevent laboratory contamination by pesticide vapors. Volumetric ware must not be baked at high temperatures. Otherwise, rinse glassware with the following series of solvents: methanol, acetone, methylene chloride (dichloromethane, DCM), and hexane, in this order.

3.2.4

After drying and cooling, seal and store glassware in a clean environment to prevent any accumulation of dust or other contaminants. Store inverted or capped with solvent-cleaned or ashed aluminum foil.

3.2.5

Vacuum manifolds (including valves and tips) must be rinsed with appropriate organic solvent (e.g., methanol and acetone) before starting a new batch of samples.

3.3

All materials used in the analysis must be demonstrated to be free from interferences by running method blanks (Section 7.3.1) initially. The level of interference must be below the MDL (Tables 7 and 8) before this Method can be performed on actual samples.

3.4

Field and laboratory personnel must be aware that many of the compounds included in this Method are common ingredients in household pesticide products, and exposure to these products should be limited prior to sample collection or sample handling. The potential for contamination bias during sample collection or handling is monitored by the use of field blanks and laboratory method blanks.

3.5

The levels of accuracy and precision that can be achieved with this Method depend on the sample matrix, which may decrease extraction recovery and ionization efficiency for some compounds. The performance data from multi-laboratory evaluation are provided in Tables 5-6 and 9-10 as examples and guidance.

4. SAFETY

4.1

This Method does not address all safety issues associated with its use. The laboratory is responsible for maintaining a safe work environment and a current awareness file of the Occupational Safety and Health Administration (OSHA) regulations regarding the safe handling of the chemicals specified in this method. A reference file of material safety data sheets (MSDSs) needs to be made available to all personnel involved in these analyses. The analyst must carefully review the MSDS for all utilized chemicals and reagents and follow all safety recommendations specified in the MSDS.

4.2

The toxicity or carcinogenicity of the chemicals used in this Method has not been precisely determined; however, each compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level.

4.2.1

Some pesticides, most notably 4,4'-DDT, have been tentatively classified as known or suspected human or mammalian carcinogens. Pure standards of pesticides are to be handled only by highly trained personnel thoroughly familiar with handling and cautionary procedures and the associated risks.

4.3

The pure pesticides and samples suspected to contain high concentrations of these compounds are handled using essentially the same techniques employed in handling radioactive or infectious materials. Well-ventilated, controlled access laboratories are required.

4.3.1

All steps that use organic solvents are performed in a well-vented fume hood. Exhaust from solvent evaporation from samples must be vented to a fume hood.

4.3.2 Personal protective equipment (PPE)

Appropriate PPE (gloves, eyewear, etc.) is used during the handling of reagents and chemicals. Use disposable gloves, an apron or lab coat, safety glasses or mask, and a glove box or fume hood. During analytical operations that may give rise to aerosols or dust, wear respirators equipped with activated carbon filters.

4.3.2.1

Nitrile gloves are commonly used to reduce exposure of the hands. When handling samples suspected or known to contain high concentrations of pesticides or DCM, an additional set of gloves can also be worn beneath the nitrile gloves. If DCM comes into contact with the gloves, the outer layer gloves must be removed immediately.

4.3.2.2

Eye protection (preferably full-face shields) must be worn while working with exposed samples or pure analytical standards.

4.3.3 Effluent vapors

The laboratory should be equipped with a suitable ventilation system to remove effluent vapors of the sample from the splitter of the GC and from roughing pumps on the MS.

4.3.4 Training

Workers must be trained in the proper method of removing contaminated gloves and clothing without contacting the exterior surfaces.

4.3.5 Personal hygiene

Wash hands thoroughly after each operation involving high concentrations of the pesticides, and before breaks (coffee, lunch, and shift).

4.3.6 Decontamination

For glassware, if it can be baked at high temperature (e.g., 500 °C), then follow the glassware cleaning protocol in Section 3.2. For other glassware and tools, wash with detergent water and rinse with deionized water, and then rinse with methanol and acetone. For bench surfaces, clean with a paper towel, then wipe with methanol- and acetone-soaked paper towels.

5. Apparatus and Materials

Note: Brand names, suppliers, and part numbers are for illustration purposes only and no endorsement is implied. Equivalent performance may be achieved using apparatus and materials other than those specified here. Meeting the performance requirements of this Method is the responsibility of the laboratory.

5.1 Equipment for glassware cleaning

5.1.1 Laboratory sink

5.1.2 Kiln or muffle furnace

Capable of reaching 500 °C and maintaining 500 °C for 4 hours, with temperature controller and safety switch.

5.1.3 Aluminum foil

Solvents (acetone and DCM) rinsed or baked in a kiln. If baked at 500 °C, heavy-duty aluminum foil is required, as thinner foil will become brittle and unusable.

5.2 Equipment for sample preparation

5.2.1

Laboratory fume hood of sufficient size to contain the sample preparation equipment.

5.2.2 Balances

5.2.2.1 Analytical Capable of weighing 0.1 mg

5.2.2.2 Top-loading Capable of weighing 10 mg

5.3 Filtration apparatus

5.3.1Glass graduated cylinder

5.3.2 Whatman GF/A filter or equivalent

5.3.3 Vacuum pump

5.3.4 Filtration apparatus

5.3.4.1 Stainless-steel vacuum manifold for processing large volume sample

5.3.4.2 Glass filtration funnels

5.3.5 Glass vials (40 mL)

5.4 Sample loading and extraction apparatus

Note: *HLB is selected as the sorbent material for this method due to its capacity to capture the suite of analytes listed within this method. Other SPE sorbents may be used, provided that the laboratory establishes the elution conditions and meets the requirements in Section 7.1.3 with that SPE sorbent as an integral part of the analysis.*

5.4.1

SPE 12-position vacuum, manifold set (AH0-6023, Phenomenex) (for aqueous samples)

5.4.2

HLB 6cc (500mg) cartridges (Waters, Milford, MA) (for aqueous samples)

5.4.3

Three-station SPE disk manifold (47 mm) (Affinisep, Miami, FL, USA) or equivalent (for Chemcatcher samples)

5.4.4

Attract SPE disks with HLB sorbent (47 mm diameter, SKU# 1144L92) (Thomas Scientific, Swedesboro, NJ, USA). (for Chemcatcher samples)

5.4.5

Pasteur Pyrex borosilicate glass pipettes

5.4.6

Disposable culture tubes 13×100 mm (Fisher 14-961-27)

5.4.7

Autosampler vials, with Teflon-lined screw caps

5.5 Concentration apparatus

5.5.1

TurboVap II concentration station (closed cell concentrator) with concentration tubes, or equivalent

5.5.2 Nitrogen manifold set-up, providing nitrogen stream

5.5.3 Clamp stand

5.6 Gas chromatograph

Must have splitless or on-column injection port for capillary column, temperature program with isothermal hold, and must meet all of the performance specifications in Section 7.

5.6.1 GC instrument

An Agilent 7890 GC (Wilmington, DE, USA) coupled to a 5975C quadrupole mass-selective detector or equivalent.

5.6.2 GC column

A ZB-5MSi column (30 m × 0.25 mm × 0.25 µm, Phenomenex, Torrance, CA, USA) or equivalent.

5.7 Data system

Capable of collecting, recording, storing, and processing mass spectrometry data.

5.7.1 Data acquisition

The signal at each specified *m/z* value must be collected repetitively throughout the monitoring period and stored on a mass storage device.

5.7.2 Response factors and multipoint calibrations

The data system must record and maintain lists of response factors and multipoint calibrations.

6. REAGENTS AND STANDARDS

6.1 Reagent water

Millipore water or equivalent (18 MΩ cm)

6.2 Extraction reagents

6.2.1 Acetone

Optima grade or equivalent (A929-4 Fisher)

6.2.2 Methanol

Optima grade or equivalent (A454-4 Fisher)

6.2.3 DCM

Optima grade or equivalent (D151-4 Fisher)

6.2.4 *n*-Hexane

Ultra Resi-analysed or equivalent (JT9262-3 VWR)

6.2.5 Isopropanol (IPA)

Optima grade or equivalent (A461-1, Fisher)

6.3 Stock solutions

Prepare from materials (labelled or native) of known purity and composition or purchase as solutions or mixtures with certification to their purity, concentration, and authenticity. If the chemical purity is 98% or greater, the weight may be used without correction to calculate the concentration of the standard.

6.4 Calibration standards

Combine and dilute the stock solutions to produce a series of solutions with various concentrations for building calibration curves to quantify the concentration of the analyte.

7. QUALITY CONTROL

7.1

Each laboratory using this Method must operate a QC program. The minimum requirements of this program consist of an IDC and ongoing QC. These QC criteria are discussed in the following sections and are summarized in Tables 11 and 12. Laboratory performance is compared to established performance criteria to determine if the results of analyses meet the performance characteristics of the Method or if corrective actions are needed.

7.1.1

The laboratory must perform an IDC to confirm low system background, demonstrate IPR, determine MDL, and confirm the accuracy of the calibration standards. This demonstration is given in Section 7.2.

7.1.2

The laboratory must meet all ongoing QC requirements given in Section 7.3 for continued performance.

7.1.3

In recognition of advances that are occurring in analytical technology, and to overcome matrix interferences, the laboratory is permitted certain options to improve separations or lower the costs of measurements. These options include alternate extraction, concentration, and cleanup procedures (e.g., with alternate SPE or SPE disk sorbent media), and changes in columns and detectors. If an analytical technique other than the techniques specified in this Method is used, that technique must have a specificity equal to or greater than the specificity of the techniques in this Method for the analytes of interest. Alternate determinative techniques, such as the substitution of spectroscopic or immuno-assay techniques, and changes that degrade method performance, are not allowed.

7.2 Initial Demonstration of Capability (IDC)

An IDC must be performed by the laboratory prior to independently analyzing samples using this Method. The IDC must be repeated if other changes occur (e.g., significant change in

procedure, change in personnel). Prior to conducting IDC, the analyst must establish retention times in Section 8.2 and meet the calibration requirements in Section 8.3.

7.2.1 Demonstrate low system background

Analyze a method blank immediately after injecting the highest calibration standard in the selected calibration range. Background concentrations of all analytes must be less than the MDL (Tables 7 and 8). If any pesticide analyte is found in the method blank at concentrations greater than or equal to the MDL, analysis of samples must be halted until the sample batch is re-extracted and the extracts re-analyzed, and the blank associated with the sample batch shows no evidence of contamination at these levels.

7.2.2 Demonstrate precision and recovery

For aqueous samples, at least three IPRs, i.e., 1-L aliquots of reagent water spiked with an appropriate amount of the native and labeled compounds, are used. For passive sampler samples, at least three spiked Chemcatchers are used. All sample processing steps that are to be used for processing samples, including preparation and extraction (Section 9), must be included in this procedure. Compute R% and RSD for each compound using the internal standard. For each pesticide and labeled recovery standards compound, R% must be within a range of 50-150 for both matrices, and RSD must be within ±30% for aqueous samples and ±50% for Chemcatcher samples (Tables 5 and 6). Only analytes that meet these criteria shall be included in the laboratory report.

7.2.3 Determine Method Detection Limit (MDL)

The laboratory must establish MDLs for analytes using the MDL procedure at 40 CFR 136, appendix B. Select a spiking level, typically 2-10 times the estimated MDL; the IDL is used as the estimated MDL for this purpose. Process a minimum of seven spiked samples (reagent water and the Attract SPE disk without any pre-exposure) and seven method blank samples through all steps of the method. The samples used for the MDL must be prepared in at least three batches on three separate calendar dates and analyzed on three separate calendar dates. Preparation and analysis may be on the same day.

7.2.3.1

Compute the MDL_s based on the spiked samples as follows:

$$MDL_s = t_{(n-1,1-\alpha=0.99)} \times S_s$$

Where MDL_s = the method detection limit based on spiked samples; $t_{(n\text{-}1,\ 1\text{-}\alpha\ =\ 0.99)}$ = the Student's *t*-value appropriate for a single-tailed 99th percentile t statistic and a standard deviation

estimate with n-1 degrees of freedom. $t_{(n-1,\ 1-\alpha\ =\ 0.99)}$ =3.143 for seven replicates. S_s = sample standard deviation of the replicate spiked sample analyses.

7.2.3.2

If all of the method blanks for an individual analyte give numerical results, compute the MDL_b based on the method blanks as follows:

$$MDL_b = \bar{X} + t_{(n-1,1-\alpha=0.99)} \times S_b$$

Where MDL_b = the method detection limit based on method blanks. $\bar{X}$ = mean of the method blank results (use zero in place of the mean if the mean is negative). $t_{(n-1,\ 1-\alpha\ =\ 0.99)}$ = the Student's *t*-value appropriate for a single-tailed 99th percentile t statistic and a standard deviation estimate with n-1 degrees of freedom. $t_{(n-1,\ 1-\alpha\ =\ 0.99)}$ =3.143 for seven replicates. S_s = sample standard deviation of the replicate method blank sample analyses.

7.2.3.3

Select the greater of MDL_s or MDL_b as the MDL. The MDL_s data as MDL are provided in Tables 7 and 8.

7.2.4 Limit of Quantification (LOQ)

The limit of quantification (LOQ) is the smallest concentration that produces a quantitative result with known and recorded precision and bias. In this method, the LOQ is established by each laboratory and must be equal to or greater than the MDL and within the calibration range. For the purpose of this method, the terms "minimum level", "reporting limit", "quantification limit", and "limit of quantification" are used synonymously.

7.3 Ongoing QC requirements

The QC elements listed in this section must be included when processing and analyzing samples.

7.3.1 Method blank

Analyze a method blank per sample batch (20 or fewer field samples). Analyses of method blanks are required to demonstrate no adverse contamination in the sample preparation and analysis procedure. All samples must be associated with an uncontaminated method blank before the results for those samples may be reported or used for permitting or regulatory compliance. Confirm that the method blank is free from contamination by that the concentration of all analytes in the method blank is less than the MDL.

7.3.2 Perform the CCV

The CCV solution, a standard solution of pesticides prepared in a manner similar to the calibration standards (e.g., a midpoint calibration standard), is analyzed at the beginning of each sample batch to monitor the instrument stability in comparison to the initial calibration curve. The CCV solution must be analyzed every 24 h during the sample analysis period. The CCV must be within 70-130% of the expected concentration for each compound, and the retention time (RT) of each analyte must be within ± 0.2 min of the target RT. Samples must be analyzed between acceptable CCV analyses. If a CCV fails the QC criteria, the instrument is recalibrated (See Sections 8.2-8.3) and the affected samples are reanalyzed.

7.3.3 Inject solvent blank

Inject a solvent blank (in this case hexane) after injecting the calibration standards and the CCV solution. Inject a solvent blank every 7 samples or after every suspect dirty sample (at the discretion of the analyst). If analytes are detected in the solvent blank, the source of the carryover is determined, and the sample set is reanalyzed.

7.3.4 LCS

Analyze an LCS per sample batch. The LCS is spiked with similar analytes at the same concentrations as in the MS and is processed identically to the samples. The R% must be within the range of 50-150. When the results of the MS analysis (Section 7.3.7) indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix. If, however, any individual R% falls outside the range for recovery, system performance is unacceptable for that compound. Troubleshoot and reestablish IDC (Section 7.2).

7.3.5 Check instrument sensitivity

Check and maintain the GC/MS instrument for high sensitivity following the instrument manufacturer's instructions. Prior to the analysis of a set of calibration standards, change the inlet liner and septum. During the analysis of sample, replace the liner and septum (at the discretion of the analyst) when signs of deterioration are visible (e.g., poor chromatography, low column pressure, after injection of a suspect dirty sample, etc.). Inject a mid-point calibration standard and a solvent blank to check the instrument performance every 24 h. Instrument sensitivity must be greater than or equal to 50% of the initial calibration level. If the instrumental sensitivity becomes less than 50%, analysis of samples must be halted until the sensitivity of the instrument is resumed.

7.3.6 Recovery standards

The laboratory must spike all samples with labeled recovery standards to monitor method performance. The R% of these labeled recovery standards must be within the range of 50-150% for trifluralin-d_{14} and $^{13}C_4$-fipronil. If the R% falls outside the range for these two recovery standards, the sample results are invalid, and the sample batch is re-extracted and the extracts re-analyzed. Recoveries for DBOFB are for informational purposes only.

7.3.7 MS

Analyze a laboratory MS per sample batch. The R% must be within the range of 50-150. If the R% of MS falls outside of the range, check the R% of the LCS (Section 7.3.4). If the R% of LCS still meets the acceptance criteria, no corrective action is required. Document the matrix spike failure, and flag the associated sample to indicate potential matrix interference.

7.3.8 Matrix spike duplicates (MSD) or laboratory replicate

Analyze a minimum of one MSD or one laboratory replicate per sample batch. The RSD between the replicate samples must be within ±30% for aqueous samples and ±50% for Chemcatcher samples for each analyte included in IDC. If the RSD fails to meet the acceptance criteria, the sample batch is re-extracted and the extracts re-analyzed.

7.3.9 Verification of MDL

If the method is modified in a way that could reasonably affect its sensitivity – such as a change in instrumentation, extraction technique, or quantitation procedure – a new MDL must be established following the initial MDL procedure. Additionally, if method performance data indicate a sustained decline – such as consistently low spike recoveries, declining calibration response, more than 5% of method blanks or spiked samples failing to meet criteria – the MDL must be re-determined. Independently, if the laboratory believes the sensitivity of the method has changed significantly, re-determine MDL. At least once every thirteen months, re-calculate MDL_s and MDL_b from the collected spiked samples and method blank results. If the verified MDL is within 0.5 to 2.0 times the existing MDL, and fewer than 3% of the method blank results (for the individual analyte) have numerical results above the existing MDL, then the existing MDL may optionally be left unchanged. Otherwise, adjust the MDL to the new verification MDL. The range of 0.5 to 2.0 approximates the 95th percentile confidence interval for the initial MDL determination with six degrees of freedom.

7.3.10 OPR

Determine the precision and recovery using at least three OPR standards at least every thirteen months. If the verified precision and recovery are within the range of 50-150% of the existing

results, the existing procedure may optionally be left unchanged. Otherwise, analysis of samples must be halted until the precision and recovery are resumed.

8. CALIBRATION AND STANDARDIZATION

8.1 Establish operating conditions

8.1.1 Mass spectrometer instrumental parameters

Optimize the tune parameters using perfluorotributylamine (PFTBA) following the instrument manufacturer's instructions. The optimized operating conditions for the Agilent 5975C quadrupole mass spectrometer, used in single-laboratory evaluation and followed during multi-laboratory evaluation, operated in electron ionization (EI) mode under selected ion monitoring (SIM) mode:

- Transfer line temperature: 280 °C
- Ion source temperature: 230 °C
- Quadrupole mass spectrometer temperature: 150 °C

8.1.2 Chromatographic conditions

The method's chromatographic conditions are optimized for compound separation and for sensitivity. The chromatographic conditions for this Method using the Agilent 7890 GC and column from single-laboratory evaluation and followed during multi-laboratory evaluation, are specified below:

- Analytical column: ZB-5MSi column (30 m×0.25 mm×0.25 µm)
- Inlet: Isothermally at 300 °C in splitless mode
- Oven temperature: From 80 °C (1 min hold) to 190 °C at 5 °C/min, to 260 °C at 4 °C/min, to 290 °C at 20 °C/min, and to 300°C at 50 °C/min (20 min hold).
- Carrier gas: Ultrahigh purity (> 99.999%) helium
- Flow rate: 1 mL/min
- Injection volume: 1 µL (or other volume as appropriate)

8.2 Establish stable RT

Inject a midpoint calibration standard (e.g., 500 ng/mL) under optimized GC/MS conditions to determine the RTs of each method analyte. The RTs of analytes observed from all participating laboratories during the Multi-Laboratory Method Validation are listed in Table 3. After establishing RTs, ensure that the RT of each analyte is within ±0.2 min of the target RT in the midpoint calibration standard.

Note: Analyte retention orders determined in this step may differ slightly from that listed in Table 3, but retention times and MS ions are sufficient for laboratories to identify analytes and establish chromatographic methods.

8.3 Initial calibration

Calibration is performed using a series of calibration solutions, with at least five (and up to nine) calibration standards within the quantitation range, with the lowest standard at or below LOQ or the lowest concentration for which quantitative data are to be reported.

Build internal standard calibration curves using instrumental software. The calibration ranges used from participating laboratories are specified in Table 3 (10 to 2000 ng/mL or other concentrations as appropriate). The calibration curve is built based on the areas of the characteristic peaks of the same RTs of the corresponding peaks in the calibration standard. The R^2 of the linear calibration curve must be greater than or equal to 0.99. If the R^2 is less than 0.99 for a majority of compounds, inspect the system for problems and re-analyze the calibration solutions. Alternatively, preparation and analysis of fresh calibration standards or performing a new initial calibration.

8.4 Calibration frequency

Each GC/MS system must be calibrated whenever the laboratory takes an action that changes the chromatographic conditions and experiences a recovery action for low sensitivity.

9. PROCEDURE

9.1

Water sample filtration, loading, and elution (for aqueous samples only. Go to Section 9.2 for Chemcatcher samples.)

9.1.1 Sample filtration

9.1.1.1

Measure the sample volume with a graduated cylinder and record the volume.

9.1.1.2

Place a GF/A 1.6 µm filter on the filtration apparatus.

9.1.1.3

Turn on the vacuum in the filtration system and begin transferring the sample into the filtration funnel. Ensure that the water level of the sample does not exceed one-third of the filtration funnel's capacity (approximately 100-150 mL). Exercise caution when working with samples containing high levels of suspended solids, as the filter may become clogged. In such cases, replace the filter with a new one as needed until the filtration process is complete for the sample.

9.1.1.4

Transfer the filtered sample into a clean glass flask or bottle for loading onto the SPE cartridge.

9.1.2 Conditioning the HLB cartridge

9.1.2.1

Place the Oasis HLB SPE cartridge on a vacuum manifold and place the waste vessel container under the manifold.

9.1.2.2

Pre-condition the SPE cartridge by sequentially adding DCM (10 mL), followed by acetone (10 mL), and reagent water (10 mL). Add the first solvent into the barrel (6 mL) of the HLB cartridge. Turn on the vacuum pump, maintaining a pressure of 5~10 psi. Open the manifold flow control valve. Once a small amount of solvent passes through the cartridge, turn off the vacuum pump, and allow the solvent in the cartridge barrel to be pulled through the cartridge by gravity. This technique prevents the solvent from passing through the column too quickly. Turn the vacuum pump on and off to control the flow, continuing to add all three solvents (10 mL each) sequentially to the cartridge barrel until conditioning is complete. Allow the sorbent to soak with each solution for approximately 30 s.

9.1.2.3

Once pre-conditioning begins, ensure that the cartridge does not dry out until loading the water sample.

9.1.3 Sample loading

9.1.3.1 Cleaning the sample transfer tubing

Clean the sample transfer tubing, typically made of polypropylene or Teflon, both before and after loading the sample.

Begin by cleaning the external surface of the sample transfer tubing using soapy water, followed by sequential rinses with reagent water, methanol, acetone, DCM, hexane, and acetone.

For internal cleaning, place a used SPE cartridge on the vacuum manifold, insert the adapter, and submerge the opposite end of the cartridge into a solvent container until it reaches the bottom. Turn on the vacuum and unlatch the manifold flow control valve, enabling the solvent to pass through the sample transfer tubing at an approximate flow rate of 10 mL/min. Clean the sample transfer tubing in the order of soapy water, followed by sequential rinses with reagent water, methanol, acetone, DCM, and hexane. Before transitioning to reagent water, rinse the external portion of the sample transfer tubing submerged in soapy water with reagent water. No such rinsing is required before switching to the subsequent solvents in the cleaning sequence.

9.1.3.2 Spiking Recovery Standard (RS) Solution

Spike a predetermined amount of RS solution into the water sample. To keep the recovery standard concentration within environmentally relevant ranges, ensure that the recovery standard concentration in the extracted sample is lower or equal to the concentration of the midpoint of the calibration curve assuming 100% recovery. For GC/MS analysis, use trifluralin-d_{14}, 4,4'-dibromooctafluorobiphenyl (DBOFB), and $^{13}C_4$-fipronil in acetonitrile (or other labeled compounds as appropriate) as the RS solution. After analysis, the laboratory should confirm and adjust the spiked concentration, if necessary, to ensure that the spiked recovery standard concentration is environmentally relevant.

9.1.3.3

Set up an SPE loading system by assembling a stainless-steel vacuum manifold, a vacuum pump, and a dedicated wastewater container for handling large-volume samples.

9.1.3.4

Position the conditioned HLB SPE cartridge onto the stainless-steel vacuum manifold with the flow control valve remaining closed. Insert the SPE cartridge adapter into the cartridge and submerge the opposite end of the cartridge into a solvent container until it reaches the bottom. Turn the vacuum on and gradually open the flow control valve to direct the sample into the SPE cartridge, maintaining control over the flow rate through the SPE cartridge at approximately 10 mL/min.

Note: Loading the aqueous phase onto SPE cartridges, even after filtering, could be slow if colloidal material in the matrix clogged the pore spaces of the cartridges sufficiently.

9.1.3.5

Once the sample is loaded, leave the vacuum pump running for up to 15 min to dry the sorbent.

9.1.3.6

Wrap the cartridge in aluminum foil and store it at -20 °C until extraction. Some of this method's analytes are stable on HLB SPE cartridges for at least 20 months (Reference 6); however, not all analytes have been evaluated.

9.1.4 Elution of analytes from SPE cartridge

9.1.4.1

Detach the cover assembly of the SPE manifold, remove the waste container from the chamber, and place the collection rack assembly into the chamber. Arrange the disposable 10 mL collection glass tubes on the rack and cover the chamber with the assembly. Ensure that the delivery tips are properly inserted into all the collection tubes.

9.1.4.2

Insert the tip of the loaded SPE cartridge into the Luer stopcock valve on the manifold. If the cartridge, wrapped in aluminum foil, was stored in the freezer after sample loading, allow it to reach room temperature before placing it on the manifold.

9.1.4.3

Elute the loaded SPE cartridge by passing a solvent mixture of acetone/DCM (10 mL, 1:1 by volume) through it at a controlled flow rate of 1 mL/min. Since a commonly used collection glass tube has a capacity of 10 mL, divide the eluting solution into two portions (5 mL each) to add to the cartridge, preventing overflow. Combine the two extract portions in a Turbovap concentrator tube. Additionally, rinse the collection tube with the acetone/DCM solvent mixture, directing the rinsate into the concentrator tube. The extract should be processed (see Section 9.3) immediately after the elution. If it is not possible, the concentrator tube may be covered with aluminum foil to prevent contamination and to keep it from drying out and stored at −20 °C for a maximum of 72 h until processing.

9.2

HLB disk (Chemcatcher passive sampler sequestration media) sample cleaning, conditioning, and extraction (go to Section 9.1 for aqueous samples)

9.2.1 Cleaning and conditioning

9.2.1.1

Set up an HLB disk loading system by assembling an SPE disk manifold (47 mm), a vacuum pump, and a dedicated wastewater container for handling large-volume samples.

9.2.1.2

Assemble the support base, an HLB disk, and a funnel on the manifold. The solvents for cleaning and conditioning include acetone (10 mL), isopropyl alcohol (IPA, 10 mL), methanol (10 mL), and reagent water (20 mL). Add each solvent sequentially into the funnel, turn on the vacuum pump, and gently open the manifold flow control valve to allow the solvent to pass through the disk. Control the flow to let the solvent soak into the disk for 1 min before being drawn through. Repeat this procedure for each solvent, preventing the disk from drying between conditioning steps.

Note: This method is usable irrespective of the number of stations on the disk manifold (Section 5.4.3); however, having fewer stations requires more cleaning between samples.

9.2.1.3

Keep the conditioned disk in reagent water in a closed container and store it at 4 °C until deployment for passive sampling or use for matrix spiking. Analytes sequestered to similar passive samplers have been shown to be stable for up to 6 years at -20 °C (Reference 7); however, Chemcatcher disks were not evaluated, nor were all analytes of this Method.

9.2.2 Elution of analytes from HLB disk

Insert a collection vial (40 mL) into the SPE disk manifold.

Assemble the SPE apparatus and place the HLB disk on the support base. If the disk was stored in the fridge, allow it to reach room temperature before placing it on the manifold.

Elute the HLB disk by passing a solvent mixture of methanol/acetonitrile (10 mL, 1:1 by volume) through it. Control the flow to allow the solvent to soak into the disk for 1 min before being drawn through.

Remove the filtration support, take the collection vial out of the manifold, cover the vial, and store it at −20 °C until further processing (see Section 9.3).

9.3 Concentration of the extract

9.3.1

Evaporate the solvent volume of extracts from Sections 9.1 and 9.2 to approximately 1 mL on the Turbovap using a gentle stream of nitrogen. Add acetonitrile (~5 mL) three times during the concentration for solvent exchange. Ensure that the extract does not dry out.

Note: Concentration of eluted extracts to 1 mL final volume for instrumental analysis could also be slow.

9.3.2

Further concentrate the extract to less than 0.5 mL. Transfer the concentrated extract into an autosampler vial using a glass disposable pipette. Rinse the concentrator tube three times with small amounts of acetonitrile and transfer the rinsate into the autosampler vial. If the solution volume exceeds 1 mL, reduce it by blowing down the nitrogen to below 1 mL. (The 1 mL volume can be estimated by comparing it with a vial containing a known 1 mL solution.)

9.3.3

Spike the IS solution into the extract. To keep the IS concentration within environmentally relevant ranges, ensure that the IS concentration in the extracted sample is lower or equal to the concentration of the midpoint of the calibration curve assuming 100% recovery. For GC/MS analysis, use acenaphthene-d_{10} and bifenthrin-d_5 (or other labeled compounds as appropriate). After analysis, the laboratory should confirm and adjust the spiked concentration, if necessary, to ensure that the spiked recovery standard concentration is environmentally relevant.

9.3.4

Add acetonitrile into the vial to bring the final volume to 1 mL.

9.3.5

Filter the extract through a 0.2 µm syringe filter and transfer it to a new autosampler vial.

9.3.6

Store the extracts in a freezer at −20 °C.

9.4 Instrumental analysis

9.4.1

Analyze the samples on a GC/MS system. Calibration and standardization must be performed and verified prior to analysis of the samples as noted in Section 8.

9.4.1.1

Load the calibration standard solutions (including CCVs), the solvent blank (hexane), the QA/QC samples including LCS samples, MS/MSD samples, and actual samples injected to the GC instrument.

9.4.1.2

Analyze a solvent blank and a mid-point calibration standard solution (i.e., the CCV) to check the system as noted in Sections 7.3.3 and 7.3.2.

9.4.1.3

Inject the calibration solutions from low to high concentrations. Build and evaluate initial calibration curves for the pesticides and the recovery standards as noted in Sections 8.2 and 8.3.

9.4.1.4

Inject at least one solvent blank (at the discretion of the analyst) after injection of the calibration solutions to avoid any carryover contamination.

9.4.1.5

Inject QA/QC samples, including LCS, MS, MSD or laboratory replicate samples, prior to injection of sample extracts. Inject the clean solvent intermittently during injection sequences for QA/QC samples, and between each dirty sample extract (at the discretion of the analyst) as noted in Section 7.3.3.

9.4.2 Continuing calibration verification

Inject a midpoint concentration of calibration standard (e.g., 500 ng/mL for GC/MS) to verify initial calibration and RT stability every 24 hours during the analytical sequence for sample extracts.

10. CALCULATIONS AND REPORTING

10.1 Quantitation based on internal calibration curve

10.1.1

Quantitation is based on the areas of the characteristic peaks as compared to the areas of the corresponding peaks at the same RTs in the calibration standard, using internal calibration procedures.

10.1.2

Once a target compound has been identified based on the RT, quantification ion and confirmation ion, the quantitation of the compound is based on the integrated abundance of the quantification ion from the extracted ion chromatogram.

Table 3 lists example RTs for the target analytes. The RTs listed in Table 3 are provided for illustrative purposes only. Each laboratory must determine RTs and RT windows for its specific application of the method.

10.1.3

Use the integration produced by the software to determine if the integration is correct because the software should produce more consistent integrations. However, manual integrations may be necessary when the software does not produce proper integration results due to improper baseline selection, missing peaks, coelution, partial integration of peaks, etc. The analyst is responsible for ensuring that the integration is correct whether performed by the software or done manually.

10.1.4

Multi-point (5 to 9 points) calibration curves are constructed by using linear regression from the calibration standards. The selection of standards depends on sample concentrations and instrument performance. The correlation coefficient for each standard curve has to be greater than or equal to 0.99 to be accepted. The RRF for each compound is calculated from the calibration curve.

10.1.4.1 RRF calculation

Calculate the RRF for each selected compound relative to one of the internal standards as follows:

$$RRF = \frac{C_i \times A_c}{C_c \times A_i}$$

where C_c = concentration of the selected compound, in nanograms per milliliter; A_i = peak area of the quantitation ion for the internal standard; C_i = concentration of the internal standard, in nanograms per milliliter; and A_c = peak area of the quantitation ion for the selected compound.

10.1.5

The concentration (ng/mL) of the compound in the extract is calculated from the RRF by the quantitative analysis software as follows:

$$C_{ex} = \frac{C_i \times A_{ex}}{RRF \times A_i}$$

where C_{ex} = the concentration (ng/mL) of the compound in the extract. A_{ex} = peak area of the quantitation ion for the selected compound in the extract.

10.2

Using the concentration in the extract determined above, compute the percent recovery of the recovery standard using the following equation:

$$Recovery\ (\%) = \frac{C_{ex} \times V_{ex}(ng)}{expected\ mass\ (ng)} \times 100$$

where $V_{ex} =$ the extract volume (mL).

10.2.1

The concentration of a native pesticide in the aqueous phase of the sample is computed using the concentration of the compound in the extract and the volume of water extracted (V_s, L), as follows:

$$concentration\ in\ aqueous\ phase\ \left(\frac{ng}{L}\right) = \frac{C_{ex} \times V_{ex}}{V_s}$$

The concentration of a native pesticide in a passive sampler is reported as ng/Chemcatcher.

10.3

If any pesticide exceeds the calibration range of the system, dilute the sample extract by the factor necessary to bring the concentration within the calibration range, and add an additional internal standard solution to the diluted extract to maintain the same concentration as in the calibration standards (e.g., 500 ng/mL or other concentrations as appropriate), and analyze an aliquot of this diluted extract. The pesticide concentration in the extract must be back-calculated from the diluted extract to facilitate the calculation of the concentration in the aqueous phase.

