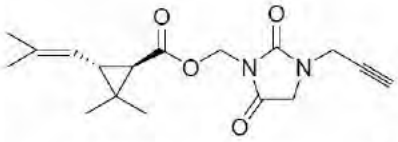
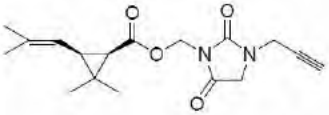
Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
1	**REFERENCE**		**Official use only**
1.1	**Reference**	Hiler, T. and Lomax, R. 2016. Aerobic Aquatic Metabolism of [^{14}C]-imiprothrin. [redacted]	
1.2	**Data protection**	Yes	
1.2.1	Data owner	Sumitomo Chemical Company Ltd.	
1.2.2	Criteria for data protection	Data submitted to the MS after 13 May 2000 on existing a.s. for the purpose of its entry into the Union list	
2	**GUIDELINES AND QUALITY ASSURANCE**		
2.1	**Guideline study**	Yes. OECD 308. Aerobic and Anaerobic Transformation in Aquatic Sediment (Apr 2002).	
2.2	**GLP**	Yes	
2.3	**Deviations**	No deviations from guideline quoted in the study report.	
3	**MATERIALS AND METHODS**		
3.1	**Test material**	(1*R*)-*cis*-[cyclopropyl-1-^{14}C]-imiprothrin and (1*R*)-*trans*-[cyclopropyl-1-^{14}C]-imiprothrin.	
3.1.1	Lot/Batch number	Lot numbers [redacted]	
3.1.2	Specification	(1*R*)-*cis*-[cyclopropyl-1-^{14}C]-imiprothrin: Specific activity: [redacted] (1*R*)-*trans*-[cyclopropyl-1-^{14}C]-imiprothrin. Specific activity: [redacted].	
3.1.3	Purity	(1*R*)-*cis*-[cyclopropyl-1-^{14}C]-imiprothrin: [redacted] (immediately before treatment), [redacted] (immediately after treatment) by HPLC. (1*R*)-*trans*-[cyclopropyl-1-^{14}C]-imiprothrin. [redacted] (immediately before treatment), [redacted] (immediately after treatment) by HPLC.	
3.1.4	Further relevant properties	Molecular weight 318.37 g/mol. Solubility in water 95.3 mg/L at 25°C (*trans*/*cis* = 4/1).	
3.1.5	Radiolabelling	The position of the ^{14}C labels are shown below: (1*R*)-*cis*-[imidazolidinyl-5-^{14}C]-imiprothrin [redacted] (1*R*)-*trans*-[cyclopropyl-1-^{14}C]-imiprothrin [redacted] The two radiolabelled isomers (1*R*)-*cis*-[imidazolidinyl-5-^{14}C]-imiprothrin and (1*R*)-*trans*-[cyclopropyl-1-^{14}C]-imiprothrin were used separately.	

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
3.1.6	Method of analysis	HPLC - Capcell Pak C-18 UG-120 column (250 mm x 4.6 mm, 5 µm), 25°C, mobile phase – gradient system a) 0.005% Pic A Reagent in HPLC grade water, b) Acetonitrile (HPLC grade), c) Methanol (HPLC grade), 0 mins 100% a), 5 mins 100% a), 10 mins 95% a) 5% b), 30 mins 60% a) 40% b), 45 mins 30% a) 70% c), 50 mins 30% a) 70% c), 55 mins 30% b) 70% c), 70 mins 30% b) 70% c), 72 mins 100% a). Flow rate 1 mL/min, co-chromatography with authentic reference standards (UV 230 nm), ^{14}C detection - β-RAM flow-through detector (2 mL/min, cell size 500 µL).	
3.2	**Reference substance**		
3.2.1	(1*R*)-*trans*-Imiprothrin	Structure:  Lot no. [redacted]. Certificate of analysis – Yes.	
3.2.2	(1*R*)-*cis*-Imiprothrint	Structure:  Lot no. [redacted] Certificate of analysis – Yes.	
3.2.3	ωt-COOH -1*R*-*trans*- PRA	Structure: [redacted] Lot no. [redacted] Certificate of analysis – Yes.	
3.2.4	ωc-COOH-1*R*-*cis*-PRA	Structure: [redacted] Lot no. [redacted] Certificate of analysis – Yes.	
	[redacted]	Structure: Lot no. [redacted]. Certificate of analysis – Yes.	
	[redacted]	Structure: [redacted] Lot no. [redacted] Certificate of analysis – Yes.	
	[redacted]	Structure: [redacted] Lot no. [redacted] Certificate of analysis – Yes.	
	[redacted]	Structure: [redacted] Lot no. [redacted] Certificate of analysis – Yes.	

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
3.3	**Test System**		
3.3.1	Test system	Two natural aquatic water/sediment, collected from sites in the US, were used as test systems for the study. The test systems were selected to provide contrasting properties with respect to particle size distribution, organic carbon content and pH. Sediments were sampled to a depth of 0-5 cm and sieved to 2 mm and the water samples passed through a 0.2 mm sieve during sampling. The water/sediment systems were transported to the test facility and upon arrival were stored refigerated (typically <4°C) in the dark until use in the study.	X
3.3.2	Characterisation of test system	The physicochemical characteristics of the water/sediment systems, determined by Agvise Laboratories Inc., are summarised in Table 1.	
3.4	**Study design**		
3.4.1	Experimental set-up	Individual samples of the water/sediment systems were prepared in amber narrow neck glass bottles (250 mL capacity). Samples contained ~102 g (50 g dry weight equivalent) of the Goose River sediment and ~98 mL of Goose River water, whereas the golden lake (GL) samples contained ~ 76 g (50 g dry weight equivalent) of the sediment and ~129 mL of the corresponding water (to obtain a water/sediment volume ratio of approximately 3:1 in both systems). Each sample was connected to an individual series of traps for continuous aeration/trapping throughout the study. A peristaltic pump was used to pull humidified air through the samples. Ambient air continuously passed through the water layer of the samples through de-ionized water before flushing the headspace of the samples and through the traps to collect volatile degradates. Each set of traps included one foam plug trap and one ethylene glycol (EG) trap to collect organic volatiles, and two 10% aqueous NaOH caustic traps to collect CO_2. The test systems were stored at 20±2°C in a walk in chamber in the dark.	
3.4.2	Equilibration to the study conditions	The test systems were equilibrated in the experimental conditions for 31 days before treatment with the test substances.	
3.4.3	Test substance application	The average target dose rate for the study was 0.123 µg/g. The dose rate was based on the rate needed to obtain sufficient sensitivity to detect degradates formed at approximately 1 to 2% of the applied radioactivity and to be below the solubility limit of the test substance. The maximum expected single field application rate ($PEC_{STP/SW}$ 0.105 µg/L) for direct application indoors with possible access to a body of water via sewage treatment plants (STP), drains, surface water (SW), and etc. was increased so as to detect and quantitate reliably the presence of low level degradates with a dose rate of 0.123 µg/g. Aliquots of the application solution were taken prior to, during and after application and radioassayed by liquid scintillation counting (LSC) to determine the application rate and to demonstrate homogeneity of the test solution during the application process. [redacted] The dosing solution (100 µL) was added directly to the test systems.	

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
3.4.4	Monitoring of experimental conditions	The dissolved oxygen (DO), pH and redox potential (ORP, platinum electrode with quinhydrone standard solutions) of the water layers were measured as well as the pH and ORP of the sediment of each sample. The results are shown in Table 3.	
3.4.5	Determination of microbial activity	The untreated sediment was analyzed for microbial viability at the time of collection, prior to dosing, and at the conclusion of the study following the substrate- induced respiration (SIR) method (production rate of CO_2 after glucose addition) as defined by Anderson and Domsch[1]. Microbial biomass results are presented in Table 1.	
3.5	**Sampling**		
3.5.1	Sampling intervals	Samples were collected immediately after treatment (time 0) and after 1, 2, 6, 13, 60, and 101 days of incubation at 20 ± 2°C. A schedule of events is presented in Table 2. At each sampling time, duplicate samples were removed from the constant temperature chamber along with their respective volatile traps. Monitoring of dissolved oxygen, pH and redox potential was conducted as described in Section 3.4.4.	
3.5.2	Control samples	No control samples used.	
3.5.3	Collection of volatile trapping solutions	Volatile traps were replenished at each sampling interval. Sampled traps quantified by liquid scintillation counting (LSC).	
3.6	**Method of analysis**		
3.6.1	Extraction procedures	The water layers were carefully decanted (volume measured) from the sediment and acidified to pH 2 using 6M HCl prior to storage. The water layer was quantified by LSC. The sediment layer was extracted with acetonitrile:0.1N HCl (3x100 mL, 5:1 v/v) by shaking (60 mins) and centrifugation. The sediment extracts were quantified by LSC.	
3.6.2	Sample work-up	Sub-samples (30 mL) of the water layer were concentrated using a solid phase extraction (SPE) cartridge (strata-x), eluting with methanol (6 mL). The final water layer extract was quantified by LSC. Sub-samples (40 mL) of the sediment extracts were concentrated by speed vacuum to the aqueous layer. The extracts were rinsed with acetonitrile (2x 500 µL) and combined with the extract. The concentrated sediment extract was quantified by LSC.	

[1] Anderson, J.P.E., and Domsch, K.H., A physiological method for the quantitative measurement of microbial biomass in soil, Soil Biol. Biochem. 10, 215-221, 1978.

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
3.6.3	Analytical method, primary (HPLC)	Concentrated water and sediment extracts were analysed using the HPLC method outlined in Section 3.1.6. [redacted] The following modified method was utilised for identification of unknown metabolites: HPLC - Capcell Pak C-18 UG-120 column (250 mm x 4.6 mm, 5 µm), 25°C, mobile phase – gradient system a) 0.2% TFA in HPLC grade water, b) 0.2% TFA in acetonitrile (HPLC grade), c) 0.2% TFA in methanol (HPLC grade), 0 mins 100% a), 5 mins 100% a), 10 mins 95% a) 5% b), 30 mins 60% a) 40% b), 45 mins 30% a) 70% c), 50 mins 30% a) 70% c), 55 mins 30% b) 70% c), 70 mins 30% b) 70% c), 72 mins 100% a). Flow rate 1 mL/min, co-chromatography with authentic reference standards (UV 230 nm), ^{14}C detection - β-RAM flow-through detector (2 mL/min, cell size 500 µL). The following normal phase HPLC method was utilised for the determination of the isomer ratio: Chiralcell OJ-H column, 40°C, mobile phase – isocratic system hexane:isopropanol (9:1 v/v). Flow rate 1 mL/min, UV 230 nm, ^{14}C detection - β-RAM flow-through detector (2 mL/min, cell size 500 µL).	
3.6.4	Analytical method, secondary (TLC)	Confirmatory analysis was conducted on selected water layer samples using the following system 2D-TLC – sample volume (100 µL), EMD Silica Gel 60 F254 pre-coated 20 cm x 20 cm x 250 µm thickness TLC plates, solvent system – a) butanol:acetic acid:water (6:1:1 v/v/v), b) chloroform:acetonitrile:acetic acid (9:1:1 v/v/v), detection using Storm Phosphorimaging system, co chromatography with authentic reference standards.	
3.6.5	LC/MS confirmation	Full scan MS experiments were conducted using a Thermo Scientific Q-Exactive mass spectrometer interfaced with a Thermo Scientific, Dionex Ultimate 3000 UHPLC system. HPLC - Capcell Pak C-18 UG-120 column (250 mm x 4.6 mm, 5 µm), 25°C, mobile phase – gradient system a) 0.2% formic acid in HPLC grade water, b) 0.2% formic acid in acetonitrile (HPLC grade), , 0 mins 100% a), 5 mins 100% a), 10 mins 95% a), 30 mins 60% a), 45 mins 30% a), 50 mins 30% a), 55 mins 0% a), 70 mins 0% a), 72 mins 100% a). Flow to MS 90%. For identification of unknown metabolites, mass spectral data was generated by electrospray ionization (ESI) in the positive polarity. Full scan MS analysis was conducted at a resolving power of 70,000 over a scan range of m/z = 50 to 750. Fractions for LSC were collected at a rate of three per minute (20 seconds per fraction).	
3.6.6	Method of analysis for extracted sediment	The residual sediments were weighed and the unextracted radioactivity remaining in the sediments (4 x 0.1g to 0.5 g aliquots) were determined by combustion and subsequent radioassay by LSC. Combustion analysis was carried out using a Biological Oxidizer (R.J. Harvey Instrument Corporation) and the $^{14}CO_2$ generated was trapped with Harvey cocktail. The ^{14}C content was determined by LSC.	

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
3.6.7	Bound residues fractionation	The post extracted sediment (PES) of *cis* GL, *trans* GR, and *trans* GL from the final time point, except *cis* GR at day 60 were subject to soxhlet extraction, using a final volume of 125ml of 1M acetic acid. Sediments were weighed into cellulose thimbles and extracted for 2 hours. Aliquots of the soxhlet extracts were radioassayed by LSC. The radioactivity bound to the soil after the initial extraction (acetonitrile:0.1M HCl, (5:1, v/v) was characterized by humic/fulvic acid partitioning[2]. An aliquot (approximately 5.0g) of the PES was shaken overnight on a wrist-action shaker with ~ 25 mL of 0.5 M NaOH. After separation by centrifugation, the pellet was washed with 0.5 M NaOH, centrifuged again and the caustic solutions were combined. The radioactivity in the pellet was termed as the humin fraction. The resulting alkaline extracts were acidified to pH 1 with 12 M HCl and left to stand at room temperature overnight. Upon standing, coagulants formed are the humic acids which were isolated by centrifugation. The supernatants (alkali extractable but soluble in acid) were the fulvic acid fraction. The isolated coagulants i.e. the humic acids were dissolved in measured volumes of 0.5M NaOH (alkali extractable and insoluble in acid). Aliquots of the humic and fulvic acids fractions were radioassayed by LSC.	
3.7	**Degradation kinetics**	-	
3.7.1		DT_{50} and DT_{90} values for (*cis* and *trans*) imiprothrin in the water layer and the total test system, were calculated using suitable software (KinGui, version 2.2012.320.1629) in consideration of the FOCUS Approach on Degradation Kinetics[3].	X
4	**RESULTS**		
4.1	**Recovery of applied radioactivity (mass balance)**	The total recovery of applied radioactivity (mass balance) from the test systems (Goose River and Golden Lake) treated with [*cis*-^{14}C]-Imiprothrin and [*trans*-^{14}C]-Imiprothrin test susbstance are presented in Tables 4 to 7. [redacted]	X

2 Schnitzer, M., Organic Matter Characterization, in "Methods for Soil Analysis, Part 2, Chemical and Microbiological Properties," 2nd edition, Pages 582-584, Page A.L., Miller R.H. and Keeney, D.R. Editors, ASA, SSSA Publisher, Madison, WI, 1982.

3 Guidance Document on Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration, Forum for the Co-ordination of pesticide fate models and their Use (FOCUS), Version 2.0, June 2006.