10.4 Reporting of data results

10.4.1

Report the result for each pesticide in each sample, method blank, and matrix spikes at or above the LOQ to 3 significant figures, in the concentration of the original matrix (i.e., ng/L for aqueous samples, ng/Chemcatcher for passive samplers). Report the result below the LOQ in each sample as <LOQ.

10.4.2.

Report the percent recovery of the recovery standard (RS).

11. METHOD PERFORMANCE

Performance data and related information from the Multi-Laboratory Validation Study are provided in this SOP only for example and guidance. These data do not represent the required performance criteria for users of the methods. Instead, performance criteria should be developed on a project-specific basis, and the laboratory should establish in-house QC performance criteria for the application of this method. Performance data must not be used as absolute QC acceptance criteria for the purposes of laboratory QC or accreditation.

NOTE: The laboratory should establish an in-house target analyte list for the application of this method. Some analytes shown in multi-laboratory evaluation to be problematic across participating laboratories, due to poor and/or variable recoveries, are novaluron (GC analyte #2), chlorothalonil (GC analyte #21), and deltamethrin (GC analyte #111), and recovery standard DBOFB (no DQO requirements, and recovery is for informational purposes only, as noted in Section 7.3.6). The laboratory should use this information to prioritize optimization of analytes to be measured by this method.

11.1

Table 1 lists the analytes evaluated for this Method, along with their CAS Numbers, chemical classes, and pesticide types. Internal and recovery standards are included.

11.2

Table 2 provides information on the GC/MS instruments used by participating laboratories, including details about the GC/MS systems, columns, and operating conditions.

11.3

Table 3 lists representative RTs, quantification ions, confirmation ions, calibration ranges, and IDLs for the analytes.

11.4

Table 4 lists concentrations of solutions of selected analytes purchased from an alternate vendor at the specified levels, and measured against the calibration solutions obtained from a common vendor and used by all participating laboratories.

11.5

Tables 5A-D contain performance data of individual laboratories for analytes on spiked reagent water (aqueous LCS). Table 5X contains performance data summarized across all laboratories for the aqueous LCS. Data is provided for guidance purposes.

11.6

Tables 6A-D contain performance data of individual laboratories for analytes on spiked blank Chemcatcher disk samples (Chemcatcher passive sampler LCS). Table 6X contains performance data summarized across all laboratories for the Chemcatcher LCS. Data is provided for guidance purposes.

11.7

Tables 7-8 contains Method Detection Limit (MDL) information for individual laboratories for the aqueous and Chemcatcher matrices. Data is provided for guidance purposes.

11.8

Table 9 contains performance data on matrix spikes (1L river water) from individual laboratories. Data is provided for guidance purposes.

11.9

Table 10 contains performance data for matrix spikes (Chemcatcher disks) exposed to river water in the laboratory for 14 d. Data is provided for guidance purposes.

12. Pollution Prevention and Waste Management

12.1 Pollution Prevention

12.1.1

Pollution prevention encompasses any technique that reduces or eliminates the quantity or toxicity of waste at the point of generation. Many opportunities for pollution prevention exist in laboratory operations. Whenever feasible, laboratory personnel should use pollution prevention techniques to address waste generation. When waste cannot be reduced at the source, recycling is the next best option.

12.1.2

The pesticides in this method are used in extremely small amounts and pose little threat to the environment when managed properly. Standards should be prepared in volumes consistent with laboratory use to minimize the disposal of excess volumes of expired standards.

12.1.3

For information about pollution prevention applied to laboratories and research institutions, consult *Less is Better: Laboratory Chemical Management for Waste Reduction*, available from the American Chemical Society's Department of Governmental Relations and Science Policy, 1155 16th Street NW, Washington DC 20036, 202/872-4477.

12.2 Waste Management

12.2.1

The laboratory is responsible for complying with all Federal, State, and local regulations governing waste management, particularly the hazardous waste identification rules and land disposal restrictions, for protecting the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Compliance is also required with any sewage discharge permits and regulations. An overview of requirements can be found in the *Environmental Management Guide for Small Laboratories* (EPA 233-B-98-001).

12.2.1.1

All liquid waste produced during the extraction is considered “organic waste” and must be placed in thick-walled carboys and disposed of according to local regulations.

12.2.1.2

The solid-waste stream produced during sample analysis comprises SPE cartridges, extracted Chemcatcher passive samplers, and assorted disposable glassware (such as glass pipettes and vials). Once the solid-waste items have been dried in a hood (that is, until no organic solvent remains), they can be disposed of according to local policy.

12.2.2

For further information on waste management, consult *The Waste Management Manual for Laboratory Personnel and Less is Better-Laboratory Chemical Management for Waste Reduction*, available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th Street N.W., Washington, D.C. 20036.

13. REFERENCES

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14. TABLES AND VALIDATION DATA

The Tables listed below include performance results from four laboratories (designated as Laboratories A-D), including those from the Single-Laboratory Method Validation where the SOP was developed.

Table 1. Analyte list with Chemical Abstracts Service (CAS) numbers, chemical classes, and pesticide types, arranged by increasing Retention Time (RT) observed in the Single Laboratory Validation.

#	Analyte[1]	CAS	Chemical Class	Pesticide Type
1	Dichlorvos	62-73-7	Organophosphate	Insecticide
2	Novaluron	116714-46-6	Benzoylurea	Herbicide
3	3,5-Dichloroaniline	626-43-7	Aniline Derivative	Degradate
4	Acenaphthene-d_{10} (IS)	15067-26-2	Polycyclic aromatic hydrocarbon	-
5	Cycloate	1134-23-2	Thiocarbamate	Herbicide
6	Trifluralin-d_{14} (RS)	347841-79-6	Aniline	-
7	Trifluralin	1582-09-8	Aniline	Herbicide
8	4,4'-dibromooctafluorobiphenyl (DBOFB, RS)	10386-84-2	Polybrominated biphenyl	-
9	Benefin	1861-40-1	Dinitroaniline	Herbicide
10	Pentachloroanisole	1825-21-4	Organochlorine	Insecticide
11	Simazine	122-34-9	Triazine	Herbicide
12	Prometon	1610-18-0	Triazine	Herbicide
13	Carbofuran	1563-66-2	Carbamate	Insecticide
14	Imazalil	35554-44-0	Triazole	Fungicide
15	Atrazine	1912-24-9	Triazine	Herbicide
16	Clomazone	81777-89-1	Isoxazlidinone	Herbicide
17	Pentachloronitrobenzene	82-68-8	Organochlorine	Fungicide
18	Propyzamide	23950-58-5	Benzamide	Herbicide
19	Pyrimethanil	53112-28-0	Pyrimidine	Fungicide
20	Diazinon	333-41-5	Organophosphate	Insecticide
21	Chlorothalonil	1897-45-6	Chloronitrile	Fungicide
22	Triallate	2303-17-5	Carbamate	Herbicide
23	Tefluthrin	79538-32-2	Pyrethroid	Insecticide
24	Tebupirimfos	96182-53-5	Organophosphate	Insecticide
25	Propanil	709-98-8	Anilide	Herbicide
26	Methyl parathion	298-00-0	Organophosphate	Insecticide
27	Acibenzolar-S-methyl	126448-41-7	Organophosphate	Insecticide

#	Analyte[1]	CAS	Chemical Class	Pesticide Type
28	Carbaryl	63-25-2	Carbamate	Insecticide
29	Prometryn	7287-19-6	Triazine	Herbicide
30	Metalaxyl	57837-19-1	Phenylamide	Fungicide
31	Dithiopyr	97886-45-8	Pyridine	Herbicide
32	Prodiamine	29091-21-2	Dinitroaniline	Herbicide
33	Thiobencarb	28249-77-6	Thiocarbamate	Herbicide
34	Malathion	121-75-5	Organophosphate	Insecticide
35	Metolachlor	51218-45-2	Chloroacetanilide	Herbicide
36	Chlorpyrifos	2921-88-2	Organophosphate	Insecticide
37	Triadimefon	43121-43-3	Triazole	Fungicide
38	DCPA (Dacthal)	1861-32-1	Benzenedicarboxylic acid	Herbicide
39	Flufenacet	142459-58-3	Anilide	Herbicide
40	Tetraconazole	67915-22-6	Azole	Fungicide
41	Butralin	33629-47-9	Dinitroaniline	Herbicide
42	Cyprodinil	121552-61-2	Pyrimidine	Fungicide
43	Pendimethalin	40487-42-1	Aniline	Herbicide
44	Fipronil sulfide	120067-83-6	Phenylpyrazole	Insecticide
45	Fluazinam	79622-59-6	Pyridine	Fungicide
46	Fluopyram	658066-35-4	Pyridinyl-ethylamide	Fungicide
47	Triadimenol	55219-65-3	Triazole	Fungicide
48	$^{13}C_4$-Fipronil (RS)	-	Phenylpyrazole	-
49	Fipronil	120068-37-3	Phenylpyrazole	Insecticide
50	Captan	133-06-2	Phthalimide	Fungicide
51	Allethrin	584-79-2	Pyrethroid	Insecticide
52	Methoprene	40596-69-8	Terpene	Insecticide
53	Triflumizole	68694-11-1	Azole	Fungicide
54	Paclobutrazol	76738-62-0	Triazole	Herbicide
55	Flutriafol	76674-21-0	Triazole	Fungicide
56	Flumetralin	62924-70-3	Dinitroaniline	Herbicide
57	Napropamide	15299-99-7	Amide	Herbicide
58	Picoxystrobin	117428-22-5	Strobilurin	Fungicide
59	Ethalfluralin	55283-68-6	Aniline	Herbicide
60	Flutolanil	66332-96-5	Anilide	Fungicide
61	Fludioxonil	131341-86-1	Pyrrole	Fungicide
62	*p,p'*-DDE	72-55-9	Organochlorine	Degradate
63	Tribuphos	78-48-8	Organophosphate	Insecticide
64	Oxadiazon	19666-30-9	Oxadiazolone	Herbicide
65	Myclobutanil	88671-89-0	Triazole	Fungicide
66	Oxyfluorfen	42874-03-3	Nitrophenyl ether	Herbicide
67	Fipronil sulfone	120068-36-2	Phenylpyrazole	Insecticide
68	Kresoxim-methyl	143390-89-0	Strobilurin	Fungicide
69	Cyproconazole	94361-06-5	Triazole	Fungicide

#	Analyte[1]	CAS	Chemical Class	Pesticide Type
70	Chlorfenapyr	122453-73-0	Pyrrole	Insecticide
71	*p,p'*-DDD	72-54-8	Organochlorine	Degradate
72	Quinoxyfen	124495-18-7	Quinoline	Fungicide
73	Fenhexamide	126833-17-8	Anilide	Fungicide
74	*p,p'*-DDT	50-29-3	Organochlorine	Insecticide
75	Propiconazole	60207-90-1	Triazole	Fungicide
76	Trifloxystrobin	141517-21-7	Strobilurin	Fungicide
77	Fluopicolide	239110-15-7	Benzamide	Fungicide
78	Hexazinone	51235-04-2	Triazinone	Herbicide
79	Tebuconazole + Metcona	107534-96-3 125116-23-6	Azole	Fungicide
80	Propargite	2312-35-8	Sulfite Ester	Insecticide
81	Piperonyl butoxide	51-03-6	Methylenedioxy Phenyl Derivative	Insecticide
82	Resmethrin	10453-86-8	Pyrethroid	Insecticide
83	Zoxamide	156052-68-5	Benzamide	Fungicide
84	Iprodione	36734-19-7	Dicarboximide	Fungicide
85	Phosmet	732-11-6	Organophosphate	Insecticide
86	Tetramethrin	7696-12-0	Pyrethroid	Insecticide
87	Tetradifon	116-29-0	Bridged diphenyl	Insecticide
88	Bifenthrin-d_5 (IS)	-	Pyrethroid	-
89	Fluxapyroxad	907204-31-3	Pyrazole-carboxamide	Fungicide
90	Bifenthrin	82657-04-3	Pyrethroid	Insecticide
91	Etoxazole	161326-34-7	Oxazoline	Insecticide
92	Fenamidone	161326-34-7	Imidazolinone	Fungicide
93	Malaoxon	1634-78-2	Organosphosphate	Insecticide
94	Phenothrin	26046-85-5	Pyrethroid	Insecticide
95	Pyriproxyfen	95737-68-1	Juvenile Hormone Analog	insecticide
96	Cyhalofop-butyl	122008-85-9	Propionate	Herbicide
97	Cyhalothrin	68085-85-8	Pyrethroid	Insecticide
98	Fenpropathrin	39515-41-8	Pyrethroid	Insecticide
99	Pyridaben	96489-71-3	Pyridazinone	Insecticide
100	Coumaphos	56-72-4	Organophosphate	Insecticide
101	Fenbuconazole	114369-43-6	Triazole	Fungicide
102	Cyfluthrin	68359-37-5	Pyrethroid	Insecticide
103	Boscalid	188425-85-6	Pyridine	Fungicide
104	Cypermethrin	52315-07-8	Pyrethroid	Insecticide
105	Etofenprox	80844-07-1	Pyrethroid	Insecticide
106	Pyraclostrobin	175013-18-0	Strobilurin	Fungicide
107	Esfenvalerate	66230-04-4	Pyrethroid	Insecticide
108	*tau*-Fluvalinate	102851-06-9	Pyrethroid	Insecticide

#	Analyte[1]	CAS	Chemical Class	Pesticide Type
109	Difenoconazole	119446-68-3	Triazole	Fungicide
110	Indoxacarb	173584-44-6	Oxadiazine	Insecticide
111	Deltamethrin	52918-63-5	Pyrethroid	Insecticide
112	Azoxystrobin	131860-33-8	Strobilurin	Fungicide
113	Famoxadone	131807-57-3	Oxazole	Fungicide
114	Dimethomorph	110488-70-5	Morpholine	Fungicide
115	Fluoxastrobin	361377-29-9	Strobilurin	Fungicide

[1] Trifluralin-d_{14}, 4,4'-dibromooctafluorobiphenyl (DBOFB), and $^{13}C_4$-fipronil were used as Recovery Standards (RS), and acenaphthene-d_{10} and bifenthrin-d_5 were used as Internal Standards (IS).

Table 2. Gas Chromatography-Mass Spectrometry (GC/MS) instrumentation and operating conditions across participating laboratories

Laboratory	A	B	C	D
GC/MS Manufacturer	Agilent	Agilent	Agilent	Agilent
GC/MS model	7890/5975C	5977B/8890	7890B/5977A	7890A / 5975C
Column model	ZB-5MSi	J&W DB-5	ZB-5MSi	J&W DB-5MS
Column dimensions	30 m × 0.25 mm × 0.25 µm	60 m × 0.25 mm × 0.25 µm	30 m × 0.25 mm × 0.25 µm	30 m × 0.25 mm × 0.25 µm
Injection mode	Splitless	Multimode Inlet	Splitless	Splitless
Injection volume	1 µL	2 µL	1 µL	1 µL
Inlet temperature	300 ℃	45°C for 0.2 mins then 300°C/min to 300°C	300 ℃	300 ℃
Carrier gas	He	He	He	He
Carrier gas flow rate	1 mL/min	1.5 mL/min	1 mL/min	1 mL/min
Oven temperature program	80 °C for 1 min, followed by 5 °C/min to 190 °C for 0 min, followed by 4 °C/min to 260 °C for 0 min, followed by 20 °C/min to 290 °C for 1.2 min, followed by 50 °C/min to 300 °C for 20 min	45°C for 5 mins, then 25°C/min to 125°C, then 2.5°C/min to 300°C	80 °C for 1 min, followed by 5 °C/min to 190 °C for 0 min, followed by 4 °C/min to 260 °C for 0 min, followed by 20 °C/min to 290 °C for 1.2 min, followed by 50 °C/min to 300 °C for 20 min	80 °C for 1 min, followed by 5 °C/min to 190 °C for 0 min, followed by 4 °C/min to 260 °C for 0 min, followed by 20 °C/min to 290 °C for 0 min, followed by 50 °C/min to 300 °C for 5.8 min
Transferline temperature	280 ℃	300 ℃	280 ℃	280 ℃
Ion source temperature	230 ℃	250 ℃	230 ℃	230 ℃
Quad temperature	150 ℃	150 ℃	150 ℃	150 ℃
Data analysis software	MSD ChemStation E.02.01.1177	Masshunter	MassHunter GC/MS Acquisition B.07.00.1413	Masshunter

Table 3. Characteristic m/z values for instrument calibration, Retention Times (RT), and calibration ranges, with concentrations expressed as ng/mL extract from each laboratory. The lower limit of the calibration range represents the Instrumental Detection Limit (IDL) of the GC/MS method for each analyte. The analytes that did not elute in the same order as those from Laboratory A are highlighted in yellow background or marked with an asterisk.

#	Analyte[1]	Quantitation Ion (*m/z*)	Confirmation Ion (*m/z*)	Lab A RT (min)	Lab A Calibration Range (ng/mL)	Lab B RT (min)	Lab B Calibration Range (ng/mL)	Lab C RT (min)	Lab C Calibration Range (ng/mL)	Lab D RT (min)	Lab D Calibration Range (ng/mL)
1	Dichlorvos	109	185	10.349	10-1800	16.501	10-400	9.157	10 - 500	9.736	10−2000
2	Novaluron	168	140	11.066	10-1800	17.110	10-400	9.867	10 - 500	10.504	10−2000
3	3,5-Dichloroaniline	161	163	14.096	10-1800	21.403	10-400	12.95	10 - 1000	13.689	10−2000
4	Acenaphthene-d_{10} (IS)	164	162	16.025	10-1800	24.519	-	-	-	15.652	1000−1000
5	Cycloate	83	154	19.57	10-1800	30.234	10-400	18.434	50 - 1000	19.266	10−2000
6	Trifluralin-d_{14} (RS)	315	267	20.401	10-1800	-	-	19.233	10 - 1000	19.843	1000−1000
7	Trifluralin	306	264	20.716	10-1800	31.959	10-400			20.024	10−2000
8	4,4'-dibromooctafluorobiphenyl (DBOFB, RS)	456	-	20.745	10-1800	-	-	-	-	20.028	1000−1000
9	Benefin	292	264	20.802	10-1800	31.949	10-400	19.352	10 - 1000	20.144	10−2000
10	Pentachloroanisole	265	280	21.55	10-1800	33.959	25-400	20.074	10 - 750	20.932	10−2000
11	Simazine	201	186	21.898	10-1800	34.263	10-400	20.722	10 - 1000	21.521	10−2000
12	Prometon	210	225	21.985	10-1800	34.395	10-400	20.805	10 - 1000	21.555	10−2000
13	Carbofuran	164	149	22.007	10-1800	34.466	10-400	20.696*	10 - 500	21.631	10−2000
14	Imazalil	215	173	22.116	10-1800	34.710	10-400	20.935	10 - 1000	21.704	10−2000
15	Atrazine	200	215	22.138	10-1800	34.720	10-400	20.940	10 - 1000	21.773	10−2000
16	Clomazone	125	204	22.203	10-1800	34.466*	10-400	20.987	10 - 1000	21.773	10−2000
17	Pentachloronitrobenzene	237	280	22.64	10-1800	34.710	25-400	20.079*	10 - 750	21.833	10−2000
18	Propyzamide	173	255	22.815	10-1800	36.151	10-400	21.62	10 - 1000	22.455	10−2000
19	Pyrimethanil	198	199	23.034	10-1800	-	-	21.864	10 - 1000	22.585	10−2000
20	Diazinon	179	304	23.319	10-1800	36.496	10-400	21.859*	10 - 1000	22.684	10−2000

#	Analyte[1]	Quantitation Ion (*m/z*)	Confirmation Ion (*m/z*)	Lab A RT (min)	Lab A Calibration Range (ng/mL)	Lab B RT (min)	Lab B Calibration Range (ng/mL)	Lab C RT (min)	Lab C Calibration Range (ng/mL)	Lab D RT (min)	Lab D Calibration Range (ng/mL)
21	Chlorothalonil	266	264	23.625	10-1800	36.912	10-400	21.734*	10 - 750	22.707	10−2000
22	Triallate	86	268	23.757	10-1800	37.663	10-400	22.445	10 - 1000	23.296	10−2000
23	Tefluthrin	177	197	23.801	10-1800	37.887	10-400	22.523	10 - 750	23.338	10−2000
24	Tebupirimfos	261	234	24.107	10-1800	37.785*	10-400	22.772	10 - 1000	23.617	10−2000
25	Propanil	161	217	24.701	10-1800	38.455	10-400	23.405	10 - 1000	24.254	10−2000
26	Methyl parathion	109	125	25.107	10-1800	39.551	10-400	23.789	10 - 750	24.677	10−2000
27	Acibenzolar-S-methyl	182	135	25.25	10-1800	42.363	10-400	23.976	10 - 1000	24.89	10−2000
28	Carbaryl	144	115	25.298	10-1800	40.739*	25-400	24.012	10 - 1000	25.096	10−2000
29	Prometryn	241	184	25.68	10-1800	40.719*	10-400	24.391	10 - 1000	25.276	10−2000
30	Metalaxyl	206	160	25.728	10-1800	41.338	10-400	-	-	25.421	10−2000
31	Dithiopyr	354	286	26.257	10-1800	40.394*	10-400	24.541	10 - 1000	24.879*	30−2000
32	Prodiamine	321	279	26.499	10-1800	41.409	25-400	25.029	10 - 750	25.903	10−2000
33	Thiobencarb	100	72	26.712	10-1800	42.759	25-400	25.543	10 - 1000	26.251	10−2000
34	Malathion	125	173	26.802	10-1800	43.307	10-400	25.351*	10 - 1000	26.312	10−2000
35	Metolachlor	162	238	26.984	10-1800	41.145*	500-1500	25.387	10 - 1000	26.439	10−2000
36	Chlorpyrifos	197	314	27.196	10-1800	43.794	10-400	25.517	10 - 750	26.469	10−2000
37	Triadimefon	57	208	27.318	10-1800	44.149	10-400	25.978	10 - 1000	26.584	10−2000
38	DCPA (Dacthal)	301	332	27.409	10-1800	44.362	10-400	25.662*	10 - 750	26.887	10−2000
39	Flufenacet	151	211	27.439	10-1800	44.515	10-400	25.978	10 - 1000	26.902	10−2000
40	Tetraconazole	336	338	27.621	10-1800	44.464*	25-400	26.072	10 - 1000	26.979	10−2000
41	Butralin	266	224	27.924	10-1800	44.789	10-400	26.31	10 - 1000	27.237	10−2000
42	Cyprodinil	224	225	28.227	10-1800	45.428	10-400	26.907	10 - 1000	27.681	10−2000
43	Pendimethalin	252	281	28.56	10-1800	45.976	10-400	26.876*	10 - 1000	27.816	10−2000
44	Fipronil sulfide	351	420	28.772	10-1800	46.555	25-400	26.757*	10 - 1000	27.847	10−2000
45	Fluazinam	418	372	28.893	25-1800	46.778	10-400	27.172	100 - 1000	27.892	30−2000
46	Fluopyram	223	396	29.015	10-1800	44.931*	250-1000	27.488	10 - 1000	28.103	1000−1000
47	Triadimenol	112	168	29.045	25-1800	47.265	25-400	20.8	10 - 1000	28.107	10−1500
48	$^{13}C_4$-Fipronil (RS)	371	-	29.068	25-1800	47.428	10-400	-	-	28.428	10−2000

#	Analyte[1]	Quantitation Ion (*m/z*)	Confirmation Ion (*m/z*)	Lab A RT (min)	Lab A Calibration Range (ng/mL)	Lab B RT (min)	Lab B Calibration Range (ng/mL)	Lab C RT (min)	Lab C Calibration Range (ng/mL)	Lab D RT (min)	Lab D Calibration Range (ng/mL)
49	Fipronil	367	369	29.075	25-1800	47.316*	10-400	27.172*	10 - 1000	28.474	30−2000
50	Captan	79	107	29.075	50-1800	47.326	10-400	28.23	10 - 1000	28.589	10−2000
51	Allethrin	123	136	29.075	25-1800	47.072*	25-400	27.654*	10 - 1000	28.684	10−2000
52	Methoprene	73	111	29.409	25-1800	47.296	10-400	28.22	10 - 1000	28.848	10−2000
53	Triflumizole	278	206	29.5	25-1800	47.905	10-400	27.903*	10 - 1000	29.162	10−2000
54	Paclobutrazol	236	125	29.803	25-1800	48.128	50-400	28.21	25 - 1000	29.42	10−2000
55	Flutriafol	123	219	30.322	25-1800	47.788*	10-400	28.915	10 - 1000	29.611	10−2000
56	Flumetralin	143	404	30.353	25-1800	49.661	25-400	28.661*	10 - 750	29.908	10−2000
57	Napropamide	72	128	30.571	25-1800	49.600*	10-400	29.060	10 - 750	29.939	10−2000
58	Picoxystrobin	145	335	30.695	25-1800	50.117	10-400	28.988*	10 - 1000	29.939	30−2000
59	Ethalfluralin	276	316	30.726	50-1800	50.097	10-400	28.977*	10 - 1000	30.056	10−2000
60	Flutolanil	173	281	30.788	25-1800	29.330*	50-400	29.315	10 - 1000	30.286	10−2000
61	Fludioxonil	127	318	31.068	50-1800	50.310	10-400	29.351	10 - 1000	30.322	10−2000
62	*p,p'*-DDE	248	248	31.099	25-1800	50.767	25-400	29.315*	10 - 1000	30.666	10−2000
63	Tribuphos	169	202	31.161	25-1800	51.061	10-400	29.911	10 - 1000	30.691	10−2000
64	Oxadiazon	175	258	31.41	50-1800	51.041*	10-400	29.891*	10 - 1000	30.866	10−2000
65	Myclobutanil	179	150	31.472	25-1800	51.406	10-400	29.911	10 - 1000	30.904	10−2000
66	Oxyfluorfen	252	300	31.69	25-1800	51.559	10-400	30.16	10 - 750	30.916	10−2000
67	Fipronil sulfone	383	255	31.752	25-1800	51.802	25-400	29.688*	10 - 1000	31.126	10−2000
68	Kresoxim-methyl	116	131	31.876	25-1800	51.873	10-400	30.249	10 - 1000	31.221	10−2000
69	Cyproconazole	222	139	32.063	25-1800	51.147*	10-400	30.56	10 - 1000	31.489	10−2000
70	Chlorfenapyr	59	247	32.342	25-1800	52.634	50-400	30.508*	10 - 1000	31.577	10−2000
71	*p,p'*-DDD	235	165	32.901	25-1800	50.747*	50-1000	31.473	10 - 1000	32.49	10−2000
72	Quinoxyfen	237	272	34.251	25-1800	54.076	10-400	32.807	10 - 1000	33.833	10−2000
73	Fenhexamide	97	177	34.402	25-1800	56.288	10-400	35.842	10 - 1000	34.032	10−2000
74	*p,p'*-DDT	235	165	34.528	25-1800	58.440	10-400	33.092*	10 - 1000	34.043	10−2000
75	Propiconazole	173	259	34.653	25-1800	56.765	25-400	33.102	10 - 1000	34.127	10−2000
76	Trifloxystrobin	116	131	34.754	25-1800	56.461*	10-400	33.056*	10 - 1000	34.127	10−2000

#	Analyte[1]	Quantitation Ion (*m/z*)	Confirmation Ion (*m/z*)	Lab A RT (min)	Lab A Calibration Range (ng/mL)	Lab B RT (min)	Lab B Calibration Range (ng/mL)	Lab C RT (min)	Lab C Calibration Range (ng/mL)	Lab D RT (min)	Lab D Calibration Range (ng/mL)
77	Fluopicolide	209	347	34.88	25-1800	56.867	10-400	33.294	10 - 1000	34.305	10−2000
78	Hexazinone	171	83	34.98	25-1800	57.222	10-400	33.3	10 - 1000	34.326	10−2000
79	Tebuconazole + Metcona	125	250	35.081	25-1800	57.405	10-400	33.684	10 - 1000	34.732	10−2000
80	Propargite	135	173	35.433	50-1800	57.679	100-400	33.99	10 - 1000	34.961	10−2000
81	Piperonyl butoxide	176	177	35.634	25-1800	58.156	10-400	34.296	10 - 1000	35.315	10−2000
82	Resmethrin	123	171	35.735	25-1800	58.450	10-400	34.446	10 - 1000	35.433	10−2000
83	Zoxamide	187	358	35.861	25-1800	57.395*	25-400	35.759	10 - 1000	35.463	10−2000
84	Iprodione	314	187	36.368	25-1800	58.897	25-400	34.976*	10 - 500	35.984	10−2000
85	Phosmet	160	93	36.572	25-1800	59.668	10-400	35.022	10 - 1000	36.081	10−2000
86	Tetramethrin	164	123	36.624	25-1800	60.115	-	35.578	10 - 1000	36.308	10−2000
87	Tetradifon	159	-	36.956	25-1800	60.572	10-400	35.282*	10 - 1000	36.308	10−2000
88	Bifenthrin-d_5 (IS)	186	-	36.956	25-1800	-	-	35.5	10 - 1000	36.457	1000−1000
89	Fluxapyroxad	381	159	36.982	25-1800	60.582	-	35.282*	10 - 500	36.501	10−2000
90	Bifenthrin	181	123	36.982	25-1800	60.592	25-400	35.842	10 - 1000	36.597	10−2000
91	Etoxazole	141	359	37.314	25-1800	60.653	10-400	35.764*	10 - 1000	36.802	10−2000
92	Fenamidone	238	268	37.365	25-1800	61.303	10-400	35.754*	10 - 1000	36.798*	10−2000
93	Malaoxon	268	314	37.365	25-1800	61.302*	10-400	35.759	10 - 1000	36.798	10−2000
94	Phenothrin	123	183	38.109	25-1800	40.536*	10-400	36.776	10 - 1000	36.871	10−2000
95	Pyriproxyfen	136	78	38.558	25-1800	47.001	10-400	37.259	10 - 1000	37.817	10−2000
96	Cyhalofop-butyl	256	129	38.821	25-1800	63.647	25-400	37.451	10 - 1000	38.302	10−2000
97	Cyhalothrin	181	197	38.914	25-1800	60.059*	10-400	37.85	10 - 1000	38.486	10−2000
98	Fenpropathrin	181	208	39.378	25-1800	62.490	10-400	35.842*	10 - 1000	38.875	10−2000
99	Pyridaben	147	309	41.127	25-1800	67.687	25-400	39.863	10 - 1000	40.783	10−2000
100	Coumaphos	362	226	41.315	25-1800	-	-	39.734	10 - 1000	40.902	10−2000
101	Fenbuconazole	129	198	41.843	25-1800	69.372	25-400	40.652	10 - 1000	41.513	10−2000
102	Cyfluthrin	206	226	42.257	25-1800	69.514	25-400	41.332	10 - 1000	42.002	10−2000
103	Boscalid	140	342	42.389	25-1800	70.803	25-400	41.425	10 - 1000	42.109	10−2000

#	Analyte[1]	Quantitation Ion (*m/z*)	Confirmation Ion (*m/z*)	Lab A RT (min)	Lab A Calibration Range (ng/mL)	Lab B RT (min)	Lab B Calibration Range (ng/mL)	Lab C RT (min)	Lab C Calibration Range (ng/mL)	Lab D RT (min)	Lab D Calibration Range (ng/mL)
104	Cypermethrin	163	181	42.521	50-1800	71.523	25-1000	41.96	10 - 1000	42.274	30−2000
105	Etofenprox	163	-	42.803	25-1800	71.828	25-400	41.96	10 - 1000	42.521	10−2000
106	Pyraclostrobin	132	164	43.867	25-1800	74.335	25-400	42.847	10 - 1000	43.3	10−2000
107	Esfenvalerate	125	167	44.143	25-1800	74.152*	-	43.054	10 - 1000	43.402	10−2000
108	*tau*-Fluvalinate	250	181	44.17	25-1800	75.238	25-400	42.961*	10 - 1000	43.486	10−2000
109	Difenoconazole	265	323	44.501	50-1800	75.979	100-400	43.438	10 - 750	43.864	10−2000
110	Indoxacarb	150	218	45.079	25-1800	77.613	100-400	43.672	10 - 1000	44.07	10−2000
111	Deltamethrin	181	253	45.134	50-1800	75.005*	25-400	43.791	25 - 1000	44.231	10−2000
112	Azoxystrobin	344	388	45.74	25-1800	77.989	50-400	44.009	10 - 1000	44.456	10−2000
113	Famoxadone	330	197	45.74	50-1800	78.070	50-400	44.248	10 - 1000	44.728	10−2000
114	Dimethomorph	301	165	46.401	25-1800	78.121	50-400	44.595	10 - 750	45.103	10−2000
115	Fluoxastrobin	188	219	48.851	25-1800	80.750	100-400	46.178	10 - 500	46.874	10−2000

[1] Trifluralin-d_{14}, 4,4'-dibromooctafluorobiphenyl (DBOFB), and $^{13}C_4$-fipronil were used as Recovery Standards (RS), and acenaphthene-d_{10} and bifenthrin-d_5 were used as Internal Standards (IS).

Table 4C. Measured concentrations of selected analytes in standards from a second source for calibration verification in laboratory C.

Analyte	10 ng/mL	50 ng/mL	1000 ng/mL	Solvent	Source vendor
Dichlorvos	-	76	1309	EtOAc	Absolute Standards
Trifluralin	-	56	799	MeOH	CPI
Simazine	4.74	63	1100	EtOAc	CPI
Prometon	1.75	42	870	EtOAc	CPI
Atrazine	7.51	41	949	EtOAc	CPI
Pentachloronitrobenzene	-	57	955	EtOAc	CPI
Diazinon	9.12	52	861	EtOAc	Absolute Standards
Tefluthrin	6.62	34	740	MeOH	CPI
Methyl parathion	3.86	52	1180	EtOAc	Absolute Standards
Prometryn	5.92	51	850	EtOAc	CPI
Thiobencarb	9.22	40	897	EtOAc	CPI
Malathion	10.58	45	807	MeOH w/ 0.1% formic acid	CPI
Chlorpyrifos	7.84	42	936	EtOAc	Absolute Standards
Pendimethalin	-	56	760	MeOH	CPI
Fipronil sulfide	-	43	700	Acetone	AccuStandard
Fipronil	5.21	54	974	Acetone	AccuStandard
p,p'-DDE	4.18	41	959	Hexane	AccuStandard
Fipronil sulfone	-	11	647	Acetone	AccuStandard
p,p'-DDD	6.19	53	884	Hexane	AccuStandard
p,p'-DDT	8.64	61	953	Hexane	AccuStandard
Bifenthrin	-	39	888	MeOH	CPI
Phenothrin (sumithrin)	5.38	61	-	MeOH	CPI
Cyhalothrin	-	29	1457	MeOH	CPI
Fenpropathrin	7.44	33	897	MeOH	CPI
Coumaphos	10.15	55	-	EtOAc	Absolute Standards
Cyfluthrin	-	32	-	MeOH	CPI
Cypermethrin	-	28	-	MeOH	CPI
tau-Fluvalinate	-	14	-	MeOH	CPI
Esfenvalerate	4.60	51	-	MeOH	CPI
Deltamethrin	-	64	2156	MeOH	CPI

Table 4D. Measured concentration of selected analytes in standards from a second source for calibration verification in laboratory D.