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
4.2	**Distribution of applied radioactivity**	Most of the applied radioactivity was detected in the water layers and steadily dissipated to the sediment layer. [redacted] [redacted]	
		The level of applied radioactivity extractable from the sediment layer were at a maximum at 6d in the test systems treated with [*cis*-^{14}C]-Imiprothrin and comprised 43.2 and 25.0% AR for the Goose River and Golden Lake systems, respectively.	X
		The level of applied radioactivity extractable from the sediment layer were at a maximum at 13d in the test systems treated with [*trans*-^{14}C]-Imiprothrin and comprised 31.1 and 17.0% AR for the Goose River and Golden Lake systems, respectively.	X
		The level of applied radioactivity as bound residues in the test systems treated with [*cis*-^{14}C]-Imiprothrin were at a maximum at 60d and 101d for the Goose River and Golden Lake systems, respectively and comprised 28.3 and 35.8% AR.	
		The level of applied radioactivity as bound residues in the test systems treated with [*trans*-^{14}C]-Imiprothrin were at a maximum at 101d for the Goose River and Golden Lake systems, respectively and comprised 26.2 and 35.7% AR.	X
		^{14}C-Carbon dioxide was evolved from each test system, reaching a maximum after 101d incubation. In the [*cis*-^{14}C]-Imiprothrin treated systems levels of 39.9 and 44.5%AR were obtained in the Goose River and Golden Lake systems, respectively, in the [*trans*-^{14}C]-Imiprothrin treated systems the corresponding levels were 52.3 and 39.9% AR.	
		Applied radioactivity recovered in the ethylene glycol and foam plug trap solutions was insignificant throughout the study and represented an average of < 0.3% AR in all treated samples.	

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
4.2.1	Fractionation of sediment bound residue	Results for the humic/fulvic partition are presented in Table 8. The post extracted sediment (PES) of *cis* Golden Lake, *trans* Goose River, and *trans* Golden Lake from the final time point, except *cis* Goose River at day 60 were subject to soxhlet extraction. Humic/fulvic acid partition was performed on day 60 time point for the *cis* GR and day 101 for the *cis* GL sediment and day 101 time point for the *trans* GR and GL sediment samples to further characterize the non-extractable residues in the soils. The results of the partition showed that the majority of the radiocarbon was present in the insoluble humin fraction, i.e. between 0.6% and 1.9% AR. Only 0.4% AR to 1.2% AR was found in the fulvic acid fraction and 0.1 to 0.2% AR in the humic acid fraction.	
4.3	**Profile of components**	The profile of components recovered from the test systems are presented in Table 9. For the total system (i.e. water and sediment layers overall) of the Goose River and Golden Lake test systems treated with [*cis*-^{14}C]-Imiprothrin, the level of imiprothrin detected declined from an average of 82.8 and 76.2% AR, respectively, at 0d to 0.7 and 0.5% AR at the end of the study (i.e. 101d). Two major (i.e. >10% AR) degradation product were observed, [redacted] (maximum of 20.2% at 13d and 21.6% AR at 6d) and PG (maximum of 13.0% AR in Goose River at 31d). In addition, CPG was observed as a major metabolite (maximum of 43.1 and 46.0% AR at 31d). Other unknown peaks were detected as minor degradates throughout the study, but no individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction of the water layer and the sediment extracts. For the total system (i.e. water and sediment layers overall) of the Goose River and Golden Lake test systems treated with [*trans*-^{14}C]-Imiprothrin, the level of imiprothrin detected declined from an average of 98.7 and 81.8% AR, respectively, at 0d to <LOD at the end of the study (i.e. 101d). Two major (i.e. >10% AR) degradation product were observed, [redacted] (maximum of 52.6 and 31.6% AR at 6d) and PG (maximum of 16.7% AR at 31d in the Goose River system). In addition, CPG was observed as a major metabolite (maximum of 47.8 and 49.2% AR at 31d). Other unknown peaks were detected as minor degradates throughout the study, but no individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction of the water layer and the sediment extracts.	
4.3.1	Isomerisation	The test substances were also analyzed by normal-phase HPLC to establish their isomer ratio at dosing and in sediment extracts and water phases by normal-phase HPLC. Isomerization of the test substance was not observed during the incubation period.	
4.3.2	Confirmatory analysis	The identification of both [redacted] and CPG-Me was based on HPLC retention times and co- elution with the corresponding reference standards. The HPLC assignment of [redacted] and CPG-Me was confirmed by two-dimensional TLC analysis of representative samples (*cis*-water layer day 13 and 31, (GR and GL) Rep A) (*trans*-water layer day 13 (GR and GL) Rep B and day 31 (GL Rep A) (GR Rep B)) with reference standards. Using LC/MS the metabolites [redacted], CPG and PMH were confirmed.	

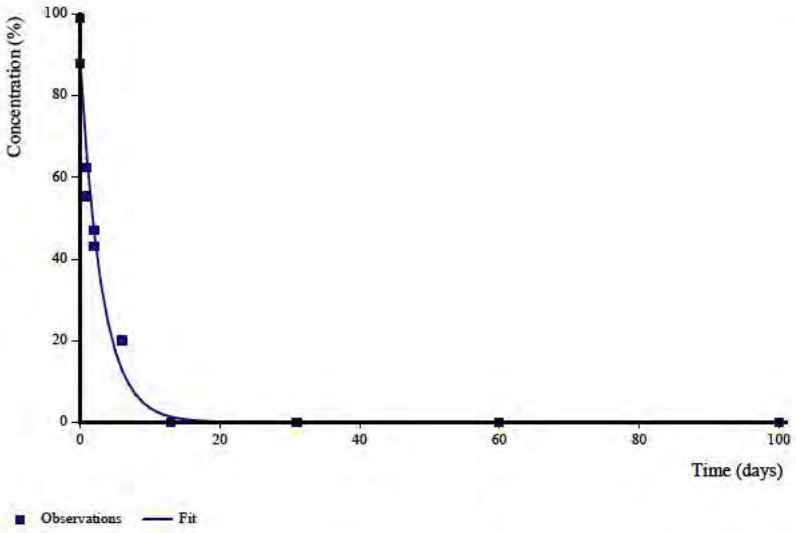
Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
4.4	**Degradation pathway**	The degradation pathway is presented in Figure 1.	
4.5	**Degradation rate**	The degradation rate of [*cis*-^{14}C]-Imiprothrin and [*trans*-^{14}C]-Imiprothrin in the Goose River and Golden Lake test systems (whole system and water layer) is summarised in Table 10. [redacted]	X

Annex Point IIIA 10.1.3.2		**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
5	**APPLICANT'S SUMMARY AND CONCLUSION**		
5.1	**Materials and methods**	The degradation of [*cis*-^{14}C]- and [*trans*-^{14}C]-Imiprothrin has been investigated in two natural water/sediment systems according to the OECD 308 guideline.	
5.2	**Results and discussion**	[redacted] [redacted] Most of the applied radioactivity was detected in the water layers and steadily dissipated to the sediment layer. By the end of the study i.e. 101d, the recovered radioactivity remaining in the water layer represented an average of 11.5 and 6.9% AR for [*cis*-^{14}C]-Imiprothrin and an average of 5.1 and 12.1% AR, for the [*trans*-^{14}C]-Imiprothrin. The level of applied radioactivity extractable from the sediment layer were at a maximum at 6d in the test systems treated with [*cis*-^{14}C]-Imiprothrin and comprised 43.2 and 25.0% AR for the Goose River and Golden Lake systems, respectively. The level of applied radioactivity extractable from the sediment layer were at a maximum at 13d in the test systems treated with [*trans*-^{14}C]-Imiprothrin and comprised 31.1 and 17.0% AR for the Goose River and Golden Lake systems, respectively. The level of applied radioactivity as bound residues in the test systems were at a maximum at the end of the study and comprised *ca* 27% AR for the Goose River system and *ca* 36% in the Golden Lake system, for each radiolabelled Imiprothrin form. Further analysis showed the radioactivity was associated primarily with an insoluble humin fraction. Radiolabelled carbon dioxide was produced in significant amounts by the end of the incubation phase, accounting for 39.9 to 44.5% AR from the [*cis*-^{14}C]-Imiprothrin labelled test systems and 39.9 to 52.35 AR from the [*trans*-^{14}C]-Imiprothrin labelled test systems. For the total system of the Goose River and Golden Lake test systems, treated with [*cis*-^{14}C]-Imiprothrin, the level of Imiprothrin detected declined from an average of 82.8 and 76.2% AR, respectively, at 0d to 0.7 and 0.5% AR at the end of the study. The DT_{50} in the whole system was determined to be 5.9 and 5.7 days for the Goose River and Golden Lake test systems, respectively. Major degradation products observed in this study were [redacted] [redacted] The isomerization of the test substances was not observed during the incubation period.	X

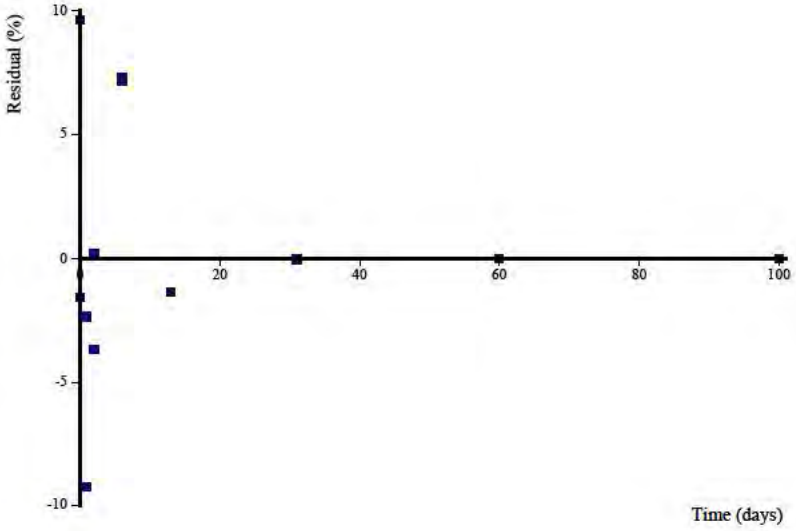
Annex Point IIIA 10.1.3.2	**Biodegradation in freshwater** **IIIA 10.1.3.2 Water/sediment degradation test**	
5.3 Conclusion	[redacted] [redacted] Carbon dioxide comprosed the major terminal degradation product accounting for ca 40 to 52% AR depending on label position and test system.	X X
5.3.1 Reliability	The study was carried out to GLP and according to recognized guidance. As such the study is considered to be fully reliable without restriction and is assessed as Klimisch 1.	
5.3.2 Deficiencies	No relevant deficiencies were identified in the study report.	

	Evaluation by Competent Authorities	
	Use separate "evaluation boxes" to provide transparency as to the comments and views submitted	
EVALUATION BY RAPPORTEUR MEMBER STATE		

Date	23/02/2016
Materials and Methods	The Applicant's version is considered to be acceptable noting the following: **3.3.1** The water/ sediment systems chosen were not contrasting with respect to pH.
Results and discussion	The Applicant's version is considered to be acceptable noting the following: **4.1** The total overall mass balance for the Goose River and Golden Lake test systems treated with [*cis*-^{14}C]-Imiprothrin averaged 96.6 ± 6.1% AR and 100.0 ± 5.2% AR, respectively. The total overall mass balance for the Goose River and Golden Lake test systems treated with [*trans*-^{14}C]-Imiprothrin averaged 96.3 ± 3.9% AR and 96.9 ± 3.8% AR, respectively. **4.2** The level of applied radioactivity extractable from the sediment layer were at a maximum at 6d in the test systems treated with [*cis*-^{14}C]-Imiprothrin and comprised 43.3 and 25.0% AR for the Goose River and Golden Lake systems, respectively. The level of applied radioactivity extractable from the sediment layer were at a maximum at 13d in the test systems treated with [*trans*-^{14}C]-Imiprothrin and comprised 31.6 and 17.0% AR for the Goose River and Golden Lake systems, respectively. The level of applied radioactivity as bound residues in the test systems treated with [*trans*-^{14}C]-Imiprothrin were at a maximum at 101d for the Goose River and Golden Lake systems, respectively and comprised 26.2 and 35.**8**% AR. ^{14}C-Carbon dioxide was evolved from each test system, reaching a maximum after 101d incubation. In the [*cis*-^{14}C]-Imiprothrin treated systems levels of 39.**6** and 44.5% AR were obtained in the Goose River and Golden Lake systems, respectively, in the [*trans*-^{14}C]-Imiprothrin treated systems the corresponding levels were 52.3 and 39.9% AR. **3.7.1, 4.5, 5.2 and 5.3** As it was unclear if FOCUS guidance had been followed by the applicant with respect to the statistical analysis (chi squared and t test values) of the kinetic fits presented, the UK CA has recalculated the dissipation rate constants using CAKE version 2. The ordinary least squares method of minimisation (OLS) as recommended in the FOCUS guidance was used and a day 0 total recovery value was used to account for early degradation in line with FOCUS recommendations. **Data set: *Cis*-imiprothrin disspiation from Goose river water** (SFO) with OLS **Observations and Fitted Model:**



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	89.34	3.004	N/A	84.05	94.63	82.9	95.78
k_Parent	0.3237	0.02929	1.33E-008	0.2721	0.3753	0.2609	0.387

χ^2

Parameter	Error %	Degrees of Freedom
All data	10.7	6
Parent	10.7	6

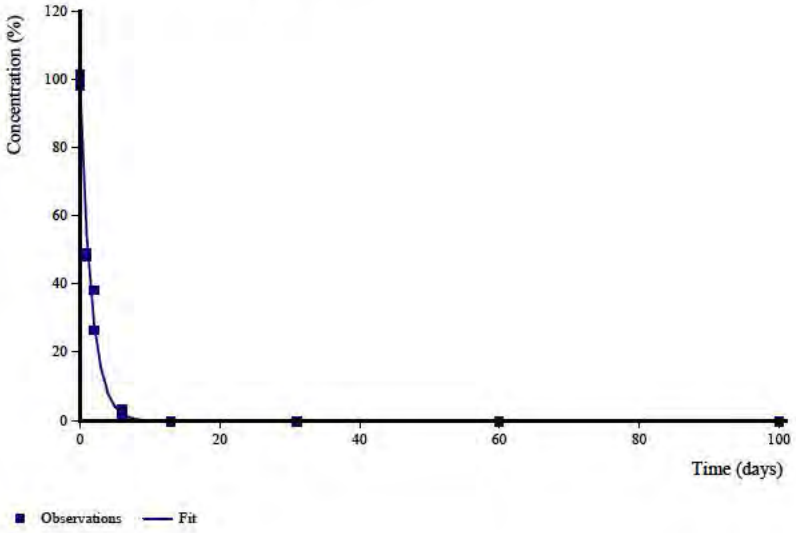
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	2.14	7.11

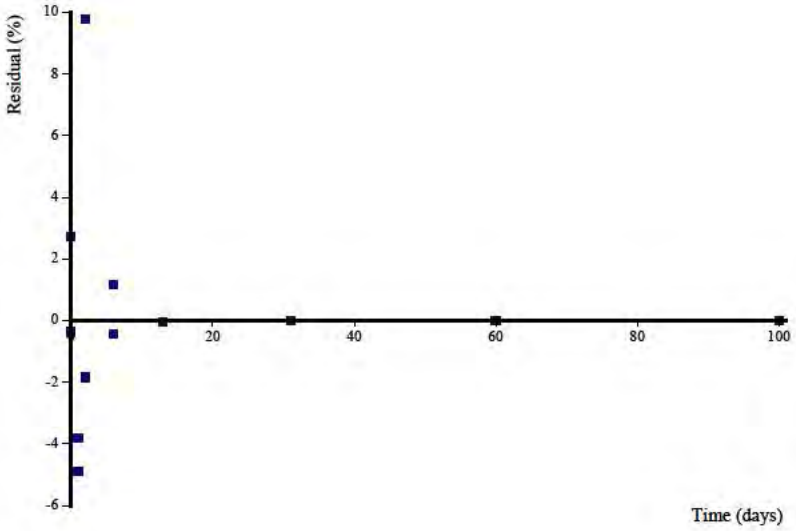
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: *Trans*-imiprothrin disspiation from Goose river water (SFO) with OLS

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	98.77	2.237	N/A	94.83	102.7	93.97	103.6
k_Parent	0.6244	0.03324	1.25E-011	0.5659	0.6829	0.5531	0.696

χ^2

Parameter	Error %	Degrees of Freedom
All data	7.39	6
Parent	7.39	6

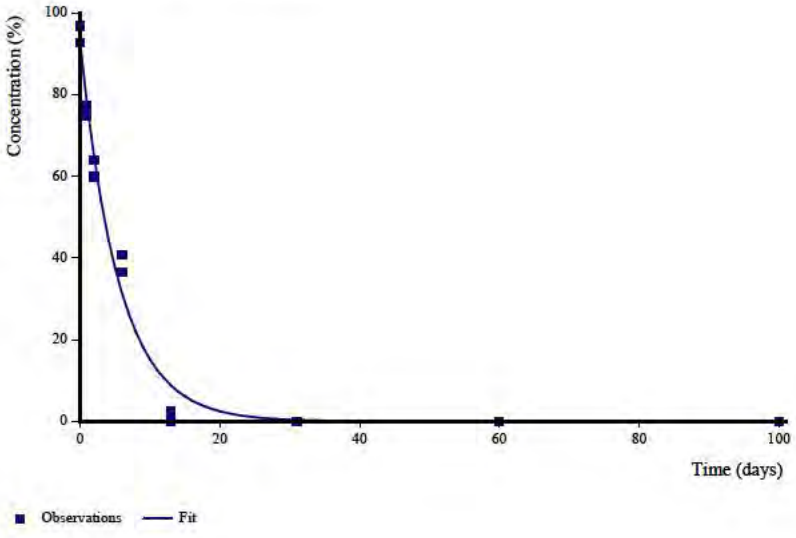
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	1.11	3.69

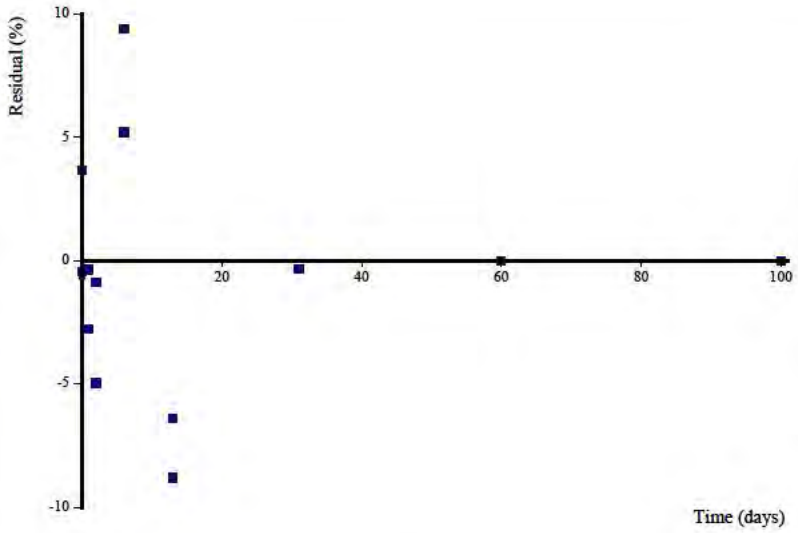
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: ***Cis*-imiprothrin disspiation from Golden Lake water** (SFO) with OLS

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	93.25	2.533	N/A	88.79	97.71	87.81	98.68
k_Parent	0.1815	0.01436	2.41E-009	0.1562	0.2068	0.1507	0 212

χ^2

Parameter	Error %	Degrees of Freedom
All data	9.24	6
Parent	9.24	6

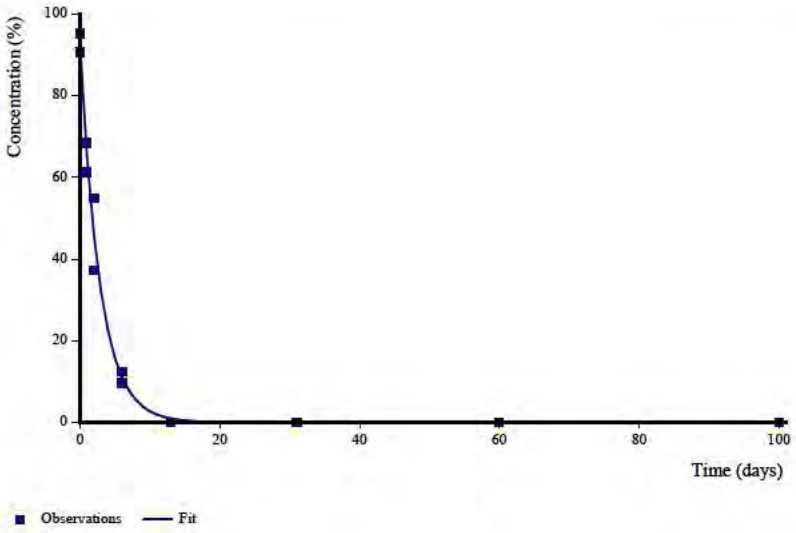
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	3.82	12.7

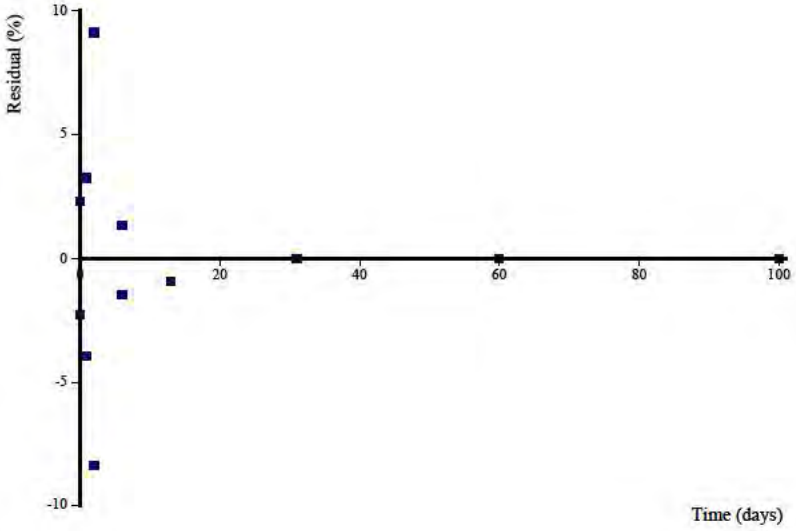
On the basis of the low chi^2 error value and acceptable visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: ***Trans*-imiprothrin disspiation from Golden Lake water** (SFO) with OLS

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	92.85	2.434	N/A	88.56	97.14	87.63	98.07
k_Parent	0.3548	0.02459	4.26E-010	0.3115	0.3981	0.302	0.408

χ^2

Parameter	Error %	Degrees of Freedom
All data	1.1	6
Parent	1.1	6

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	1.95	6.49

On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

A summary of Imiprothrin Water Dissipation at 20 ºC

Compound	**System**	**DT_{50}**	**DT_{90}**	**χ^2**	**Prob. > t**
Cis-imiprothrin	Goose River	2.14	7.11	10.7	1.33E-08
Trans- imiprothrin	Goose River	1.11	3.69	7.39	1.21E-11
Cis-imiprothrin	Golden Lake	3.82	12.7	9.24	2.41E-09
Trans- imiprothrin	Golden Lake	1.95	6.49	1.10	4.26E-10

Imiprothrin degradation kinetics have also been revised by the UK CA, following FOCUS guidelines using CAKE version 3 and have been calculated for degradation products where possible.

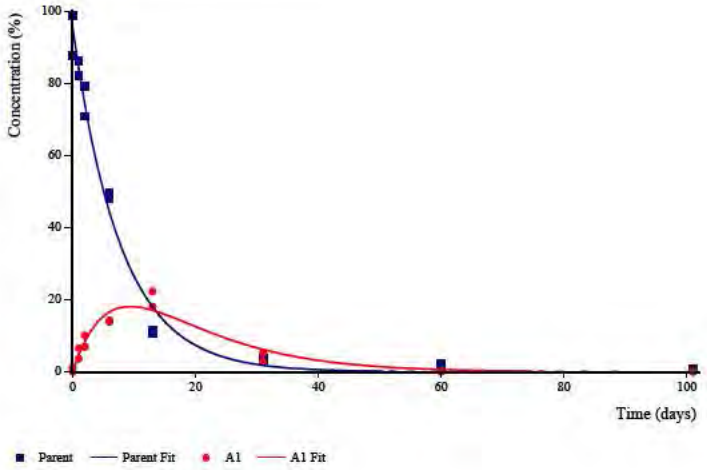
Where possible sequential total system fits were attempted for parent and first metabolite. Where this was not possible to achive acceptable fits, a simpler conservative top down approach from the time point of peak residues was used. The ordinary least squares method of minimisation (OLS) as recommeded in the FOCUS guidance was used and a day 0 total recovery value was used to account for sediment residues, or metabolites.

Summary of Kinetic fit used

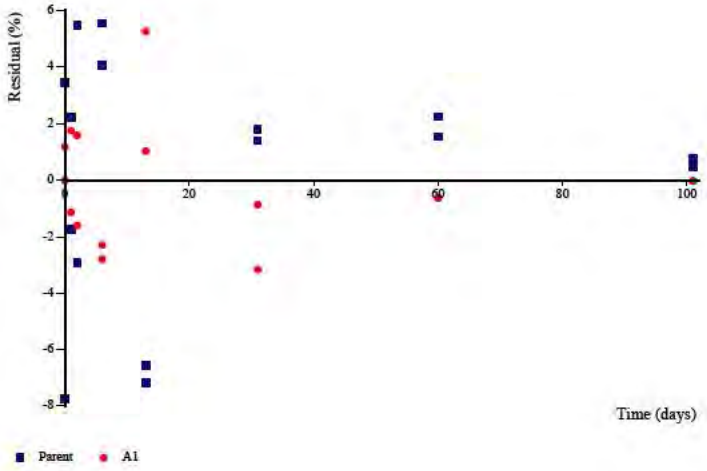
Soil	**Isomer**	**Compound**	**Fitting Comment**
Goose River	Cis	Imiprothrin	SFO with [redacted]
		[redacted]	SFO with imiprothrin
		[redacted]	SFO peak onwards
		[redacted]	SFO peak onwards
	Trans	Imiprothrin	SFO fitted alone
		[redacted]	SFO peak onwards
		[redacted]	SFO peak onwards
		[redacted]	SFO peak onwards
Golden Lake	Cis	Imiprothrin	SFO fitted alone
		[redacted]	SFO peak onwards
		[redacted]	Unable to fit data
		[redacted]	Not major metabolite
	Trans	Imiprothrin	SFO fitted alone
		[redacted]	Unable to fit data
		[redacted]	SFO peak onwards
		[redacted]	Not major metabolite

Data set: ***Cis*-imiprothrin degradation from Goose river water** (SFO) with OLS fitted **simultaneously with** [redacted]

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	95.45	1.893	N/A	92.22	98.68	91.56	99.34
k_Parent	0.1284	0.00774	1.17E -015	0.1152	0.1416	0 1125	0.144
f_Parent_to _A1	0.43	0.07436	N/A	0.3032	0.5569	0 2772	0.583
k_A1	0.08735	0.02442	6.96E -004	0.0457	0.129	0.0372	0.138

χ^2

Parameter	Error %	Degrees of Freedom
All data	9.31	11
Parent	6.45	6
A1	18.5	5

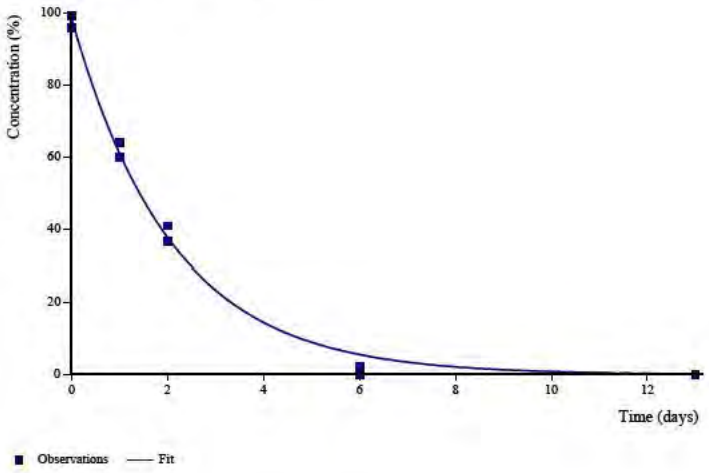
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	5.4	17.9
A1	7.94	26.4

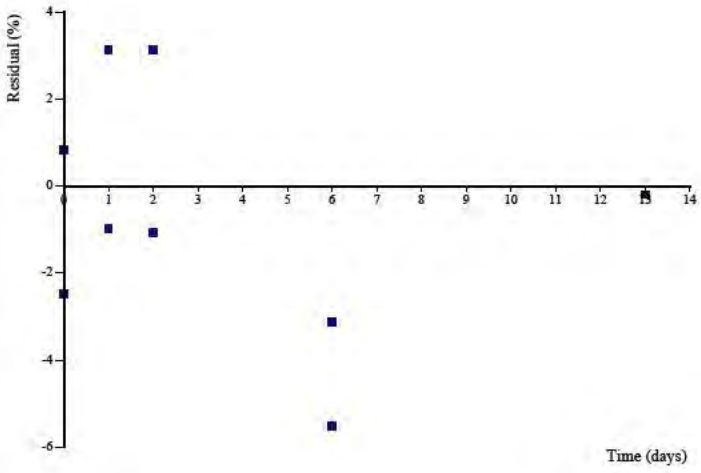
On the basis of the low chi^2 error value for imiprothrin and good visual fit based on traditional and residual plots the UK CA considered the SFO fits to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: ***Cis*-imiprothrin degradation from Golden lake water** (SFO) with OLS

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	98.37	1.989	N/A	94.67	102.1	93.78	103
k_Parent	0.48	0.02405	2.07E -008	0.4353	0.5247	0.4245	0.535

χ^2

Parameter	Error %	Degrees of Freedom
All data	4.17	3
Parent	4.17	3

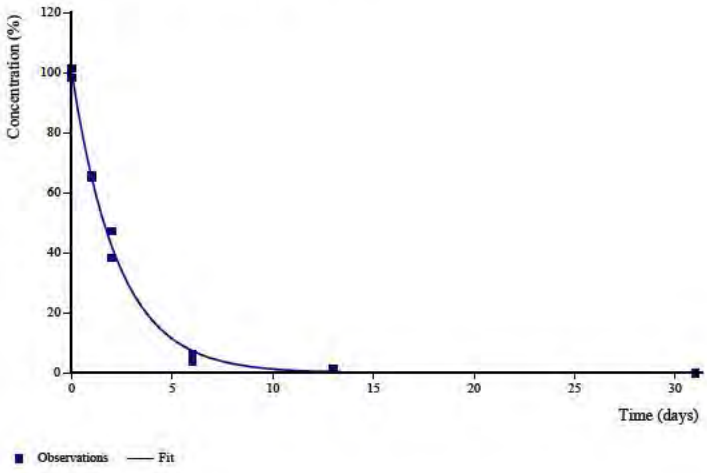
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	1.44	4.8