Analyte	10 ng/mL	1000 ng/mL	Solvent	Source vendor
Cycloate	0.18	817	Acetonitrile	Agilent
Trifluralin	8.78	944	Acetone	Agilent
Propyzamide	7.56	843	Acetone	Agilent
Diazinon	6.82	1064	Methanol	Agilent
Carbaryl	0	836	Actonitrile	Agilent
Chlorpyrifos	0	974	Acetone	Agilent
Tetraconazole	12.8	1054	None (Solid 100 mg)	Supelco
Fipronil	6.29	1184	Methanol	Agilent
Ethalfluralin	0	1063	Acetone	Agilent
Myclobutanil	11.97	956	Acetonitrile	Agilent
p,p'-DDT	0	637	Methanol	Agilent
Fluopicolide	0	898	Acetonitrile	Agilent
Bifenthrin	8.39	1251	Acetone	SPEX

Table 5A. Recoveries of analytes in 1 L reagent water Laboratory Control Samples (LCSs), arranged by analyte number (Table 1), following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory A, with high and low spiking levels of 250 ng/L and 100 ng/L, respectively. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red and an asterisk.

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
1	Dichlorvos	53%	54%	40%	49%*	16%	100%	93%	95%	96%	4%
2	Novaluron	29%	21%	34%	28%*	23%	24%	27%	35%	29%*	20%
3	3,5-Dichloroaniline	64%	66%	40%	57%	26%	83%	95%	69%	82%	16%
5	Cycloate	44%	44%	31%	40%*	19%	80%	103%	68%	84%	21%
7	Trifluralin	43%	35%	27%	35%*	23%	44%	66%	26%	45%*	44%*
9	Benefin	44%	34%	27%	35%*	24%	45%	70%	28%	48%*	44%*
10	Pentachloroanisole	21%	18%	10%	16%*	35%*	35%	47%	12%	31%*	57%*
11	Simazine	81%	76%	71%	76%	7%	95%	109%	106%	103%	7%
12	Prometon	86%	79%	71%	79%	10%	91%	110%	107%	103%	10%
13	Carbofuran	57%	47%	57%	54%	11%	122%	58%	77%	86%	38%*
14	Imazalil	73%	68%	65%	69%	6%	120%	115%	105%	113%	7%
15	Atrazine	72%	67%	62%	67%	7%	126%	128%	118%	124%	4%
16	Clomazone	63%	60%	49%	57%	13%	130%	132%	118%	127%	6%
17	Pentachloronitrobenzene	30%	27%	16%	24%*	30%	62%	69%	27%	53%	43%*
18	Propyzamide	70%	73%	65%	69%	6%	108%	102%	103%	104%	3%
19	Pyrimethanil	65%	61%	53%	60%	10%	105%	103%	99%	102%	3%
20	Diazinon	61%	56%	48%	55%	12%	106%	107%	100%	104%	4%
21	Chlorothalonil	83%	88%	84%	85%	3%	593%	679%	289%	520%*	39%*
22	Triallate	46%	38%	30%	38%*	21%	68%	96%	53%	72%	30%
23	Tefluthrin	28%	22%	22%	24%*	14%	37%	52%	27%	39%*	33%*
24	Tebupirimfos	56%	48%	40%	48%*	17%	91%	100%	72%	88%	16%
25	Propanil	82%	82%	78%	81%	3%	130%	113%	107%	117%	10%
26	Methyl parathion	69%	64%	66%	66%	4%	92%	87%	95%	91%	4%
27	Acibenzolar-S-methyl	81%	76%	70%	76%	7%	92%	109%	109%	103%	9%
28	Carbaryl	57%	56%	57%	57%	1%	123%	103%	99%	108%	12%
29	Prometryn	89%	81%	78%	83%	7%	124%	120%	116%	120%	3%
30	Metalaxyl	67%	58%	56%	60%	10%	94%	102%	84%	93%	10%
31	Dithiopyr	46%	33%	46%	42%*	18%	132%	47%	63%	81%	56%*
32	Prodiamine	84%	78%	74%	79%	6%	74%	89%	89%	84%	10%
33	Thiobencarb	77%	65%	65%	69%	10%	101%	118%	123%	114%	10%
34	Malathion	69%	68%	68%	68%	1%	107%	89%	110%	102%	11%
35	Metolachlor	81%	80%	70%	77%	8%	123%	128%	117%	123%	4%
36	Chlorpyrifos	55%	48%	45%	49%*	10%	81%	87%	79%	82%	5%
37	Triadimefon	86%	81%	77%	81%	6%	98%	101%	108%	102%	5%
38	Dacthal	66%	60%	56%	61%	8%	110%	110%	101%	107%	5%
39	Flufenacet	74%	70%	69%	71%	4%	136%	106%	118%	120%	13%
40	Tetraconazole	88%	87%	84%	86%	2%	101%	104%	106%	104%	2%

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
41	Butralin	65%	58%	56%	60%	8%	57%	74%	68%	66%	13%
42	Cyprodinil	76%	75%	70%	74%	4%	107%	104%	106%	106%	1%
43	Pendimethalin	65%	60%	58%	61%	6%	59%	75%	71%	68%	12%
44	Fipronil sulfide	83%	86%	83%	84%	2%	104%	103%	102%	103%	1%
45	Fluazinam	61%	60%	62%	61%	2%	71%	43%	66%	60%	25%
46	Fluopyram	67%	79%	103%	83%	22%	-	-	-	-	-
47	Triadimenol	89%	87%	88%	88%	1%	108%	105%	111%	108%	3%
49	Fipronil	90%	91%	89%	90%	1%	124%	109%	116%	116%	6%
50	Captan	86%	93%	92%	90%	4%	116%	113%	123%	117%	4%
51	Allethrin	61%	64%	67%	64%	5%	68%	32%	65%	55%	36%*
52	Methoprene	39%	42%	45%	42%*	7%	54%	58%	57%	56%	4%
53	Triflumizole	83%	84%	80%	82%	3%	82%	84%	88%	85%	4%
54	Paclobutrazol	91%	91%	87%	90%	3%	94%	93%	94%	94%	1%
55	Flutriafol	96%	91%	85%	91%	6%	95%	105%	99%	100%	5%
56	Flumetralin	64%	67%	61%	64%	5%	64%	70%	63%	66%	6%
57	Napropamide	91%	93%	85%	90%	5%	83%	103%	105%	97%	13%
58	Picoxystrobin	95%	99%	91%	95%	4%	89%	90%	91%	90%	1%
59	Ethalfluralin	91%	92%	83%	89%	6%	111%	113%	110%	111%	1%
60	Flutolanil	96%	89%	85%	90%	6%	105%	109%	102%	105%	3%
61	Fludioxonil	59%	57%	54%	57%	4%	66%	72%	64%	67%	6%
62	*p,p'*-DDE	82%	79%	80%	80%	2%	94%	84%	93%	90%	6%
63	Tribuphos	62%	59%	59%	60%	3%	63%	67%	62%	64%	4%
64	Oxadiazon	78%	75%	72%	75%	4%	118%	116%	114%	116%	2%
65	Myclobutanil	85%	85%	84%	85%	1%	107%	103%	105%	105%	2%
66	Oxyflurofen	70%	74%	71%	72%	3%	85%	81%	83%	83%	2%
67	Fipronil sulfone	92%	100%	93%	95%	5%	117%	114%	116%	116%	1%
68	Kresoxim-methyl	79%	81%	76%	79%	3%	119%	118%	118%	118%	0%
69	Cyproconazole	93%	90%	92%	92%	2%	104%	103%	102%	103%	1%
70	Chlorfenapyr	79%	84%	77%	80%	5%	96%	100%	110%	102%	7%
71	*p,p'*-DDD	60%	60%	54%	58%	6%	66%	75%	74%	72%	7%
72	Quinoxyfen	74%	70%	67%	70%	5%	103%	93%	93%	96%	6%
73	Fenhexamide	114%	111%	108%	111%	3%	267%	249%	174%	230%*	21%
74	*p,p'*-DDT	48%	47%	44%	46%*	4%	67%	73%	72%	71%	5%
75	Propiconazole	88%	96%	89%	91%	5%	100%	100%	98%	99%	1%
76	Trifloxystrobin	89%	88%	81%	86%	5%	100%	100%	101%	100%	1%
77	Fluopicolide	97%	91%	89%	92%	5%	105%	102%	101%	103%	2%
78	Hexazinone	87%	87%	86%	87%	1%	118%	102%	104%	108%	8%
79	Tebuconazole + Metconazole	93%	93%	94%	93%	1%	98%	99%	98%	98%	1%
80	Propargite	46%	63%	63%	57%	17%	90%	75%	87%	84%	9%
81	Piperonyl butoxide	80%	80%	78%	79%	1%	79%	76%	77%	77%	2%
82	Resmethrin	32%	37%	39%	36%*	10%	31%	14%	31%	25%*	39%*
83	Zoxamide	70%	68%	73%	70%	4%	146%	76%	88%	103%	36%*
84	Iprodione	24%	49%	70%	48%*	48%*	116%	68%	84%	89%	27%

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
85	Phosmet	1%	13%	24%	13%*	91%*	111%	65%	83%	86%	27%
86	Tetramethrin	29%	61%	66%	52%	39%*	64%	32%	58%	51%	33%*
87	Tetradifon	96%	97%	91%	95%	3%	102%	94%	99%	98%	4%
89	Fluxapyroxad	102%	96%	95%	98%	4%	99%	103%	107%	103%	4%
90	Bifenthrin	42%	44%	44%	43%*	3%	55%	59%	60%	58%	5%
91	Etoxazole	60%	65%	63%	63%	4%	80%	84%	89%	84%	5%
92	Fenamidone	93%	91%	84%	89%	5%	114%	113%	105%	111%	4%
93	Malaoxon	91%	95%	85%	90%	6%	110%	106%	106%	107%	2%
94	Phenothrin	36%	39%	40%	38%*	5%	41%	25%	45%	37%*	29%
95	Pyriproxyfen	65%	68%	69%	67%	3%	79%	68%	80%	76%	9%
96	Cyhalofop-butyl	71%	71%	73%	72%	2%	95%	74%	85%	85%	12%
97	Cyhalothrin	108%	101%	88%	99%	10%	53%	58%	53%	55%	5%
98	Fenpropathrin	31%	41%	47%	40%*	20%	59%	50%	62%	57%	11%
99	Pyridaben	55%	64%	62%	60%	8%	75%	77%	76%	76%	1%
100	Coumaphos	74%	69%	78%	74%	6%	100%	65%	77%	81%	22%
101	Fenbuconazole	94%	93%	90%	92%	2%	106%	85%	88%	93%	12%
102	Cyfluthrin	44%	51%	55%	50%	11%	67%	53%	62%	61%	12%
103	Boscalid	100%	97%	93%	97%	4%	119%	96%	95%	103%	13%
104	Cypermethrin	50%	52%	58%	53%	8%	68%	63%	67%	66%	4%
105	Etofenprox	45%	48%	51%	48%*	6%	60%	57%	58%	58%	3%
106	Pyraclostrobin	77%	74%	88%	80%	9%	248%	122%	129%	166%*	43%*
107	Esfenvalerate	38%	46%	46%	43%*	11%	66%	45%	59%	57%	19%
108	*tau*-Fluvalinate	30%	36%	42%	36%*	17%	68%	42%	55%	55%	24%
109	Difenoconazole	91%	95%	91%	92%	3%	110%	84%	94%	96%	14%
110	Indoxacarb	40%	36%	48%	41%*	15%	105%	53%	69%	76%	35%*
111	Deltamethrin	26%	53%	52%	44%*	35%*	116%	63%	123%	101%	33%*
112	Azoxystrobin	89%	87%	86%	87%	2%	140%	97%	97%	111%	22%
113	Famoxadone	62%	74%	83%	73%	14%	113%	68%	74%	85%	29%
114	Dimethomorph	101%	102%	93%	99%	5%	145%	112%	109%	122%	16%
115	Fluoxastrobin	69%	69%	80%	73%	9%	215%	129%	123%	156%*	33%*

Table 5B. Recoveries of analytes in 1 L reagent water Laboratory Control Samples (LCSs), arranged by analyte number (Table 1), following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory B, with high spiking levels of 250 ng/L. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red and an asterisk.

#	Analyte	High1	High2	High3	High4	High Mean	High RSD
1	Dichlorvos	35%	38%	35%	29%	34%*	11%
2	Novaluron	3%	3%	4%	3%	3%*	15%
3	3,5-Dichloroaniline	33%	42%	35%	34%	36%*	11%
5	Cycloate	21%	17%	23%	12%	18%*	27%
7	Trifluralin	4%	3%	4%	2%	3%*	29%
9	Benefin	2%	1%	2%	1%	2%*	38%*
10	Pentachloroanisole	11%	12%	13%	9%	11%*	15%
11	Simazine	91%	110%	89%	85%	94%	12%
12	Prometon	109%	100%	105%	118%	108%	7%
13	Carbofuran	9%	8%	9%	10%	9%*	9%
14	Imazalil	97%	91%	94%	96%	95%	3%
15	Atrazine	115%	104%	108%	110%	109%	4%
16	Clomazone	72%	91%	77%	62%	76%	16%
17	Pentachloronitrobenzene	3%	3%	0%	4%	3%*	69%*
18	Propyzamide	70%	76%	73%	60%	70%	10%
19	Pyrimethanil	59%	110%	78%	82%	82%	26%
20	Diazinon	33%	34%	21%	38%	32%*	23%
21	Chlorothalonil	-	-	-	-	-	-
22	Triallate	6%	11%	10%	9%	9%*	24%
23	Tefluthrin	6%	6%	8%	14%	9%*	45%*
24	Tebupirimfos	9%	14%	14%	12%	12%	19%
25	Propanil	112%	107%	110%	123%	113%	6%
26	Methyl parathion	12%	18%	18%	13%	15%	21%
27	Acibenzolar-S-methyl	43%	63%	43%	51%	50%	19%
28	Carbaryl	78%	74%	89%	81%	81%	8%
29	Prometryn	52%	95%	69%	87%	76%	25%
30	Metalaxyl	105%	111%	130%	118%	116%	9%
31	Dithiopyr	24%	22%	19%	12%	19%*	27%
32	Prodiamine	8%	10%	6%	4%	7%*	37%*
33	Thiobencarb	15%	17%	22%	14%	17%*	21%
34	Malathion	55%	61%	48%	76%	60%	20%
35	Metolachlor	58%	41%	59%	76%	59%	24%
36	Chlorpyrifos	7%	16%	15%	12%	13%*	32%*
37	Triadimefon	57%	51%	75%	50%	58%	20%
38	Dacthal	23%	35%	31%	21%	28%*	24%
39	Flufenacet	31%	35%	41%	56%	41%*	27%

#	Analyte	High1	High2	High3	High4	High Mean	High RSD
40	Teraconazole	113%	115%	83%	105%	104%	14%
41	Butralin	4%	5%	3%	2%	4%*	37%*
42	Cyprodinil	24%	49%	36%	23%	33%*	37%*
43	Pendimethalin	4%	5%	6%	4%	5%*	20%
44	Fipronil sulfide	64%	54%	68%	41%	57%	21%
45	Fluazinam	0%	0%	0%	0%	0%*	-
46	Fluopyram	53%	92%	59%	81%	71%	26%
47	Triadimenol	60%	65%	64%	77%	67%	11%
49	Fipronil	50%	79%	56%	70%	64%	21%
50	Captan	4%	4%	2%	1%	3%*	55%*
51	Allethrin	4%	9%	9%	6%	7%*	35%*
52	Methoprene	5%	12%	4%	6%	7%*	53%*
53	Triflumizole	27%	47%	30%	64%	42%*	41%*
54	Paclobutrazol	86%	95%	52%	86%	80%	24%
55	Flutriafol	94%	112%	93%	97%	99%	9%
56	Flumetralin	2%	5%	3%	3%	3%*	39%*
57	Napropamide	50%	45%	67%	42%	51%	22%
58	Picoxystrobin	35%	80%	45%	85%	61%	41%*
59	Ethalfluralin	11%	11%	10%	12%	11%*	7%
60	Flutolanil	63%	66%	80%	97%	77%	20%
61	Fludioxinil	105%	136%	138%	109%	122%	14%
62	*p,p'*-DDE	9%	19%	11%	15%	14%*	33%*
63	Tribuphos	4%	9%	9%	3%	6%*	51%*
64	Oxadiazon	25%	25%	23%	23%	24%*	5%
65	Myclobutanil	116%	135%	169%	91%	128%	26%
66	Oxyflurofen	7%	3%	5%	7%	6%*	35%*
67	Fipronil sulfone	68%	70%	66%	81%	71%	9%
68	Kresoxim-methyl	32%	35%	63%	47%	44%*	32%*
69	Cyproconazole	90%	103%	115%	132%	110%	16%
70	Chlorfenapyr	18%	20%	13%	14%	16%*	20%
71	*p,p'*-DDD	7%	12%	10%	10%	10%*	21%
72	Quinoxyfen	17%	22%	20%	20%	20%*	10%
73	Fenhexamide	17%	17%	19%	13%	17%*	15%
74	*p,p'*-DDT	17%	10%	16%	7%	13%*	38%*
75	Propiconazole	63%	74%	59%	67%	66%	10%
76	Trifloxystrobin	9%	17%	17%	13%	14%*	27%
77	Fluopicolide	54%	65%	76%	42%	59%	25%
78	Hexazinone	113%	140%	139%	136%	132%	10%
79	Tebuconazole + Metcona	112%	85%	101%	102%	100%	11%
80	Propargite	10%	8%	13%	15%	12%*	27%
81	Piperonyl butoxide	16%	18%	14%	20%	17%*	15%
82	Resemethrin	51%	84%	57%	63%	64%	23%
83	Zoxamide	47%	52%	82%	63%	61%	25%

#	Analyte	High1	High2	High3	High4	High Mean	High RSD
84	Iprodione	58%	53%	62%	52%	56%	8%
85	Phosmet	10%	9%	8%	10%	9%*	10%
86	Tetramethrin	7%	6%	5%	8%	7%*	20%
87	Tetradifon	-	-	-	-	-	-
89	Fluxapyroxad	83%	63%	80%	72%	75%	12%
90	Bifenthrin	11%	5%	31%	11%	15%*	78%*
91	Etoxazole	113%	81%	114%	95%	101%	16%
92	Fenamidone	115%	82%	115%	96%	102%	16%
93	Malaoxon	104%	94%	75%	77%	88%	16%
94	Phenothrin	17%	10%	5%	14%	12%*	45%*
95	Pyriproxyfen	-	-	-	-	-	-
96	Cyhalofop-butyl	16%	16%	14%	12%	15%*	13%
97	Cyhalothrin	11%	5%	31%	11%	15%*	78%*
98	Fenpropathrin	14%	14%	13%	15%	14%*	6%
99	Pyridaben	9%	3%	9%	8%	7%*	40%*
100	Coumaphos	-	-	-	-	-	-
101	Fenbuconazole	96%	102%	103%	122%	106%	11%
102	Cyfluthrin	48%	72%	47%	50%	54%	22%
103	Boscalid	81%	87%	60%	55%	71%	22%
104	Cypermethrin	73%	62%	76%	107%	80%	24%
105	Etofenprox	21%	24%	9%	10%	16%*	48%*
106	Pyraclostrobin	54%	56%	93%	72%	69%	26%
107	Esfenvalerate	-	-	1%	-	0%*	200%*
108	*tau*-Fluvalinate	11%	7%	9%	26%	13%*	65%*
109	Difenoconazole	26%	30%	41%	41%	35%*	22%
110	Indoxacarb	27%	23%	43%	43%	34%*	31%*
111	Deltamethrin	14%	8%	29%	7%	15%*	70%*
112	Azoxystrobin	99%	87%	86%	75%	87%	11%
113	Famoxadone	40%	48%	32%	30%	38%*	22%
114	Dimethomorph	125%	111%	97%	91%	106%	14%
115	Fluoxastrobin	94%	89%	118%	77%	95%	18%

Table 5C. Recoveries of analytes in 1 L reagent water Laboratory Control Samples (LCSs), arranged by analyte number (Table 1), following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory C, with low spiking levels of 50 ng/L. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red and an asterisk.

#	Analyte	Low1	Low2	Low3	Low4	Low5	Low6	Low7	Low Mean	Low RSD
1	Dichlorvos	79%	74%	88%	126%	90%	123%	126%	101%	23%
2	Novaluron	76%	54%	85%	95%	109%	128%	79%	89%	27%
3	3,5-Dichloroaniline	70%	63%	86%	116%	80%	98%	91%	86%	21%
5	Cycloate	81%	83%	94%	128%	92%	120%	127%	104%	20%
7	Trifluralin	77%	69%	71%	137%	78%	103%	112%	92%	28%
9	Benefin	71%	62%	76%	122%	70%	102%	117%	89%	28%
10	Pentachloroanisole	53%	64%	60%	104%	60%	105%	90%	77%	29%
11	Simazine	73%	62%	98%	95%	77%	123%	123%	93%	26%
12	Prometon	74%	79%	99%	117%	127%	129%	140%	109%	24%
13	Carbofuran	118%	119%	95%	143%	147%	163%	164%	136%	19%
14	Imazalil	60%	62%	71%	91%	107%	103%	129%	89%	29%
15	Atrazine	66%	57%	68%	99%	77%	117%	117%	86%	29%
16	Clomazone	58%	60%	78%	100%	73%	102%	106%	82%	25%
17	Pentachloronitrobenzene	63%	77%	78%	106%	74%	109%	137%	92%	28%
18	Propyzamide	60%	74%	77%	113%	90%	114%	115%	92%	24%
19	Pyrimethanil	57%	62%	62%	94%	79%	96%	109%	80%	25%
20	Diazinon	61%	61%	69%	82%	80%	104%	139%	85%	33%*
21	Chlorothalonil	-	-	-	-	-	-	-	-	-
22	Triallate	67%	66%	74%	110%	75%	114%	113%	88%	26%
23	Tefluthrin	68%	63%	57%	105%	65%	102%	114%	82%	29%
24	Tebupirimfos	73%	92%	89%	112%	80%	98%	113%	94%	16%
25	Propanil	92%	69%	116%	143%	145%	150%	146%	123%	26%
26	Methyl parathion	56%	63%	66%	132%	108%	125%	95%	92%	34%*
27	Acibenzolar-S-methyl	61%	61%	70%	114%	73%	123%	93%	85%	30%
28	Carbaryl	135%	181%	137%	229%	187%	182%	214%	181%*	20%
29	Prometryn	58%	74%	87%	102%	121%	115%	113%	96%	25%
30	Metalaxyl	71%	78%	112%	129%	125%	112%	131%	108%	22%
31	Dithiopyr	68%	67%	76%	92%	65%	99%	116%	83%	23%
32	Prodiamine	40%	62%	78%	96%	90%	98%	119%	83%	31%*
33	Thiobencarb	55%	63%	72%	100%	89%	104%	106%	84%	25%
34	Malathion	60%	60%	83%	108%	92%	103%	100%	87%	23%
35	Metolachlor	63%	69%	75%	101%	93%	109%	106%	88%	21%
36	Chlorpyrifos	63%	66%	89%	104%	68%	101%	120%	87%	25%
37	Triadimefon	72%	73%	110%	125%	121%	154%	129%	112%	27%
38	Dacthal	56%	61%	72%	94%	74%	84%	91%	76%	19%
39	Flufenacet	76%	80%	104%	134%	115%	144%	135%	113%	24%
40	Teraconazole	68%	83%	111%	121%	118%	129%	143%	110%	24%
41	Butralin	60%	74%	89%	114%	77%	117%	98%	90%	24%
42	Cyprodinil	53%	82%	92%	57%	91%	101%	145%	89%	35%*

#	Analyte	Low1	Low2	Low3	Low4	Low5	Low6	Low7	Low Mean	Low RSD
43	Pendimethalin	56%	68%	110%	130%	89%	170%	132%	108%	37%*
44	Fipronil sulfide	79%	101%	112%	118%	130%	159%	122%	117%	21%
45	Fluazinam	324%	283%	209%	6%	410%	308%	287%	261%*	49%*
46	Fluopyram	81%	91%	101%	124%	129%	175%	162%	123%	29%
47	Triadimenol	71%	133%	177%	136%	175%	168%	94%	136%	30%*
49	Fipronil	102%	127%	168%	148%	189%	186%	136%	151%*	21%
50	Captan	41%	147%	67%	216%	143%	158%	186%	137%	46%*
51	Allethrin	98%	100%	102%	191%	131%	137%	169%	133%	27%
52	Methoprene	67%	66%	76%	128%	117%	159%	145%	108%	36%*
53	Triflumizole	86%	133%	114%	149%	140%	170%	180%	139%	23%
54	Paclobutrazol	182%	100%	0%	0%	123%	165%	58%	90%	82%*
55	Flutriafol	83%	87%	133%	127%	157%	146%	146%	126%	23%
56	Flumetralin	71%	78%	92%	143%	121%	145%	147%	114%	29%
57	Napropamide	70%	77%	111%	150%	137%	148%	143%	119%	28%
58	Picoxystrobin	80%	81%	128%	135%	157%	138%	143%	123%	25%
59	Ethalfluralin	44%	8%	0%	39%	121%	70%	157%	63%	92%*
60	Flutolanil	75%	86%	116%	128%	145%	160%	151%	123%	27%
61	Fludioxinil	67%	87%	124%	148%	168%	156%	160%	130%	30%*
62	*p,p'*-DDE	47%	59%	52%	106%	85%	106%	95%	79%	32%*
63	Tribuphos	68%	70%	92%	116%	116%	123%	128%	102%	25%
64	Oxadiazon	61%	57%	68%	107%	117%	111%	106%	90%	29%
65	Myclobutanil	70%	85%	120%	132%	154%	136%	132%	118%	25%
66	Oxyflurofen	51%	73%	90%	104%	111%	141%	117%	98%	30%*
67	Fipronil sulfone	66%	103%	110%	121%	168%	151%	155%	125%	29%
68	Kresoxim-methyl	83%	70%	107%	128%	133%	143%	145%	116%	26%
69	Cyproconazole	83%	359%	254%	204%	153%	242%	222%	217%*	40%*
70	Chlorfenapyr	74%	90%	98%	126%	142%	137%	133%	114%	23%
71	*p,p'*-DDD	72%	73%	85%	105%	109%	121%	105%	96%	20%
72	Quinoxyfen	58%	71%	85%	114%	131%	123%	109%	99%	28%
73	Fenhexamide	258%	232%	419%	327%	562%	529%	601%	418%*	36%*
74	*p,p'*-DDT	72%	89%	107%	158%	176%	146%	150%	128%	30%*
75	Propiconazole	78%	83%	122%	121%	159%	145%	141%	121%	25%
76	Trifloxystrobin	70%	75%	118%	125%	160%	165%	148%	123%	31%*
77	Fluopicolide	80%	94%	102%	128%	141%	121%	138%	115%	20%
78	Hexazinone	62%	86%	96%	121%	157%	134%	134%	113%	29%
79	Tebuconazole + Metcona	72%	77%	137%	155%	174%	182%	167%	138%	33%*
80	Propargite	64%	76%	115%	119%	159%	150%	142%	118%	31%*
81	Piperonyl butoxide	59%	70%	91%	144%	162%	130%	132%	113%	35%*
82	Resemethrin	70%	77%	89%	127%	128%	134%	127%	107%	26%
83	Zoxamide	148%	90%	152%	134%	2346%	150%	95%	445%*	188%*
84	Iprodione	115%	165%	158%	196%	167%	147%	169%	160%*	15%
85	Phosmet	79%	93%	110%	161%	143%	165%	151%	129%	27%
86	Tetramethrin	79%	76%	73%	99%	72%	114%	98%	87%	19%
87	Tetradifon	75%	94%	129%	155%	157%	161%	153%	132%	26%

#	Analyte	Low1	Low2	Low3	Low4	Low5	Low6	Low7	Low Mean	Low RSD
89	Fluxapyroxad	55%	81%	108%	117%	148%	139%	144%	113%	31%*
90	Bifenthrin	72%	74%	107%	108%	121%	123%	98%	100%	21%
91	Etoxazole	72%	108%	154%	147%	153%	82%	151%	124%	29%
92	Fenamidone	61%	82%	79%	97%	93%	96%	92%	86%	15%
93	Malaoxon	59%	66%	74%	86%	102%	103%	90%	83%	21%
94	Phenothrin	70%	69%	76%	101%	80%	100%	101%	85%	17%
95	Pyriproxyfen	66%	67%	88%	90%	103%	112%	97%	89%	19%
96	Cyhalofop-butyl	69%	66%	78%	82%	97%	92%	98%	83%	16%
97	Cyhalothrin	70%	71%	89%	92%	98%	99%	93%	87%	14%
98	Fenpropathrin	108%	108%	135%	136%	146%	144%	140%	131%	12%
99	Pyridaben	76%	60%	98%	98%	99%	109%	100%	91%	19%
100	Coumaphos	83%	57%	89%	101%	95%	116%	89%	90%	20%
101	Fenbuconazole	83%	62%	101%	109%	122%	117%	113%	101%	21%
102	Cyfluthrin	102%	68%	128%	109%	130%	123%	129%	113%	20%
103	Boscalid	76%	69%	95%	96%	125%	116%	101%	97%	21%
104	Cypermethrin	88%	71%	98%	84%	87%	121%	87%	91%	17%
105	Etofenprox	74%	63%	87%	95%	101%	99%	125%	92%	22%
106	Pyraclostrobin	183%	127%	135%	140%	143%	225%	238%	170%*	27%
107	Esfenvalerate	134%	96%	152%	110%	110%	167%	142%	130%	20%
108	*tau*-Fluvalinate	92%	68%	85%	105%	123%	111%	113%	100%	19%
109	Difenoconazole	90%	54%	117%	118%	92%	110%	144%	104%	27%
110	Indoxacarb	76%	71%	97%	91%	84%	140%	112%	96%	25%
111	Deltamethrin	106%	106%	125%	159%	135%	153%	140%	132%	16%
112	Azoxystrobin	69%	63%	101%	109%	126%	112%	130%	101%	26%
113	Famoxadone	70%	78%	100%	123%	165%	173%	154%	123%	34%*
114	Dimethomorph	70%	64%	93%	85%	109%	98%	97%	88%	18%
115	Fluoxastrobin	83%	85%	97%	110%	116%	117%	113%	103%	14%

Table 5D. Recoveries of analytes in 1 L reagent water Laboratory Control Samples (LCSs), arranged by analyte number (Table 1), following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory D, with high and low spiking levels of 500 ng/L and 100 ng/L, respectively. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red and an asterisk.

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
1	Dichlorvos	84%	79%	74%	79%	6%	93%	81%	81%	85%	8%
2	Novaluron	57%	33%	25%	38%*	43%*	45%	27%	44%	39%*	26%
3	3,5-Dichloroaniline	67%	58%	58%	61%	9%	71%	47%	38%	52%	33%*
5	Cycloate	83%	72%	73%	76%	8%	91%	67%	75%	78%	16%
7	Trifluralin	83%	72%	73%	76%	8%	86%	55%	72%	71%	22%
9	Benefin	83%	69%	61%	71%	16%	84%	53%	68%	68%	22%
10	Pentachloroanisole	60%	56%	59%	58%	3%	80%	55%	62%	66%	19%
11	Simazine	94%	91%	88%	91%	3%	91%	81%	83%	85%	6%
12	Prometon	87%	89%	87%	87%	1%	98%	70%	76%	81%	18%
13	Carbofuran	75%	86%	86%	82%	7%	81%	80%	79%	80%	1%
14	Imazalil	93%	88%	80%	87%	7%	89%	78%	80%	83%	7%
15	Atrazine	94%	88%	82%	88%	7%	94%	73%	77%	81%	14%
16	Clomazone	92%	84%	77%	84%	9%	96%	76%	84%	85%	12%
17	Pentachloronitrobenzene	65%	58%	59%	60%	7%	81%	52%	64%	66%	22%
18	Propyzamide	93%	87%	88%	89%	4%	98%	67%	82%	82%	19%
19	Pyrimethanil	91%	81%	77%	83%	9%	95%	68%	72%	78%	18%
20	Diazinon	91%	79%	79%	83%	8%	97%	60%	80%	79%	23%
21	Chlorothalonil	7%	40%	50%	33%*	69%*	0%	11%	35%	15%*	117%*
22	Triallate	85%	72%	72%	76%	10%	95%	58%	77%	76%	24%
23	Tefluthrin	86%	68%	67%	74%	15%	86%	50%	67%	67%	27%
24	Tebupirimfos	91%	77%	95%	88%	11%	89%	58%	85%	77%	22%
25	Propanil	85%	86%	83%	85%	2%	88%	66%	67%	74%	17%
26	Methyl parathion	78%	78%	76%	77%	2%	73%	53%	64%	63%	16%
27	Acibenzolar-S-methyl	83%	73%	76%	77%	7%	84%	64%	74%	74%	14%
28	Carbaryl	58%	69%	68%	65%	10%	59%	62%	63%	61%	4%
29	Prometryn	95%	88%	92%	92%	3%	104%	74%	87%	89%	17%
30	Metalaxyl	94%	89%	91%	91%	3%	100%	79%	87%	89%	12%
31	Dithiopyr	93%	82%	83%	86%	7%	98%	58%	88%	81%	26%
32	Prodiamine	94%	84%	84%	87%	7%	91%	57%	80%	76%	23%
33	Thiobencarb	90%	76%	76%	81%	10%	92%	55%	79%	75%	25%
34	Malathion	89%	82%	89%	86%	5%	83%	51%	72%	69%	24%
35	Metolachlor	94%	88%	90%	91%	4%	104%	68%	86%	86%	21%
36	Chlorpyrifos	87%	72%	76%	78%	10%	77%	39%	63%	60%	33%*
37	Triadimefon	94%	83%	86%	88%	7%	97%	57%	79%	78%	26%
38	Dacthal	93%	82%	86%	87%	6%	101%	59%	83%	81%	26%
39	Flufenacet	87%	86%	86%	87%	1%	93%	61%	76%	77%	21%
40	Teraconazole	96%	84%	88%	89%	7%	103%	57%	74%	78%	30%*
41	Butralin	92%	75%	74%	80%	13%	85%	50%	72%	69%	26%

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
42	Cyprodinil	93%	84%	87%	88%	5%	101%	62%	81%	81%	24%
43	Pendimethalin	90%	77%	77%	81%	10%	76%	42%	64%	61%	28%
44	Fipronil sulfide	96%	89%	92%	92%	4%	107%	59%	90%	85%	29%
45	Fluazinam	53%	84%	128%	88%	42%*	50%	72%	98%	73%	33%*
46	Fluopyram	93%	88%	85%	89%	5%	100%	64%	84%	83%	22%
47	Triadimenol	63%	70%	56%	63%	11%	72%	51%	54%	59%	19%
49	Fipronil	118%	107%	199%	141%	36%*	96%	89%	132%	106%	22%
50	Captan	0%	40%	44%	28%*	87%*	0%	15%	24%	13%*	94%*
51	Allethrin	85%	55%	35%	58%	43%*	62%	30%	33%	42%*	42%*
52	Methoprene	89%	67%	61%	72%	20%	69%	37%	57%	54%	30%
53	Triflumizole	87%	75%	64%	75%	15%	82%	43%	67%	64%	30%*
54	Paclobutrazol	66%	67%	57%	64%	9%	77%	52%	55%	61%	23%
55	Flutriafol	90%	83%	74%	82%	10%	88%	66%	69%	74%	16%
56	Flumetralin	90%	79%	75%	81%	10%	78%	55%	79%	70%	20%
57	Napropamide	95%	89%	90%	91%	3%	89%	67%	88%	81%	16%
58	Picoxystrobin	94%	83%	80%	85%	9%	88%	57%	84%	76%	22%
59	Ethalfluralin	94%	83%	85%	87%	7%	83%	53%	79%	72%	23%
60	Flutolanil	90%	82%	80%	84%	7%	88%	61%	78%	76%	18%
61	Fludioxinil	91%	86%	88%	88%	3%	83%	59%	82%	75%	18%
62	*p,p'*-DDE	95%	88%	85%	89%	6%	92%	59%	89%	80%	22%
63	Tribuphos	94%	83%	82%	87%	8%	89%	58%	76%	75%	21%
64	Oxadiazon	95%	81%	81%	86%	9%	88%	58%	89%	78%	23%
65	Myclobutanil	95%	79%	71%	82%	15%	83%	52%	79%	71%	23%
66	Oxyflurofen	88%	77%	73%	79%	10%	71%	52%	75%	66%	19%
67	Fipronil sulfone	90%	80%	79%	83%	7%	80%	52%	69%	67%	21%
68	Kresoxim-methyl	94%	84%	86%	88%	6%	92%	62%	88%	81%	20%
69	Cyproconazole	100%	95%	87%	94%	7%	94%	70%	85%	83%	15%
70	Chlorfenapyr	90%	79%	78%	82%	8%	87%	56%	84%	76%	23%
71	*p,p'*-DDD	94%	83%	83%	87%	7%	89%	59%	84%	77%	21%
72	Quinoxyfen	94%	81%	81%	85%	8%	86%	56%	83%	75%	22%
73	Fenhexamide	75%	73%	87%	78%	10%	64%	62%	84%	70%	18%
74	*p,p'*-DDT	91%	77%	78%	82%	10%	80%	52%	73%	68%	21%
75	Propiconazole	92%	77%	85%	84%	9%	85%	49%	65%	66%	27%
76	Trifloxystrobin	94%	83%	79%	85%	9%	87%	56%	81%	74%	22%
77	Fluopicolide	96%	90%	91%	93%	4%	94%	70%	88%	84%	15%
78	Hexazinone	98%	96%	96%	96%	1%	97%	95%	92%	95%	3%
79	Tebuconazole + Metcona	93%	86%	77%	85%	10%	87%	55%	69%	70%	23%
80	Propargite	101%	80%	74%	85%	17%	106%	59%	79%	81%	29%
81	Piperonyl butoxide	92%	82%	80%	85%	8%	84%	57%	78%	73%	20%
82	Resemethrin	77%	43%	22%	47%*	59%*	35%	15%	22%	24%*	42%*
83	Zoxamide	70%	73%	76%	73%	4%	64%	47%	64%	58%	17%
84	Iprodione	88%	97%	170%	118%	38%*	81%	96%	123%	100%	21%
85	Phosmet	72%	64%	64%	67%	7%	62%	38%	44%	48%*	26%
86	Tetramethrin	91%	65%	44%	67%	35%*	70%	39%	45%	51%	33%*

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
87	Tetradifon	100%	95%	97%	97%	3%	93%	62%	88%	81%	21%
89	Fluxapyroxad	100%	97%	97%	98%	2%	97%	72%	93%	88%	15%
90	Bifenthrin	98%	87%	84%	89%	8%	95%	64%	94%	84%	21%
91	Etoxazole	100%	88%	84%	91%	9%	94%	60%	80%	78%	22%
92	Fenamidone	99%	94%	97%	97%	3%	98%	72%	93%	88%	16%
93	Malaoxon	96%	92%	94%	94%	2%	88%	62%	82%	77%	17%
94	Phenothrin	90%	60%	37%	62%	43%*	65%	43%	49%	52%	22%
95	Pyriproxyfen	92%	82%	80%	85%	8%	87%	56%	81%	75%	22%
96	Cyhalofop-butyl	94%	87%	83%	88%	6%	91%	59%	87%	79%	22%
97	Cyhalothrin	88%	86%	78%	84%	6%	79%	58%	82%	73%	18%
98	Fenpropathrin	96%	84%	81%	87%	9%	86%	56%	83%	75%	22%
99	Pyridaben	94%	82%	77%	84%	10%	81%	49%	72%	67%	25%
100	Coumaphos	86%	78%	74%	80%	7%	77%	46%	62%	62%	26%
101	Fenbuconazole	86%	76%	66%	76%	13%	69%	37%	56%	54%	30%
102	Cyfluthrin	86%	84%	72%	81%	9%	70%	45%	69%	61%	24%
103	Boscalid	93%	88%	88%	90%	3%	92%	62%	81%	78%	19%
104	Cypermethrin	89%	87%	81%	86%	5%	97%	70%	86%	84%	16%
105	Etofenprox	96%	87%	85%	89%	6%	94%	63%	91%	83%	21%
106	Pyraclostrobin	75%	79%	80%	78%	3%	59%	51%	61%	57%	9%
107	Esfenvalerate	87%	82%	82%	84%	4%	72%	42%	65%	60%	26%
108	tau-Fluvalinate	87%	88%	82%	86%	3%	80%	58%	79%	72%	17%
109	Difenoconazole	92%	68%	69%	76%	18%	90%	41%	59%	63%	40%*
110	Indoxacarb	95%	88%	87%	90%	5%	96%	63%	94%	85%	22%
111	Deltamethrin	81%	30%	25%	45%*	68%*	61%	6%	6%	24%*	131%*
112	Azoxystrobin	104%	98%	102%	101%	3%	109%	77%	94%	93%	17%
113	Famoxadone	99%	87%	88%	91%	7%	95%	61%	81%	79%	22%
114	Dimethomorph	103%	91%	90%	94%	8%	107%	72%	81%	87%	21%
115	Fluoxastrobin	96%	76%	75%	82%	14%	77%	42%	47%	55%	35%*

Table 5X. Recoveries of analytes in 1 L reagent water Laboratory Control Samples (LCSs), arranged by analyte number (Table 1), following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Summary of performance data from all laboratories, with high and low spiking levels of 250-500 ng/L and 50-100 ng/L, respectively. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red and an asterisk.

#	Analyte	Total High Mean	Total High RSD	Total Low Mean	Total Low RSD
1	Dichlorvos	52%	39%*	96%	19%
2	Novaluron	21%*	85%*	64%	53%*
3	3,5-Dichloroaniline	50%*	28%	77%	27%
5	Cycloate	42%*	62%*	93%	23%
7	Trifluralin	35%*	93%*	77%	38%*
9	Benefin	32%*	96%*	74%	36%*
10	Pentachloroanisole	27%*	82%*	64%	41%*
11	Simazine	88%	12%	94%	20%
12	Prometon	93%	16%	101%	23%
13	Carbofuran	44%*	74%*	111%	32%*
14	Imazalil	85%	14%	93%	24%
15	Atrazine	90%	21%	94%	27%
16	Clomazone	73%	19%	93%	26%
17	Pentachloronitrobenzene	26%*	97%*	77%	36%*
18	Propyzamide	75%	14%	92%	20%
19	Pyrimethanil	76%	22%	85%	22%
20	Diazinon	54%	43%*	88%	26%
21	Chlorothalonil	35%*	110%*	268%*	114%*
22	Triallate	38%*	79%*	82%	26%
23	Tefluthrin	33%*	90%*	69%	38%*
24	Tebupirimfos	46%*	74%*	89%	18%
25	Propanil	95%	17%	110%	29%
26	Methyl parathion	49%*	60%*	85%	30%*
27	Acibenzolar-S-methyl	66%	23%	87%	25%
28	Carbaryl	69%	17%	136%	43%*
29	Prometryn	83%	16%	100%	22%
30	Metalaxyl	92%	28%	100%	20%
31	Dithiopyr	46%*	65%*	82%	30%
32	Prodiamine	53%	75%*	82%	25%
33	Thiobencarb	52%	59%*	89%	26%
34	Malathion	70%	19%	86%	23%
35	Metolachlor	74%	23%	96%	23%
36	Chlorpyrifos	43%*	68%*	80%	27%
37	Triadimefon	74%	21%	102%	27%
38	Dacthal	55%	48%*	84%	22%

#	Analyte	Total High Mean	Total High RSD	Total Low Mean	Total Low RSD
39	Flufenacet	64%	34%*	106%	26%
40	Teraconazole	94%	13%	101%	25%
41	Butralin	43%*	82%*	80%	26%
42	Cyprodinil	62%	43%*	91%	27%
43	Pendimethalin	45%*	80%*	88%	42%*
44	Fipronil sulfide	76%	24%	107%	23%
45	Fluazinam	45%*	98%*	171%*	79%*
46	Fluopyram	80%	20%	111%	32%*
47	Triadimenol	72%	17%	112%	39%*
49	Fipronil	95%	45%*	132%	25%
50	Captan	37%*	111%*	104%	66%*
51	Allethrin	39%*	77%*	94%	56%*
52	Methoprene	37%*	80%*	84%	47%*
53	Triflumizole	64%	35%*	109%	38%*
54	Paclobutrazol	78%	20%	84%	64%*
55	Flutriafol	92%	11%	108%	28%
56	Flumetralin	45%*	82%*	93%	37%*
57	Napropamide	75%	29%	105%	29%
58	Picoxystrobin	79%	27%	105%	30%
59	Ethalfluralin	57%	70%*	76%	61%*
60	Flutolanil	83%	14%	108%	29%
61	Fludioxinil	92%	33%*	103%	41%*
62	*p,p'*-DDE	56%	66%*	82%	25%
63	Tribuphos	46%*	78%*	87%	30%
64	Oxadiazon	58%	51%*	93%	26%
65	Myclobutanil	101%	30%*	104%	28%
66	Oxyflurofen	47%*	77%*	87%	29%
67	Fipronil sulfone	82%	14%	109%	33%*
68	Kresoxim-methyl	68%	33%*	108%	25%
69	Cyproconazole	100%	14%	160%*	56%*
70	Chlorfenapyr	55%	61%*	103%	25%
71	*p,p'*-DDD	47%*	73%*	86%	22%
72	Quinoxyfen	55%	57%*	93%	25%
73	Fenhexamide	63%	67%*	294%*	63%*
74	*p,p'*-DDT	43%*	71%*	101%	41%*
75	Propiconazole	79%	16%	104%	31%*
76	Trifloxystrobin	57%	65%*	107%	33%*
77	Fluopicolide	79%	24%	105%	21%
78	Hexazinone	108%	21%	108%	23%
79	Tebuconazole + Metcona	94%	11%	113%	39%*
80	Propargite	47%*	72%*	102%	33%*
81	Piperonyl butoxide	56%	60%*	95%	36%*
82	Resemethrin	51%	39%*	69%	69%*

#	Analyte	Total High Mean	Total High RSD	Total Low Mean	Total Low RSD
83	Zoxamide	67%	16%	277%*	225%*
84	Iprodione	72%	55%*	130%	31%*
85	Phosmet	28%*	101%*	100%	44%*
86	Tetramethrin	38%*	82%*	71%	34%*
87	Tetradifon	58%	86%*	112%	30%*
89	Fluxapyroxad	89%	15%	105%	26%
90	Bifenthrin	46%*	74%*	87%	28%
91	Etoxazole	86%	23%	104%	33%*
92	Fenamidone	97%	11%	92%	17%
93	Malaoxon	90%	10%	87%	20%
94	Phenothrin	35%*	74%*	67%	38%*
95	Pyriproxyfen	46%*	88%*	83%	19%
96	Cyhalofop-butyl	54%	64%*	83%	15%
97	Cyhalothrin	61%	68%*	77%	22%
98	Fenpropathrin	44%*	74%*	101%	37%*
99	Pyridaben	46%*	76%*	82%	21%
100	Coumaphos	46%*	87%*	81%	25%
101	Fenbuconazole	93%	16%	88%	30%
102	Cyfluthrin	61%	26%	89%	36%*
103	Boscalid	84%	18%	94%	20%
104	Cypermethrin	73%	25%	84%	19%
105	Etofenprox	48%*	68%*	82%	26%
106	Pyraclostrobin	75%	16%	143%	46%*
107	Esfenvalerate	38%*	96%*	97%	44%*
108	*tau*-Fluvalinate	42%*	78%*	83%	30%
109	Difenoconazole	64%	43%*	93%	31%*
110	Indoxacarb	53%	50%*	89%	26%
111	Deltamethrin	33%*	71%*	100%	51%*
112	Azoxystrobin	91%	10%	102%	23%
113	Famoxadone	64%	39%*	104%	37%*
114	Dimethomorph	100%	11%	95%	23%
115	Fluoxastrobin	84%	18%	104%	42%*

Table 6A. Recoveries of analytes on Chemcatcher passive sampler (47 mm diameter Hydrophilic-Lipophilic Balance HLB disk) laboratory control samples (LCSs), arranged by analyte number (Table 1). Performance data from Laboratory A, with high and low spiking levels of 250 ng/disk and 100 ng/disk, respectively. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low4	Low5	Low6	Low Mean	Low RSD
1	Dichlorvos	49%	56%	57%	54%	8%	77%	62%	71%	65%	87%	62%	71%	14%
2	Novaluron	31%	39%	32%	34%*	13%	16%	15%	57%	21%	25%	14%	25%*	66%*
3	3,5-Dichloroaniline	68%	67%	67%	67%	1%	103%	74%	100%	94%	78%	87%	89%	13%
5	Cycloate	51%	58%	58%	56%	7%	57%	47%	59%	69%	76%	58%	61%	17%
7	Trifluralin	57%	58%	49%	55%	9%	54%	39%	50%	60%	65%	44%	52%	19%
9	Benefin	58%	58%	49%	55%	9%	57%	45%	50%	63%	69%	50%	56%	16%
10	Pentachloroanisole	51%	51%	47%	50%*	5%	25%	24%	31%	35%	47%	29%	32%*	27%
11	Simazine	79%	77%	74%	77%	3%	90%	78%	79%	88%	114%	67%	86%	19%
12	Prometon	78%	73%	69%	73%	6%	81%	74%	74%	84%	97%	72%	80%	12%
13	Carbofuran	44%	58%	46%	49%*	15%	34%	50%	34%	20%	34%	20%	32%*	35%
14	Imazalil	69%	74%	70%	71%	4%	84%	73%	81%	83%	89%	74%	81%	8%
15	Atrazine	62%	70%	69%	67%	7%	94%	83%	87%	87%	98%	81%	88%	7%
16	Clomazone	55%	64%	58%	59%	8%	89%	70%	87%	88%	92%	78%	84%	10%
17	Pentachloronitrobenzene	58%	58%	50%	55%	8%	44%	31%	49%	51%	33%	41%	42%*	20%
18	Propyzamide	73%	71%	67%	70%	4%	87%	75%	76%	78%	85%	67%	78%	9%
19	Pyrimethanil	67%	68%	71%	69%	3%	154%	61%	78%	68%	79%	45%	81%	47%
20	Diazinon	78%	68%	67%	71%	9%	85%	65%	72%	65%	96%	69%	75%	17%
21	Chlorothalonil	-	-	-	-	-	198%	366%	561%	227%	65%	335%	292%*	58%*
22	Triallate	52%	62%	57%	57%	9%	59%	47%	56%	65%	82%	58%	61%	19%
23	Tefluthrin	57%	62%	57%	59%	5%	49%	44%	52%	55%	76%	59%	56%	20%
24	Tebupirimfos	72%	64%	64%	67%	7%	74%	54%	56%	58%	92%	61%	66%	22%
25	Propanil	67%	78%	73%	73%	8%	108%	103%	94%	95%	85%	71%	93%	14%
26	Methyl parathion	61%	63%	58%	61%	4%	79%	64%	73%	59%	77%	56%	68%	14%
27	Acibenzolar-S-methyl	21%	32%	19%	24%*	29%	16%	42%	21%	12%	14%	10%	19%*	62%*
28	Carbaryl	72%	70%	70%	71%	2%	94%	77%	81%	83%	95%	73%	84%	11%
29	Prometryn	61%	73%	65%	66%	9%	60%	47%	74%	47%	42%	44%	52%	24%
30	Metalaxyl	87%	86%	80%	84%	4%	99%	67%	91%	80%	58%	76%	79%	19%
31	Dithiopyr	71%	76%	71%	73%	4%	97%	71%	80%	81%	84%	74%	81%	11%
32	Prodiamine	81%	79%	72%	77%	6%	99%	75%	78%	80%	82%	64%	80%	14%
33	Thiobencarb	63%	73%	73%	70%	8%	87%	63%	79%	74%	92%	67%	77%	15%
34	Malathion	69%	68%	60%	66%	8%	80%	71%	65%	63%	87%	52%	70%	18%
35	Metolachlor	67%	70%	68%	68%	2%	91%	74%	83%	88%	90%	79%	84%	8%
36	Chlorpyrifos	69%	62%	63%	65%	6%	79%	59%	67%	57%	92%	60%	69%	20%
37	Triadimefon	80%	81%	80%	80%	1%	185%	77%	85%	79%	90%	52%	95%	49%
38	Dacthal	58%	65%	61%	61%	6%	90%	69%	79%	78%	81%	68%	78%	11%
39	Flufenacet	66%	71%	59%	65%	9%	100%	87%	87%	84%	86%	80%	87%	8%
40	Teraconazole	96%	83%	81%	87%	9%	201%	87%	98%	82%	84%	54%	101%	51%*
41	Butralin	68%	66%	56%	63%	10%	80%	60%	66%	71%	69%	56%	67%	13%
42	Cyprodinil	75%	73%	75%	74%	2%	175%	75%	83%	73%	87%	49%	90%	48%

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low4	Low5	Low6	Low Mean	Low RSD
43	Pendimethalin	73%	68%	58%	66%	12%	81%	58%	67%	72%	74%	58%	68%	13%
44	Fipronil sulfide	76%	83%	72%	77%	7%	111%	105%	96%	78%	94%	81%	94%	14%
45	Captan	72%	76%	68%	72%	6%	85%	71%	80%	68%	75%	72%	75%	8%
46	Fluazinam	-	-	-	-	-	-	-	-	-	-	-	-	-
47	Fluopyram	86%	64%	76%	75%	15%	210%	94%	102%	87%	86%	50%	105%	52%*
49	Triadimenol	102%	92%	88%	94%	8%	228%	93%	101%	89%	101%	59%	112%	53%*
50	Fipronil	68%	63%	51%	61%	14%	115%	98%	102%	73%	88%	75%	92%	18%
51	Allethrin	74%	72%	65%	70%	7%	82%	69%	71%	63%	74%	67%	71%	9%
52	Methoprene	80%	79%	72%	77%	6%	88%	73%	74%	65%	87%	56%	74%	17%
53	Triflumizole	87%	79%	74%	80%	8%	163%	68%	79%	63%	65%	44%	80%	52%*
54	Paclobutrazol	95%	79%	76%	83%	12%	109%	89%	89%	87%	84%	64%	87%	16%
55	Flutriafol	101%	81%	86%	89%	12%	181%	78%	75%	83%	84%	51%	92%	49%
56	Flumetralin	81%	77%	69%	76%	8%	80%	68%	57%	65%	65%	53%	65%	15%
57	Napropamide	79%	76%	74%	76%	3%	86%	75%	67%	80%	85%	66%	77%	11%
58	Ethalfluralin	91%	93%	91%	92%	1%	100%	65%	86%	92%	54%	59%	76%	25%
59	Picoxystrobin	91%	89%	86%	89%	3%	109%	79%	90%	90%	51%	74%	82%	24%
60	Flutolanil	96%	98%	91%	95%	4%	114%	80%	90%	95%	50%	73%	84%	26%
61	*p,p'*-DDE	72%	76%	75%	74%	3%	121%	70%	66%	69%	72%	49%	75%	33%
62	Fludioxinil	78%	84%	87%	83%	6%	218%	79%	74%	79%	73%	51%	96%	64%*
63	Tribuphos	80%	77%	77%	78%	2%	77%	58%	54%	63%	65%	52%	62%	15%
64	Oxadiazon	72%	80%	83%	78%	7%	109%	92%	79%	101%	95%	80%	93%	13%
65	Myclobutanil	87%	81%	88%	85%	4%	179%	81%	73%	84%	84%	54%	93%	47%
66	Oxyflurofen	84%	75%	72%	77%	8%	94%	79%	75%	87%	67%	66%	78%	14%
67	Fipronil sulfone	22%	36%	34%	31%*	25%	61%	76%	90%	49%	38%	51%	61%	32%
68	Kresoxim-methyl	92%	90%	88%	90%	2%	107%	84%	83%	89%	54%	71%	81%	22%
69	Cyproconazole	96%	84%	82%	87%	9%	197%	82%	80%	81%	84%	53%	96%	53%*
70	Chlorfenapyr	78%	85%	88%	84%	6%	110%	93%	84%	88%	125%	84%	97%	17%
71	*p,p'*-DDD	77%	80%	76%	78%	3%	91%	75%	64%	64%	82%	57%	72%	18%
72	Quinoxyfen	83%	91%	82%	85%	6%	97%	68%	84%	81%	49%	61%	73%	24%
73	Fenhexamide	58%	77%	49%	61%	23%	375%	247%	347%	310%	110%	208%	266%*	37%
74	*p,p'*-DDT	57%	63%	67%	62%	8%	80%	71%	63%	58%	76%	62%	68%	13%
75	Propiconazole	96%	90%	82%	89%	8%	193%	83%	85%	80%	75%	52%	95%	52%*
76	Trifloxystrobin	106%	96%	91%	98%	8%	108%	78%	83%	83%	56%	66%	79%	22%
77	Fluopicolide	85%	79%	80%	81%	4%	99%	88%	77%	99%	80%	67%	85%	15%
78	Hexazinone	98%	92%	89%	93%	5%	100%	81%	80%	88%	44%	61%	76%	26%
79	Tebuconazole + Metcona	100%	81%	80%	87%	13%	200%	79%	77%	80%	84%	53%	96%	55%*
80	Propargite	63%	83%	78%	75%	14%	97%	79%	66%	64%	70%	63%	73%	18%
81	Piperonyl butoxide	97%	84%	78%	86%	11%	90%	79%	68%	69%	73%	56%	73%	16%
82	Resemethrin	76%	71%	64%	70%	9%	77%	58%	61%	57%	60%	60%	62%	12%
83	Zoxamide	39%	58%	34%	44%*	29%	91%	79%	68%	35%	16%	35%	54%	55%*
84	Iprodione	50%	58%	34%	47%*	26%	-	18%	13%	-	-	-	16%*	23%
85	Phosmet	43%	46%	29%	39%*	23%	-	-	-	-	-	-	-	-
86	Tetramethrin	91%	71%	59%	74%	22%	63%	61%	55%	56%	57%	34%	54%	19%
87	Tetradifon	90%	87%	83%	87%	4%	202%	92%	90%	87%	80%	55%	101%	51%*

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low4	Low5	Low6	Low Mean	Low RSD
89	Fluxapyroxad	90%	87%	81%	86%	5%	204%	92%	103%	95%	78%	53%	104%	50%
90	Bifenthrin	79%	81%	82%	81%	2%	87%	72%	69%	63%	74%	77%	74%	11%
91	Etoxazole	74%	79%	77%	77%	3%	113%	87%	68%	75%	86%	64%	82%	22%
92	Fenamidone	106%	94%	88%	96%	10%	114%	85%	91%	88%	55%	73%	84%	23%
93	Malaoxon	100%	93%	83%	92%	9%	111%	80%	90%	85%	52%	74%	82%	24%
94	Phenothrin	82%	80%	72%	78%	7%	81%	69%	66%	64%	68%	69%	70%	9%
95	Pyriproxyfen	84%	79%	76%	80%	5%	89%	79%	67%	68%	71%	57%	72%	15%
96	Cyhalofop-butyl	89%	85%	80%	85%	5%	106%	93%	83%	93%	82%	68%	88%	15%
97	Cyhalothrin	150%	136%	125%	137%	9%	101%	90%	90%	58%	69%	91%	83%	19%
98	Fenpropathrin	45%	52%	38%	45%*	16%	46%	44%	52%	30%	33%	48%	42%*	21%
99	Pyridaben	83%	81%	76%	80%	5%	110%	87%	79%	75%	86%	71%	85%	16%
100	Coumaphos	82%	84%	76%	81%	5%	105%	90%	83%	62%	77%	55%	79%	23%
101	Fenbuconazole	103%	90%	86%	93%	10%	192%	87%	100%	90%	77%	48%	99%	49%
102	Cyfluthrin	62%	68%	56%	62%	10%	77%	64%	69%	47%	44%	65%	61%	21%
103	Boscalid	83%	90%	86%	86%	4%	110%	89%	98%	90%	51%	67%	84%	26%
104	Cypermethrin	58%	66%	53%	59%	11%	92%	46%	77%	54%	60%	74%	67%	25%
105	Etofenprox	85%	77%	74%	79%	7%	88%	77%	70%	61%	68%	78%	74%	13%
106	Pyraclostrobin	93%	86%	80%	86%	8%	221%	164%	220%	142%	94%	133%	162%*	31%
107	Esfenvalerate	35%	48%	34%	39%*	20%	60%	56%	55%	40%	30%	58%	50%	24%
108	*tau*-Fluvalinate	18%	45%	28%	30%*	45%	56%	55%	56%	33%	19%	51%	45%*	34%
109	Difenoconazole	77%	74%	75%	75%	2%	221%	115%	93%	102%	71%	50%	109%	55%*
110	Indoxacarb	75%	78%	69%	74%	6%	100%	95%	97%	51%	59%	55%	76%	31%
111	Deltamethrin	-	-	-	-	-	-	-	-	-	-	-	-	-
112	Azoxystrobin	80%	85%	76%	80%	6%	130%	115%	125%	106%	58%	78%	102%	28%
113	Famoxadone	59%	77%	71%	69%	13%	161%	88%	76%	61%	47%	31%	77%	59%*
114	Dimethomorph	89%	95%	83%	89%	7%	157%	132%	143%	119%	60%	94%	118%	30%
115	Fluoxastrobin	101%	99%	94%	98%	4%	151%	150%	176%	108%	70%	100%	126%	31%

Table 6B. Recoveries of analytes on Chemcatcher passive sampler (47 mm diameter Hydrophilic-Lipophilic Balance HLB disk) laboratory control samples (LCSs), arranged by analyte number (Table 1). Performance data from Laboratory B, with high spiking levels of 250 ng/disk. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

#	Analyte	High1	High2	High3	High4	High Mean	High RSD
1	Dichlorvos	11%	9%	10%	10%	10%*	8%
2	Novaluron	22%	26%	17%	24%	22%*	17%
3	3,5-Dichloroaniline	11%	7%	9%	10%	9%*	18%
5	Cycloate	26%	28%	30%	24%	27%*	10%
7	Trifluralin	14%	12%	12%	10%	12%*	14%
9	Benefin	6%	5%	5%	4%	5%*	16%
10	Pentachloroanisole	22%	21%	23%	17%	21%*	13%
11	Simazine	84%	77%	81%	74%	79%	6%
12	Prometon	64%	70%	59%	55%	62%	10%
13	Carbofuran	6%	7%	8%	7%	7%*	12%
14	Imazalil	71%	56%	51%	48%	57%	18%
15	Atrazine	67%	57%	53%	52%	57%	12%
16	Clomazone	57%	50%	48%	53%	52%	8%
17	Pentachloronitrobenzene	11%	11%	15%	11%	12%*	17%
18	Propyzamide	34%	33%	35%	32%	34%*	4%
19	Pyrimethanil	53%	46%	45%	43%	47%*	9%
20	Diazinon	48%	41%	38%	41%	42%*	10%
21	Chlorothalonil	1%	-	-	1%	1%*	115%*
22	Triallate	38%	31%	27%	33%	32%*	14%
23	Tefluthrin	45%	34%	29%	33%	35%*	19%
24	Tebupirimfos	50%	39%	38%	42%	42%*	13%
25	Propanil	63%	57%	63%	62%	61%	5%
26	Methyl parathion	52%	36%	39%	43%	43%*	16%
27	Acibenzolar-S-methyl	33%	32%	50%	19%	34%*	38%
28	Carbaryl	8%	8%	10%	9%	9%*	11%
29	Prometryn	66%	80%	56%	64%	67%	15%
30	Metalaxyl	78%	106%	77%	78%	85%	17%
31	Dithiopyr	87%	80%	59%	57%	71%	21%
32	Prodiamine	30%	29%	22%	22%	26%*	17%
33	Thiobencarb	69%	76%	55%	58%	65%	15%
34	Malathion	68%	51%	56%	49%	56%	15%
35	Metolachlor	69%	75%	56%	56%	64%	15%
36	Chlorpyrifos	57%	56%	40%	42%	49%*	18%
37	Triadimefon	71%	85%	58%	58%	68%	19%
38	Dacthal	106%	121%	92%	96%	104%	12%
39	Flufenacet	44%	50%	36%	34%	41%*	18%

#	Analyte	High1	High2	High3	High4	High Mean	High RSD
40	Teraconazole	103%	128%	107%	125%	116%	11%
41	Butralin	24%	23%	17%	17%	20%*	19%
42	Cyprodinil	72%	64%	47%	45%	57%	23%
43	Pendimethalin	26%	26%	21%	21%	24%*	12%
44	Fipronil sulfide	43%	27%	30%	28%	32%*	23%
45	Fluazinam	1%	1%	1%	1%	1%*	0%
46	Fluopyram	45%	56%	40%	38%	45%*	18%
47	Triadimenol	55%	38%	38%	37%	42%*	21%
49	Fipronil	89%	97%	71%	83%	85%	13%
50	Captan	2%	3%	3%	3%	3%*	18%
51	Allethrin	40%	40%	27%	24%	33%*	26%
52	Methoprene	56%	30%	22%	22%	33%*	50%
53	Triflumizole	71%	60%	45%	35%	53%	30%
54	Paclobutrazol	29%	20%	23%	22%	24%*	16%
55	Flutriafol	98%	82%	75%	68%	81%	16%
56	Flumetralin	9%	10%	10%	8%	9%*	10%
57	Napropamide	66%	78%	55%	54%	63%	18%
58	Picoxystrobin	88%	94%	66%	63%	78%	20%
59	Ethalfluralin	3%	4%	3%	4%	4%*	16%
60	Flutolanil	50%	55%	59%	58%	56%	7%
61	Fludioxinil	59%	67%	77%	62%	66%	12%
62	*p,p'*-DDE	70%	47%	45%	47%	52%	23%
63	Tribuphos	29%	19%	20%	20%	22%*	21%
64	Oxadiazon	87%	96%	69%	66%	80%	18%
65	Myclobutanil	91%	90%	104%	106%	98%	9%
66	Oxyflurofen	28%	27%	21%	21%	24%*	16%
67	Fipronil sulfone	31%	22%	20%	19%	23%*	24%
68	Kresoxim-methyl	66%	84%	56%	52%	65%	22%
69	Cyproconazole	78%	55%	54%	47%	59%	23%
70	Chlorfenapyr	73%	49%	48%	47%	54%	23%
71	*p,p'*-DDD	58%	43%	29%	28%	40%*	36%
72	Quinoxyfen	79%	78%	56%	51%	66%	22%
73	Fenhexamide	27%	17%	17%	16%	19%*	27%
74	*p,p'*-DDT	51%	56%	39%	36%	46%*	21%
75	Propiconazole	50%	66%	55%	50%	55%	14%
76	Trifloxystrobin	51%	54%	33%	32%	43%*	27%
77	Fluopicolide	64%	43%	43%	38%	47%*	25%
78	Hexazinone	114%	80%	78%	73%	86%	22%
79	Tebuconazole + Metcona	74%	59%	58%	51%	61%	16%
80	Propargite	65%	58%	72%	75%	68%	11%
81	Piperonyl butoxide	26%	17%	16%	15%	19%*	27%
82	Resemethrin	72%	67%	80%	62%	70%	11%
83	Zoxamide	40%	56%	32%	34%	41%*	27%