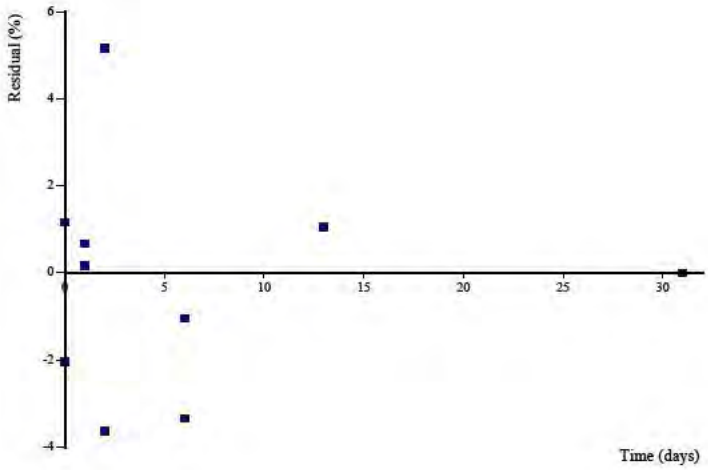
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: ***Trans*-imiprothrin degradation from Goose river water** (SFO) with OLS

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	100.2	1.648	N/A	97.25	103.2	96.56	103.9
k_Parent	0.4357	0.01814	1.78E -010	0.4029	0.4686	0.3953	0.476

χ^2

Parameter	Error %	Degrees of Freedom
All data	2.38	4
Parent	2.38	4

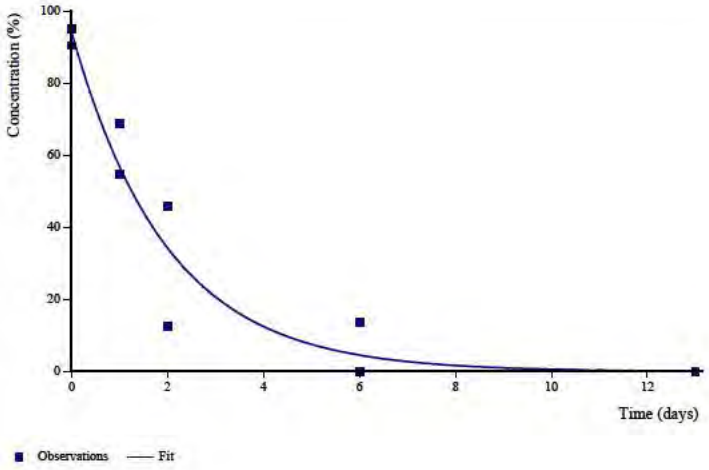
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	1.59	5.28

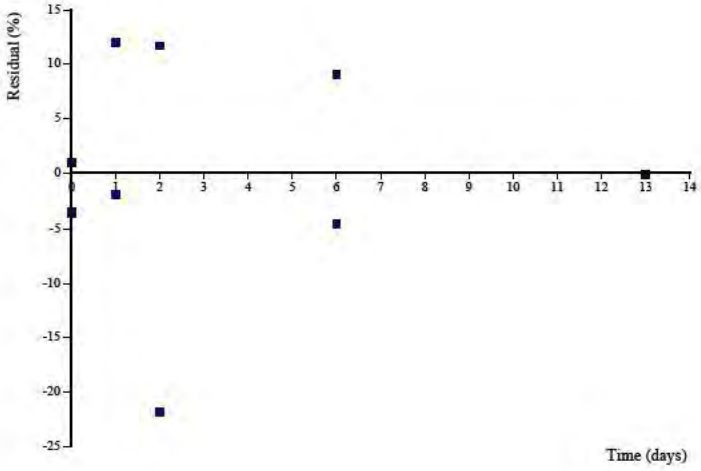
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: ***Trans*-imiprothrin degradation from Golden lake water** (SFO) with OLS

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	94.09	7.134	N/A	80.83	107.4	77.64	110.5
k_Parent	0 5059	0.09394	3.29E -004	0 3312	0.6806	0.2893	0.723

χ^2

Parameter	Error %	Degrees of Freedom
All data	7.13	3
Parent	7.13	3

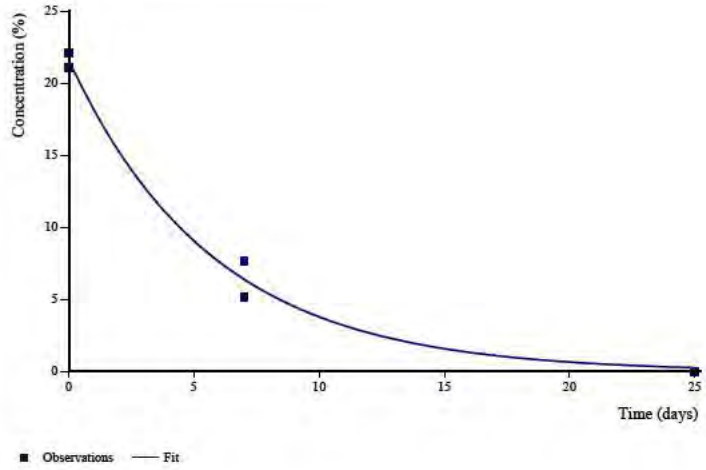
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	1.37	4.55

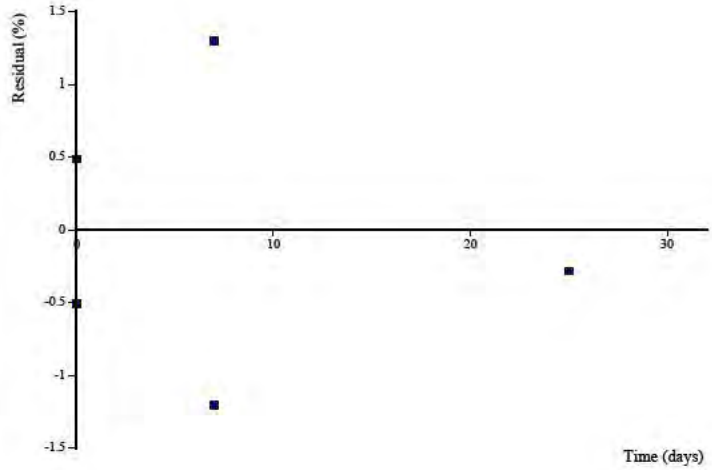
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots (despite the variability in replicate measurements) the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: [redacted] **peak onwards in Golden lake system** (SFO) with OLS (from *cis*-imiprothrin)

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	21.61	0.6876	N/A	20.14	23.08	19.7	23.52
k_Parent	0.1737	0.0158	1.95E -004	0.14	0.2074	0.1298	0.218

χ^2

Parameter	Error %	Degrees of Freedom
All data	1.55	1
Parent	1.55	1

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	3.99	13.3

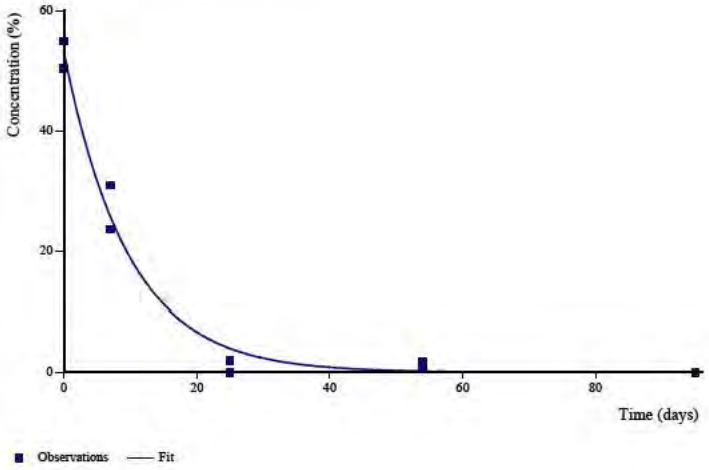
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: [redacted] **peak onwards in Golden lake system** (SFO) with OLS (from *trans*-imiprothrin)

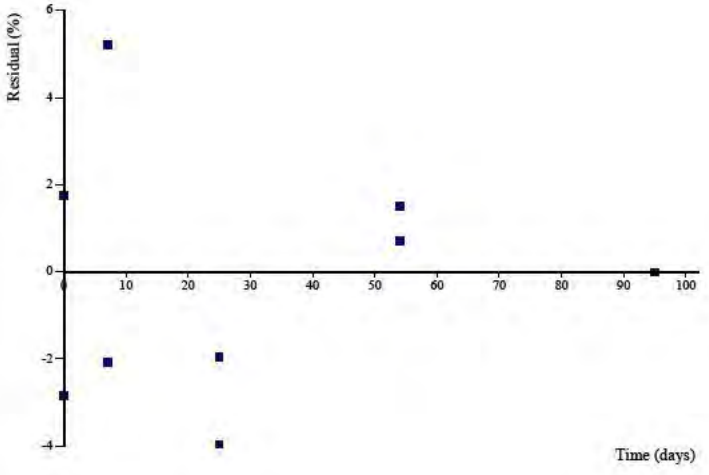
An acceptable fit of the data could not be obtained.

Data set: [redacted] **peak onwards in Goose river system** (SFO) with OLS (from *trans*-imiprothrin)

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	99.1	8.617	N/A	83.07	115.1	79.23	119
k_Parent	0.1039	0.01076	5.54E -006	0.08385	0.1239	0.07904	0.129

χ^2

Parameter	Error %	Degrees of Freedom
All data	7.77	3
Parent	7.77	3

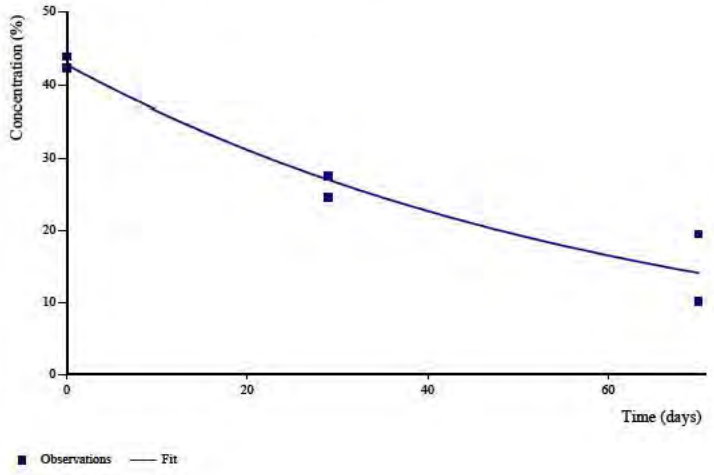
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	6.67	22.2

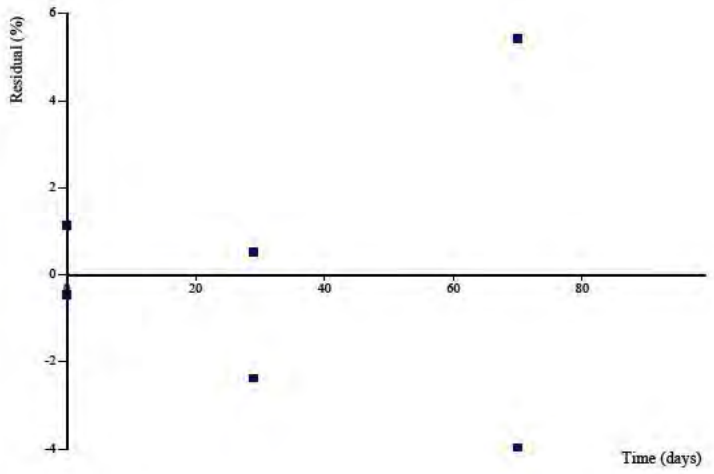
On the basis of the low chi^2 error value and acceptable visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: **CPG peak onwards in Goose river system** (SFO) with OLS (from *cis*-imiprothrin)

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	42.76	2.465	N/A	37.5	48.01	35.91	49.6
k_Parent	0.01588	0.002406	0.00136	0.01076	0.02101	0.00920	0.023

χ^2

Parameter	Error %	Degrees of Freedom
All data	2.24	1
Parent	2.24	1

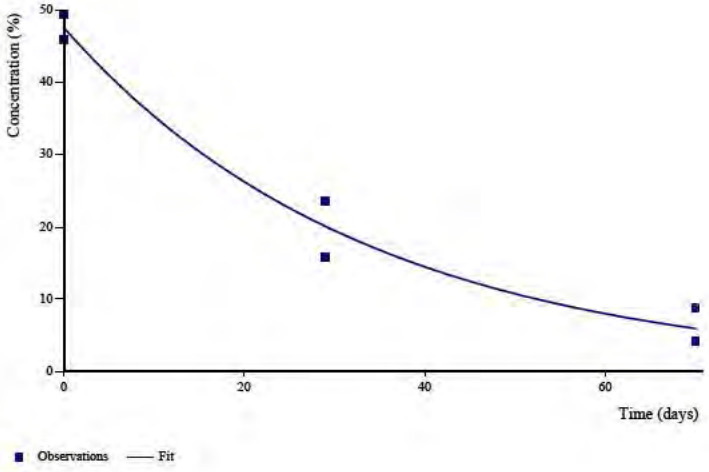
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	43.6	145

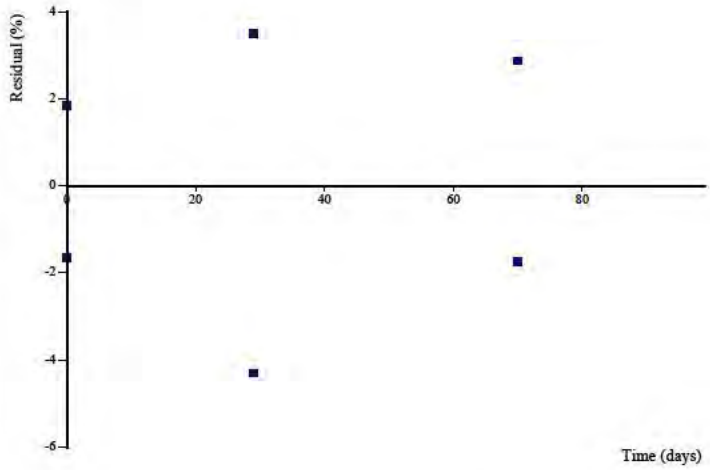
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: **CPG peak onwards in Goose river system** (SFO) with OLS (from *trans*-imiprothrin)

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	47.65	2.427	N/A	42.48	52.83	40.91	54.39
k_Parent	0.02976	0.003705	6.52E -004	0.02186	0.03766	0.01947	0.04

χ^2

Parameter	Error %	Degrees of Freedom
All data	1.45	1
Parent	1.45	1

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	23.3	77.4

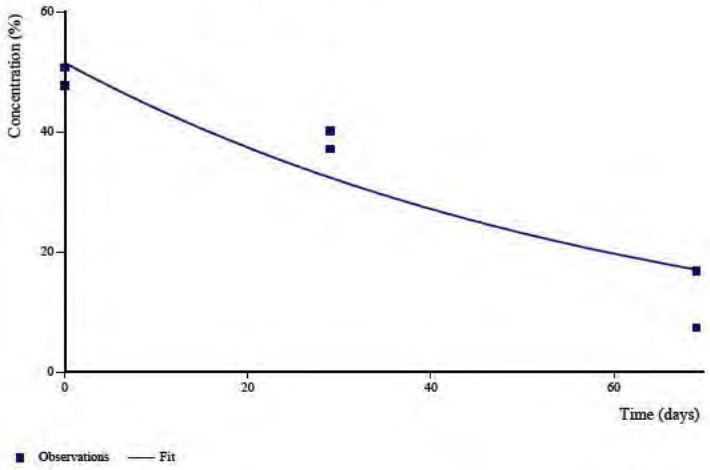
On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: C**PG peak onwards in Golden lake system** (SFO) with OLS (from *cis*-imiprothrin)

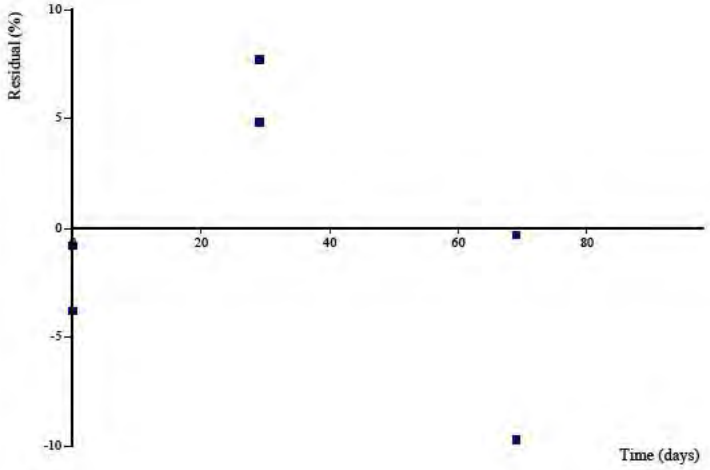
An acceptable fit of the data could not be obtained.