#	Analyte	High1	High2	High3	High4	High Mean	High RSD
84	Iprodione	19%	15%	11%	11%	14%*	27%
85	Phosmet	4%	3%	3%	3%	3%*	15%
86	Tetramethrin	24%	25%	17%	14%	20%*	27%
87	Tetradifon	-	-	-	-	-	-
89	Fluxapyroxad	88%	67%	65%	62%	71%	17%
90	Bifenthrin	35%	23%	23%	45%	32%*	34%
91	Etoxazole	43%	49%	56%	43%	48%*	13%
92	Fenamidone	44%	49%	57%	53%	51%	11%
93	Malaoxon	28%	18%	19%	39%	26%*	38%
94	Phenothrin	31%	30%	19%	19%	25%*	27%
95	Pyriproxyfen	-	-	-	-	-	-
96	Cyhalofop-butyl	40%	51%	29%	27%	37%*	30%
97	Cyhalothrin	37%	29%	30%	26%	31%*	15%
98	Fenpropathrin	28%	26%	37%	21%	28%*	24%
99	Pyridaben	36%	26%	25%	25%	28%*	19%
100	Coumaphos	-	-	-	-	-	-
101	Fenbuconazole	140%	95%	90%	101%	107%	21%
102	Cyfluthrin	51%	47%	56%	64%	55%	13%
103	Boscalid	47%	31%	36%	32%	37%*	20%
104	Cypermethrin	82%	68%	71%	73%	74%	8%
105	Etofenprox	32%	44%	31%	30%	34%*	19%
106	Pyraclostrobin	31%	25%	15%	14%	21%*	38%
107	Esfenvalerate	5%	4%	2%	2%	3%*	46%
108	*tau*-Fluvalinate	24%	18%	18%	24%	21%*	16%
109	Difenoconazole	40%	35%	35%	34%	36%*	8%
110	Indoxacarb	86%	74%	89%	80%	82%	8%
111	Deltamethrin	24%	22%	20%	18%	21%*	12%
112	Azoxystrobin	126%	111%	101%	88%	107%	15%
113	Famoxadone	84%	61%	75%	75%	74%	13%
114	Dimethomorph	88%	86%	99%	80%	88%	9%
115	Fluoxastrobin	31%	37%	31%	27%	32%*	13%

Table 6C. Recoveries of analytes on Chemcatcher passive sampler (47 mm diameter Hydrophilic-Lipophilic Balance HLB disk) laboratory control samples (LCSs), arranged by analyte number (Table 1). Performance data from Laboratory C, with low spiking levels of 50 ng/disk. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

#	Analyte	Low1	Low2	Low3	Low 4	Low5	Low6	Low7	Low Mean	Low RSD
1	Dichlorvos	77%	39%	60%	62%	42%	57%	107%	63%	36%
2	Novaluron	87%	13%	65%	66%	110%	0%	40%	54%	72%*
3	3,5-Dichloroaniline	84%	36%	71%	85%	36%	52%	96%	66%	37%
5	Cycloate	94%	36%	61%	72%	23%	43%	91%	60%	46%
7	Trifluralin	86%	27%	66%	68%	24%	54%	94%	60%	45%
9	Benefin	79%	37%	50%	78%	23%	55%	93%	59%	42%
10	Pentachloroanisole	68%	25%	45%	65%	9%	24%	54%	41%*	54%*
11	Simazine	86%	40%	56%	82%	55%	53%	88%	66%	29%
12	Prometon	68%	45%	52%	69%	44%	86%	125%	70%	41%
13	Carbofuran	49%	96%	62%	46%	77%	153%	186%	96%	57%*
14	Imazalil	79%	43%	70%	71%	55%	70%	94%	69%	24%
15	Atrazine	76%	51%	45%	76%	54%	59%	97%	65%	28%
16	Clomazone	72%	39%	57%	67%	41%	56%	91%	60%	30%
17	Pentachloronitrobenzene	89%	30%	52%	70%	5%	18%	109%	53%	72%*
18	Propyzamide	78%	50%	62%	77%	60%	63%	98%	70%	23%
19	Pyrimethanil	69%	42%	50%	66%	36%	50%	83%	57%	29%
20	Diazinon	74%	44%	47%	67%	51%	62%	123%	67%	40%
21	Chlorothalonil	-	-	-	-	-	-	-	-	-
22	Triallate	78%	36%	46%	72%	23%	47%	80%	55%	41%
23	Tefluthrin	89%	36%	62%	72%	28%	52%	96%	62%	41%
24	Tebupirimfos	60%	43%	65%	70%	31%	79%	71%	60%	28%
25	Propanil	96%	80%	83%	108%	100%	115%	158%	106%	25%
26	Methyl parathion	70%	55%	57%	68%	39%	78%	105%	67%	31%
27	Acibenzolar-S-methyl	62%	40%	53%	67%	33%	53%	95%	58%	35%
28	Carbaryl	0%	128%	0%	0%	109%	235%	237%	101%	105%*
29	Prometryn	69%	44%	49%	62%	49%	74%	95%	63%	28%
30	Metalaxyl	81%	50%	74%	92%	81%	84%	146%	87%	34%
31	Dithiopyr	78%	33%	57%	78%	63%	71%	78%	65%	25%
32	Prodiamine	59%	14%	62%	85%	43%	79%	88%	61%	43%
33	Thiobencarb	71%	42%	53%	76%	45%	63%	94%	63%	29%
34	Malathion	70%	47%	58%	76%	47%	69%	94%	66%	26%
35	Metolachlor	72%	35%	60%	76%	44%	53%	94%	62%	33%
36	Chlorpyrifos	69%	39%	55%	80%	58%	62%	98%	66%	29%
37	Triadimefon	86%	55%	77%	89%	67%	75%	124%	82%	27%
38	Dacthal	75%	36%	55%	68%	35%	51%	68%	55%	29%
39	Flufenacet	84%	57%	64%	92%	85%	88%	118%	84%	24%
40	Teraconazole	75%	53%	66%	75%	110%	107%	110%	85%	28%
41	Butralin	64%	38%	58%	77%	52%	66%	99%	65%	30%
42	Cyprodinil	82%	33%	64%	67%	80%	95%	106%	75%	32%

#	Analyte	Low1	Low2	Low3	Low 4	Low5	Low6	Low7	Low Mean	Low RSD
43	Pendimethalin	78%	33%	53%	78%	64%	78%	94%	68%	30%
44	Fipronil sulfide	87%	62%	85%	75%	142%	134%	139%	103%	33%
45	Captan	226%	0%	27%	0%	0%	235%	0%	70%	158%*
46	Fluazinam	71%	52%	47%	86%	122%	121%	124%	89%	38%
47	Fluopyram	140%	52%	151%	211%	63%	74%	131%	117%	49%
49	Triadimenol	102%	77%	124%	57%	177%	125%	103%	109%	35%
50	Fipronil	83%	106%	46%	102%	109%	134%	146%	104%	32%
51	Allethrin	91%	86%	96%	119%	105%	68%	121%	98%	19%
52	Methoprene	91%	45%	65%	82%	89%	92%	116%	83%	27%
53	Triflumizole	121%	70%	92%	102%	144%	133%	164%	118%	27%
54	Paclobutrazol	82%	61%	214%	108%	139%	102%	80%	112%	46%
55	Flutriafol	88%	61%	75%	93%	130%	137%	149%	105%	32%
56	Flumetralin	86%	51%	68%	90%	73%	88%	124%	83%	27%
57	Napropamide	92%	52%	58%	91%	69%	95%	126%	83%	31%
58	Ethalfluralin	89%	57%	76%	94%	97%	143%	157%	102%	35%
59	Picoxystrobin	34%	64%	79%	0%	7%	0%	118%	43%*	106%*
60	Flutolanil	84%	60%	77%	89%	127%	133%	158%	104%	34%
61	*p,p'*-DDE	90%	75%	71%	104%	172%	127%	159%	114%	35%
62	Fludioxinil	67%	42%	54%	67%	35%	56%	73%	56%	25%
63	Tribuphos	73%	43%	53%	83%	68%	76%	101%	71%	27%
64	Oxadiazon	69%	42%	50%	69%	69%	87%	105%	70%	30%
65	Myclobutanil	82%	50%	81%	81%	110%	134%	128%	95%	32%
66	Oxyflurofen	67%	39%	53%	84%	89%	101%	102%	76%	32%
67	Fipronil sulfone	73%	47%	43%	48%	107%	104%	146%	81%	48%
68	Kresoxim-methyl	89%	45%	74%	90%	89%	94%	117%	85%	26%
69	Cyproconazole	368%	21%	84%	175%	207%	204%	245%	186%*	60%*
70	Chlorfenapyr	102%	68%	72%	88%	96%	112%	128%	95%	22%
71	*p,p'*-DDD	80%	52%	60%	76%	60%	95%	111%	76%	28%
72	Quinoxyfen	57%	38%	44%	76%	59%	90%	115%	68%	40%
73	Fenhexamide	29%	265%	130%	248%	405%	451%	436%	281%*	57%*
74	*p,p'*-DDT	102%	59%	72%	100%	79%	120%	128%	94%	27%
75	Propiconazole	79%	60%	85%	94%	98%	132%	144%	99%	30%
76	Trifloxystrobin	91%	56%	77%	81%	132%	120%	136%	99%	31%
77	Fluopicolide	98%	60%	60%	64%	102%	115%	133%	90%	32%
78	Hexazinone	73%	55%	63%	80%	107%	118%	139%	91%	34%
79	Tebuconazole + Metcona	85%	57%	74%	89%	122%	156%	153%	105%	37%
80	Propargite	65%	45%	47%	78%	84%	137%	116%	82%	42%
81	Piperonyl butoxide	76%	43%	66%	73%	78%	106%	127%	81%	34%
82	Resemethrin	89%	35%	73%	82%	73%	82%	128%	80%	34%
83	Zoxamide	132%	92%	116%	117%	110%	110%	198%	125%	27%
84	Iprodione	125%	89%	73%	64%	144%	174%	129%	114%	35%
85	Phosmet	70%	61%	55%	76%	99%	128%	128%	88%	35%
86	Tetramethrin	85%	37%	54%	78%	47%	73%	92%	67%	31%
87	Tetradifon	91%	60%	74%	93%	130%	138%	152%	105%	33%

#	Analyte	Low1	Low2	Low3	Low 4	Low5	Low6	Low7	Low Mean	Low RSD
89	Fluxapyroxad	70%	54%	78%	73%	138%	125%	152%	99%	39%
90	Bifenthrin	85%	49%	55%	71%	96%	101%	97%	79%	27%
91	Etoxazole	92%	93%	94%	113%	105%	144%	94%	105%	18%
92	Fenamidone	80%	54%	52%	79%	65%	76%	103%	73%	24%
93	Malaoxon	67%	57%	84%	72%	71%	102%	85%	77%	19%
94	Phenothrin	83%	57%	58%	86%	57%	75%	87%	72%	20%
95	Pyriproxyfen	86%	52%	56%	74%	70%	92%	96%	75%	23%
96	Cyhalofop-butyl	93%	46%	52%	76%	76%	95%	83%	74%	25%
97	Cyhalothrin	89%	52%	64%	65%	82%	102%	91%	78%	23%
98	Fenpropathrin	79%	74%	61%	66%	117%	144%	113%	93%	34%
99	Pyridaben	81%	58%	60%	77%	105%	94%	94%	81%	22%
100	Coumaphos	70%	55%	57%	61%	99%	89%	81%	73%	23%
101	Fenbuconazole	83%	57%	69%	86%	105%	102%	113%	88%	23%
102	Cyfluthrin	83%	70%	56%	73%	76%	99%	113%	81%	23%
103	Boscalid	86%	57%	72%	79%	79%	107%	102%	83%	21%
104	Cypermethrin	56%	65%	52%	71%	57%	102%	76%	68%	25%
105	Etofenprox	75%	53%	59%	75%	71%	82%	92%	72%	18%
106	Pyraclostrobin	286%	225%	213%	60%	142%	252%	203%	197%*	38%
107	Esfenvalerate	53%	57%	25%	41%	92%	117%	115%	71%	51%*
108	*tau*-Fluvalinate	48%	82%	71%	79%	118%	137%	107%	92%	33%
109	Difenoconazole	91%	67%	56%	83%	86%	115%	91%	84%	22%
110	Indoxacarb	89%	73%	69%	73%	108%	122%	128%	95%	26%
111	Deltamethrin	73%	106%	47%	62%	134%	131%	131%	98%	38%
112	Azoxystrobin	73%	61%	64%	75%	95%	104%	109%	83%	23%
113	Famoxadone	67%	53%	63%	73%	129%	118%	149%	93%	41%
114	Dimethomorph	75%	56%	81%	83%	92%	92%	100%	83%	17%
115	Fluoxastrobin	98%	75%	110%	79%	112%	140%	119%	105%	22%

Table 6D. Recoveries of analytes on Chemcatcher passive sampler (47 mm diameter Hydrophilic-Lipophilic Balance HLB disk) laboratory control samples (LCSs), arranged by analyte number (Table 1). Performance data from Laboratory D, with high and low spiking levels of 500 ng/disk and 100 ng/disk, respectively. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
1	Dichlorvos	57%	166%	63%	95%	64%*	61%	36%	63%	53%	28%
2	Novaluron	2%	51%	64%	39%*	84%*	6%	27%	0%	11%*	126%*
3	3,5-Dichloroaniline	78%	112%	42%	77%	46%	55%	29%	77%	53%	45%
5	Cycloate	42%	22%	1%	22%*	94%*	37%	9%	25%	24%*	58%*
7	Trifluralin	39%	18%	1%	19%*	98%*	26%	17%	8%	17%*	54%*
9	Benefin	40%	19%	2%	20%*	95%*	27%	19%	10%	19%*	45%
10	Pentachloroanisole	22%	10%	0%	11%*	101%*	22%	14%	3%	13%*	72%*
11	Simazine	27%	82%	108%	72%	58%*	22%	12%	88%	41%*	102%*
12	Prometon	67%	203%	83%	118%	63%*	0%	43%	0%	14%*	173%*
13	Carbofuran	5%	4%	6%	5%*	25%	36%	0%	8%	15%*	128%*
14	Imazalil	85%	198%	86%	123%	53%*	74%	42%	63%	60%	28%
15	Atrazine	84%	195%	88%	122%	51%*	74%	39%	68%	60%	31%
16	Clomazone	72%	165%	92%	109%	45%	65%	42%	77%	61%	29%
17	Pentachloronitrobenzene	27%	10%	1%	13%*	107%*	22%	12%	9%	14%*	46%
18	Propyzamide	78%	148%	94%	107%	34%	70%	38%	79%	62%	34%
19	Pyrimethanil	73%	148%	86%	103%	39%	65%	35%	57%	52%	30%
20	Diazinon	71%	96%	59%	75%	25%	64%	45%	72%	61%	23%
21	Chlorothalonil	4%	34%	39%	25%*	75%*	5%	14%	16%	11%*	53%*
22	Triallate	45%	23%	4%	24%*	85%*	40%	27%	31%	32%*	20%
23	Tefluthrin	52%	40%	2%	31%*	84%*	38%	24%	12%	25%*	53%*
24	Tebupirimfos	64%	48%	20%	44%*	50%*	55%	38%	62%	52%	24%
25	Propanil	81%	156%	88%	108%	38%	71%	28%	72%	57%	44%
26	Methyl parathion	41%	81%	75%	66%	32%	21%	17%	52%	30%*	63%*
27	Acibenzolar-S-methyl	82%	69%	41%	64%	33%	66%	39%	66%	57%	27%
28	Carbaryl	56%	69%	61%	62%	11%	59%	26%	69%	52%	44%
29	Prometryn	2%	0%	3%	2%*	95%*	9%	0%	7%	5%*	89%*
30	Metalaxyl	87%	157%	96%	113%	34%	76%	49%	83%	69%	26%
31	Dithiopyr	84%	174%	87%	115%	44%	75%	36%	76%	63%	36%
32	Prodiamine	71%	73%	80%	74%	6%	52%	38%	76%	55%	35%
33	Thiobencarb	71%	84%	69%	75%	11%	61%	48%	79%	62%	25%
34	Malathion	54%	67%	61%	61%	11%	50%	18%	49%	39%*	46%
35	Metolachlor	78%	136%	93%	102%	29%	68%	55%	82%	69%	20%
36	Chlorpyrifos	64%	44%	29%	46%*	38%	36%	11%	44%	30%*	58%*
37	Triadimefon	84%	134%	92%	103%	26%	68%	41%	81%	63%	32%
38	Dacthal	78%	77%	55%	70%	18%	67%	46%	75%	63%	24%
39	Flufenacet	62%	115%	90%	89%	30%	53%	42%	65%	53%	22%
40	Teraconazole	90%	125%	91%	102%	20%	73%	43%	82%	66%	31%
41	Butralin	58%	49%	41%	49%*	17%	38%	29%	52%	40%*	29%
42	Cyprodinil	83%	104%	85%	91%	13%	73%	56%	78%	69%	17%

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
43	Pendimethalin	60%	52%	43%	52%	16%	29%	22%	47%	33%*	40%
44	Fipronil sulfide	85%	110%	95%	97%	13%	75%	57%	91%	74%	23%
45	Captan	0%	25%	26%	17%*	87%*	0%	0%	0%	0%*	-
46	Fluazinam	86%	145%	91%	107%	31%	72%	46%	89%	69%	32%
47	Fluopyram	82%	242%	85%	136%	67%*	68%	8%	80%	52%	75%*
49	Triadimenol	81%	469%	295%	282%*	69%*	104%	65%	148%	106%	40%
50	Fipronil	0%	0%	0%	0%*	0%	0%	0%	0%	0%*	-
51	Allethrin	44%	107%	21%	57%	78%*	39%	11%	54%	35%*	63%*
52	Methoprene	58%	95%	50%	68%	35%	13%	0%	70%	28%*	135%*
53	Triflumizole	75%	137%	89%	100%	32%	64%	18%	83%	55%	61%*
54	Paclobutrazol	86%	221%	90%	132%	58%*	74%	12%	81%	56%	69%*
55	Flutriafol	87%	247%	91%	141%	64%*	80%	18%	83%	60%	61%*
56	Flumetralin	62%	97%	75%	78%	23%	46%	19%	65%	43%*	53%*
57	Napropamide	94%	219%	101%	138%	51%*	82%	29%	94%	68%	51%*
58	Ethalfluralin	86%	170%	98%	118%	38%	78%	27%	98%	68%	54%*
59	Picoxystrobin	89%	179%	98%	122%	40%	72%	22%	91%	62%	57%*
60	Flutolanil	88%	198%	101%	129%	47%	78%	27%	95%	67%	53%*
61	*p,p'*-DDE	72%	161%	90%	108%	44%	80%	17%	84%	60%	62%*
62	Fludioxinil	12%	117%	61%	63%	83%*	27%	14%	38%	26%*	44%
63	Tribuphos	89%	199%	96%	128%	48%	80%	25%	87%	64%	53%*
64	Oxadiazon	88%	164%	95%	116%	37%	85%	30%	96%	70%	51%*
65	Myclobutanil	84%	138%	82%	101%	31%	62%	21%	79%	54%	56%*
66	Oxyflurofen	65%	117%	87%	90%	29%	51%	22%	71%	48%*	51%*
67	Fipronil sulfone	82%	99%	46%	76%	36%	68%	18%	75%	54%	58%*
68	Kresoxim-methyl	85%	152%	90%	109%	35%	79%	27%	94%	67%	53%*
69	Cyproconazole	89%	240%	94%	141%	61%*	84%	16%	91%	64%	65%*
70	Chlorfenapyr	78%	155%	91%	108%	38%	77%	27%	85%	63%	50%
71	*p,p'*-DDD	68%	126%	80%	92%	34%	71%	22%	76%	56%	53%*
72	Quinoxyfen	78%	147%	93%	106%	34%	76%	26%	92%	65%	53%*
73	Fenhexamide	54%	219%	87%	120%	73%*	24%	0%	75%	33%	117%*
74	*p,p'*-DDT	56%	111%	73%	80%	35%	58%	18%	63%	46%	54%*
75	Propiconazole	77%	152%	98%	109%	36%	65%	25%	85%	58%	53%*
76	Trifloxystrobin	78%	163%	98%	113%	39%	69%	24%	95%	63%	57%*
77	Fluopicolide	83%	213%	105%	134%	52%*	76%	30%	96%	67%	50%*
78	Hexazinone	93%	347%	100%	180%*	81%*	85%	27%	100%	71%	54%*
79	Tebuconazole + Metcona...	86%	202%	101%	129%	49%	71%	16%	91%	59%	65%*
80	Propargite	94%	160%	90%	115%	34%	87%	10%	96%	64%	73%*
81	Piperonyl butoxide	82%	178%	102%	120%	42%	74%	33%	124%	77%	59%*
82	Resemethrin	23%	50%	8%	27%*	80%*	8%	0%	31%	13%*	126%*
83	Zoxamide	6%	42%	38%	29%*	68%*	13%	3%	20%	12%*	72%*
84	Iprodione	13%	33%	28%	25%*	43%	44%	3%	31%	26%*	81%*
85	Phosmet	13%	0%	5%	6%*	109%*	28%	0%	17%	15%*	95%*
86	Tetramethrin	32%	18%	5%	19%*	74%*	44%	8%	31%	28%*	66%*
87	Tetradifon	87%	221%	97%	135%	55%*	76%	22%	96%	65%	59%*

#	Analyte	High1	High2	High3	High Mean	High RSD	Low1	Low2	Low3	Low Mean	Low RSD
89	Fluxapyroxad	89%	220%	103%	137%	52%*	79%	26%	96%	67%	55%*
90	Bifenthrin	86%	147%	91%	108%	31%	83%	20%	94%	66%	60%*
91	Etoxazole	93%	166%	96%	118%	35%	82%	28%	95%	68%	53%*
92	Fenamidone	87%	218%	102%	136%	53%*	78%	28%	100%	69%	54%*
93	Malaoxon	85%	216%	100%	134%	54%*	68%	17%	90%	58%	65%*
94	Phenothrin	37%	96%	7%	47%*	96%*	38%	18%	32%	29%*	36%
95	Pyriproxyfen	77%	157%	92%	109%	39%	76%	23%	90%	63%	56%*
96	Cyhalofop-butyl	86%	175%	104%	122%	38%	77%	26%	101%	68%	56%*
97	Cyhalothrin	23%	76%	51%	50%	53%*	38%	13%	39%	30%*	48%
98	Fenpropathrin	75%	148%	93%	105%	36%	70%	20%	77%	56%	56%*
99	Pyridaben	70%	150%	97%	106%	39%	55%	17%	84%	52%	65%*
100	Coumaphos	46%	119%	87%	84%	43%	53%	14%	60%	42%*	58%*
101	Fenbuconazole	70%	130%	94%	98%	31%	57%	16%	77%	50%*	63%*
102	Cyfluthrin	31%	106%	75%	70%	54%*	44%	13%	40%	32%*	54%*
103	Boscalid	79%	199%	104%	128%	50%	77%	25%	95%	66%	55%*
104	Cypermethrin	28%	83%	70%	60%	48%	31%	9%	57%	32%*	76%*
105	Etofenprox	71%	155%	90%	105%	42%	67%	11%	93%	57%	73%*
106	Pyraclostrobin	30%	110%	143%	95%	62%*	47%	12%	69%	43%*	67%*
107	Esfenvalerate	15%	87%	68%	57%	66%*	30%	10%	36%	25%*	54%*
108	*tau*-Fluvalinate	16%	72%	45%	44%*	63%*	7%	0%	15%	7%*	101%*
109	Difenoconazole	71%	129%	101%	100%	29%	59%	28%	94%	60%	55%*
110	Indoxacarb	56%	120%	85%	87%	37%	74%	22%	62%	53%	52%*
111	Deltamethrin	11%	49%	38%	33%*	60%*	14%	0%	21%	12%*	92%*
112	Azoxystrobin	86%	206%	113%	135%	47%	90%	35%	107%	77%	49%
113	Famoxadone	39%	41%	20%	33%*	35%	67%	13%	40%	40%*	68%*
114	Dimethomorph	82%	232%	114%	143%	55%*	87%	32%	108%	76%	53%*
115	Fluoxastrobin	39%	104%	119%	87%	49%	25%	6%	81%	37%*	105%*

Table 6X. Recoveries of analytes on Chemcatcher passive sampler (47 mm diameter Hydrophilic-Lipophilic Balance HLB disk) laboratory control samples (LCSs), arranged by analyte number (Table 1). Summary of performance data from all laboratories, with high and low spiking levels of 250-500 ng/disk and 50-100 ng/disk, respectively. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

#	Analyte	Total High Mean	Total High RSD	Total Low Mean	Total Low RSD
1	Dichlorvos	49%*	97%*	63%	30%
2	Novaluron	31%*	57%*	39%*	92%*
3	3,5-Dichloroaniline	47%*	78%*	69%	37%
5	Cycloate	34%*	53%*	50%	50%*
7	Trifluralin	27%*	79%*	47%*	56%*
9	Benefin	25%*	97%*	48%*	52%*
10	Pentachloroanisole	26%*	67%*	31%*	65%*
11	Simazine	76%	26%	64%	41%
12	Prometon	82%	53%*	59%	58%*
13	Carbofuran	19%*	111%*	64%	84%*
14	Imazalil	81%	53%*	69%	22%
15	Atrazine	80%	53%*	69%	27%
16	Clomazone	71%	49%	66%	27%
17	Pentachloronitrobenzene	25%*	87%*	42%*	77%*
18	Propyzamide	67%	55%*	70%	22%
19	Pyrimethanil	70%	44%	65%	47%
20	Diazinon	61%	31%	67%	31%
21	Chlorothalonil	11%*	154%*	193%*	119%*
22	Triallate	37%*	47%	49%*	38%
23	Tefluthrin	41%*	44%	50%	49%
24	Tebupirimfos	50%	32%	58%	25%
25	Propanil	79%	37%	94%	32%
26	Methyl parathion	55%	28%	60%	40%
27	Acibenzolar-S-methyl	34%*	82%*	46%*	61%*
28	Carbaryl	30%*	89%*	74%	112%*
29	Prometryn	66%	11%	65%	31%
30	Metalaxyl	93%	26%	83%	29%
31	Dithiopyr	85%	39%	69%	26%
32	Prodiamine	56%	47%	65%	36%
33	Thiobencarb	69%	12%	66%	25%
34	Malathion	60%	12%	61%	31%
35	Metolachlor	77%	30%	68%	26%
36	Chlorpyrifos	53%	25%	58%	39%
37	Triadimefon	82%	26%	85%	42%
38	Dacthal	81%	27%	63%	27%

#	Analyte	Total High Mean	Total High RSD	Total Low Mean	Total Low RSD
39	Flufenacet	63%	40%	79%	27%
40	Teraconazole	103%	17%	91%	43%
41	Butralin	42%*	48%	60%	32%
42	Cyprodinil	72%	24%	82%	40%
43	Pendimethalin	45%*	45%	60%	37%
44	Fipronil sulfide	65%	47%	97%	29%
45	Captan	47%*	129%*	70%	130%*
46	Fluazinam	81%	73%*	91%	54%*
47	Fluopyram	129%	109%*	120%	46%
49	Triadimenol	52%	73%*	83%	66%*
50	Fipronil	28%*	115%*	74%	67%*
51	Allethrin	51%	53%*	78%	40%
52	Methoprene	56%	45%	69%	47%
53	Triflumizole	75%	37%	100%	43%
54	Paclobutrazol	74%	81%*	95%	49%
55	Flutriafol	102%	51%*	96%	45%
56	Flumetralin	50%*	72%*	70%	36%
57	Napropamide	90%	53%*	78%	31%
58	Ethalfluralin	94%	31%	90%	37%
59	Picoxystrobin	65%	91%*	59%	70%*
60	Flutolanil	89%	48%	93%	36%
61	p,p'-DDE	81%	36%	95%	44%
62	Fludioxinil	65%	45%	65%	77%*
63	Tribuphos	71%	78%*	68%	30%
64	Oxadiazon	90%	31%	75%	32%
65	Myclobutanil	95%	18%	89%	45%
66	Oxyflurofen	60%	56%*	71%	34%
67	Fipronil sulfone	41%*	67%*	74%	45%
68	Kresoxim-methyl	85%	32%	82%	29%
69	Cyproconazole	92%	60%*	143%	70%*
70	Chlorfenapyr	79%	40%	88%	28%
71	*p,p'*-DDD	67%	44%	72%	31%
72	Quinoxyfen	84%	31%	71%	36%
73	Fenhexamide	62%	98%*	233%*	71%*
74	*p,p'*-DDT	61%	34%	78%	38%
75	Propiconazole	82%	38%	94%	44%
76	Trifloxystrobin	80%	50%	88%	35%
77	Fluopicolide	83%	61%*	84%	32%
78	Hexazinone	116%	70%*	85%	34%
79	Tebuconazole + Metcona	89%	48%	98%	50%
80	Propargite	84%	35%	77%	42%
81	Piperonyl butoxide	69%	75%*	80%	34%
82	Resemethrin	57%	42%	61%	57%*

#	Analyte	Total High Mean	Total High RSD	Total Low Mean	Total Low RSD
83	Zoxamide	38%*	37%	88%	61%*
84	Iprodione	27%*	61%*	76%	75%*
85	Phosmet	15%*	120%*	66%	66%*
86	Tetramethrin	36%*	79%*	56%	42%
87	Tetradifon	67%	105%*	101%	45%
89	Fluxapyroxad	95%	48%	99%	47%
90	Bifenthrin	69%	55%*	75%	31%
91	Etoxazole	78%	47%	93%	29%
92	Fenamidone	90%	56%*	77%	30%
93	Malaoxon	78%	76%*	76%	31%
94	Phenothrin	47%*	67%*	62%	35%
95	Pyriproxyfen	57%	96%*	73%	28%
96	Cyhalofop-butyl	77%	57%*	78%	30%
97	Cyhalothrin	68%	73%*	70%	39%
98	Fenpropathrin	56%	70%*	74%	46%
99	Pyridaben	67%	60%*	77%	32%
100	Coumaphos	49%*	93%*	71%	34%
101	Fenbuconazole	100%	21%	88%	46%
102	Cyfluthrin	62%	32%	67%	38%
103	Boscalid	79%	64%*	83%	28%
104	Cypermethrin	65%	25%	61%	40%
105	Etofenprox	69%	56%*	70%	30%
106	Pyraclostrobin	63%	73%*	163%*	54%*
107	Esfenvalerate	37%*	65%*	57%	57%*
108	tau-Fluvalinate	24%*	100%*	64%	65%*
109	Difenoconazole	67%	47%	92%	50%
110	Indoxacarb	81%	21%	86%	33%
111	Deltamethrin	26%*	50%*	72%	72%*
112	Azoxystrobin	107%	36%	91%	31%
113	Famoxadone	60%	34%	84%	51%*
114	Dimethomorph	105%	44%	95%	36%
115	Fluoxastrobin	68%	55%*	102%	48%

Table 7. Summary of Method Detection Limits (MDLs, ng/L) of analytes in aqueous matrices, arranged by analyte number (Table 1), following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). A spiking level of 100 ng/L was used for Laboratory A, Laboratory B, and Laboratory D, while 50 ng/L was used for Laboratory C to determine the MDLs.