Data set: C**PG peak onwards in Golden lake system** (SFO) with OLS (from *trans*-imiprothrin)

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	51.48	4.706	N/A	41.45	61.52	38.42	64.55
k_Parent	0.01598	0.00383	0.00700	0.007817	0.02415	0.00535	0.027

χ^2

Parameter	Error %	Degrees of Freedom
All data	12.8	1
Parent	12.8	1

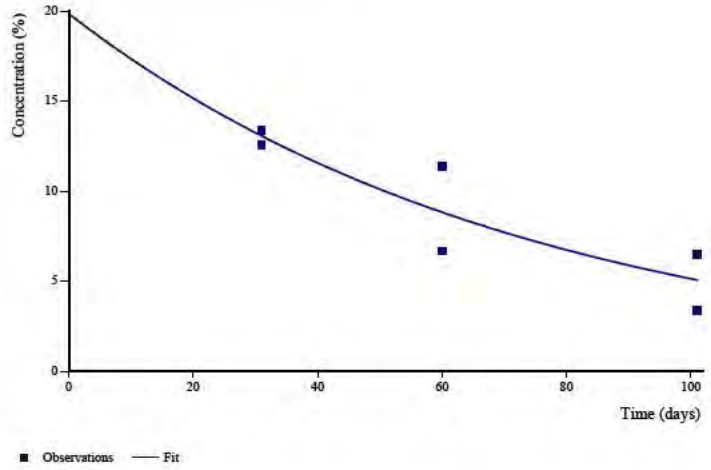
Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	43.4	144

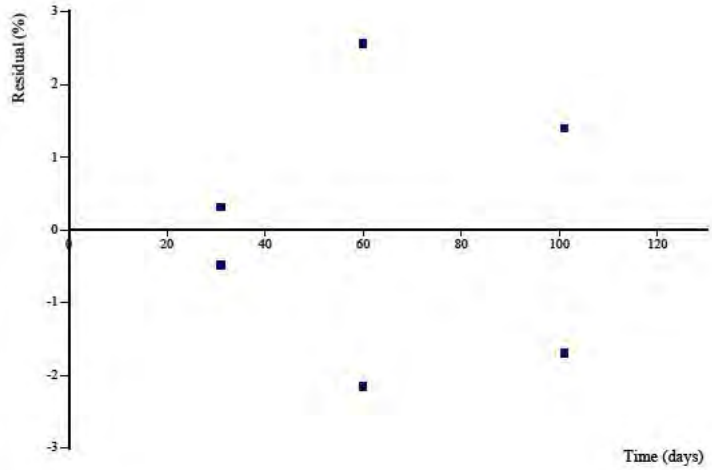
On the basis of the low chi^2 error value and acceptable visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: **PG peak onwards in Goose river system** (SFO) with OLS (from *cis*-imiprothrin)

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	19.86	3.96	N/A	11.42	28.3	8.863	30.85
k_Parent	0.01347	0.003924	0.0132	0.00510	0.02184	0.002575	0.024

χ^2

Parameter	Error %	Degrees of Freedom
All data	1.47	1
Parent	1.47	1

Decay Times:

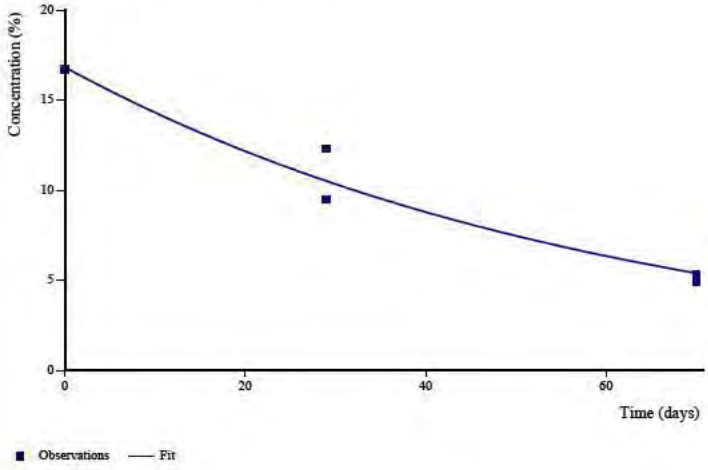
Compartment	DT50 (days)	DT90 (days)
Parent	51.5	171

On the basis of the low chi^2 error value and acceptable visual fit based on

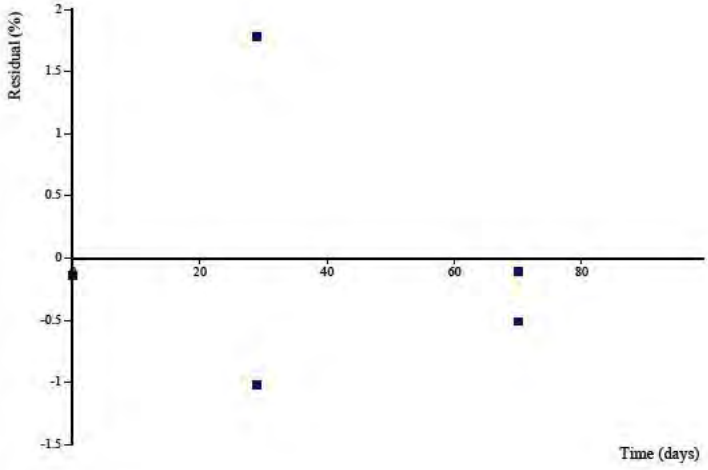
traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: **PG peak onwards in Goose river system** (SFO) with OLS (from *trans*-imiprothrin)

Observations and Fitted Model:



Residuals:



Estimated Values:

Parameter	Value	σ	Prob. > t	Lower (90%) CI	Upper (90%) CI	Lower (95%) CI	Upper (95%) CI
Parent_0	119.9	17.05	N/A	83.52	156.2	72.53	167.2
k_Parent	0.02976	0.003705	6.52E -004	0.02186	0.03766	0.01947	0.04

χ^2

Parameter	Error %	Degrees of Freedom
All data	2.39	1
Parent	2.39	1

Decay Times:

Compartment	DT50 (days)	DT90 (days)
Parent	42.7	142

On the basis of the low chi^2 error value and good visual fit based on traditional and residual plots the UK CA considered the SFO fit to be acceptable and no further assessment of non-SFO kinetic models was considered necessary.

Data set: **PG in Golden lake system** was not present at high enough levels to be considered a major metabolite.

Water/ Sediment Degradation at 20 ºC

Compound	System	Measured DT_{50} (days) at 20°C	Measured DT_{90} (days) at 20°C	χ^2	Prob. > t
Cis-imiprothrin	Goose River	5.40	17.9	9.31	1.17E-15
Cis-imiprothrin	Golden Lake	1.44	4.80	4.17	2.07E-08
Trans-imiprothrin	Goose River	1.59	5.28	2.38	1.78E-10
Trans-imiprothrin	Golden Lake	1.37	4.55	7.13	3.29E-04
[redacted]	Goose River	7.94	26.4	18.5	6.96E-04
[redacted]	Golden Lake	3.99	13.3	1.55	1.95E-04
[redacted]	Goose River	6.67	22.2	7.77	5.54E-06
[redacted]	Goose River	43.6	145	2.24	1.36E-03
[redacted]	Goose River	23.3	77.4	1.45	4.35E-04
[redacted]	Golden Lake	43.4	144	12.8	0.007001
[redacted]	Goose River	51.5	171	1.47	0.01324
[redacted]	Goose River	42.7	142	2.39	6.52E-04

<table>
<tr><td>Conclusion</td><td>The applicant’s version is considered to be acceptable noting the following:

4.1 and 5.3 For [cis-^{14}C]-Imiprothrin the DT_{50} in the whole system was determined to be 5.4 and 1.4 days for the Goose River and Golden Lake test systems, respectively. For [trans-^{14}C]-Imiprothrin the DT_{50} in the whole system was determined to be 1.6 and 1.4 days, respectively.

Major degradates of either Cis or Trans- Imiprothrin and their respective compartments
<table><tr><th rowspan="2">Degradate</th><th colspan="2">#Max % formed in;</th></tr><tr><th>Water</th><th>Sediment</th></tr><tr><td>[redacted]</td><td>38.8</td><td>13.9</td></tr><tr><td>[redacted]</td><td>49.2</td><td>14.2</td></tr><tr><td>[redacted]</td><td>-</td><td>16.7</td></tr><tr><td>[redacted]</td><td colspan="2">100*</td></tr></table>*worst case default as not measured

It is noted that due to the position of radiolabelling the levels of and fate of degradation products relating to the chrysanthemic acid moiety could not be identified in this study.</td></tr>
<tr><td>Reliability</td><td>Accepted as being 1.</td></tr>
<tr><td>Acceptability</td><td>The Applicant’s version is considered to be acceptable.</td></tr>
</table>

Remarks	Although imiprothrin has been shown to be stable in a ready biodegradation study (reported A7.1.1.2.1) rapid degradation has been observed in both Goose river and Golden lake water/sediment systems at 20 ºC. Also in contrast to the ready biodegradation study significant amounts of CO_2 and bound residues were observed, 39.6 – 52.3 % AR (CO_2) and 26.2- 35.8 %AR (bound). This indicates that imiprothrin will be subject to significant levels of mineralisation in the aquatic environment. **Table 9** The correct table for GR trans-imiprothrin sediment extract is provided below

Goose River (GR) trans (Sediment Extract)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
trans-Imiprothrin	Rep A	8.6	17.5	11.8	2.1	1.4	0.0	0.0	0.0
	Rep B	10.2	15.9	9.0	2.8	1.4	0.0	0.0	0.0
	Average	9.4	16.7	10.4	2.5	1.4	0.0	0.0	0.0
cis-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
c/t-PRA	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PGH	Rep A	0.0	0.0	0.0	14.2	3.7	0.0	0.9	0.0
	Rep B	0.0	0.0	0.0	13.5	6.4	0.0	1.7	0.0
	Average	0.0	0.0	0.0	13.9	5.1	0.0	1.3	0.0
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PG	Rep A	0.0	0.0	3.9	5.6	12.2	16.7	12.3	5.3
	Rep B	0.0	0.0	2.1	3.7	9.4	16.7	9.5	4.9
	Average	0.0	0.0	3.0	4.7	10.8	16.7	10.9	5.1
CPG (trans UK1)	Rep A	0.0	0.0	0.0	8.1	13.4	8.8	3.3	2.1
	Rep B	0.0	0.0	0.0	7.6	15.0	9.7	3.1	1.1
	Average	0.0	0.0	0.0	7.9	14.2	9.3	3.2	1.6
Others	Rep A	0.0	0.0	5.5	0.0	0.0	0.0	1.3	0.0
	Rep B	0.0	2.3	8.4	0.0	0.0	0.0	1.8	0.0
	Average	0.0	1.2	7.0	0.0	0.0	0.0	1.6	0.0

COMMENTS FROM.	
Date	*Give date of comments submitted*
Materials and Methods	*Discuss additional relevant discrepancies referring to the (sub)heading numbers and to applicant's summary and conclusion.* *Discuss if deviating from view of rapporteur member state*
Reliability	*Discuss if deviating from view of rapporteur member state*
Findings	*Discuss if deviating from view of rapporteur member state*
Conclusion	*Discuss if deviating from view of rapporteur member state*
Remarks	

Table 1: Characterisation of the water/sediment system.

Characteristics	**Goose River**	**Golden Lake**
Water layer		
Sample no.	[redacted]	[redacted]
Sampling location	Grand Forks County, ND	Steele County, ND
Date of collection	November 5,2013	November 5,2013
Storage conditions	Typically <4ºC	Typically <4ºC
Received at PTRL	November 12,2013	November 12,2013
Duration of storage[1]	7 days	7 days
Start Incubation Period[2]	November 19,2013	November 19,2013
Pre-incubation period[3]	31 and 49 days	31 and 49 days
Samples dosed	December 20, 2013 January 7, 2014	December 20, 2013 January 7, 2014
pH	8.5	8.7
Calcium (ppm)	164	110
Magnesium (ppm)	94	97
Sodium (ppm)	166	97
Hardness (mg equivalent $CaCO_3$/L)	802	679
Conductivity (mmhos/cm)	1.76	1.40
Sodium Adsorption Ratio (SAR)	2.56	1.63
Total Dissolved Solids (ppm)	1610	1274
Turbidity (NTU)	5.89	10.4
Total Organic Content of Water Layer (ppm): At collection Start of study End of study	 12.81 16.39 10.64	 14.59 19.00 12.00

Table 1: Characterisation of the water/sediment system.

Characteristics	**Goose River**		**Golden Lake**	
Sediment layer				
Sampling location	Grand Forks County, ND		Steele County, ND	
Date of collection	November 5, 2013		November 5, 2013	
Sampling depth (cm)	0-5		0-5	
Received at PTRL	November 12, 2013		November 12, 2013	
Storage conditions	Typically < 4°C		Typically < 4°C	
Duration of storage1	7 days		7 days	
Start incubation period2	November 19,2013		November 19, 2013	
Pre incubation period3	31 and 49 days		31 and 49 days	
Samples dosed	December 20, 2013 January 7, 2014		December 20, 2013 January 7, 2014	
Sand (%)	31		85	
Silt (%)	38		12	
Clay (%)	31		3	
Texture (USDA)	Clay Loam		Loamy Sand	
pH 1:1 soil:water ratio	7.8		8.1	
Organic matter (%)	5.9		2.1	
Organic carbon (%)4	3.43		1.22	
Bulk density (gm/cc)	0.88		0.99	
CEC (meq/100 g soil)	22.3		9.5	
Moisture at 0.33 bar	53.8		18.9	
Wet/dry ratio	2.04		1.52	
Base Saturation Data	%	ppm	%	ppm
Calcium	59.5	2650	53.7	1021
Magnesium	25.8	688	31.6	361
Sodium	3.9	200	4.0	88
Potassium	2.9	253	3.1	115
Hydrogen	7.9	18	7.6	7
Microbial Biomass of Sediment (µg C/ g soil): At collection Start of study End of study	 820 338 180		 455 257 239	

[1] The duration of storage is the time from when the water or sediment was received at PTRL to the start of the incubation period.
[2] The start of the incubation period is the date when the traps and samples are hooked up to pumps and stored in the Controlled Temperature Chamber at 20°C.
[3] The pre-incubation period is the time from start of incubation to dosing.
[4] Organic carbon = organic matter ÷ 1.72.