#	Analyte	Lab A	Lab B	Lab C	Lab D	MIN	MAX
1	Dichlorvos	37.0	22.0	36.2	12.1	12.1	37.0
2	Novaluron	37.7	17.0	38.0	25.8	17.0	38.0
3	3,5-Dichloroaniline	61.82	27	27.9	35.6	27.0	61.8
5	Cycloate	33.1	44	32.6	20.8	20.8	44.0
7	Trifluralin	22.4	8	40.3	28.5	8.0	40.3
9	Benefin	19.8	7	38.5	29.8	7.0	38.5
10	Pentachloroanisole	46.7	30	35.1	22.7	22.7	46.7
11	Simazine	23.2	46	37.6	18.9	18.9	46.0
12	Prometon	23.7	64	40.1	41.5	23.7	64.0
13	Carbofuran	18	6	40.5	23.6	6.0	40.5
14	Imazalil	23.4	64	40.2	23.1	23.1	64.0
15	Atrazine	20.8	83	39.1	27.5	20.8	83.0
16	Clomazone	28	87	31.7	27.5	27.5	87.0
17	Pentachloronitrobenzene	27.3	8	41.3	27.2	8.0	41.3
18	Propyzamide	29.7	28	35.2	30.8	28.0	35.2
19	Pyrimethanil	30.1	61	31.7	32.6	30.1	61.0
20	Diazinon	22.1	30	43.8	34.1	22.1	43.8
21	Chlorothalonil	56.7	-	-	33.4	33.4	56.7
22	Triallate	27.3	5.8	35.8	30.6	5.8	35.8
23	Tefluthrin	20.9	31	37.5	30.5	20.9	37.5
24	Tebupirimfos	24.7	29	23.9	40.6	23.9	40.6
25	Propanil	41.8	74	49.7	29.2	29.2	74.0
26	Methyl parathion	36.8	51	48.4	22.9	22.9	51.0
27	Acibenzolar-S-methyl	23.6	25.1	65	39.9	23.6	65.0
28	Carbaryl	16.1	20.0	41	55.4	16.1	55.4
29	Prometryn	20.5	29.6	63	36.8	20.5	63.0
30	Metalaxyl	19.2	82	37.9	25.8	19.2	82.0
31	Dithiopyr	22.4	49	30.4	37.0	22.4	49.0
32	Prodiamine	15.3	15	40.6	32.5	15.0	40.6
33	Thiobencarb	19.8	38	32.3	32.8	19.8	38.0
34	Malathion	25	53	31.3	27.7	25.0	53.0
35	Metolachlor	29.5	67	29.2	33.0	29.2	67.0
36	Chlorpyrifos	15.4	35	34.7	37.4	15.4	37.4
37	Triadimefon	27.8	91	47.2	33.5	27.8	91.0
38	Dacthal	30.7	54	22.5	37.2	22.5	54.0
39	Flufenacet	23.4	71	42.5	27.5	23.4	71.0
40	Teraconazole	28.7	175	41.3	42.3	28.7	175.0
41	Butralin	13	12	33.0	31.1	12.0	33.0
42	Cyprodinil	22.4	55	48.4	34.5	22.4	55.0

#	Analyte	Lab A	Lab B	Lab C	Lab D	MIN	MAX
43	Pendimethalin	10.9	21	62.7	30.1	10.9	62.7
44	Fipronil sulfide	30.6	89	39.0	41.3	30.6	89.0
45	Captan	10.1	-	97.8	35.0	78.5	97.8
46	Fluazinam	91.7	79	200.3	78.5	22.8	200.3
47	Fluopyram	22.8	78	55.7	31.2	22.5	78.0
49	Triadimenol	22.5	65	65.2	28.1	32.5	94.0
50	Fipronil	32.5	86	50.2	94.0	10.1	86.0
51	Allethrin	18.6	22	57.0	39.0	18.6	57.0
52	Methoprene	16.8	39	60.4	29.9	16.8	60.4
53	Triflumizole	24.1	56	50.6	33.9	24.1	56.0
54	Paclobutrazol	30.6	113	115.7	30.3	30.3	115.7
55	Flutriafol	56.2	65	45.8	26.1	26.1	65.0
56	Flumetralin	48.7	27	51.9	28.9	27.0	51.9
57	Napropamide	30.1	97	53.1	24.5	24.5	97.0
58	Ethalfluralin	35.6	84	90.9	30.9	30.9	90.9
59	Picoxystrobin	32.1	10	47.6	31.3	10.0	47.6
60	Flutolanil	42	115	51.1	25.1	25.1	115.0
61	*p,p'*-DDE	48	101	40.1	33.3	33.3	101.0
62	Fludioxinil	70.9	53	61.4	25.4	25.4	70.9
63	Tribuphos	45.9	38	39.4	27.1	27.1	45.9
64	Oxadiazon	31.31	62	41.3	33.8	31.3	62.0
65	Myclobutanil	46.2	159	46.9	30.4	30.4	159.0
66	Oxyflurofen	31.3	24	46.8	26.9	24.0	46.8
67	Fipronil sulfone	62.12	85	55.8	29.8	29.8	85.0
68	Kresoxim-methyl	33.3	69	46.1	29.4	29.4	69.0
69	Cyproconazole	55	123	135.2	24.0	24.0	135.2
70	Chlorfenapyr	82.9	53	41.7	32.0	32.0	82.9
71	*p,p'*-DDD	37.7	34	30.0	32.3	30.0	37.7
72	Quinoxyfen	35	54	43.4	33.9	33.9	54.0
73	Fenhexamide	189.7	53	235.6	39.6	39.6	235.6
74	*p,p'*-DDT	30.5	30	61.1	29.2	29.2	61.1
75	Propiconazole	69.9	39	48.3	33.3	33.3	69.9
76	Trifloxystrobin	30.9	38	60.0	30.3	30.3	60.0
77	Fluopicolide	57.9	112	36.5	22.8	22.8	112.0
78	Hexazinone	69.6	138	51.7	4.9	4.9	138.0
79	Tebuconazole + Metcona	63.7	128	71.9	29.5	29.5	128.0
80	Propargite	65.88	63	57.4	43.5	43.5	65.9
81	Piperonyl butoxide	64.3	49	61.9	27.7	27.7	64.3
82	Resemethrin	38.8	557	43.3	27.2	27.2	557.0
83	Zoxamide	63.9	75	46.2	22.3	22.3	75.0
84	Iprodione	73.2	107	38.7	88.7	38.7	107.0
85	Phosmet	55.9	8	54.5	25.5	8.0	55.9
86	Tetramethrin	63.9	19	25.7	36.0	19.0	63.9
87	Tetradifon	44.4	-	54.0	29.8	29.8	54.0

#	Analyte	Lab A	Lab B	Lab C	Lab D	MIN	MAX
89	Fluxapyroxad	80.1	64	55.1	25.3	25.3	80.1
90	Bifenthrin	20.6	33	32.4	34.2	20.6	34.2
91	Etoxazole	42.4	109	56.4	32.8	32.8	109.0
92	Fenamidone	46.8	111	20.3	26.0	20.3	111.0
93	Malaoxon	48	55	26.8	25.7	25.7	55.0
94	Phenothrin	35.2	44	23.2	33.0	23.2	44.0
95	Pyriproxyfen	46.3	-	27.0	31.0	27.0	46.3
96	Cyhalofop-butyl	59.2	48	20.3	31.7	20.3	59.2
97	Cyhalothrin	42.46	48	18.9	25.7	18.9	48.0
98	Fenpropathrin	58	20	25.3	32.2	20.0	58.0
99	Pyridaben	62.7	25	27.1	30.6	25.0	62.7
100	Coumaphos	78.7	-	28.3	28.9	28.3	78.7
101	Fenbuconazole	91.5	87	33.7	28.5	28.5	91.5
102	Cyfluthrin	69	26	35.7	30.4	26.0	69.0
103	Boscalid	61.9	64	31.2	27.2	27.2	64.0
104	Cypermethrin	71.2	43	24.4	24.0	24.0	71.2
105	Etofenprox	35.8	69	31.8	33.9	31.8	69.0
106	Pyraclostrobin	96.56	99	71.6	20.7	20.7	99.0
107	Esfenvalerate	54.72	27	40.3	26.3	26.3	54.7
108	*tau*-Fluvalinate	89.1	-	29.7	28.8	28.8	89.1
109	Difenoconazole	70.77	27	45.1	47.4	27.0	70.8
110	Indoxacarb	64.2	267	37.3	35.4	35.4	267.0
111	Deltamethrin	59	55	33.0	70.1	33.0	70.1
112	Azoxystrobin	72.47	203	41.0	27.8	27.8	203.0
113	Famoxadone	55.84	76	65.8	32.7	32.7	76.0
114	Dimethomorph	90.16	214	25.4	32.9	25.4	214.0
115	Fluoxastrobin	83.84	566	22.9	36.8	22.9	566.0

Table 8. Summary of Method Detection Limits (MDLs, ng/disk) of analytes on Chemcatcher passive samplers on Hydrophilic-Lipophilic Balance (HLB) disk (47 mm diameter) used as sorbent media, arranged by analyte number (Table 1). A spiking level of 100 ng/disk was used for Laboratory A, Laboratory B, and Laboratory D, while 50 ng/disk was used for Laboratory C to determine the MDLs.

#	Analyte	Lab A	Laby B	Lab C	Lab D	MIN	MAX
1	Dichlorvos	36.8	9	36.0	36.3	9.0	36.8
2	Novaluron	35.1	26	61.7	68.6	26.0	68.6
3	3,5-Dichloroaniline	40.2	7	38.4	45.0	7.0	45.0
5	Cycloate	45.7	19	43.0	81.7	19.0	81.7
7	Trifluralin	30.4	9	42.2	81.2	9.0	81.2
9	Benefin	24.7	4	39.4	73.5	4.0	73.5
10	Pentachloroanisole	43.7	15	35.7	82.9	15.0	82.9
11	Simazine	41.3	38	30.1	109.5	30.1	109.5
12	Prometon	23.5	33	44.9	197.1	23.5	197.1
13	Carbofuran	38.3	2	84.8	44.0	2.0	84.8
14	Imazalil	27.2	29	25.6	46.0	25.6	46.0
15	Atrazine	15.7	31	29.2	54.1	15.7	54.1
16	Clomazone	22.9	24	28.7	58.4	22.9	58.4
17	Pentachloronitrobenzene	22.9	8	60.1	71.9	8.0	71.9
18	Propyzamide	29.4	8	25.1	60.1	8.0	60.1
19	Pyrimethanil	33.2	25	26.1	57.1	25.0	57.1
20	Diazinon	34.5	20	42.5	38.3	20.0	42.5
21	Chlorothalonil	32.6	-	-	34.4	32.6	34.4
22	Triallate	33.8	21	35.0	76.5	21.0	76.5
23	Tefluthrin	38	26	40.4	83.5	26.0	83.5
24	Tebupirimfos	45	22	26.6	56.6	22.0	56.6
25	Propanil	39.3	38	40.9	56.0	38.0	56.0
26	Methyl parathion	31.9	25	32.9	72.2	25.0	72.2
27	Acibenzolar-S-methyl	33.2	53.5	43	31.6	31.6	53.5
28	Carbaryl	21	24.8	31	167.1	21.0	167.1
29	Prometryn	23.4	61.2	12	28.1	12.0	61.2
30	Metalaxyl	14.7	56	46.1	63.6	14.7	63.6
31	Dithiopyr	21.9	40	25.7	72.4	21.9	72.4
32	Prodiamine	18.2	14	41.6	51.8	14.0	51.8
33	Thiobencarb	20.4	37	28.8	42.4	20.4	42.4
34	Malathion	21.5	27	26.3	51.6	21.5	51.6
35	Metolachlor	14	35	31.6	51.3	14.0	51.3
36	Chlorpyrifos	31.8	29	29.8	66.0	29.0	66.0
37	Triadimefon	27.5	39	34.0	52.3	27.5	52.3
38	Dacthal	16.4	55	25.3	48.7	16.4	55.0
39	Flufenacet	7.1	26	31.4	49.2	7.1	49.2
40	Teraconazole	39.8	104	36.8	48.4	36.8	104.0
41	Butralin	23.2	11	30.3	47.7	11.0	47.7
42	Cyprodinil	26.2	32	37.1	34.5	26.2	37.1

#	Analyte	Lab A	Laby B	Lab C	Lab D	MIN	MAX
43	Pendimethalin	20.4	13	31.8	49.9	13.0	49.9
44	Fipronil sulfide	21.7	23	53.0	45.6	21.7	53.0
45	Captan	-	-	51.6	0.0	0.0	51.6
46	Fluazinam	37.4	29	173.1	0.0	29.0	173.1
47	Fluopyram	32.9	27	53.1	51.3	24.0	123.7
49	Triadimenol	24	80	90.1	123.7	20.0	422.9
50	Fipronil	20	4	60.6	422.9	0.0	60.6
51	Allethrin	12.1	24	29.4	60.9	12.1	60.9
52	Methoprene	24.7	17	35.5	93.5	17.0	93.5
53	Triflumizole	38.7	43	50.9	87.4	38.7	87.4
54	Paclobutrazol	30.1	15	80.5	141.2	15.0	141.2
55	Flutriafol	43.4	43	53.4	123.9	43.0	123.9
56	Flumetralin	26.8	6	35.9	57.8	6.0	57.8
57	Napropamide	19.4	41	40.2	136.2	19.4	136.2
58	Ethalfluralin	37.7	51	71.4	98.5	37.7	98.5
59	Picoxystrobin	42.4	6	56.1	99.2	6.0	99.2
60	Flutolanil	49.1	47	56.1	124.4	47.0	124.4
61	*p,p'*-DDE	41	67	22.0	59.2	22.0	67.0
62	Fludioxinil	38.8	37	63.0	123.1	37.0	123.1
63	Tribuphos	19.2	15	29.7	112.4	15.0	112.4
64	Oxadiazon	11.8	49	33.4	80.2	11.8	80.2
65	Myclobutanil	35.1	73	47.3	73.3	35.1	73.3
66	Oxyflurofen	39.8	12	37.8	57.0	12.0	57.0
67	Fipronil sulfone	30.1	18	61.4	94.8	18.0	94.8
68	Kresoxim-methyl	33.9	47	34.2	95.1	33.9	95.1
69	Cyproconazole	41.9	40	175.6	110.8	40.0	175.6
70	Chlorfenapyr	75.3	38	33.6	73.1	33.6	75.3
71	*p,p'*-DDD	33	24	33.4	74.6	24.0	74.6
72	Quinoxyfen	48.6	43	43.1	79.2	43.0	79.2
73	Fenhexamide	-	15	253.0	164.9	15.0	253.0
74	*p,p'*-DDT	23	29	39.7	63.6	23.0	63.6
75	Propiconazole	51.5	27	46.7	98.7	27.0	98.7
76	Trifloxystrobin	39.5	31	48.1	79.1	31.0	79.1
77	Fluopicolide	31.4	33	46.0	130.2	31.4	130.2
78	Hexazinone	31.2	59	48.8	115.1	31.2	115.1
79	Tebuconazole + Metcona	38.2	35	60.8	117.3	35.0	117.3
80	Propargite	142	49	54.2	106.5	49.0	142.0
81	Piperonyl butoxide	34.2	15	43.1	131.0	15.0	131.0
82	Resemethrin	34.4	139	43.0	65.1	34.4	139.0
83	Zoxamide	30.1	39	53.7	41.4	30.1	53.7
84	Iprodione	197.1	18	63.1	49.1	18.0	197.1
85	Phosmet	96.6	2	47.9	33.4	2.0	96.6
86	Tetramethrin	28.8	22	32.3	66.0	22.0	66.0
87	Tetradifon	40.7	-	54.6	128.5	40.7	128.5

#	Analyte	Lab A	Laby B	Lab C	Lab D	MIN	MAX
89	Fluxapyroxad	45.8	36	60.6	137.7	36.0	137.7
90	Bifenthrin	35.2	21	33.1	88.7	21.0	88.7
91	Etoxazole	43.6	46	29.6	82.4	29.6	82.4
92	Fenamidone	39.1	47	28.0	136.4	28.0	136.4
93	Malaoxon	35.6	22	23.3	137.1	22.0	137.1
94	Phenothrin	24	20	22.0	68.3	20.0	68.3
95	Pyriproxyfen	31.5	-	27.3	79.0	27.3	79.0
96	Cyhalofop-butyl	41.5	33	29.5	85.8	29.5	85.8
97	Cyhalothrin	47.9	22	27.8	38.7	22.0	47.9
98	Fenpropathrin	28	27	48.8	73.6	27.0	73.6
99	Pyridaben	27	19	27.6	75.1	19.0	75.1
100	Coumaphos	51	-	26.6	69.0	26.6	69.0
101	Fenbuconazole	55.9	74	32.3	106.1	32.3	106.1
102	Cyfluthrin	52.2	28	30.1	51.5	28.0	52.2
103	Boscalid	58.5	25	27.2	137.4	25.0	137.4
104	Cypermethrin	54.7	49	27.0	73.5	27.0	73.5
105	Etofenprox	32.4	25	20.8	90.3	20.8	90.3
106	Pyraclostrobin	275	17	118.0	140.2	17.0	275.0
107	Esfenvalerate	153.7	15	48.0	34.4	15.0	153.7
108	*tau*-Fluvalinate	80.5	-	57.6	56.8	56.8	80.5
109	Difenoconazole	327.7	14	29.8	79.5	14.0	327.7
110	Indoxacarb	122.2	283	38.9	68.6	38.9	283.0
111	Deltamethrin	-	16	57.5	40.3	16.0	57.5
112	Azoxystrobin	254.8	123	30.6	138.9	30.6	254.8
113	Famoxadone	201.2	72	59.6	76.3	59.6	201.2
114	Dimethomorph	329.3	72	22.3	160.4	22.3	329.3
115	Fluoxastrobin	383.8	36	36.1	141.2	36.0	383.8

Table 9A. Recoveries of analyte Matrix Spikes (MSs) in 1 L river water, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table, following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory A, with a spiking level of 100 ng/L. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red or in asterisk.

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
1	Dichlorvos	49%	54%	61%	54%	55%	9%
2	Novaluron	8%	8%	11%	5%	8%*	31%*
3	3,5-Dichloroaniline	52%	60%	65%	64%	60%	10%
5	Cycloate	121%	65%	73%	70%	82%	32%*
7	Trifluralin	46%	25%	26%	23%	30%*	36%*
9	Benefin	43%	23%	24%	21%	28%*	37%*
10	Pentachloroanisole	50%	52%	59%	49%	53%	9%
11	Simazine	93%	47%	50%	54%	61%	35%*
12	Prometon	87%	45%	47%	53%	58%	34%*
13	Carbofuran	63%	54%	57%	46%	55%	13%
14	Imazalil	49%	45%	52%	55%	50%	9%
15	Atrazine	46%	48%	55%	61%	53%	13%
16	Clomazone	52%	54%	59%	66%	58%	11%
17	Pentachloronitrobenzene	29%	28%	31%	29%	29%*	4%
18	Propyzamide	36%	34%	37%	38%	36%*	5%
19	Pyrimethanil	48%	51%	57%	63%	55%	12%
20	Diazinon	27%	26%	28%	28%	27%*	4%
21	Chlorothalonil	19%	33%	29%	24%	26%*	23%
22	Triallate	86%	48%	49%	52%	59%	31%*
23	Tefluthrin	32%	31%	35%	31%	32%*	6%
24	Tebupirimfos	33%	33%	36%	34%	34%*	4%
25	Propanil	62%	66%	67%	72%	67%	6%
26	Methyl parathion	39%	37%	36%	36%	37%*	4%
27	Acibenzolar-S-methyl	38%	37%	39%	38%	38%*	2%
28	Carbaryl	50%	35%	38%	22%	36%*	32%*
29	Prometryn	78%	40%	46%	46%	53%	33%*
30	Metalaxyl	50%	50%	55%	56%	53%	6%
31	Dithiopyr	48%	53%	54%	53%	52%	5%
32	Prodiamine	86%	44%	43%	44%	54%	39%*
33	Thiobencarb	89%	45%	48%	50%	58%	36%*
34	Malathion	27%	25%	26%	26%	26%*	3%
35	Metolachlor	47%	50%	56%	60%	53%	11%
36	Chlorpyrifos	30%	32%	31%	32%	31%*	3%
37	Triadimefon	39%	48%	48%	48%	46%*	10%
38	Dacthal	63%	69%	70%	71%	68%	5%
39	Flufenacet	42%	41%	46%	47%	44%*	7%

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
40	Teraconazole	43%	49%	50%	52%	49%*	8%
41	Butralin	70%	36%	37%	36%	45%*	38%*
42	Cyprodinil	40%	49%	50%	56%	49%*	14%
43	Pendimethalin	60%	30%	31%	31%	38%*	39%*
44	Fipronil sulfide	39%	43%	45%	50%	44%*	10%
45	Fluazinam	25%	24%	30%	-	26%*	12%
46	Fluopyram	40%	41%	44%	48%	43%*	8%
47	Triadimenol	37%	39%	43%	45%	41%*	9%
49	Fipronil	38%	38%	41%	37%	39%*	4%
50	Captan	31%	37%	38%	37%	36%*	9%
51	Allethrin	39%	44%	49%	45%	44%*	9%
52	Methoprene	25%	24%	24%	24%	24%*	2%
53	Triflumizole	46%	46%	48%	43%	46%*	5%
54	Paclobutrazol	51%	53%	56%	60%	55%	7%
55	Flutriafol	86%	88%	93%	92%	90%	4%
56	Flumetralin	81%	77%	78%	75%	78%	3%
57	Napropamide	203%	97%	112%	109%	130%	38%*
58	Picoxystrobin	103%	97%	103%	102%	101%	3%
59	Ethalfluralin	110%	113%	108%	111%	111%	2%
60	Flutolanil	98%	92%	96%	97%	96%	3%
61	Fludioxinil	98%	91%	90%	95%	94%	4%
62	*p,p'*-DDE	100%	101%	108%	105%	104%	4%
63	Tribuphos	81%	74%	82%	77%	79%	5%
64	Oxadiazon	126%	130%	137%	137%	133%	4%
65	Myclobutanil	83%	86%	97%	92%	90%	7%
66	Oxyflurofen	114%	111%	114%	102%	110%	5%
67	Fipronil sulfone	115%	110%	126%	99%	113%	10%
68	Kresoxim-methyl	81%	79%	79%	80%	80%	1%
69	Cyproconazole	88%	88%	89%	89%	89%	1%
70	Chlorfenapyr	108%	118%	126%	124%	119%	7%
71	*p,p'*-DDD	96%	99%	104%	104%	101%	4%
72	Quinoxyfen	139%	130%	139%	134%	136%	3%
73	Fenhexamide	281%	246%	269%	207%	251%*	13%
74	*p,p'*-DDT	85%	78%	86%	79%	82%	5%
75	Propiconazole	104%	96%	111%	101%	103%	6%
76	Trifloxystrobin	90%	86%	88%	82%	87%	4%
77	Fluopicolide	123%	111%	116%	108%	115%	6%
78	Hexazinone	93%	90%	98%	97%	95%	4%
79	Tebuconazole + Metcona	90%	89%	94%	87%	90%	3%
80	Propargite	110%	103%	93%	75%	95%	16%
81	Piperonyl butoxide	110%	107%	111%	105%	108%	3%
82	Resemethrin	34%	27%	31%	30%	31%*	9%
83	Zoxamide	144%	89%	97%	61%	98%	35%*
84	Iprodione	107%	80%	74%	38%	75%	38%*

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
85	Phosmet	38%	26%	23%	13%	25%*	41%*
86	Tetramethrin	70%	67%	65%	36%	60%	27%
87	Tetradifon	99%	98%	103%	102%	101%	2%
89	Fluxapyroxad	110%	116%	130%	100%	114%	11%
90	Bifenthrin	79%	82%	90%	81%	83%	6%
91	Etoxazole	76%	67%	86%	75%	76%	10%
92	Fenamidone	83%	81%	86%	79%	82%	4%
93	Malaoxon	82%	77%	77%	77%	78%	3%
94	Phenothrin	60%	54%	60%	51%	56%	8%
95	Pyriproxyfen	80%	72%	77%	73%	76%	5%
96	Cyhalofop-butyl	82%	76%	76%	59%	73%	14%
97	Cyhalothrin	100%	95%	91%	94%	95%	4%
98	Fenpropathrin	70%	61%	64%	47%	61%	16%
99	Pyridaben	120%	102%	95%	77%	99%	18%
100	Coumaphos	91%	72%	67%	60%	73%	18%
101	Fenbuconazole	97%	95%	100%	90%	96%	4%
102	Cyfluthrin	97%	82%	93%	77%	87%	11%
103	Boscalid	106%	96%	99%	91%	98%	6%
104	Cypermethrin	83%	83%	84%	69%	80%	9%
105	Etofenprox	78%	70%	71%	65%	71%	8%
106	Pyraclostrobin	101%	112%	102%	96%	103%	7%
107	Esfenvalerate	84%	63%	69%	44%	65%	25%
108	*tau*-Fluvalinate	104%	86%	93%	70%	88%	16%
109	Difenoconazole	144%	129%	132%	112%	129%	10%
110	Indoxacarb	124%	105%	117%	72%	105%	22%
111	Deltamethrin	149%	172%	160%	123%	151%*	14%
112	Azoxystrobin	148%	119%	122%	107%	124%	14%
113	Famoxadone	100%	81%	88%	53%	81%	25%
114	Dimethomorph	132%	103%	106%	95%	109%	15%
115	Fluoxastrobin	106%	72%	72%	62%	78%	25%
8	DBOFB (RS)	28%	26%	30%	24%	27%	10%

Table 9B. Recoveries of analyte Matrix Spikes (MSs) in 1 L river water, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table, following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory B, with a spiking level of 100 ng/L. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red or in asterisk.

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
1	Dichlorvos	87%	79%	97%	109%	93%	14%
2	Novaluron	63%	62%	66%	63%	64%	3%
3	3,5-Dichloroaniline	79%	82%	85%	94%	85%	8%
5	Cycloate	88%	85%	92%	98%	91%	6%
7	Trifluralin	68%	76%	72%	78%	74%	6%
9	Benefin	89%	79%	89%	98%	89%	9%
10	Pentachloroanisole	79%	68%	76%	82%	76%	8%
11	Simazine	78%	76%	80%	77%	78%	2%
12	Prometon	90%	73%	70%	85%	80%	12%
13	Carbofuran	78%	85%	94%	89%	87%	8%
14	Imazalil	92%	79%	84%	84%	85%	6%
15	Atrazine	90%	80%	80%	82%	83%	6%
16	Clomazone	68%	60%	63%	68%	65%	6%
17	Pentachloronitrobenzene	73%	60%	70%	72%	69%	9%
18	Propyzamide	71%	69%	80%	75%	74%	7%
19	Pyrimethanil	86%	85%	86%	91%	87%	3%
20	Diazinon	64%	76%	73%	77%	73%	8%
21	Chlorothalonil	12%	4%	12%	8%	9%*	43%*
22	Triallate	72%	75%	80%	81%	77%	6%
23	Tefluthrin	63%	63%	74%	75%	69%	10%
24	Tebupirimfos	62%	65%	68%	69%	66%	5%
25	Propanil	101%	75%	70%	66%	78%	20%
26	Methyl parathion	75%	84%	69%	81%	77%	9%
27	Acibenzolar-S-methyl	90%	80%	77%	85%	83%	7%
28	Carbaryl	85%	69%	76%	72%	76%	9%
29	Prometryn	68%	72%	73%	74%	72%	4%
30	Metalaxyl	76%	72%	68%	70%	72%	5%
31	Dithiopyr	56%	65%	64%	65%	63%	7%
32	Prodiamine	57%	69%	66%	74%	67%	11%
33	Thiobencarb	71%	64%	64%	72%	68%	6%
34	Malathion	41%	38%	40%	41%	40%*	4%
35	Metolachlor	69%	67%	72%	72%	70%	3%
36	Chlorpyrifos	71%	66%	67%	76%	70%	6%
37	Triadimefon	69%	65%	65%	61%	65%	5%
38	Dacthal	88%	85%	87%	90%	88%	2%
39	Flufenacet	90%	78%	83%	95%	87%	9%

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
40	Teraconazole	77%	62%	61%	62%	66%	12%
41	Butralin	77%	65%	65%	72%	70%	8%
42	Cyprodinil	74%	63%	65%	65%	67%	7%
43	Pendimethalin	74%	67%	71%	83%	74%	9%
44	Fipronil sulfide	63%	55%	55%	58%	58%	7%
45	Fluazinam	58%	91%	61%	52%	66%	27%
46	Fluopyram	62%	57%	51%	57%	57%	8%
47	Triadimenol	71%	58%	57%	62%	62%	10%
49	Fipronil	42%	45%	48%	39%	44%*	9%
50	Captan	36%	75%	65%	60%	59%	28%
51	Allethrin	55%	57%	63%	55%	58%	7%
52	Methoprene	43%	44%	45%	50%	46%*	7%
53	Triflumizole	28%	14%	20%	18%	20%*	29%
54	Paclobutrazol	70%	41%	38%	37%	47%*	34%*
55	Flutriafol	62%	55%	52%	58%	57%	8%
56	Flumetralin	49%	50%	43%	57%	50%*	12%
57	Napropamide	73%	51%	48%	57%	57%	19%
58	Picoxystrobin	55%	48%	48%	54%	51%	7%
59	Ethalfluralin	92%	76%	88%	103%	90%	12%
60	Flutolanil	65%	49%	46%	44%	51%	19%
61	Fludioxinil	83%	68%	76%	70%	74%	9%
62	*p,p'*-DDE	65%	51%	54%	54%	56%	11%
63	Tribuphos	62%	52%	60%	61%	59%	8%
64	Oxadiazon	67%	56%	56%	61%	60%	9%
65	Myclobutanil	49%	43%	48%	33%	43%*	17%
66	Oxyflurofen	92%	69%	86%	57%	76%	21%
67	Fipronil sulfone	77%	62%	45%	56%	60%	22%
68	Kresoxim-methyl	70%	61%	60%	58%	62%	9%
69	Cyproconazole	84%	48%	53%	53%	60%	28%
70	Chlorfenapyr	70%	67%	58%	63%	65%	8%
71	*p,p'*-DDD	87%	58%	64%	68%	69%	18%
72	Quinoxyfen	76%	51%	58%	56%	60%	18%
73	Fenhexamide	69%	58%	86%	60%	68%	19%
74	*p,p'*-DDT	89%	82%	60%	57%	72%	22%
75	Propiconazole	76%	47%	39%	46%	52%	32%*
76	Trifloxystrobin	97%	64%	81%	79%	80%	17%
77	Fluopicolide	85%	72%	65%	68%	73%	12%
78	Hexazinone	71%	73%	61%	71%	69%	8%
79	Tebuconazole + Metcona	93%	95%	81%	105%	94%	11%
80	Propargite	75%	111%	116%	115%	104%	19%
81	Piperonyl butoxide	70%	45%	50%	49%	54%	21%
82	Resemethrin	88%	73%	95%	88%	86%	11%
83	Zoxamide	85%	92%	75%	83%	84%	8%
84	Iprodione	95%	111%	112%	83%	100%	14%

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
85	Phosmet	74%	65%	59%	65%	66%	9%
86	Tetramethrin	92%	62%	67%	67%	72%	19%
87	Tetradifon	-	-	-	-	-	-
89	Fluxapyroxad	44%	36%	31%	31%	36%*	17%
90	Bifenthrin	68%	74%	74%	67%	71%	5%
91	Etoxazole	88%	66%	65%	53%	68%	21%
92	Fenamidone	83%	67%	74%	57%	70%	16%
93	Malaoxon	80%	79%	66%	72%	74%	9%
94	Phenothrin	77%	61%	69%	77%	71%	11%
95	Pyriproxyfen	-	-	-	-	-	-
96	Cyhalofop-butyl	79%	84%	67%	82%	78%	10%
97	Cyhalothrin	76%	82%	74%	82%	79%	5%
98	Fenpropathrin	115%	99%	94%	87%	99%	12%
99	Pyridaben	62%	42%	32%	59%	49%*	29%
100	Coumaphos	40%	40%	49%	43%	43%*	10%
101	Fenbuconazole	85%	77%	81%	86%	82%	5%
102	Cyfluthrin	77%	76%	80%	88%	80%	7%
103	Boscalid	75%	78%	92%	83%	82%	9%
104	Cypermethrin	79%	76%	73%	64%	73%	9%
105	Etofenprox	64%	31%	33%	18%	37%*	53%*
106	Pyraclostrobin	33%	53%	37%	55%	45%*	25%
107	Esfenvalerate	52%	69%	70%	55%	62%	15%
108	*tau*-Fluvalinate	100%	8%	80%	85%	68%	60%*
109	Difenoconazole	63%	98%	70%	64%	74%	22%
110	Indoxacarb	56%	60%	60%	38%	54%	20%
111	Deltamethrin	73%	116%	86%	79%	89%	22%
112	Azoxystrobin	70%	101%	80%	82%	83%	16%
113	Famoxadone	-	-	-	-	-	-
114	Dimethomorph	76%	79%	64%	63%	71%	12%
115	Fluoxastrobin	34%	37%	30%	46%	37%*	19%

Table 9C. Recoveries of analyte Matrix Spikes (MSs) in 1 L river water, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table, following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory C, with a spiking level of 200 ng/L. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red or in asterisk.

#	Analyte	MS1	MS2	MS3	Mean	RSD
1	Dichlorvos	118%	105%	124%	116%	8%
2	Novaluron	39%	9%	10%	19%*	88%*
3	3,5-Dichloroaniline	98%	92%	115%	102%	12%
5	Cycloate	95%	90%	124%	103%	18%
7	Trifluralin	66%	64%	82%	71%	14%
9	Benefin	66%	60%	88%	71%	21%
10	Pentachloroanisole	56%	43%	75%	58%	28%
11	Simazine	113%	110%	128%	117%	8%
12	Prometon	121%	107%	121%	116%	7%
13	Carbofuran	217%	199%	221%	212%	6%
14	Imazalil	116%	117%	121%	118%	2%
15	Atrazine	117%	105%	124%	115%	8%
16	Clomazone	113%	105%	123%	114%	8%
17	Pentachloronitrobenzene	70%	58%	99%	76%	28%
18	Propyzamide	123%	108%	118%	116%	7%
19	Pyrimethanil	108%	96%	111%	105%	8%
20	Diazinon	94%	80%	98%	91%	10%
21	Chlorothalonil	-	-	-	-	-
22	Triallate	88%	77%	112%	92%	19%
23	Tefluthrin	46%	45%	56%	49%*	12%
24	Tebupirimfos	96%	78%	103%	92%	14%
25	Propanil	121%	118%	120%	120%	1%
26	Methyl parathion	132%	111%	130%	124%	9%
27	Acibenzolar-S-methyl	115%	104%	120%	113%	7%
28	Carbaryl	183%	182%	199%	188%	5%
29	Prometryn	122%	106%	121%	116%	8%
30	Metalaxyl	126%	106%	119%	117%	9%
31	Dithiopyr	99%	100%	115%	105%	9%
32	Prodiamine	121%	103%	116%	113%	8%
33	Thiobencarb	108%	93%	115%	105%	11%
34	Malathion	105%	87%	113%	102%	13%
35	Metolachlor	118%	104%	115%	112%	7%
36	Chlorpyrifos	93%	77%	108%	93%	17%
37	Triadimefon	125%	108%	118%	117%	7%
38	Dacthal	114%	101%	124%	113%	10%
39	Flufenacet	123%	110%	126%	120%	7%

#	Analyte	MS1	MS2	MS3	Mean	RSD
40	Teraconazole	126%	110%	122%	119%	7%
41	Butralin	105%	82%	108%	98%	14%
42	Cyprodinil	115%	91%	118%	108%	14%
43	Pendimethalin	103%	88%	113%	101%	12%
44	Fipronil sulfide	135%	114%	125%	125%	8%
45	Fluazinam	338%	344%	324%	335%	3%
46	Fluopyram	128%	110%	121%	120%	8%
47	Triadimenol	126%	96%	113%	112%	13%
49	Fipronil	162%	114%	123%	133%	19%
50	Captan	83%	54%	58%	65%	24%
51	Allethrin	90%	74%	86%	83%	10%
52	Methoprene	65%	53%	59%	59%	10%
53	Triflumizole	135%	117%	135%	129%	8%
54	Paclobutrazol	132%	137%	127%	132%	4%
55	Flutriafol	139%	118%	126%	128%	8%
56	Flumetralin	92%	78%	87%	86%	8%
57	Napropamide	118%	112%	119%	116%	3%
58	Picoxystrobin	108%	105%	108%	107%	2%
59	Ethalfluralin	110%	105%	112%	109%	3%
60	Flutolanil	132%	113%	123%	123%	8%
61	Fludioxinil	119%	109%	128%	119%	8%
62	*p,p'*-DDE	67%	60%	74%	67%	10%
63	Tribuphos	95%	72%	81%	83%	14%
64	Oxadiazon	114%	100%	117%	110%	8%
65	Myclobutanil	127%	116%	123%	122%	5%
66	Oxyflurofen	96%	86%	95%	92%	6%
67	Fipronil sulfone	127%	112%	122%	120%	6%
68	Kresoxim-methyl	120%	110%	118%	116%	5%
69	Cyproconazole	200%	130%	185%	172%	21%
70	Chlorfenapyr	103%	88%	102%	98%	9%
71	*p,p'*-DDD	91%	78%	94%	88%	10%
72	Quinoxyfen	108%	87%	101%	99%	11%
73	Fenhexamide	192%	190%	200%	194%	3%
74	*p,p'*-DDT	88%	77%	85%	83%	7%
75	Propiconazole	141%	120%	124%	128%	9%
76	Trifloxystrobin	114%	103%	113%	110%	6%
77	Fluopicolide	120%	103%	113%	112%	8%
78	Hexazinone	127%	110%	118%	118%	7%
79	Tebuconazole + Metcona	143%	127%	137%	136%	6%
80	Propargite	99%	80%	87%	89%	11%
81	Piperonyl butoxide	117%	100%	106%	108%	8%
82	Resemethrin	61%	49%	50%	53%	12%
83	Zoxamide	67%	53%	53%	58%	14%
84	Iprodione	130%	121%	105%	119%	11%

#	Analyte	MS1	MS2	MS3	Mean	RSD
85	Phosmet	115%	94%	104%	104%	10%
86	Tetramethrin	62%	62%	64%	63%	2%
87	Tetradifon	134%	113%	122%	123%	9%
89	Fluxapyroxad	128%	113%	122%	121%	6%
90	Bifenthrin	68%	47%	48%	54%	22%
91	Etoxazole	77%	67%	35%	60%	37%*
92	Fenamidone	110%	88%	93%	97%	12%
93	Malaoxon	109%	82%	96%	96%	14%
94	Phenothrin	53%	42%	46%	47%*	12%
95	Pyriproxyfen	87%	59%	72%	73%	19%
96	Cyhalofop-butyl	85%	71%	75%	77%	9%
97	Cyhalothrin	80%	57%	57%	65%	21%
98	Fenpropathrin	86%	62%	66%	71%	18%
99	Pyridaben	62%	43%	45%	50%	21%
100	Coumaphos	122%	86%	88%	99%	21%
101	Fenbuconazole	129%	97%	101%	109%	16%
102	Cyfluthrin	68%	44%	60%	57%	21%
103	Boscalid	113%	83%	90%	95%	16%
104	Cypermethrin	76%	50%	55%	60%	23%
105	Etofenprox	58%	41%	44%	48%*	19%
106	Pyraclostrobin	285%	257%	258%	267%	6%
107	Esfenvalerate	79%	56%	68%	68%	17%
108	*tau*-Fluvalinate	76%	59%	63%	66%	13%
109	Difenoconazole	142%	99%	92%	111%	24%
110	Indoxacarb	90%	61%	61%	71%	24%
111	Deltamethrin	94%	68%	75%	79%	17%
112	Azoxystrobin	115%	91%	101%	102%	12%
113	Famoxadone	114%	102%	101%	106%	7%
114	Dimethomorph	115%	92%	96%	101%	12%
115	Fluoxastrobin	148%	110%	121%	126%	15%
6	Trifluralin-d_{14} (RS)	104%	96%	131%	110%	17%
8	DBOFB (RS)	54%	52%	79%	62%	24%

Table 9D. Recoveries of analyte Matrix Spikes (MSs) in 1 L river water, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table, following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). Performance data from Laboratory D, with a spiking level of 500 ng/L. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red and an asterisk.

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
1	Dichlorvos	34%	62%	23%	53%	43%*	42%*
2	Novaluron	64%	73%	68%	72%	69%	6%
3	3,5-Dichloroaniline	48%	40%	31%	43%	41%*	17%
5	Cycloate	50%	42%	31%	38%	40%*	20%
7	Trifluralin	63%	52%	58%	49%	56%	11%
9	Benefin	64%	53%	59%	50%	56%	11%
10	Pentachloroanisole	19%	15%	15%	14%	16%*	16%
11	Simazine	204%	116%	107%	112%	135%	34%*
12	Prometon	38%	29%	31%	29%	32%*	13%
13	Carbofuran	76%	73%	56%	65%	68%	13%
14	Imazalil	97%	94%	91%	93%	94%	2%
15	Atrazine	93%	93%	90%	92%	92%	2%
16	Clomazone	86%	87%	80%	85%	85%	4%
17	Pentachloronitrobenzene	98%	97%	97%	99%	98%	1%
18	Propyzamide	93%	92%	91%	93%	92%	1%
19	Pyrimethanil	83%	83%	79%	82%	82%	2%
20	Diazinon	92%	90%	85%	87%	88%	4%
21	Chlorothalonil	10%	9%	12%	3%	9%*	42%*
22	Triallate	67%	56%	60%	54%	59%	9%
23	Tefluthrin	64%	58%	64%	51%	59%	11%
24	Tebupirimfos	97%	84%	82%	77%	85%	10%
25	Propanil	75%	77%	77%	75%	76%	1%
26	Methyl parathion	83%	80%	77%	76%	79%	4%
27	Acibenzolar-S-methyl	59%	61%	60%	59%	60%	2%
28	Carbaryl	41%	41%	22%	32%	34%*	27%
29	Prometryn	103%	103%	103%	103%	103%	0%
30	Metalaxyl	100%	103%	103%	103%	102%	1%
31	Dithiopyr	97%	94%	95%	91%	94%	3%
32	Prodiamine	116%	116%	118%	115%	116%	1%
33	Thiobencarb	87%	86%	83%	84%	85%	2%
34	Malathion	92%	88%	86%	87%	88%	3%
35	Metolachlor	96%	96%	95%	96%	96%	1%
36	Chlorpyrifos	82%	77%	78%	73%	77%	5%
37	Triadimefon	98%	100%	99%	100%	99%	1%
38	Dacthal	95%	92%	92%	90%	92%	2%
39	Flufenacet	96%	95%	93%	94%	94%	1%

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
40	Teraconazole	106%	107%	108%	109%	108%	1%
41	Butralin	96%	92%	94%	88%	93%	3%
42	Cyprodinil	93%	93%	93%	94%	93%	1%
43	Pendimethalin	98%	95%	98%	92%	96%	3%
44	Fipronil sulfide	109%	110%	112%	112%	111%	1%
45	Fluazinam	86%	69%	34%	52%	60%	37%*
46	Fluopyram	101%	104%	101%	102%	102%	1%
47	Triadimenol	89%	90%	89%	88%	89%	1%
49	Fipronil	160%	134%	130%	127%	138%	11%
50	Captan	0%	0%	0%	0%	0%*	0%
51	Allethrin	78%	77%	78%	78%	78%	1%
52	Methoprene	81%	80%	81%	78%	80%	2%
53	Triflumizole	94%	93%	94%	89%	92%	3%
54	Paclobutrazol	94%	97%	92%	95%	95%	2%
55	Flutriafol	93%	94%	99%	98%	96%	3%
56	Flumetralin	97%	96%	98%	95%	96%	1%
57	Napropamide	99%	100%	100%	97%	99%	1%
58	Picoxystrobin	96%	100%	99%	98%	98%	2%
59	Ethalfluralin	100%	105%	106%	104%	104%	3%
60	Flutolanil	91%	95%	97%	95%	94%	2%
61	Fludioxinil	80%	82%	82%	77%	80%	3%
62	*p,p'*-DDE	101%	100%	97%	99%	99%	2%
63	Tribuphos	98%	95%	95%	93%	95%	2%
64	Oxadiazon	92%	92%	93%	90%	92%	1%
65	Myclobutanil	93%	93%	93%	93%	93%	0%
66	Oxyflurofen	100%	102%	101%	99%	101%	1%
67	Fipronil sulfone	78%	76%	85%	71%	78%	7%
68	Kresoxim-methyl	93%	97%	97%	95%	95%	2%
69	Cyproconazole	103%	103%	105%	104%	104%	1%
70	Chlorfenapyr	91%	90%	91%	87%	90%	2%
71	*p,p'*-DDD	93%	94%	97%	93%	94%	2%
72	Quinoxyfen	92%	98%	99%	97%	97%	3%
73	Fenhexamide	60%	80%	73%	71%	71%	11%
74	*p,p'*-DDT	87%	86%	87%	83%	86%	2%
75	Propiconazole	88%	90%	89%	92%	90%	2%
76	Trifloxystrobin	98%	103%	104%	103%	102%	3%
77	Fluopicolide	98%	104%	104%	103%	102%	3%
78	Hexazinone	98%	99%	99%	99%	99%	1%
79	Tebuconazole + Metcona	99%	99%	101%	103%	101%	2%
80	Propargite	72%	68%	75%	65%	70%	6%
81	Piperonyl butoxide	96%	97%	98%	98%	97%	1%
82	Resemethrin	65%	58%	57%	59%	60%	6%
83	Zoxamide	68%	67%	49%	59%	61%	14%
84	Iprodione	69%	55%	49%	52%	56%	15%

#	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
85	Phosmet	2%	2%	3%	2%	2%*	17%
86	Tetramethrin	79%	76%	81%	78%	79%	2%
87	Tetradifon	99%	101%	98%	99%	99%	1%
89	Fluxapyroxad	105%	107%	107%	108%	107%	1%
90	Bifenthrin	95%	97%	99%	98%	97%	1%
91	Etoxazole	104%	106%	106%	102%	104%	2%
92	Fenamidone	101%	106%	105%	105%	104%	2%
93	Malaoxon	100%	105%	104%	104%	103%	2%
94	Phenothrin	81%	75%	76%	77%	77%	3%
95	Pyriproxyfen	87%	90%	89%	88%	89%	1%
96	Cyhalofop-butyl	101%	102%	102%	103%	102%	1%
97	Cyhalothrin	82%	80%	76%	90%	82%	7%
98	Fenpropathrin	94%	95%	95%	94%	94%	1%
99	Pyridaben	95%	94%	96%	94%	95%	1%
100	Coumaphos	88%	85%	82%	83%	84%	3%
101	Fenbuconazole	85%	87%	88%	91%	88%	3%
102	Cyfluthrin	88%	88%	84%	87%	87%	2%
103	Boscalid	94%	98%	97%	95%	96%	2%
104	Cypermethrin	89%	89%	84%	89%	88%	3%
105	Etofenprox	93%	94%	95%	92%	93%	2%
106	Pyraclostrobin	62%	52%	44%	45%	51%	16%
107	Esfenvalerate	69%	65%	55%	71%	65%	11%
108	*tau*-Fluvalinate	97%	94%	86%	94%	93%	5%
109	Difenoconazole	96%	93%	94%	94%	94%	1%
110	Indoxacarb	98%	96%	94%	91%	95%	3%
111	Deltamethrin	33%	33%	26%	31%	31%*	11%
112	Azoxystrobin	115%	118%	120%	118%	118%	1%
113	Famoxadone	103%	102%	99%	99%	101%	2%
114	Dimethomorph	111%	108%	114%	112%	111%	2%
115	Fluoxastrobin	96%	96%	92%	87%	93%	5%
6	Trifluralin-d_{14} (RS)	82%	77%	89%	89%	84%	7%
8	DBOFB (RS)	43%	41%	49%	57%	48%*	16%
48	$^{13}C_4$-Fipronil (RS)	106%	108%	116%	116%	112%	5%

Table 9X. Summary of performance data from all laboratories. Recoveries of analyte Matrix Spikes (MSs) in 1 L river water, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table, following Solid Phase Extraction (SPE) with Hydrophilic-Lipophilic Balance (HLB) cartridge (6cc, 500 mg sorbent). The spiking amount in 1 L river water was 100 ng for Laboratory A and Laboratory B, 200 ng for Laboratory C, and 500 ng for Laboratory D. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>30%) are highlighted in red and an asterisk.

#	Analyte	Lab A Mean	Lab A RSD	Lab B Mean	Lab B RSD	Lab C Mean	Lab C RSD	Lab D Mean	Lab D RSD	Total Mean	Total RSD
1	Dichlorvos	55%	9%	93%	14%	116%	8%	43%*	42%*	74%	42%*
2	Novaluron	8%*	31%*	64%	3%	19%*	88%*	69%	6%	41%*	70%*
3	3,5-Dichloroaniline	60%	10%	85%	8%	102%	12%	41%*	17%	70%	35%*
5	Cycloate	82%	32%*	91%	6%	103%	18%	40%*	20%	77%	37%*
7	Trifluralin	30%*	36%*	74%	6%	71%	14%	56%	11%	57%	34%*
9	Benefin	28%*	37%*	89%	9%	71%	21%	56%	11%	60%	42%*
10	Pentachloroanisole	53%	9%	76%	8%	58%	28%	16%*	16%	50%	49%*
11	Simazine	61%	35%*	78%	2%	117%	8%	135%	34%*	96%	41%*
12	Prometon	58%	34%*	80%	12%	116%	7%	32%*	13%	68%	48%*
13	Carbofuran	55%	13%	87%	8%	212%	6%	68%	13%	98%	62%*
14	Imazalil	50%	9%	85%	6%	118%	2%	94%	2%	85%	29%
15	Atrazine	53%	13%	83%	6%	115%	8%	92%	2%	84%	28%
16	Clomazone	58%	11%	65%	6%	114%	8%	85%	4%	78%	28%
17	Pentachloronitrobenzene	29%*	4%	69%	9%	76%	28%	98%	1%	67%	41%*
18	Propyzamide	36%*	5%	74%	7%	116%	7%	92%	1%	77%	39%*
19	Pyrimethanil	55%	12%	87%	3%	105%	8%	82%	2%	81%	23%
20	Diazinon	27%*	4%	73%	8%	91%	10%	88%	4%	68%	40%*
21	Chlorothalonil	26%*	23%	9%*	43%*	-	-	9%*	42%*	15%*	66%*
22	Triallate	59%	31%*	77%	6%	92%	19%	59%	9%	70%	25%
23	Tefluthrin	32%*	6%	69%	10%	49%*	12%	59%	11%	53%	29%
24	Tebupirimfos	34%*	4%	66%	5%	92%	14%	85%	10%	68%	36%*
25	Propanil	67%	6%	78%	20%	120%	1%	76%	1%	83%	25%
26	Methyl parathion	37%*	4%	77%	9%	124%	9%	79%	4%	76%	41%*
27	Acibenzolar-S-methyl	38%*	2%	83%	7%	113%	7%	60%	2%	71%	40%*
28	Carbaryl	36%*	32%*	76%	9%	188%	5%	34%*	27%	76%	80%*
29	Prometryn	53%	33%*	72%	4%	116%	8%	103%	0%	84%	32%*
30	Metalaxyl	53%	6%	72%	5%	117%	9%	102%	1%	84%	31%*
31	Dithiopyr	52%	5%	63%	7%	105%	9%	94%	3%	77%	29%
32	Prodiamine	54%	39%*	67%	11%	113%	8%	116%	1%	86%	36%*
33	Thiobencarb	58%	36%*	68%	6%	105%	11%	85%	2%	77%	27%
34	Malathion	26%*	3%	40%*	4%	102%	13%	88%	3%	61%	53%*
35	Metolachlor	53%	11%	70%	3%	112%	7%	96%	1%	81%	29%
36	Chlorpyrifos	31%*	3%	70%	6%	93%	17%	77%	5%	66%	36%*
37	Triadimefon	46%*	10%	65%	5%	117%	7%	99%	1%	79%	36%*
38	Dacthal	68%	5%	88%	2%	113%	10%	92%	2%	89%	19%
39	Flufenacet	44%*	7%	87%	9%	120%	7%	94%	1%	84%	33%*
40	Teraconazole	49%*	8%	66%	12%	119%	7%	108%	1%	83%	36%*

#	Analyte	Lab A Mean	Lab A RSD	Lab B Mean	Lab B RSD	Lab C Mean	Lab C RSD	Lab D Mean	Lab D RSD	Total Mean	Total RSD
41	Butralin	45%*	38%*	70%	8%	98%	14%	93%	3%	75%	32%*
42	Cyprodinil	49%*	14%	67%	7%	108%	14%	93%	1%	77%	31%*
43	Pendimethalin	38%*	39%*	74%	9%	101%	12%	96%	3%	76%	36%*
44	Fipronil sulfide	44%*	10%	58%	7%	125%	8%	111%	1%	82%	43%*
45	Fluazinam	26%*	12%	66%	27%	335%	3%	60%	37%*	113%	108%*
46	Fluopyram	43%*	8%	57%	8%	120%	8%	102%	1%	78%	41%*
47	Triadimenol	41%*	9%	62%	10%	112%	13%	89%	1%	74%	38%*
49	Fipronil	39%*	4%	44%*	9%	133%	19%	138%	11%	85%	59%*
50	Captan	36%*	9%	59%	28%	65%	24%	0%*	0%	38%*	74%*
51	Allethrin	44%*	9%	58%	7%	83%	10%	78%	1%	65%	26%
52	Methoprene	24%*	2%	46%*	7%	59%	10%	80%	2%	52%	42%*
53	Triflumizole	46%*	5%	20%*	29%	129%	8%	92%	3%	68%	62%*
54	Paclobutrazol	55%	7%	47%*	34%*	132%	4%	95%	2%	79%	44%*
55	Flutriafol	90%	4%	57%	8%	128%	8%	96%	3%	90%	28%
56	Flumetralin	78%	3%	50%*	12%	86%	8%	96%	1%	77%	24%
57	Napropamide	130%	38%*	57%	19%	116%	3%	99%	1%	100%	37%*
58	Picoxystrobin	101%	3%	51%	7%	107%	2%	98%	2%	88%	27%
59	Ethalfluralin	111%	2%	90%	12%	109%	3%	104%	3%	103%	10%
60	Flutolanil	96%	3%	51%	19%	123%	8%	94%	2%	89%	30%*
61	Fludioxinil	94%	4%	74%	9%	119%	8%	80%	3%	90%	19%
62	*p,p'*-DDE	104%	4%	56%	11%	67%	10%	99%	2%	82%	26%
63	Tribuphos	79%	5%	59%	8%	83%	14%	95%	2%	79%	19%
64	Oxadiazon	133%	4%	60%	9%	110%	8%	92%	1%	98%	29%
65	Myclobutanil	90%	7%	43%*	17%	122%	5%	93%	0%	85%	34%*
66	Oxyflurofen	110%	5%	76%	21%	92%	6%	101%	1%	95%	17%
67	Fipronil sulfone	113%	10%	60%	22%	120%	6%	78%	7%	91%	30%
68	Kresoxim-methyl	80%	1%	62%	9%	116%	5%	95%	2%	87%	23%
69	Cyproconazole	89%	1%	60%	28%	172%	21%	104%	1%	101%	43%*
70	Chlorfenapyr	119%	7%	65%	8%	98%	9%	90%	2%	92%	23%
71	*p,p'*-DDD	101%	4%	69%	18%	88%	10%	94%	2%	88%	16%
72	Quinoxyfen	136%	3%	60%	18%	99%	11%	97%	3%	98%	30%
73	Fenhexamide	251%*	13%	68%	19%	194%	3%	71%	11%	143%	60%*
74	*p,p'*-DDT	82%	5%	72%	22%	83%	7%	86%	2%	81%	12%
75	Propiconazole	103%	6%	52%	32%*	128%	9%	90%	2%	91%	32%*
76	Trifloxystrobin	87%	4%	80%	17%	110%	6%	102%	3%	94%	15%
77	Fluopicolide	115%	6%	73%	12%	112%	8%	102%	3%	100%	19%
78	Hexazinone	95%	4%	69%	8%	118%	7%	99%	1%	94%	19%
79	Tebuconazole + Metcona	90%	3%	94%	11%	136%	6%	101%	2%	103%	18%
80	Propargite	95%	16%	104%	19%	89%	11%	70%	6%	90%	20%
81	Piperonyl butoxide	108%	3%	54%	21%	108%	8%	97%	1%	91%	27%
82	Resemethrin	31%*	9%	86%	11%	53%	12%	60%	6%	58%	38%*
83	Zoxamide	98%	35%*	84%	8%	58%	14%	61%	14%	76%	32%*
84	Iprodione	75%	38%*	100%	14%	119%	11%	56%	15%	85%	34%*

#	Analyte	Lab A Mean	Lab A RSD	Lab B Mean	Lab B RSD	Lab C Mean	Lab C RSD	Lab D Mean	Lab D RSD	Total Mean	Total RSD
85	Phosmet	25%*	41%*	66%	9%	104%	10%	2%*	17%	46%*	86%*
86	Tetramethrin	60%	27%	72%	19%	63%	2%	79%	2%	69%	18%
87	Tetradifon	101%	2%	-	-	123%	9%	99%	1%	106%	11%
89	Fluxapyroxad	114%	11%	36%*	17%	121%	6%	107%	1%	93%	40%*
90	Bifenthrin	83%	6%	71%	5%	54%	22%	97%	1%	78%	21%
91	Etoxazole	76%	10%	68%	21%	60%	37%*	104%	2%	78%	27%
92	Fenamidone	82%	4%	70%	16%	97%	12%	104%	2%	88%	18%
93	Malaoxon	78%	3%	74%	9%	96%	14%	103%	2%	87%	16%
94	Phenothrin	56%	8%	71%	11%	47%*	12%	77%	3%	64%	20%
95	Pyriproxyfen	76%	5%	-	-	73%	19%	89%	1%	79%	12%
96	Cyhalofop-butyl	73%	14%	78%	10%	77%	9%	102%	1%	83%	16%
97	Cyhalothrin	95%	4%	79%	5%	65%	21%	82%	7%	81%	15%
98	Fenpropathrin	61%	16%	99%	12%	71%	18%	94%	1%	82%	23%
99	Pyridaben	99%	18%	49%*	29%	50%	21%	95%	1%	75%	36%*
100	Coumaphos	73%	18%	43%*	10%	99%	21%	84%	3%	73%	32%*
101	Fenbuconazole	96%	4%	82%	5%	109%	16%	88%	3%	93%	13%
102	Cyfluthrin	87%	11%	80%	7%	57%	21%	87%	2%	79%	17%
103	Boscalid	98%	6%	82%	9%	95%	16%	96%	2%	93%	11%
104	Cypermethrin	80%	9%	73%	9%	60%	23%	88%	3%	76%	16%
105	Etofenprox	71%	8%	37%*	53%*	48%*	19%	93%	2%	63%	40%*
106	Pyraclostrobin	103%	7%	45%*	25%	267%	6%	51%	16%	106%	82%*
107	Esfenvalerate	65%	25%	62%	15%	68%	17%	65%	11%	65%	16%
108	*tau*-Fluvalinate	88%	16%	68%	60%*	66%	13%	93%	5%	80%	30%
109	Difenoconazole	129%	10%	74%	22%	111%	24%	94%	1%	101%	26%
110	Indoxacarb	105%	22%	54%	20%	71%	24%	95%	3%	82%	31%*
111	Deltamethrin	151%*	14%	89%	22%	79%	17%	31%*	11%	88%	54%*
112	Azoxystrobin	124%	14%	83%	16%	102%	12%	118%	1%	107%	19%
113	Famoxadone	81%	25%	-	-	106%	7%	101%	2%	69%	65%*
114	Dimethomorph	109%	15%	71%	12%	101%	12%	111%	2%	98%	20%
115	Fluoxastrobin	78%	25%	37%*	19%	126%	15%	93%	5%	81%	43%*
6	Trifluralin-d_{14} (RS)	-	-	-	-	110%	17%	84%	7%	95%	19%
8	DBOFB (RS)	27%	10%	-	-	62%	24%	48%*	16%	44%*	38%*
48	$^{13}C_4$-Fipronil (RS)	-	-	-	-	-	-	112%	5%	112%	5%

Table 10A. Recoveries of analyte Matrix Spikes (MSs) on river-water exposed Chemcatcher passive sampler on Hydrophilic-Lipophilic Balance (HLB) disk (47 mm diameter) used as sorbent media, arranged by analyte number (Table 1) with Recovery Standards at the end of the Table. Performance data from Laboratory A, with a spiking level of 100 ng/disk. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

	Analyte	MS1	MS2	MS3	Mean	RSD
1	Dichlorvos	69%	67%	64%	67%	4%
2	Novaluron	7%	16%	14%	12%*	38%
3	3,5-Dichloroaniline	46%	47%	46%	46%*	1%
5	Cycloate	57%	56%	57%	57%	1%
7	Trifluralin	23%	24%	23%	23%*	2%
9	Benefin	22%	23%	22%	22%*	3%
10	Pentachloroanisole	40%	41%	41%	41%*	1%
11	Simazine	52%	50%	53%	52%	3%
12	Prometon	47%	45%	48%	47%*	3%
13	Carbofuran	66%	55%	63%	61%	9%
14	Imazalil	47%	49%	48%	48%*	2%
15	Atrazine	48%	47%	52%	49%*	5%
16	Clomazone	52%	48%	51%	50%	4%
17	Pentachloronitrobenzene	28%	29%	29%	29%*	2%
18	Propyzamide	40%	32%	36%	36%*	11%
19	Pyrimethanil	51%	47%	53%	50%	6%
20	Diazinon	33%	29%	35%	32%*	9%
21	Chlorothalonil	8%	2%	-	5%*	85%*
22	Triallate	40%	39%	40%	40%*	1%
23	Tefluthrin	45%	41%	43%	43%*	5%
24	Tebupirimfos	37%	34%	38%	36%*	6%
25	Propanil	65%	60%	71%	65%	8%
26	Methyl parathion	38%	34%	36%	36%*	6%
27	Acibenzolar-S-methyl	40%	38%	42%	40%*	5%
28	Carbaryl	55%	44%	48%	49%*	11%
29	Prometryn	38%	37%	40%	38%*	4%
30	Metalaxyl	52%	46%	54%	51%	8%
31	Dithiopyr	48%	45%	47%	47%*	3%
32	Prodiamine	40%	37%	38%	38%*	4%
33	Thiobencarb	43%	43%	46%	44%*	4%
34	Malathion	34%	28%	31%	31%*	10%
35	Metolachlor	50%	45%	50%	48%*	6%
36	Chlorpyrifos	33%	30%	33%	32%*	5%
37	Triadimefon	42%	39%	46%	42%*	8%
38	Dacthal	52%	50%	51%	51%	2%
39	Flufenacet	45%	38%	43%	42%*	9%

	Analyte	MS1	MS2	MS3	Mean	RSD
40	Teraconazole	46%	41%	47%	45%*	7%
41	Butralin	31%	29%	29%	30%*	4%
42	Cyprodinil	44%	40%	44%	43%*	5%
43	Pendimethalin	28%	26%	26%	27%*	4%
44	Fipronil sulfide	40%	36%	42%	39%*	8%
45	Fluazinam	69%	40%	42%	50%	32%
46	Fluopyram	38%	33%	42%	38%*	12%
47	Triadimenol	41%	36%	47%	41%*	13%
49	Fipronil	33%	30%	34%	32%*	6%
50	Captan	38%	33%	40%	37%*	10%
51	Allethrin	45%	42%	47%	45%*	6%
52	Methoprene	37%	34%	35%	35%*	4%
53	Triflumizole	46%	41%	42%	43%*	6%
54	Paclobutrazol	52%	47%	53%	51%	6%
55	Flutriafol	81%	70%	69%	73%	9%
56	Flumetralin	69%	65%	57%	64%	10%
57	Napropamide	76%	70%	68%	71%	6%
58	Picoxystrobin	72%	63%	62%	66%	8%
59	Ethalfluralin	71%	68%	68%	69%	3%
60	Flutolanil	77%	65%	65%	69%	10%
61	Fludioxinil	104%	84%	85%	91%	12%
62	p,p'-DDE	93%	80%	76%	83%	11%
63	Tribuphos	71%	64%	62%	66%	7%
64	Oxadiazon	93%	85%	82%	87%	7%
65	Myclobutanil	80%	67%	73%	73%	9%
66	Oxyflurofen	87%	78%	64%	76%	15%
67	Fipronil sulfone	93%	80%	76%	83%	11%
68	Kresoxim-methyl	67%	60%	58%	62%	8%
69	Cyproconazole	79%	68%	64%	70%	11%
70	Chlorfenapyr	92%	86%	84%	87%	5%
71	*p,p'*-DDD	98%	89%	80%	89%	10%
72	Quinoxyfen	110%	104%	94%	103%	8%
73	Fenhexamide	242%	212%	186%	213%*	13%
74	*p,p'*-DDT	74%	66%	56%	65%	14%
75	Propiconazole	82%	78%	77%	79%	3%
76	Trifloxystrobin	75%	64%	63%	67%	10%
77	Fluopicolide	90%	85%	80%	85%	6%
78	Hexazinone	80%	76%	74%	77%	4%
79	Tebuconazole + Metcona	84%	71%	69%	75%	11%
80	Propargite	211%	158%	148%	172%*	20%
81	Piperonyl butoxide	84%	82%	73%	80%	7%
82	Resemethrin	59%	53%	47%	53%	11%
83	Zoxamide	88%	88%	74%	83%	10%
84	Iprodione	96%	84%	76%	85%	12%

	Analyte	MS1	MS2	MS3	Mean	RSD
85	Phosmet	25%	28%	23%	25%*	10%
86	Tetramethrin	101%	97%	94%	97%	4%
87	Tetradifon	84%	76%	77%	79%	6%
89	Fluxapyroxad	98%	78%	85%	87%	12%
90	Bifenthrin	92%	82%	79%	84%	8%
91	Etoxazole	79%	66%	76%	74%	9%
92	Fenamidone	69%	64%	62%	65%	6%
93	Malaoxon	69%	61%	59%	63%	8%
94	Phenothrin	67%	59%	53%	60%	12%
95	Pyriproxyfen	95%	88%	82%	88%	7%
96	Cyhalofop-butyl	109%	100%	87%	99%	11%
97	Cyhalothrin	122%	101%	102%	108%	11%
98	Fenpropathrin	94%	88%	75%	86%	11%
99	Pyridaben	106%	101%	94%	100%	6%
100	Coumaphos	88%	78%	69%	78%	12%
101	Fenbuconazole	106%	96%	84%	95%	12%
102	Cyfluthrin	131%	111%	100%	114%	14%
103	Boscalid	105%	92%	92%	96%	8%
104	Cypermethrin	138%	103%	110%	117%	16%
105	Etofenprox	103%	88%	81%	91%	12%
106	Pyraclostrobin	239%	171%	178%	196%*	19%
107	Esfenvalerate	166%	144%	122%	144%	15%
108	*tau*-Fluvalinate	132%	121%	96%	116%	16%
109	Difenoconazole	180%	165%	131%	159%*	16%
110	Indoxacarb	177%	163%	146%	162%*	10%
111	Deltamethrin	118%	59%	64%	80%	41%
112	Azoxystrobin	168%	140%	122%	143%	16%
113	Famoxadone	156%	131%	128%	138%	11%
114	Dimethomorph	201%	188%	159%	183%*	12%
115	Fluoxastrobin	203%	168%	143%	171%*	18%
8	DBOFB (RS)	33%	37%	35%	35%*	6%

Table 10B. Recoveries of analyte Matrix Spikes (MSs) on river-water exposed Chemcatcher passive sampler on Hydrophilic-Lipophilic Balance (HLB) disk (47 mm diameter) used as sorbent media, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table. Performance data from Laboratory B, with a spiking level of 100 ng/disk. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
1	Dichlorvos	51%	49%	55%	65%	55%	13%
2	Novaluron	26%	21%	27%	35%	27%*	21%
3	3,5-Dichloroaniline	106%	115%	103%	107%	108%	5%
5	Cycloate	119%	114%	126%	114%	118%	5%
7	Trifluralin	96%	106%	102%	84%	97%	10%
9	Benefin	96%	107%	97%	98%	100%	5%
10	Pentachloroanisole	92%	114%	106%	89%	100%	12%
11	Simazine	83%	87%	95%	87%	88%	6%
12	Prometon	79%	83%	74%	87%	81%	7%
13	Carbofuran	77%	82%	86%	81%	82%	5%
14	Imazalil	104%	99%	97%	117%	104%	9%
15	Atrazine	87%	93%	96%	85%	90%	6%
16	Clomazone	95%	99%	83%	90%	92%	8%
17	Pentachloronitrobenzene	80%	84%	110%	107%	95%	16%
18	Propyzamide	84%	81%	87%	87%	85%	3%
19	Pyrimethanil	84%	91%	96%	88%	90%	6%
20	Diazinon	96%	104%	95%	98%	98%	4%
21	Chlorothalonil	6%	11%	15%	5%	9%*	50%*
22	Triallate	92%	99%	97%	96%	96%	3%
23	Tefluthrin	99%	91%	100%	90%	95%	6%
24	Tebupirimfos	87%	93%	9%	84%	68%	58%*
25	Propanil	82%	82%	77%	81%	81%	3%
26	Methyl parathion	64%	75%	61%	58%	65%	11%
27	Acibenzolar-S-methyl	102%	75%	80%	79%	84%	15%
28	Carbaryl	64%	64%	70%	67%	66%	4%
29	Prometryn	75%	85%	77%	82%	80%	6%
30	Metalaxyl	84%	90%	87%	80%	85%	5%
31	Dithiopyr	86%	86%	87%	85%	86%	1%
32	Prodiamine	94%	85%	84%	94%	89%	6%
33	Thiobencarb	78%	99%	89%	90%	89%	10%
34	Malathion	47%	56%	47%	47%	49%*	9%
35	Metolachlor	88%	100%	88%	80%	89%	9%
36	Chlorpyrifos	94%	98%	87%	75%	89%	11%
37	Triadimefon	83%	90%	82%	70%	81%	10%
38	Dacthal	98%	95%	89%	89%	93%	5%
39	Flufenacet	90%	88%	80%	81%	85%	6%

	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
40	Teraconazole	89%	74%	73%	70%	77%	11%
41	Butralin	79%	82%	77%	5%	61%	61%*
42	Cyprodinil	72%	79%	70%	71%	73%	6%
43	Pendimethalin	81%	78%	78%	73%	78%	4%
44	Fipronil sulfide	65%	65%	51%	52%	58%	13%
45	Fluazinam	67%	86%	40%	65%	65%	29%
46	Fluopyram	69%	88%	76%	68%	75%	12%
47	Triadimenol	71%	92%	67%	88%	80%	16%
49	Fipronil	45%	40%	37%	34%	39%*	12%
50	Captan	72%	35%	38%	38%	46%*	38%
51	Allethrin	78%	67%	62%	67%	69%	10%
52	Methoprene	84%	95%	85%	67%	83%	14%
53	Triflumizole	34%	45%	37%	34%	38%*	14%
54	Paclobutrazol	84%	94%	69%	66%	78%	17%
55	Flutriafol	79%	76%	66%	71%	73%	8%
56	Flumetralin	48%	49%	45%	56%	50%*	9%
57	Napropamide	64%	76%	63%	62%	66%	10%
58	Picoxystrobin	73%	73%	63%	65%	69%	8%
59	Ethalfluralin	98%	118%	115%	98%	107%	10%
60	Flutolanil	69%	55%	50%	57%	58%	14%
61	Fludioxinil	79%	88%	85%	83%	84%	5%
62	*p,p'*-DDE	96%	79%	83%	90%	87%	9%
63	Tribuphos	114%	90%	100%	113%	104%	11%
64	Oxadiazon	86%	101%	92%	91%	93%	7%
65	Myclobutanil	76%	55%	58%	58%	62%	16%
66	Oxyflurofen	85%	105%	108%	85%	96%	13%
67	Fipronil sulfone	70%	88%	5%	67%	58%	63%*
68	Kresoxim-methyl	85%	91%	80%	84%	85%	5%
69	Cyproconazole	103%	84%	81%	80%	87%	12%
70	Chlorfenapyr	78%	83%	98%	102%	90%	13%
71	*p,p'*-DDD	103%	93%	92%	99%	97%	5%
72	Quinoxyfen	82%	96%	82%	94%	89%	9%
73	Fenhexamide	22%	22%	17%	21%	21%*	12%
74	*p,p'*-DDT	78%	72%	74%	90%	79%	10%
75	Propiconazole	114%	99%	68%	79%	90%	23%
76	Trifloxystrobin	85%	81%	103%	100%	92%	12%
77	Fluopicolide	99%	108%	81%	84%	93%	14%
78	Hexazinone	63%	46%	43%	51%	51%	17%
79	Tebuconazole + Metcona	25%	14%	18%	17%	19%*	25%
80	Propargite	32%	254%	23%	22%	83%	138%*
81	Piperonyl butoxide	72%	63%	75%	75%	71%	8%
82	Resemethrin	32%	27%	24%	20%	26%*	20%
83	Zoxamide	43%	47%	52%	51%	48%*	9%
84	Iprodione	133%	123%	105%	105%	117%	12%