Table 2: Schedule of events.

Date	Sample no.	DAT[A]	Extraction	HPLC	Combustion
Goose River					
1/7/2014	[redacted]	0	1/7/2014	1/7/2014	1/13/2014
1/8/2014	[redacted]	1	1/8/2014	1/8/2014	1/14/2014
1/9/2014	[redacted]	2	1/9/2014	1/9/2014	1/15/2014
1/13/2014	[redacted]	6	1/13/2014	1/13/2014	1/22/2014
1/2/2014	[redacted]	13	1/2/2014	1/2/2014	1/8/2014(*trans*) 1/9/2014 (*cis*)
1/20/2014	[redacted]	31	1/20/2014	1/20/2014	1/23/2014
2/18/2014	[redacted]	60	2/18/2014	2/18/2014	2/24/2014
3/31/2014	[redacted]	101	3/31/2014	3/31/2014	4/7/2014
Golden Lake					
1/7/2014	[redacted]	0	1/7/2014	1/7/2014	1/13/2014
1/8/2014	[redacted]	1	1/8/2014	1/8/2014	1/14/2014
1/9/2014	[redacted]	2	1/9/2014	1/9/2014	1/15/2014
1/13/2014	[redacted]	6	1/13/2014	1/13/2014	1/22/2014
1/2/2014	[redacted]	13	1/2/2014	1/2/2014	1/8/2014(*trans*) 1/9/2014 (*cis*)
1/20/2014	[redacted]	31	1/20/2014	1/20/2014	1/23/2014
2/18/2014	[redacted]	60	2/18/2014	2/18/2014	2/24/2014
3/31/2014	[redacted]	101	3/31/2014	3/31/2014	4/7/2014

[A] Days after treatment.

Note: test system was treated over 2 dates. 0d to 6d samples were treated on 7 Jan 2014, 13d to 101d samples were treated on 20 Dec 2013.

Table 3: Dissolved oxygen, pH and redox potential measurements of the aerobic aquatic test system.

Goose River - Prior to Treatment

	Measurements taken in middle of water layer			Measurements taken in sediment	
Sample #	**DO (ppm)**	**ORP (mV)**	**pH**	**ORP (mV)**	**pH**
31	8.68	105	7.80	-71	6.93

During the Study

		Measurements taken in middle of water layer			Measurements taken in sediment	
Sample ID	**Sample #**	**DO (ppm)**	**ORP (mV)**	**pH**	**ORP (mV)**	**pH**
cis- Time 0 Rep A	[redacted]	5.39	102	7.99	-71	6.64
cis- Time 0 Rep B	[redacted]	5.43	79	7.70	-74	6.67
cis-T1d Rep A	[redacted]	7.78	83	6.16	-103	6.18
cis-T1d Rep B	[redacted]	7.61	61	6.74	-38	6.51
cis-T2d Rep A	[redacted]	6.85	61	6.22	-112	6.11
cis-T2d Rep B	[redacted]	6.91	39	6.56	-97	6.31
cis-T6d Rep A	[redacted]	3.87	11	7.56	-156	6.87
cis-T6d Rep B	[redacted]	4.36	19	7.06	-143	6.61
cis-T13d Rep A	[redacted]	6.05	22	7.73	-92	7.40
cis-T13d Rep B	[redacted]	5.37	26	7.63	-18	7.34
cis-T31d Rep A	[redacted]	7.48	169	7.27	83	7.15
cis-T31d Rep B	[redacted]	7.06	139	7.45	65	7.13
cis-T60d Rep A	[redacted]	6.97	132	8.92	-14	7.79
cis-T60d Rep B	[redacted]	6.27	123	7.83	-58	7.54
cis-T101d Rep A	[redacted]	7.20	228	8.05	189	7.01
cis-T101d Rep B	[redacted]	6.91	240	7.17	135	7.01
Average =		**6.34**	**96**	**7.38**	**-32**	**6.89**

Table 3 (cont.): Dissolved oxygen, pH and redox potential measurements of the aerobic aquatic test system.

Goose River - Prior to Treatment

	Measurements taken in middle of water layer			Measurements taken in sediment	
Sample #	**DO (ppm)**	**ORP (mV)**	**pH**	**ORP (mV)**	**pH**
3	8.47	115	7.71	-84	7.01

During the Study

		Measurements taken in middle of water layer			Measurements taken in sediment	
Sample ID	Sample #	DO (ppm)	ORP (mV)	pH	ORP (mV)	pH
trans- Time 0 Rep A	[redacted]	4.71	71	8.30	-78	6.52
trans- Time 0 Rep B	[redacted]	5.31	54	7.79	-67	6.63
trans-T1d Rep A	[redacted]	7.59	38	6.05	-114	6.09
trans-T1d Rep B	[redacted]	10.01	147	6.98	-151	6.85
trans-T2d Rep A	[redacted]	9.11	36	6.59	-134	6.61
trans-T2d Rep B	[redacted]	9.44	43	7.46	-129	7.10
trans-T6d Rep A	[redacted]	8.94	160	6.61	-194	6.57
trans-T6d Rep B	[redacted]	10.45	121	7.19	-217	6.79
trans-T13d Rep A	[redacted]	6.42	44	8.06	86	6.86
trans-T13d Rep B	[redacted]	6.21	70	7.51	-118	6.98
trans-T31d Rep A	[redacted]	10.11	198	5.96	-85	5.85
trans-T31d Rep B	[redacted]	10.28	199	6.07	-49	6.05
trans-T60d Rep A	[redacted]	9.17	133	6.25	-67	6.51
trans-T60d Rep B	[redacted]	9.65	105	6.84	-76	6.53
trans-T101d Rep A	[redacted]	9.03	161	6.47	-48	6.81
trans-T101d Rep B	[redacted]	9.03	162	6.58	-57	6.93
Average =		**8.47**	**109**	**6.92**	**-94**	**6.61**

Table 3 (cont.): Dissolved oxygen, pH and redox potential measurements of the aerobic aquatic test system.

Golden Lake - Prior to Treatment

	Measurements taken in middle of water layer			Measurements taken in sediment	
Sample #	**DO (ppm)**	**ORP (mV)**	**pH**	**ORP (mV)**	**pH**
71	9.13	114	7.69	-46	7.35

During the Study

		Measurements taken in middle of water layer			Measurements taken in sediment	
Sample ID	**Sample #**	**DO (ppm)**	**ORP (mV)**	**pH**	**ORP (mV)**	**pH**
cis- Time 0 Rep A	[redacted]	6.09	85	8.25	-72	7.69
cis- Time 0 Rep B	[redacted]	6.26	82	8.24	-45	6.90
cis-T1d Rep A	[redacted]	8.45	57	7.15	-81	7.20
cis-T1d Rep B	[redacted]	8.15	55	7.42	-33	7.23
cis-T2d Rep A	[redacted]	7.33	37	7.17	-119	7.03
cis-T2d Rep B	[redacted]	7.24	42	7.58	-106	7.17
cis-T6d Rep A	[redacted]	4.33	-25	7.07	-185	7.18
cis-T6d Rep B	[redacted]	3.95	-14	7.58	-183	7.28
cis-T13d Rep A	[redacted]	7.08	18	7.86	-47	7.73
cis-T13d Rep B	[redacted]	6.88	14	8.11	-107	7.98
cis-T31d Rep A	[redacted]	6.78	160	7.29	136	7.38
cis-T31d Rep B	[redacted]	7.62	180	7.64	187	7.27
cis-T60d Rep A	[redacted]	7.32	84	7.71	104	8.14
cis-T60d Rep B	[redacted]	7.24	126	7.95	133	8.04
cis-T101d Rep A	[redacted]	8.03	208	7.07	241	7.27
cis-T101d Rep B	[redacted]	8.06	220	7.49	240	7.49
Average =		**6.93**	**83**	**7.60**	**4**	**7.44**

Table 3 (cont.): Dissolved oxygen, pH and redox potential measurements of the aerobic aquatic test system.

Golden Lake - Prior to Treatment

	Measurements taken in middle of water layer			Measurements taken in sediment	
Sample #	**DO (ppm)**	**ORP (mV)**	**pH**	**ORP (mV)**	**pH**
61	9.15	105	7.45	-64	7.56

During the Study

		Measurements taken in middle of water layer			Measurements taken in sediment	
Sample ID	**Sample #**	**DO (ppm)**	**ORP (mV)**	**pH**	**ORP (mV)**	**pH**
trans- Time 0 Rep A	[redacted]	5.80	67	7.69	-34	7.28
trans- Time 0 Rep B	[redacted]	4.89	82	7.55	-30	7.20
trans-T1d Rep A	[redacted]	10.04	25	7.09	-41	7.18
trans-T1d Rep B	[redacted]	9.95	52	7.46	-57	7.46
trans-T2d Rep A	[redacted]	9.75	47	7.65	-61	7.60
trans-T2d Rep B	[redacted]	9.71	59	7.85	-90	7.21
trans-T6d Rep A	[redacted]	11.23	-58	7.48	-224	7.45
trans-T6d Rep B	[redacted]	11.89	-73	7.49	-238	7.36
trans-T13d Rep A	[redacted]	7.45	98	7.43	-112	7.26
trans-T13d Rep B	[redacted]	6.39	8	7.54	-114	7.48
trans-T31d Rep A	[redacted]	9.87	201	6.11	-21	6.27
trans-T31d Rep B	[redacted]	10.31	203	6.34	-60	6.48
trans-T60d Rep A	[redacted]	9.59	125	7.07	-103	7.08
trans-T60d Rep B	[redacted]	9.52	143	7.11	-52	7.13
trans-T101d Rep A	[redacted]	8.63	147	7.57	-112	7.21
trans-T101d Rep B	[redacted]	8.43	128	7.39	-72	7.03
Average =		**8.97**	**78**	**7.30**	**-89**	**7.17**

Table 4: Mass balance during the aerobic aquatic metabolism of [[redacted]-^{14}C]-Imiprothrin expressed as percent of applied radiocarbon – Goose river.

Sample	Water layer	Sediment		Volatile Traps			Total Recovery
		Sediment extract	Bound Residue	EG	Foam Plug	NaOH	
[redacted]- T0d Rep A	94.5	4.4	0.0	NA	NA	NA	98.9
Cis- T0d Rep B	83.9	3.8	0.0	NA	NA	NA	87.7
Average	**89.2**	**4.1**	**0.0**	**NA**	**NA**	**NA**	**93.3**
Cis-T1d Rep A	71.6	25.1	1.6	0.0	0.0	0.0	98.3
Cis-T1d Rep B	69.0	26.8	2.2	0.0	0.0	0.0	98.0
Average	**70.3**	**26.0**	**1.9**	**0.0**	**0.0**	**0.0**	**98.2**
Cis-T2d Rep A	62.2	29.5	3.0	0.0	0.0	0.1	94.8
Cis-T2d Rep B	64.6	34.5	3.3	0.0	0.0	0.1	102.5
Average	**63.4**	**32.3**	**3.2**	**0.0**	**0.0**	**0.1**	**98.7**
Cis-T6d Rep A	52.7	43.8	6.6	0.0	0.0	0.3	103.4
Cis-T6d Rep B	53.6	42.6	7.6	0.0	0.0	0.3	104.1
Average	**53.2**	**43.2**	**7.1**	**0.0**	**0.0**	**0.3**	**103.8**
Cis-T13d Rep A	48.3	37.1	10.3	0.0	0.0	2.2	97.9
Cis-T13d Rep B	47.3	37.0	11.9	0.0	0.0	1.1	97.3
Average	**47.8**	**37.1**	**11.1**	**0.0**	**0.0**	**1.7**	**97.6**
Cis-T31d Rep A	35.2	28.8	23.9	0.0	0.0	11.7	99.6
Cis-T31d Rep B	33.9	27.6	20.9	0.0	0.0	12.6	95.0
Average	**34.6**	**28.2**	**22.4**	**0.0**	**0.0**	**12.2**	**97.3**
Cis-T60d Rep A	26.9	20.0	24.6	0.1	0.0	22.8	94.4
Cis-T60d Rep B	14.0	14.6	31.9	0.1	0.0	36.1	96.7
Average	**20.5**	**17.3**	**28.3**	**0.1**	**0.0**	**29.5**	**95.6**
Cis-T101d Rep A	17.4	6.7	26.9	0.0	0.0	32.5	83.5
Cis-T101d Rep B	5.6	11.9	26.2	0.0	0.0	46.7	90.4
Average	**11.5**	**9.3**	**26.6**	**0.0**	**0.0**	**39.6**	**87.0**
						Average =	**96.4**
						Std. Dev. =	**5.5**

Table 5: Mass balance during the aerobic aquatic metabolism of [*trans*-^{14}C]-Imiprothrin expressed as percent of applied radiocarbon – Goose river.

Sample	Water layer	Sediment		Volatile Traps			Total Recovery
		Sediment extract	Bound Residue	EG	Foam Plug	NaOH	
Trans- T0d Rep A	89.6	8.6	0.0	NA	NA	NA	98.2
Trans- T0d Rep B	91.2	10.2	0.0	NA	NA	NA	101.4
Average	**90.4**	**9.4**	**0.0**	**NA**	**NA**	**NA**	**98.8**
Trans-T1d Rep A	77.3	17.5	2.5	0.0	0.0	0.1	97.4
Trans-T1d Rep B	77.3	18.2	1.5	0.0	0.0	0.0	97.0
Average	**77.3**	**17.9**	**2.0**	**0.0**	**0.0**	**0.1**	**97.2**
Trans-T2d Rep A	75.0	21.3	2.0	0.0	0.0	0.1	98.4
Trans-T2d Rep B	74.2	19.5	2.2	0.0	0.0	0.0	95.9
Average	**74.6**	**20.4**	**2.1**	**0.0**	**0.0**	**0.1**	**97.2**
Trans-T6d Rep A	64.9	30.0	6.1	0.0	0.0	0.5	101.5
Trans-T6d Rep B	65.8	27.6	6.2	0.0	0.0	0.5	100.1
Average	**65.4**	**28.8**	**6.2**	**0.0**	**0.0**	**0.5**	**100.8**
Trans-T13d Rep A	52.0	30.8	12.3	0.0	0.0	2.1	97.2
Trans-T13d Rep B	53.4	31.6	9.6	0.0	0.0	1.9	96.5
Average	**52.7**	**31.1**	**11.0**	**0.0**	**0.0**	**2.0**	**96.9**
Trans-T31d Rep A	38.4	25.5	19.7	0.0	0.0	12.8	96.4
Trans-T31d Rep B	41.8	26.4	20.2	0.0	0.0	9.5	97.9
Average	**40.1**	**26.0**	**20.0**	**0.0**	**0.0**	**11.2**	**97.2**
Trans-T60d Rep A	24.8	17.8	25.5	0.0	0.0	22.5	90.6
Trans-T60d Rep B	20.5	16.1	26.5	0.0	0.0	27.4	90.5
Average	**22.7**	**17.0**	**26.0**	**0.0**	**0.0**	**25.0**	**90.6**
Trans-T101d Rep A	6.7	7.4	25.1	0.0	0.0	53.1	92.3
Trans-T101d Rep B	3.5	6.0	27.2	0.0	0.0	51.5	88.2
Average	**5.1**	**6.7**	**26.2**	**0.0**	**0.0**	**52.3**	**90.3**
						Average =	**96.2**
						Std. Dev. =	**3.9**

Table 6: Mass balance during the aerobic aquatic metabolism of [*cis*-^{14}C]-Imiprothrin expressed as percent of applied radiocarbon – Golden Lake.