	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
85	Phosmet	75%	68%	84%	74%	75%	9%
86	Tetramethrin	82%	70%	72%	80%	76%	8%
87	Tetradifon	-	-	-	-	-	-
89	Fluxapyroxad	129%	112%	105%	127%	118%	10%
90	Bifenthrin	99%	79%	81%	86%	86%	10%
91	Etoxazole	79%	82%	85%	85%	83%	3%
92	Fenamidone	81%	98%	87%	93%	90%	8%
93	Malaoxon	71%	74%	68%	7%	55%	58%*
94	Phenothrin	89%	80%	67%	116%	88%	24%
95	Pyriproxyfen	-	-	-	-	-	-
96	Cyhalofop-butyl	116%	73%	92%	81%	91%	21%
97	Cyhalothrin	88%	82%	89%	74%	83%	8%
98	Fenpropathrin	68%	62%	64%	66%	65%	4%
99	Pyridaben	54%	51%	54%	71%	58%	16%
100	Coumaphos	17%	13%	7%	19%	14%*	38%
101	Fenbuconazole	90%	103%	109%	85%	97%	12%
102	Cyfluthrin	73%	60%	70%	78%	70%	11%
103	Boscalid	90%	79%	83%	75%	82%	8%
104	Cypermethrin	70%	80%	72%	90%	78%	12%
105	Etofenprox	75%	66%	68%	77%	72%	7%
106	Pyraclostrobin	67%	71%	69%	59%	67%	8%
107	Esfenvalerate	97%	81%	79%	81%	85%	10%
108	*tau*-Fluvalinate	80%	71%	81%	74%	77%	6%
109	Difenoconazole	69%	77%	65%	90%	75%	15%
110	Indoxacarb	94%	79%	69%	69%	78%	15%
111	Deltamethrin	89%	79%	98%	69%	84%	15%
112	Azoxystrobin	76%	88%	97%	78%	85%	11%
113	Famoxadone	-	-	-	-	-	-
114	Dimethomorph	70%	58%	61%	70%	65%	10%
115	Fluoxastrobin	32%	30%	32%	28%	31%*	6%

Table 10C. Recoveries of analyte Matrix Spikes (MSs) on river-water exposed Chemcatcher passive sampler on Hydrophilic-Lipophilic Balance (HLB) disk (47 mm diameter) used as sorbent media, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table. Performance data from Laboratory C, with a spiking level of 200 ng/disk. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

	Analyte	MS1	MS2	Mean	RSD
1	Dichlorvos	112%	68%	90%	35%
2	Novaluron	40%	54%	47%*	21%
3	3,5-Dichloroaniline	125%	143%	134%	9%
5	Cycloate	108%	111%	110%	2%
7	Trifluralin	92%	92%	92%	0%
9	Benefin	92%	95%	94%	2%
10	Pentachloroanisole	59%	78%	69%	20%
11	Simazine	131%	123%	127%	4%
12	Prometon	129%	123%	126%	3%
13	Carbofuran	162%	86%	124%	43%
14	Imazalil	136%	125%	131%	6%
15	Atrazine	122%	112%	117%	6%
16	Clomazone	120%	109%	115%	7%
17	Pentachloronitrobenzene	81%	79%	80%	2%
18	Propyzamide	130%	117%	124%	7%
19	Pyrimethanil	118%	112%	115%	4%
20	Diazinon	114%	106%	110%	5%
21	Chlorothalonil	-	-	-	-
22	Triallate	108%	105%	107%	2%
23	Tefluthrin	111%	108%	110%	2%
24	Tebupirimfos	121%	113%	117%	5%
25	Propanil	167%	155%	161%*	5%
26	Methyl parathion	131%	125%	128%	3%
27	Acibenzolar-S-methyl	121%	111%	116%	6%
28	Carbaryl	119%	74%	97%	33%
29	Prometryn	138%	132%	135%	3%
30	Metalaxyl	132%	132%	132%	0%
31	Dithiopyr	132%	127%	130%	3%
32	Prodiamine	127%	117%	122%	6%
33	Thiobencarb	132%	128%	130%	2%
34	Malathion	132%	124%	128%	4%
35	Metolachlor	124%	126%	125%	1%
36	Chlorpyrifos	128%	125%	127%	2%
37	Triadimefon	153%	153%	153%*	0%
38	Dacthal	121%	119%	120%	1%
39	Flufenacet	152%	141%	147%	5%

	Analyte	MS1	MS2	Mean	RSD
40	Teraconazole	145%	131%	138%	7%
41	Butralin	116%	114%	115%	1%
42	Cyprodinil	110%	110%	110%	0%
43	Pendimethalin	117%	113%	115%	2%
44	Fipronil sulfide	147%	129%	138%	9%
45	Fluazinam	181%	130%	156%*	23%
46	Fluopyram	142%	126%	134%	8%
47	Triadimenol	148%	102%	125%	26%
49	Fipronil	135%	112%	124%	13%
50	Captan	120%	141%	131%	11%
51	Allethrin	159%	141%	150%	8%
52	Methoprene	123%	120%	122%	2%
53	Triflumizole	138%	136%	137%	1%
54	Paclobutrazol	134%	134%	134%	0%
55	Flutriafol	145%	140%	143%	2%
56	Flumetralin	119%	119%	119%	0%
57	Napropamide	142%	139%	141%	2%
58	Picoxystrobin	137%	126%	132%	6%
59	Ethalfluralin	139%	141%	140%	1%
60	Flutolanil	143%	137%	140%	3%
61	Fludioxinil	144%	129%	137%	8%
62	*p,p'*-DDE	77%	105%	91%	22%
63	Tribuphos	128%	127%	128%	1%
64	Oxadiazon	138%	130%	134%	4%
65	Myclobutanil	141%	135%	138%	3%
66	Oxyflurofen	112%	115%	114%	2%
67	Fipronil sulfone	155%	90%	123%	38%
68	Kresoxim-methyl	154%	150%	152%*	2%
69	Cyproconazole	205%	165%	185%*	15%
70	Chlorfenapyr	139%	133%	136%	3%
71	*p,p'*-DDD	124%	116%	120%	5%
72	Quinoxyfen	139%	138%	139%	1%
73	Fenhexamide	260%	240%	250%*	6%
74	*p,p'*-DDT	110%	111%	111%	1%
75	Propiconazole	155%	148%	152%*	3%
76	Trifloxystrobin	141%	128%	135%	7%
77	Fluopicolide	137%	122%	130%	8%
78	Hexazinone	154%	149%	152%*	2%
79	Tebuconazole + Metcona	154%	150%	152%*	2%
80	Propargite	148%	140%	144%	4%
81	Piperonyl butoxide	156%	151%	154%*	2%
82	Resemethrin	141%	147%	144%	3%
83	Zoxamide	109%	101%	105%	5%
84	Iprodione	86%	36%	61%	58%*

	Analyte	MS1	MS2	Mean	RSD
85	Phosmet	44%	5%	25%*	113%*
86	Tetramethrin	79%	31%	55%	62%*
87	Tetradifon	154%	147%	151%*	3%
89	Fluxapyroxad	152%	150%	151%*	1%
90	Bifenthrin	111%	111%	111%	0%
91	Etoxazole	143%	142%	143%	0%
92	Fenamidone	97%	97%	97%	0%
93	Malaoxon	98%	92%	95%	4%
94	Phenothrin	70%	73%	72%	3%
95	Pyriproxyfen	63%	75%	69%	12%
96	Cyhalofop-butyl	90%	81%	86%	7%
97	Cyhalothrin	84%	72%	78%	11%
98	Fenpropathrin	57%	42%	50%*	21%
99	Pyridaben	68%	70%	69%	2%
100	Coumaphos	81%	67%	74%	13%
101	Fenbuconazole	83%	76%	80%	6%
102	Cyfluthrin	58%	48%	53%	13%
103	Boscalid	75%	69%	72%	6%
104	Cypermethrin	70%	61%	66%	10%
105	Etofenprox	47%	62%	55%	19%
106	Pyraclostrobin	255%	242%	249%*	4%
107	Esfenvalerate	49%	38%	44%*	18%
108	*tau*-Fluvalinate	61%	43%	52%	24%
109	Difenoconazole	76%	75%	76%	1%
110	Indoxacarb	85%	61%	73%	23%
111	Deltamethrin	56%	34%	45%*	35%
112	Azoxystrobin	72%	72%	72%	0%
113	Famoxadone	126%	76%	101%	35%
114	Dimethomorph	70%	75%	73%	5%
115	Fluoxastrobin	88%	76%	82%	10%
6	Trifluralin-d_{14} (RS)	124%	149%	137%	13%
8	DBOFB (RS)	90%	120%	105%	20%

Table 10D. Recoveries of analyte Matrix Spikes (MSs) on river-water exposed Chemcatcher passive sampler on Hydrophilic-Lipophilic Balance (HLB) disk (47 mm diameter) used as sorbent media, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table. Performance data from Laboratory D, with a spiking level of 500 ng/disk. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
1	Dichlorvos	83%	72%	84%	79%	79%	7%
2	Novaluron	11%	10%	6%	8%	9%*	22%
3	3,5-Dichloroaniline	72%	59%	72%	70%	68%	9%
5	Cycloate	88%	76%	86%	84%	84%	6%
7	Trifluralin	87%	81%	91%	92%	88%	6%
9	Benefin	83%	78%	89%	90%	85%	7%
10	Pentachloroanisole	70%	64%	67%	72%	68%	5%
11	Simazine	186%	198%	197%	199%	195%*	3%
12	Prometon	75%	70%	72%	79%	74%	6%
13	Carbofuran	86%	83%	86%	85%	85%	1%
14	Imazalil	87%	85%	89%	88%	87%	2%
15	Atrazine	87%	86%	88%	89%	88%	2%
16	Clomazone	88%	82%	90%	90%	87%	4%
17	Pentachloronitrobenzene	97%	94%	94%	94%	95%	2%
18	Propyzamide	90%	88%	89%	90%	89%	1%
19	Pyrimethanil	83%	79%	82%	84%	82%	3%
20	Diazinon	90%	85%	91%	94%	90%	4%
21	Chlorothalonil	5%	7%	19%	5%	9%*	75%*
22	Triallate	86%	78%	85%	87%	84%	5%
23	Tefluthrin	69%	70%	77%	77%	73%	6%
24	Tebupirimfos	85%	81%	93%	92%	88%	7%
25	Propanil	76%	74%	72%	72%	73%	3%
26	Methyl parathion	80%	78%	78%	81%	79%	2%
27	Acibenzolar-S-methyl	73%	69%	68%	72%	70%	3%
28	Carbaryl	54%	54%	59%	51%	54%	6%
29	Prometryn	100%	96%	96%	100%	98%	2%
30	Metalaxyl	98%	93%	94%	95%	95%	2%
31	Dithiopyr	92%	92%	96%	98%	94%	3%
32	Prodiamine	104%	105%	106%	114%	107%	4%
33	Thiobencarb	84%	83%	83%	88%	85%	3%
34	Malathion	89%	87%	88%	90%	89%	1%
35	Metolachlor	95%	92%	94%	95%	94%	2%
36	Chlorpyrifos	81%	80%	83%	87%	83%	4%
37	Triadimefon	94%	92%	91%	94%	92%	2%
38	Dacthal	92%	89%	92%	96%	92%	3%
39	Flufenacet	94%	92%	92%	96%	94%	2%

	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
40	Teraconazole	99%	96%	96%	101%	98%	2%
41	Butralin	91%	92%	94%	100%	94%	4%
42	Cyprodinil	92%	89%	88%	92%	90%	2%
43	Pendimethalin	93%	93%	95%	102%	96%	4%
44	Fipronil sulfide	100%	99%	96%	103%	99%	3%
45	Fluazinam	96%	106%	111%	110%	106%	6%
46	Fluopyram	96%	93%	93%	97%	95%	2%
47	Triadimenol	76%	67%	67%	63%	68%	8%
49	Fipronil	105%	108%	121%	119%	113%	7%
50	Captan	0%	0%	23%	0%	6%*	200%*
51	Allethrin	79%	81%	82%	86%	82%	4%
52	Methoprene	73%	77%	80%	84%	78%	6%
53	Triflumizole	85%	85%	87%	90%	87%	3%
54	Paclobutrazol	81%	76%	75%	71%	76%	6%
55	Flutriafol	89%	86%	88%	88%	88%	2%
56	Flumetralin	89%	92%	96%	101%	94%	5%
57	Napropamide	97%	96%	96%	101%	97%	2%
58	Picoxystrobin	92%	93%	93%	98%	94%	3%
59	Ethalfluralin	96%	95%	96%	101%	97%	3%
60	Flutolanil	89%	87%	87%	90%	88%	2%
61	Fludioxinil	81%	80%	79%	81%	80%	1%
62	*p,p'*-DDE	95%	94%	93%	98%	95%	3%
63	Tribuphos	92%	91%	89%	93%	91%	2%
64	Oxadiazon	89%	88%	90%	94%	90%	3%
65	Myclobutanil	84%	90%	91%	96%	90%	5%
66	Oxyflurofen	87%	91%	92%	98%	92%	5%
67	Fipronil sulfone	79%	76%	85%	86%	81%	6%
68	Kresoxim-methyl	93%	92%	92%	95%	93%	2%
69	Cyproconazole	99%	93%	94%	97%	96%	3%
70	Chlorfenapyr	87%	88%	89%	92%	89%	3%
71	*p,p'*-DDD	89%	90%	94%	97%	93%	4%
72	Quinoxyfen	88%	90%	89%	95%	91%	3%
73	Fenhexamide	96%	91%	91%	90%	92%	3%
74	*p,p'*-DDT	85%	86%	91%	94%	89%	5%
75	Propiconazole	87%	87%	84%	90%	87%	3%
76	Trifloxystrobin	92%	94%	94%	98%	95%	3%
77	Fluopicolide	98%	96%	95%	99%	97%	2%
78	Hexazinone	98%	97%	95%	97%	97%	1%
79	Tebuconazole + Metcona	96%	93%	92%	93%	94%	2%
80	Propargite	75%	77%	77%	80%	77%	2%
81	Piperonyl butoxide	91%	91%	90%	93%	91%	1%
82	Resemethrin	63%	68%	73%	69%	68%	6%
83	Zoxamide	81%	80%	78%	82%	80%	2%
84	Iprodione	83%	87%	88%	92%	88%	4%

	Analyte	MS1	MS2	MS3	MS4	Mean	RSD
85	Phosmet	62%	61%	58%	61%	60%	3%
86	Tetramethrin	88%	89%	91%	94%	90%	3%
87	Tetradifon	102%	101%	98%	102%	101%	2%
89	Fluxapyroxad	103%	101%	101%	104%	102%	1%
90	Bifenthrin	89%	93%	95%	96%	93%	3%
91	Etoxazole	94%	98%	100%	104%	99%	4%
92	Fenamidone	104%	102%	101%	103%	102%	1%
93	Malaoxon	102%	99%	98%	102%	100%	2%
94	Phenothrin	86%	88%	91%	91%	89%	3%
95	Pyriproxyfen	84%	87%	86%	89%	87%	2%
96	Cyhalofop-butyl	92%	94%	94%	96%	94%	2%
97	Cyhalothrin	87%	91%	94%	93%	91%	4%
98	Fenpropathrin	86%	89%	91%	93%	90%	4%
99	Pyridaben	89%	91%	93%	93%	92%	2%
100	Coumaphos	84%	84%	82%	84%	83%	1%
101	Fenbuconazole	82%	81%	80%	84%	82%	2%
102	Cyfluthrin	84%	87%	93%	90%	88%	4%
103	Boscalid	96%	92%	90%	91%	92%	3%
104	Cypermethrin	90%	90%	96%	95%	93%	4%
105	Etofenprox	90%	92%	94%	94%	93%	2%
106	Pyraclostrobin	67%	56%	63%	60%	61%	8%
107	Esfenvalerate	82%	86%	91%	89%	87%	4%
108	*tau*-Fluvalinate	98%	99%	104%	104%	101%	3%
109	Difenoconazole	93%	85%	86%	92%	89%	5%
110	Indoxacarb	95%	96%	95%	99%	96%	2%
111	Deltamethrin	36%	37%	36%	35%	36%*	3%
112	Azoxystrobin	116%	110%	109%	113%	112%	3%
113	Famoxadone	100%	96%	98%	102%	99%	3%
114	Dimethomorph	106%	104%	103%	105%	104%	1%
115	Fluoxastrobin	92%	83%	88%	92%	89%	5%
6	Trifluralin-d_{14} (RS)	61%	51%	53%	48%	54%	11%
8	DBOFB (RS)	25%	22%	22%	16%	22%*	17%
48	$^{13}C_4$-Fipronil (RS)	158%	135%	126%	128%	137%	11%

Table 10X. Summary of performance data from all laboratories. Recoveries of analyte Matrix Spikes (MSs) on river-water exposed Chemcatcher passive sampler on Hydrophilic-Lipophilic Balance (HLB) disk (47 mm diameter) used as sorbent media, arranged by analyte number (Table 1) with Recovery Standards (RS) at the end of the Table. The spiking amount per exposed Chemcatcher water was 100 ng for Laboratory A and Laboratory B, 200 ng for Laboratory B, and 500 ng for Laboratory D. Mean and Relative Standard Deviation (RSD) values outside of Quality Assurance/Quality Control (QA/QC) requirements (Mean>150% or <50%, RSD>50%) are highlighted in red and an asterisk.

#	Analyte	Lab A Mean	Lab A RSD	Lab B Mean	Lab B RSD	Lab C Mean	Lab C RSD	Lab D Mean	Lab D RSD	Total Mean	Total RSD
1	Dichlorvos	67%	4%	55%	13%	90%	35%	79%	7%	71%	24%
2	Novaluron	12%*	38%	27%*	21%	47%*	21%	9%*	22%	21%*	69%*
3	3,5-Dichloroaniline	46%*	1%	108%	5%	134%	9%	68%	9%	85%	38%
5	Cycloate	57%	1%	118%	5%	110%	2%	84%	6%	92%	27%
7	Trifluralin	23%*	2%	97%	10%	92%	0%	88%	6%	76%	41%
9	Benefin	22%*	3%	100%	5%	94%	2%	85%	7%	76%	41%
10	Pentachloroanisole	41%*	1%	100%	12%	69%	20%	68%	5%	72%	33%
11	Simazine	52%	3%	88%	6%	127%	4%	195%*	3%	119%	49%
12	Prometon	47%*	3%	81%	7%	126%	3%	74%	6%	78%	33%
13	Carbofuran	61%	9%	82%	5%	124%	43%	85%	1%	84%	30%
14	Imazalil	48%*	2%	104%	9%	131%	6%	87%	2%	90%	32%
15	Atrazine	49%*	5%	90%	6%	117%	6%	88%	2%	84%	27%
16	Clomazone	50%	4%	92%	8%	115%	7%	87%	4%	84%	26%
17	Pentachloronitrobenzene	29%*	2%	95%	16%	80%	2%	95%	2%	77%	38%
18	Propyzamide	36%*	11%	85%	3%	124%	7%	89%	1%	81%	36%
19	Pyrimethanil	50%	6%	90%	6%	115%	4%	82%	3%	82%	26%
20	Diazinon	32%*	9%	98%	4%	110%	5%	90%	4%	82%	36%
21	Chlorothalonil	5%*	85%*	9%*	50%*	-	-	9%*	75%*	8%*	63%*
22	Triallate	40%*	1%	96%	3%	107%	2%	84%	5%	81%	31%
23	Tefluthrin	43%*	5%	95%	6%	110%	2%	73%	6%	79%	31%
24	Tebupirimfos	36%*	6%	68%	58%*	117%	5%	88%	7%	74%	45%
25	Propanil	65%	8%	81%	3%	161%*	5%	73%	3%	87%	38%
26	Methyl parathion	36%*	6%	65%	11%	128%	3%	79%	2%	72%	42%
27	Acibenzolar-S-methyl	40%*	5%	84%	15%	116%	6%	70%	3%	75%	35%
28	Carbaryl	49%*	11%	66%	4%	97%	33%	54%	6%	63%	30%
29	Prometryn	38%*	4%	80%	6%	135%	3%	98%	2%	84%	38%
30	Metalaxyl	51%	8%	85%	5%	132%	0%	95%	2%	87%	30%
31	Dithiopyr	47%*	3%	86%	1%	130%	3%	94%	3%	86%	31%
32	Prodiamine	38%*	4%	89%	6%	122%	6%	107%	4%	88%	35%
33	Thiobencarb	44%*	4%	89%	10%	130%	2%	85%	3%	84%	33%
34	Malathion	31%*	10%	49%*	9%	128%	4%	89%	1%	69%	50%*
35	Metolachlor	48%*	6%	89%	9%	125%	1%	94%	2%	87%	29%
36	Chlorpyrifos	32%*	5%	89%	11%	127%	2%	83%	4%	80%	40%
37	Triadimefon	42%*	8%	81%	10%	153%*	0%	92%	2%	87%	41%
38	Dacthal	51%	2%	93%	5%	120%	1%	92%	3%	87%	26%
39	Flufenacet	42%*	9%	85%	6%	147%	5%	94%	2%	87%	39%

#	Analyte	Lab A Mean	Lab A RSD	Lab B Mean	Lab B RSD	Lab C Mean	Lab C RSD	Lab D Mean	Lab D RSD	Total Mean	Total RSD
40	Teraconazole	45%*	7%	77%	11%	138%	7%	98%	2%	85%	37%
41	Butralin	30%*	4%	61%	61%*	115%	1%	94%	4%	72%	50%*
42	Cyprodinil	43%*	5%	73%	6%	110%	0%	90%	2%	77%	30%
43	Pendimethalin	27%*	4%	78%	4%	115%	2%	96%	4%	77%	41%
44	Fipronil sulfide	39%*	8%	58%	13%	138%	9%	99%	3%	79%	46%
45	Fluazinam	50%	32%	65%	29%	156%*	23%	106%	6%	88%	46%
46	Fluopyram	38%*	12%	75%	12%	134%	8%	95%	2%	82%	40%
47	Triadimenol	41%*	13%	80%	16%	125%	26%	68%	8%	74%	40%
49	Fipronil	32%*	6%	39%*	12%	124%	13%	113%	7%	73%	58%*
50	Captan	37%*	10%	46%*	38%	131%	11%	6%*	200%*	44%*	97%*
51	Allethrin	45%*	6%	69%	10%	150%	8%	82%	4%	80%	44%
52	Methoprene	35%*	4%	83%	14%	122%	2%	78%	6%	76%	37%
53	Triflumizole	43%*	6%	38%*	14%	137%	1%	87%	3%	69%	54%*
54	Paclobutrazol	51%	6%	78%	17%	134%	0%	76%	6%	80%	35%
55	Flutriafol	73%	9%	73%	8%	143%	2%	88%	2%	88%	29%
56	Flumetralin	64%	10%	50%*	9%	119%	0%	94%	5%	77%	34%
57	Napropamide	71%	6%	66%	10%	141%	2%	97%	2%	88%	31%
58	Picoxystrobin	66%	8%	69%	8%	132%	6%	94%	3%	85%	28%
59	Ethalfluralin	69%	3%	107%	10%	140%	1%	97%	3%	100%	24%
60	Flutolanil	69%	10%	58%	14%	140%	3%	88%	2%	82%	35%
61	Fludioxinil	91%	12%	84%	5%	137%	8%	80%	1%	92%	23%
62	*p,p'*-DDE	83%	11%	87%	9%	91%	22%	95%	3%	89%	10%
63	Tribuphos	66%	7%	104%	11%	128%	1%	91%	2%	95%	23%
64	Oxadiazon	87%	7%	93%	7%	134%	4%	90%	3%	97%	18%
65	Myclobutanil	73%	9%	62%	16%	138%	3%	90%	5%	85%	32%
66	Oxyflurofen	76%	15%	96%	13%	114%	2%	92%	5%	93%	16%
67	Fipronil sulfone	83%	11%	58%	63%*	123%	38%	81%	6%	81%	39%
68	Kresoxim-methyl	62%	8%	85%	5%	152%*	2%	93%	2%	92%	32%
69	Cyproconazole	70%	11%	87%	12%	185%*	15%	96%	3%	101%	40%
70	Chlorfenapyr	87%	5%	90%	13%	136%	3%	89%	3%	96%	19%
71	*p,p'*-DDD	89%	10%	97%	5%	120%	5%	93%	4%	97%	12%
72	Quinoxyfen	103%	8%	89%	9%	139%	1%	91%	3%	100%	19%
73	Fenhexamide	213%*	13%	21%*	12%	250%*	6%	92%	3%	122%	76%*
74	*p,p'*-DDT	65%	14%	79%	10%	111%	1%	89%	5%	84%	19%
75	Propiconazole	79%	3%	90%	23%	152%*	3%	87%	3%	96%	28%
76	Trifloxystrobin	67%	10%	92%	12%	135%	7%	95%	3%	94%	24%
77	Fluopicolide	85%	6%	93%	14%	130%	8%	97%	2%	98%	17%
78	Hexazinone	77%	4%	51%	17%	152%*	2%	97%	1%	86%	40%
79	Tebuconazole + Metcona	75%	11%	19%*	25%	152%*	2%	94%	2%	75%	62%*
80	Propargite	172%*	20%	83%	138%*	144%	4%	77%	2%	111%	65%*
81	Piperonyl butoxide	80%	7%	71%	8%	154%*	2%	91%	1%	92%	31%
82	Resemethrin	53%	11%	26%*	20%	144%	3%	68%	6%	63%	63%*
83	Zoxamide	83%	10%	48%*	9%	105%	5%	80%	2%	75%	28%

#	Analyte	Lab A Mean	Lab A RSD	Lab B Mean	Lab B RSD	Lab C Mean	Lab C RSD	Lab D Mean	Lab D RSD	Total Mean	Total RSD
84	Iprodione	85%	12%	117%	12%	61%	58%*	88%	4%	92%	26%
85	Phosmet	25%*	10%	75%	9%	25%*	113%*	60%	3%	51%	47%
86	Tetramethrin	97%	4%	76%	8%	55%	62%*	90%	3%	82%	22%
87	Tetradifon	79%	6%	-	-	151%*	3%	101%	2%	105%	27%
89	Fluxapyroxad	87%	12%	118%	10%	151%*	1%	102%	1%	111%	20%
90	Bifenthrin	84%	8%	86%	10%	111%	0%	93%	3%	92%	12%
91	Etoxazole	74%	9%	83%	3%	143%	0%	99%	4%	95%	25%
92	Fenamidone	65%	6%	90%	8%	97%	0%	102%	1%	89%	17%
93	Malaoxon	63%	8%	55%	58%*	95%	4%	100%	2%	77%	35%
94	Phenothrin	60%	12%	88%	24%	72%	3%	89%	3%	79%	21%
95	Pyriproxyfen	88%	7%	-	-	69%	12%	87%	2%	83%	11%
96	Cyhalofop-butyl	99%	11%	91%	21%	86%	7%	94%	2%	93%	12%
97	Cyhalothrin	108%	11%	83%	8%	78%	11%	91%	4%	91%	14%
98	Fenpropathrin	86%	11%	65%	4%	50%*	21%	90%	4%	75%	22%
99	Pyridaben	100%	6%	58%	16%	69%	2%	92%	2%	80%	24%
100	Coumaphos	78%	12%	14%*	38%	74%	13%	83%	1%	59%	54%*
101	Fenbuconazole	95%	12%	97%	12%	80%	6%	82%	2%	89%	12%
102	Cyfluthrin	114%	14%	70%	11%	53%	13%	88%	4%	83%	27%
103	Boscalid	96%	8%	82%	8%	72%	6%	92%	3%	87%	12%
104	Cypermethrin	117%	16%	78%	12%	66%	10%	93%	4%	90%	23%
105	Etofenprox	91%	12%	72%	7%	55%	19%	93%	2%	80%	20%
106	Pyraclostrobin	196%*	19%	67%	8%	249%*	4%	61%	8%	123%	66%*
107	Esfenvalerate	144%	15%	85%	10%	44%*	18%	87%	4%	93%	37%
108	*tau*-Fluvalinate	116%	16%	77%	6%	52%	24%	101%	3%	90%	27%
109	Difenoconazole	159%*	16%	75%	15%	76%	1%	89%	5%	99%	37%
110	Indoxacarb	162%*	10%	78%	15%	73%	23%	96%	2%	102%	36%
111	Deltamethrin	80%	41%	84%	15%	45%*	35%	36%*	3%	62%	44%
112	Azoxystrobin	143%	16%	85%	11%	72%	0%	112%	3%	105%	27%
113	Famoxadone	138%	11%	-	-	101%	35%	99%	3%	78%	74%*
114	Dimethomorph	183%*	12%	65%	10%	73%	5%	104%	1%	105%	46%
115	Fluoxastrobin	171%*	18%	31%*	6%	82%	10%	89%	5%	89%	62%*
6	Trifluralin-d_{14} (RS)	-	-	-	-	137%	13%	54%	11%	81%	54%*
8	DBOFB (RS)	35%*	6%	-	-	105%	20%	22%*	17%	44%*	81%*
48	$^{13}C_4$-Fipronil (RS)	-	-	-	-	-	-	137%	11%	137%	11%

Table 11. Initial Demonstration of Capability (IDC) quality control requirements. Please see the relevant references in the Method for full details.

Method reference	Requirement	Specification	Acceptance Criteria
Section 8.2	Establish stable RTs	Inject a midpoint calibration standard (e.g., 500 ng/mL) under optimized GC/MS to establish RTs.	RT of each analyte is within ± 0.2 min of target RT in the midpoint calibration standard.
Section 8.3	Initial calibration	Calibration curves with at least five calibration standards with the lowest standard at or below LOQ.	R^2 of the linear calibration curve must be ≥0.99, with the lowest calibration point at or below LOQ.
Section 7.2.1	Demonstration of low system background	Analyze a method blank after the highest standard in the calibration range.	All the method analytes are less than the MDL.
Section 7.2.2	IPR	Extract and analyze at least 3 replicate LCSs spiked with an appropriate concentration of analytes.	Mean R% must be within the range of 50-150 for both matrices. RSD must be within 30% for aqueous matrices and 50% for Chemcatcher. Only analytes that meet these criteria shall be included in the laboratory report.
Section 7.2.3	MDL determination	Determine MDL using at least 7 MS and 7 method blank samples according to the procedure at 40 CFR 136, appendix B.	Record MDL values for use for ODC. (These acceptance criteria may be updated based on results from the multi-laboratory evaluation.)
Section 7.2.4	LOQ	LOQ is established by each laboratory.	LOQ must be equal to or greater than the MDL and within the calibration range.

Table 12. Ongoing Quality Control (QC) requirements. Please see the relevant references in the Method for full details.

Method Reference	Requirement	Specification and Frequency	Acceptance Criteria
Section 7.3.1	Method blank	Include one method blank per sample batch.	All method analytes are below MDL.
Section 7.3.2	CCV	At the beginning of each analysis batch. Subsequent CCVs (e.g., a midpoint calibration standard) are required every 24 h during the same analysis period.	All CCVs must be within 70–130% of the expected concentration, and each analyte's RT must be within ±0.2 min of the target RT.
Section 7.3.3	Solvent blank	Inject a solvent blank after injecting the calibration standards and the CCV solution. Subsequent solvent blanks are injected every 7 samples or after every suspect dirty sample.	No analytes are detected in the solvent blank.
Section 7.3.4	LCS	Include one LCS per sample batch.	The R% must be within 50–150% of the expected value.
Section 7.3.5	Instrument sensitivity	Inject a midpoint calibration standard to check instrument sensitivity every 24 h before the analysis of any standards and samples.	Instrument sensitivity must be ≥50 of the initial calibration level
Section 7.3.6	Recovery standards	Spike all samples with labeled recovery standards.	The R% must be within 50–150% (DBOFB excepted).
Section 7.3.7	MS	Include one MS per sample batch.	The R% must be within 50–150%. If the R% of MS falls outside but the R% of LCS still meets the criteria, document MS failure, and flag the associated sample to indicate potential matrix interference.
Section 7.3.8	MSD or laboratory replicate	Include one MSD or a laboratory replicate sample per sample batch.	The RSD between the replicate samples must be within ±30% for aqueous matrices and ±50% for Chemcatcher.
Section 7.3.9	Verification of MDL	At least once every thirteen months, and if the method is modified in a way that could affect sensitivity or if a sustained decline in performance is observed.	If the verified MDL is within 0.5 to 2.0 times the existing MDL, and fewer than 3% of the method blank results (for the individual analyte) have numerical results above the existing MDL, then the existing MDL may optionally be left unchanged. Otherwise, adjust the MDL to the new verification MDL.
Section 7.3.10	OPR	At least 3 OPR (replicate LCSs spiked with an appropriate concentration of analytes) at least every thirteen months.	If the verified precision and recovery are within the range of 50-150% of the existing results, the existing procedure may optionally be left unchanged. Otherwise, analysis of samples must be halted until the precision and recovery are resumed.