Sample	Water layer	Sediment		Volatile Traps			Total Recovery
		Sediment extract	Bound Residue	EG	Foam Plug	NaOH	
Cis- T0d Rep A	96.9	2.3	0.0	NA	NA	NA	99.2
Cis- T0d Rep B	92.8	3.1	0.0	NA	NA	NA	95.9
Average	**94.9**	**2.7**	**0.0**	**NA**	**NA**	**NA**	**97.6**
Cis-T1d Rep A	85.9	15.0	1.2	0.4	0.0	0.0	102.5
Cis-T1d Rep B	90.0	10.2	0.8	0.0	0.0	0.0	101.0
Average	**88.0**	**12.6**	**1.0**	**0.2**	**0.0**	**0.0**	**101.8**
Cis-T2d Rep A	79.9	14.9	1.4	0.0	0.0	0.0	96.2
Cis-T2d Rep B	83.5	17.6	1.6	0.0	0.0	0.0	102.7
Average	**81.7**	**16.3**	**1.5**	**0.0**	**0.0**	**0.0**	**99.5**
Cis-T6d Rep A	76.0	23.7	5.5	0.0	0.0	0.1	105.3
Cis-T6d Rep B	71.8	26.2	5.0	0.0	0.0	0.1	103.1
Average	**73.9**	**25.0**	**5.3**	**0.0**	**0.0**	**0.1**	**104.2**
Cis-T13d Rep A	61.7	24.5	10.1	0.0	0.0	0.7	97.0
Cis-T13d Rep B	62.1	23.9	11.1	0.0	0.0	0.6	97.7
Average	**61.9**	**24.2**	**10.6**	**0.0**	**0.0**	**0.7**	**97.4**
Cis-T31d Rep A	56.4	18.0	28.6	0.0	0.0	5.6	108.6
Cis-T31d Rep B	48.6	15.3	29.8	0.0	0.0	9.3	103.0
Average	**52.5**	**16.7**	**29.2**	**0.0**	**0.0**	**7.5**	**105.8**
Cis-T60d Rep A	36.7	9.8	31.7	0.1	0.0	16.5	94.8
Cis-T60d Rep B	26.8	7.9	32.6	0.1	0.0	23.4	90.8
Average	**31.8**	**8.9**	**32.2**	**0.1**	**0.0**	**20.0**	**92.8**
Cis-T101d Rep A	6.7	3.2	36.8	0.1	0.0	44.1	90.9
Cis-T101d Rep B	7.0	3.5	34.8	0.0	0.0	44.9	90.2
Average	**6.9**	**3.4**	**35.8**	**0.1**	**0.0**	**44.5**	**90.6**
						Average =	**98.7**
						Std. Dev. =	**5.4**

Table 7: Mass balance during the aerobic aquatic metabolism of [*trans*-^{14}C]-Imiprothrin expressed as percent of applied radiocarbon – Golden Lake.

Sample	Water layer	Sediment		Volatile Traps			Total Recovery
		Sediment extract	Bound Residue	EG	Foam Plug	NaOH	
Trans- T0d Rep A	82.3	8.2	0.0	NA	NA	NA	90.5
Trans- T0d Rep B	88.7	6.4	0.0	NA	NA	NA	95.1
Average	**85.5**	**7.3**	**0.0**	**NA**	**NA**	**NA**	**92.8**
Trans-T1d Rep A	91.7	7.5	1.0	0.0	0.0	0.0	100.2
Trans-T1d Rep B	85.9	9.0	2.0	0.0	0.0	0.0	96.9
Average	**88.8**	**8.3**	**1.5**	**0.0**	**0.0**	**0.0**	**98.6**
Trans-T2d Rep A	87.1	9.4	1.2	0.0	0.0	0.0	97.7
Trans-T2d Rep B	80.3	12.5	3.1	0.0	0.0	0.0	95.9
Average	**83.7**	**11.0**	**2.2**	**0.0**	**0.0**	**0.0**	**96.8**
Trans-T6d Rep A	78.7	14.8	5.5	0.0	0.0	0.1	99.1
Trans-T6d Rep B	76.3	18.0	6.7	0.0	0.0	0.2	101.2
Average	**77.5**	**16.4**	**6.1**	**0.0**	**0.0**	**0.2**	**100.2**
Trans-T13d Rep A	67.5	17.9	10.9	0.0	0.0	0.8	97.1
Trans-T13d Rep B	70.7	16.0	10.8	0.0	0.0	0.5	98.0
Average	**69.1**	**17.0**	**10.9**	**0.0**	**0.0**	**0.7**	**97.6**
Trans-T31d Rep A	52.9	12.3	26.3	0.0	0.0	8.4	99.9
Trans-T31d Rep B	47.7	11.5	30.2	0.0	0.0	11.4	100.8
Average	**50.3**	**11.9**	**28.3**	**0.0**	**0.0**	**9.9**	**100.4**
Trans-T60d Rep A	46.6	11.1	29.4	0.0	0.0	7.4	94.5
Trans-T60d Rep B	37.2	7.7	39.0	0.0	0.0	18.1	102.0
Average	**41.9**	**9.4**	**34.2**	**0.0**	**0.0**	**12.8**	**98.3**
Trans-T101d Rep A	16.8	3.5	31.5	0.0	0.0	37.8	89.6
Trans-T101d Rep B	7.4	2.1	39.8	0.0	0.0	42.0	91.3
Average	**12.1**	**2.8**	**35.7**	**0.0**	**0.0**	**39.9**	**90.5**
						Average =	**96.9**
						Std. Dev. =	**3.8**

Table 8: Results of Humic Acids/Fulvic Acids Partition of Post-Extracted Sediment residues.

Sample id	**% dose**		
	Fulvic Acid	**Humic Acid**	**Humin**
-*cis* T60d GR Rep B	1.2%	0.2%	0.6%
-*cis* T101d GL Rep A	0.7%	0.1%	1.9%
-*trans* T101d GR Rep B	0.4%	0.1%	1.2%
-*trans* T101d GL Rep B	1.0%	0.2%	1.8%

Table 9: Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Goose River (GR) *cis* (Total system)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	**1**	**2**	**6**	**13**	**31**	**60**	**101**
cis-Imiprothrin	Rep A	86.3	86.2	70.9	48.2	11.4	3.6	1.6	0.8
	Rep B	79.3	82.2	79.3	49.7	10.8	3.2	2.3	0.5
	Average	**82.8**	**84.2**	**75.1**	**49.0**	**11.1**	**3.4**	**2.0**	**0.7**
trans-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**2.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	3.6	10.1	13.8	18.1	3.0	0.0	0.0
	Rep B	1.2	6.5	6.9	14.3	22.3	5.3	0.0	0.0
	Average	**0.6**	**5.1**	**8.5**	**14.1**	**20.2**	**4.2**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.8	1.2	3.6	5.0	12.6	11.4	3.4
	Rep B	0.0	0.0	1.2	3.7	6.0	13.4	6.7	6.5
	Average	**0.0**	**0.4**	**1.2**	**3.7**	**5.5**	**13.0**	**9.1**	**5.0**
CPG (cis UK1)	Rep A	0.0	3.0	10.8	21.9	32.4	42.3	27.5	19.5
	Rep B	0.0	6.2	13.3	28.0	31.9	43.9	24.6	10.1
	Average	**0.0**	**4.6**	**12.1**	**25.0**	**32.2**	**43.1**	**26.1**	**14.8**
Others	Rep A	11.9	3.5	2.1	11.6	18.1	2.7	3.5	0.5
	Rep B	2.7	2.6	0.0	3.7	16.3	2.6	2.1	0.3
	Average	**7.3**	**3.1**	**1.1**	**7.7**	**17.2**	**2.7**	**2.8**	**0.4**
Bound Residues	Rep A	0.0	1.6	3.0	6.6	10.3	23.9	24.6	26.9
	Rep B	0.0	2.2	3.3	7.6	11.9	20.9	31.9	26.2
	Average	**0.0**	**1.9**	**3.2**	**7.1**	**11.1**	**22.4**	**28.3**	**26.6**
EG	Rep A	NA	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	Average	**NA**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**
CO_2	Rep A	NA	0.0	0.1	0.3	2.2	11.7	22.8	32.7
	Rep B	NA	0.0	0.1	0.3	1.1	12.6	36.1	47.1
	Average	**NA**	**0.0**	**0.1**	**0.3**	**1.7**	**12.2**	**29.5**	**39.9**
Foam Plug	Rep A	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**NA**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Others is comprised of several peaks, none representing averaged >6.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon. - Goose River (GR) *cis* (Water Layer)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
cis-Imiprothrin	Rep A	81.9	62.3	43.1	20.1	0.0	0.0	0.0	0.0
	Rep B	75.5	55.4	47.0	20.0	0.0	0.0	0.0	0.0
	Average	**78.7**	**58.9**	**45.1**	**20.1**	**0.0**	**0.0**	**0.0**	**0.0**
trans-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**2.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	3.6	10.1	10.7	16.3	3.0	0.0	0.0
	Rep B	1.2	6.5	6.9	14.3	19.1	5.3	0.0	0.0
	Average	**0.6**	**5.1**	**8.5**	**12.5**	**17.7**	**4.2**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CPG (cis UK1)	Rep A	0.0	3.0	10.8	21.9	26.0	35.4	22.7	17.4
	Rep B	0.0	6.2	13.3	27.0	26.0	36.5	20.5	5.6
	Average	**0.0**	**4.6**	**12.1**	**24.5**	**26.0**	**36.0**	**21.6**	**11.5**
Others	Rep A	11.9	3.5	2.1	7.5	9.7	0.0	2.1	0.0
	Rep B	2.7	2.6	0.0	0.0	8.4	0.0	0.0	0.0
	Average	**7.3**	**3.1**	**1.1**	**3.8**	**9.1**	**0.0**	**1.1**	**0.0**

Others is comprised of several peaks, none representing averaged >6.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Goose River (GR) *cis* (Sediment extract)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
cis-Imiprothrin	Rep A	4.4	23.9	27.8	28.1	11.4	3.6	1.6	0.8
	Rep B	3.8	26.8	32.3	29.7	10.8	3.2	2.3	0.5
	Average	**4.1**	**25.4**	**30.1**	**28.9**	**11.1**	**3.4**	**2.0**	**0.7**
trans-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	0.0	0.0	3.1	1.8	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**1.6**	**2.5**	**0.0**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.8	1.2	3.6	5.0	12.6	11.4	3.4
	Rep B	0.0	0.0	1.2	3.7	6.0	13.4	6.7	6.5
	Average	**0.0**	**0.4**	**1.2**	**3.7**	**5.5**	**13.0**	**9.1**	**5.0**
CPG (cis UK1)	Rep A	0.0	0.0	0.0	0.0	6.4	6.9	4.8	2.1
	Rep B	0.0	0.0	0.0	1.0	5.9	7.4	4.1	4.5
	Average	**0.0**	**0.0**	**0.0**	**0.5**	**6.2**	**7.2**	**4.5**	**3.3**
Others	Rep A	0.0	0.0	0.0	4.1	8.4	2.7	1.4	0.5
	Rep B	0.0	0.0	0.0	3.7	7.9	2.6	2.1	0.3
	Average	**0.0**	**0.0**	**0.0**	**3.9**	**8.2**	**2.7**	**1.8**	**0.4**

Others is comprised of several peaks, none representing averaged >6.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Goose River (GR) *trans* (Total system)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
trans-Imiprothrin	Rep A	97.3	65.5	38.3	4.0	1.4	0.0	0.0	0.0
	Rep B	100.0	65.0	47.1	6.3	1.4	0.0	0.0	0.0
	Average	**98.7**	**65.3**	**42.7**	**5.2**	**1.4**	**0.0**	**0.0**	**0.0**
cis-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	1.7	1.8	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.9**	**1.5**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	19.9	21.8	54.9	23.6	0.0	0.9	0.0
	Rep B	0.0	10.7	17.4	50.3	30.9	2.0	1.7	0.0
	Average	**0.0**	**15.3**	**19.6**	**52.6**	**27.3**	**1.0**	**1.3**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	3.9	5.6	12.2	16.7	12.3	5.3
	Rep B	1.4	0.0	2.1	3.7	9.4	16.7	9.5	4.9
	Average	**0.7**	**0.0**	**3.0**	**4.7**	**10.8**	**16.7**	**10.9**	**5.1**
CPG (trans UK1)	Rep A	0.0	0.0	23.0	28.7	30.2	46.0	15.8	8.8
	Rep B	0.0	0.0	18.8	31.9	41.7	49.5	23.6	4.2
	Average	**0.0**	**0.0**	**20.9**	**30.3**	**36.0**	**47.8**	**19.7**	**6.5**
Others	Rep A	0.9	8.1	7.6	0.0	15.4	1.2	13.6	0.0
	Rep B	0.0	19.8	8.4	0.0	2.1	0.0	1.8	0.4
	Average	**0.5**	**14.0**	**8.0**	**0.0**	**8.8**	**0.6**	**7.7**	**0.2**
Bound Residues	Rep A	0.2	2.5	2.0	6.1	12.3	19.7	25.5	25.1
	Rep B	0.1	1.5	2.2	6.2	9.6	20.2	26.5	27.2
	Average	**0.2**	**2.0**	**2.1**	**6.2**	**11.0**	**20.0**	**26.0**	**26.2**
EG	Rep A	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**NA**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CO_2	Rep A	NA	0.1	0.1	0.5	2.1	12.8	22.5	53.1
	Rep B	NA	0.0	0.0	0.5	1.9	9.5	27.4	51.5
	Average	**NA**	**0.1**	**0.1**	**0.5**	**2.0**	**11.2**	**25.0**	**52.3**
Foam Plug	Rep A	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**NA**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Others is comprised of several peaks, none representing averaged >10.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Goose River (GR) *trans* (Water layer)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
trans-Imiprothrin	Rep A	88.7	48.0	26.5	1.9	0.0	0.0	0.0	0.0
	Rep B	89.8	49.1	38.1	3.5	0.0	0.0	0.0	0.0
	Average	**89.3**	**48.6**	**32.3**	**2.7**	**0.0**	**0.0**	**0.0**	**0.0**
cis-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	1.7	1.8	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.9**	**1.5**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	19.9	21.8	40.7	19.9	0.0	0.0	0.0
	Rep B	0.0	10.7	17.4	36.8	24.5	2.0	0.0	0.0
	Average	**0.0**	**15.3**	**19.6**	**38.8**	**22.2**	**1.0**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CPG (trans UK1)	Rep A	0.0	0.0	23.0	20.6	16.8	37.2	12.5	6.7
	Rep B	0.0	0.0	18.8	24.3	26.7	39.8	20.5	3.1
	Average	**0.0**	**0.0**	**20.9**	**22.5**	**21.8**	**38.5**	**16.5**	**4.9**
Others	Rep A	0.9	9.3	2.1	0.0	15.4	1.2	12.3	0.0
	Rep B	0.0	17.5	0.0	0.0	2.1	0.0	0.0	0.4
	Average	**0.5**	**13.4**	**1.1**	**0.0**	**8.8**	**0.6**	**6.2**	**0.2**

Others is comprised of several peaks, none representing averaged >10.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Goose River (GR) *trans* (Sediment extract)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
trans-Imiprothrin	Rep A	88.7	48.0	26.5	1.9	0.0	0.0	0.0	0.0
	Rep B	89.8	49.1	38.1	3.5	0.0	0.0	0.0	0.0
	Average	**89.3**	**48.6**	**32.3**	**2.7**	**0.0**	**0.0**	**0.0**	**0.0**
cis-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	1.7	1.8	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.9**	**1.5**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	19.9	21.8	40.7	19.9	0.0	0.0	0.0
	Rep B	0.0	10.7	17.4	36.8	24.5	2.0	0.0	0.0
	Average	**0.0**	**15.3**	**19.6**	**38.8**	**22.2**	**1.0**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CPG (trans UK1)	Rep A	0.0	0.0	23.0	20.6	16.8	37.2	12.5	6.7
	Rep B	0.0	0.0	18.8	24.3	26.7	39.8	20.5	3.1
	Average	**0.0**	**0.0**	**20.9**	**22.5**	**21.8**	**38.5**	**16.5**	**4.9**
Others	Rep A	0.9	9.3	2.1	0.0	15.4	1.2	12.3	0.0
	Rep B	0.0	17.5	0.0	0.0	2.1	0.0	0.0	0.4
	Average	**0.5**	**13.4**	**1.1**	**0.0**	**8.8**	**0.6**	**6.2**	**0.2**

Others is comprised of several peaks, none representing averaged >10.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Golden Lake (GL) *cis* (Total System)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
cis-Imiprothrin	Rep A	75.0	64.0	40.8	0.0	0.0	0.0	0.0	0.4
	Rep B	77.4	59.9	36.6	2.4	0.0	0.0	0.0	0.6
	Average	**76.2**	**62.0**	**38.7**	**1.2**	**0.0**	**0.0**	**0.0**	**0.5**
trans-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	2.4	7.5	21.1	7.7	0.0	0.0	0.0
	Rep B	0.0	2.5	10.9	22.1	5.2	0.0	0.0	0.0
	Average	**0.0**	**2.5**	**9.2**	**21.6**	**6.5**	**0.0**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.3**
CPG (cis UK1)	Rep A	0.0	11.6	15.0	29.0	34.3	48.6	46.6	6.7
	Rep B	0.0	10.0	17.3	26.6	36.8	43.4	37.7	7.0
	Average	**0.0**	**10.8**	**16.2**	**27.8**	**35.6**	**46.0**	**42.2**	**6.9**
Others	Rep A	2.4	0.0	0.0	3.0	16.6	2.2	1.7	0.4
	Rep B	3.1	2.1	2.9	2.6	12.9	1.9	1.1	0.4
	Average	**2.8**	**1.1**	**1.5**	**2.8**	**14.8**	**2.1**	**1.4**	**0.4**
Bound Residues	Rep A	0.0	1.2	1.4	5.5	10.1	28.6	31.7	36.8
	Rep B	0.0	0.8	0.0	5.0	11.1	29.8	32.6	34.8
	Average	**0.0**	**1.0**	**0.7**	**5.3**	**10.6**	**29.2**	**32.2**	**35.8**
EG	Rep A	NA	0.4	0.0	0.0	0.0	0.0	0.1	0.1
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	Average	**NA**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**
CO_2	Rep A	NA	0.0	0.0	0.1	0.7	5.6	16.5	44.1
	Rep B	NA	0.0	0.0	0.1	0.6	9.3	23.4	44.9
	Average	**NA**	**0.0**	**0.0**	**0.1**	**0.7**	**7.5**	**20.0**	**44.5**
Foam Plug	Rep A	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**NA**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Others is comprised of several peaks, none representing averaged >6.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Golden Lake (GL) *cis* (Water layer)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
cis-Imiprothrin	Rep A	94.1	75.0	64.0	40.8	0.0	0.0	0.0	0.0
	Rep B	89.6	77.4	59.9	36.6	2.4	0.0	0.0	0.0
	Average	**91.9**	**76.2**	**62.0**	**38.7**	**1.2**	**0.0**	**0.0**	**0.0**
trans-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	0.0	2.4	7.5	21.1	7.7	0.0	0.0
	Rep B	0.0	0.0	2.5	10.9	22.1	5.2	0.0	0.0
	Average	**0.0**	**0.0**	**2.5**	**9.2**	**21.6**	**6.5**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CPG (cis UK1)	Rep A	0.0	11.6	15.0	29.0	34.3	48.6	46.6	6.7
	Rep B	0.0	10.0	17.3	26.6	36.8	43.4	37.2	7.0
	Average	**0.0**	**10.8**	**16.2**	**27.8**	**35.6**	**46.0**	**41.9**	**6.9**
Others	Rep A	2.4	0.0	0.0	0.0	12.1	0.0	0.0	0.0
	Rep B	3.1	2.1	2.9	0.0	9.1	0.0	0.0	0.0
	Average	**2.8**	**1.1**	**1.5**	**0.0**	**10.6**	**0.0**	**0.0**	**0.0**

Others is comprised of several peaks, none representing averaged >6.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Golden Lake (GL) *cis* (Sediment extract)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
cis-Imiprothrin	Rep A	2.3	15.0	13.3	15.9	9.7	2.2	0.9	0.4
	Rep B	3.1	10.2	15.8	18.5	9.1	1.5	0.0	0.7
	Average	**2.7**	**12.6**	**14.6**	**17.2**	**9.4**	**1.9**	**0.5**	**0.6**
trans-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	1.0	1.9	6.3	12.7	7.4	2.4
	Rep B	0.0	0.0	1.3	2.6	6.1	11.3	5.7	2.4
	Average	**0.0**	**0.0**	**1.2**	**2.3**	**6.2**	**12.0**	**6.6**	**2.4**
CPG (cis UK1)	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.0**
Others	Rep A	0.0	0.0	0.0	3.0	4.5	2.2	1.7	0.4
	Rep B	0.0	0.0	0.0	2.6	3.8	1.9	1.1	0.4
	Average	**0.0**	**0.0**	**0.0**	**2.8**	**4.2**	**2.1**	**1.4**	**0.4**

Others is comprised of several peaks, none representing averaged >6.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Golden Lake (GL) *trans* (Total system)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
trans-Imiprothrin	Rep A	95.1	68.7	45.9	13.6	0.0	0.0	0.0	0.0
	Rep B	68.4	54.8	12.4	0.0	0.0	0.0	0.0	0.0
	Average	**81.8**	**61.8**	**29.2**	**6.8**	**0.0**	**0.0**	**0.0**	**0.0**
cis-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	2.4	1.4	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**1.2**	**0.7**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	7.5	29.9	34.6	29.9	0.0	0.0	0.0
	Rep B	6.0	10.5	30.2	28.6	2.2	6.5	0.0	0.0
	Average	**3.0**	**9.0**	**30.1**	**31.6**	**16.1**	**3.3**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	3.9	8.5	16.0	11.5	7.7	3.5
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
	Average	**0.0**	**0.0**	**2.0**	**4.3**	**8.0**	**5.8**	**3.9**	**2.8**
CPG (trans UK1)	Rep A	0.0	0.0	21.9	36.9	33.4	50.7	40.1	16.8
	Rep B	0.0	0.0	0.0	32.3	24.3	47.7	37.2	7.4
	Average	**0.0**	**0.0**	**11.0**	**34.6**	**28.9**	**49.2**	**38.7**	**12.1**
Others	Rep A	0.0	17.3	0.0	0.9	13.2	0.0	0.0	0.0
	Rep B	0.0	18.8	10.8	3.8	16.5	0.0	0.0	0.0
	Average	**0.0**	**18.1**	**5.4**	**2.4**	**14.9**	**0.0**	**0.0**	**0.0**
Bound Residues	Rep A	0.1	1.0	1.2	5.5	10.9	26.3	29.4	31.5
	Rep B	0.1	2.0	3.1	6.7	10.8	30.2	39.0	39.8
	Average	**0.1**	**1.5**	**2.2**	**6.1**	**10.9**	**28.3**	**34.2**	**35.7**
EG	Rep A	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**NA**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CO_2	Rep A	NA	0.0	0.0	0.2	0.8	8.4	7.4	37.8
	Rep B	NA	0.0	0.0	0.2	0.5	11.4	18.1	42.0
	Average	**NA**	**0.0**	**0.0**	**0.2**	**0.7**	**9.9**	**12.8**	**39.9**
Foam Plug	Rep A	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	NA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**NA**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Others is comprised of several peaks, none representing averaged >10.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Golden Lake (GL) *trans* (Water layer)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
trans-Imiprothrin	Rep A	82.3	68.4	54.8	12.4	0.0	0.0	0.0	0.0
	Rep B	88.7	61.2	37.3	9.6	0.0	0.0	0.0	0.0
	Average	**85.5**	**64.8**	**46.1**	**11.0**	**0.0**	**0.0**	**0.0**	**0.0**
cis-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	2.4	1.4	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**1.2**	**0.7**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	6.0	10.5	30.2	28.6	2.2	6.5	0.0
	Rep B	0.0	7.5	29.9	32.2	29.9	0.0	0.0	0.0
	Average	**0.0**	**6.8**	**20.2**	**31.2**	**29.3**	**1.1**	**3.3**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CPG (trans UK1)	Rep A	0.0	0.0	21.9	36.1	25.8	50.7	40.1	16.8
	Rep B	0.0	0.0	0.0	31.1	24.3	47.7	37.2	7.4
	Average	**0.0**	**0.0**	**11.0**	**33.6**	**25.1**	**49.2**	**38.7**	**12.1**
Others	Rep A	0.0	17.3	0.0	0.0	13.2	0.0	0.0	0.0
	Rep B	0.0	17.3	10.8	2.0	16.5	0.0	0.0	0.0
	Average	**0.0**	**17.3**	**5.4**	**1.0**	**14.9**	**0.0**	**0.0**	**0.0**

Others is comprised of several peaks, none representing averaged >10.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Table 9 (cont.): Product balance for the aerobic aquatic metabolism of [^{14}C]Imiprothrin expressed as percent of applied radiocarbon - Golden Lake (GL) *trans* (Sediment extract)

(% AR)	Sample	INCUBATION TIME (Days)							
		0	1	2	6	13	31	60	101
trans-Imiprothrin	Rep A	8.2	7.5	6.2	3.2	0.0	0.0	0.0	0.0
	Rep B	6.4	7.5	8.6	4.0	0.0	0.0	0.0	0.0
	Average	**7.3**	**7.5**	**7.4**	**3.6**	**0.0**	**0.0**	**0.0**	**0.0**
cis-Imiprothrin	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
c/t-PRA	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PGH	Rep A	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**2.9**	**0.0**	**0.0**	**0.0**	**0.0**
CPG-Me	Rep A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
PG	Rep A	0.0	0.0	3.2	6.7	10.3	12.3	11.1	3.5
	Rep B	0.0	0.0	3.9	8.5	16.0	11.5	7.7	2.1
	Average	**0.0**	**0.0**	**3.6**	**7.6**	**13.2**	**11.9**	**9.4**	**2.8**
CPG (trans UK1)	Rep A	0.0	0.0	0.0	0.8	7.6	0.0	0.0	0.0
	Rep B	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.0**	**0.0**	**1.0**	**3.8**	**0.0**	**0.0**	**0.0**
Others	Rep A	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
	Rep B	0.0	1.5	0.0	1.8	0.0	0.0	0.0	0.0
	Average	**0.0**	**0.8**	**0.0**	**1.4**	**0.0**	**0.0**	**0.0**	**0.0**

Others is comprised of several peaks, none representing averaged >10.0%AR. No individual peak represented >5% AR at two consecutive sampling intervals or >5% AR and increasing at the end of the study in each fraction.

Figure 1: Proposed degradation pathway for [imidazolidinyl-5-^{14}C]-Imiprothrin in water/sediment systems.

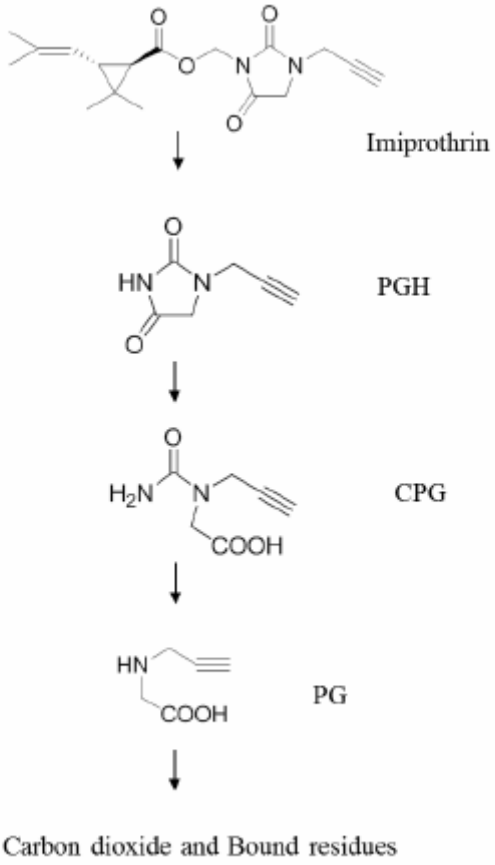


Table 10: Degradation rates of Imiprothrin in water/sediment systems.

Test system	Phase	Kinetic model	Degradation rates (days)		Chi^2err	R^2
			DT_{50}	DT_{90}		
Total system						
[*cis*-^{14}C]-Imiprothrin	Goose river	**SFO**	**5.9**	**19.7**	**9.913**	**0.979**
		FOMC	4.4	14.6	14.76	0.9668
	Golden Lake	**SFO**	**5.7**	**18.9**	**9.268**	**0.9847**
		FOMC	4.0	13.2	16.04	0.9653
[*trans*-^{14}C]-Imiprothrin	Goose river	**SFO**	**1.6**	**5.4**	**2.992**	**0.997**
		FOMC	1.5	4.9	5.474	0.9957
	Golden Lake	**SFO**	**2.4**	**7.9**	**3.629**	**0.9913**
		FOMC	1.6	5.3	17.38	0.9687
Water layer						
[*cis*-^{14}C]-Imiprothrin	Goose river	**SFO**	**2.7**	**9.1**	**5.417**	**0.993**
		FOMC	2.2	7.4	9.763	0.9876
	Golden Lake	**SFO**	**3.9**	**13.1**	**9.108**	**0.9874**
		FOMC	3.0	9.9	14.22	0.9756
[*trans*-^{14}C]-Imiprothrin	Goose river	**SFO**	**1.3**	**4.2**	**5.075**	**0.9935**
		FOMC	1.3	4.4	5.257	0.9936
	Golden Lake	**SFO**	**2.2**	**7.2**	**3.386**	**0.987**
		FOMC	1.9	6.3	6.809	0.9841

SFO – single first-order, FOMC – first-rder with multiple compartment.