Evaluation Manual for the Authorisation of Plant protection products and Biocides according to Regulation (EC) No 1107/2009

NL part

Plant protection products

Chapter 6 Fate and behaviour in the environment: behaviour in surface water and sediment

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Board for the Authorisation of Plant protection products and Biocides

Chapter 6 Fate and behaviour in the environment; behaviour in surface water and sediment

Category: Plant protection products

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GENERAL INTRODUCTION

This chapter describes the data requirements for estimation of the behaviour of a Plant Protection Product and its active substance in surface water and sediment and how reference values are derived in the NL framework (§2 - §2.5).

Substances that are approved under Regulation (EC) No 1107/2009 [1] and were approved under Directive 91/414/EEC [2] are included in Commission Implementing Regulation (EU) No 540/2011 [3].

The chapter describes the procedures following the data requirements as laid down in Commission Regulation (EU) No 283/2013 for active substances and in Commission Regulation (EU) No 284/2013 for plant protection products. These data requirements apply for active substances submitted after 31 December 2013 and for plant protection products submitted after 31 December 2015.

A concept guidance is available on the interpretation of the transitional measures for the data requirements for chemical active substances according to Regulation (EU) No 283/2013 and Regulation (EU) No 284/2013 (SANCO/11509/2013 – rev. 0.1).

For further information on the former data requirement as laid down in Commission Regulation (EU) No 544/2011 for active substances and in Commission Regulation (EU) No 545/2011 we refer to the Evaluation Manual for Authorisation of plant protection products according to Regulation (EC) No 1107/2009 version 1.0

I BEHAVIOUR IN SURFACE WATER AND SEDIMENT

2. NL FRAMEWORK

The NL framework (§2 - §2.5) describes the authorisation procedure for plant protection products based on existing substances, included in Commission Implementing Regulation (EU) No 540/2011 [3], and new active substances.
A new substance is a substance not authorised in any of the Member States of the EU on 25th of July 1993.
The plant protection product that contains such substances may be authorised if the criteria laid down in Regulation (EC) No 1107/2009 [1] are met, also taking into account the national stipulations described in the Bgb (Plant protection products and Biocides Decree) [4]. The evaluation dossiers must meet the requirements in Commission Regulation (EU) No 283/2013 [5] and Commission Regulation (EU) 284/2013 [6] implementing Regulation (EC) No 1107/2009 [1] (see Application Form and corresponding instructions).

A Member State may deviate from the EU evaluation on the basis of agricultural, phytosanitary and ecological, including climatological, conditions which are specific for that Member State, in this case the Netherlands.

The NL framework describes the dossier requirements (§2.2), evaluation methodologies (§2.3), criteria and trigger values (§2.4) for which specific rules apply in the national approval framework or when the national framework has been elaborated in more detail than the EU framework.

The NL procedure described in §2 - §2.5 of this chapter can also be used for evaluation of a substance for approval, and consequently inclusion in Commission Implementing Regulation (EU) No 540/2011 [3] where no EU procedure has been described.

2.1. Introduction

This chapter describes the procedure to determine estimated or measured concentrations in surface water and sediment following normal agricultural applications (outdoor and glasshouses). Evaluation of the aspect behaviour in surface water and sediment with regard to emission routes to surface water deviates from the EU evaluation methodology, and a NL-specific methodology is followed. This is because the Netherlands have their own NL-specific drift values data base, based on the geographical and climatological circumstances. A NL-specific scenario for loading of surface water via drainage pipes is not yet available (see section developments). Emission to surface water via atmospheric deposition is described in *Chapter 6 fate and behaviour in the environment: behaviour in air*.

The following water systems are distinguished in risk assessment:

- edge-of-field ditch: relevant for the risk assessment for organisms that depend on surface water and/or sediment (aquatic and sediment organisms, and birds and mammals (through consumption of surface water and secondary poisoning), see also *Chapter 7 Ecotoxicology; aquatic organisms*, and 7. *Ecotoxicology; terrestrial organisms; birds and mammals*.

- Drinking water abstraction points: relevant for the assessment of the drinking water criterion (this Chapter).

For the edge-of-field ditch, a decision tree with corresponding explanatory notes is presented in Appendix 1 to this chapter. This decision tree summarises the approval framework for the behaviour in surface water and sediment (edge-of-field ditch).

For the drinking water criterion, the schematic decision trees are presented in Appendix 3.

The other points described in this chapter are further elaborations of the EU procedure.

2.2. Data requirements

The data requirements for chemical Plant protection products are in agreement with the provisions in EU framework (see §1.2 of the EU part).
NL-specific data requirements and further interpretations of the EU data requirements are given in the text below.

Please note that for non-professional use the dose rate in kg/ha is corrected to match a maximum acreage of 500 m2.

Experiments carried out after 25 July 1993 must have been carried out under GLP.

There may be no doubt about the identity of the tested product or the purity of the tested substance for each study.

The studies must be carried out in compliance with the applicable guidelines. A review of the guidelines and whether or not these are required for particular fields of use is given in Appendix A to Chapter 6.

2.3. Risk assessment

The evaluation methodologies for chemical Plant protection products are in agreement with the provisions described in EU framework (see §1.3 of the EU part).

NL-specific evaluation methodologies and further elaborations of the EU procedures are given in the text below.

2.3.1. Edge-of-field ditch

The exposure concentration (Predicted Environmental Concentration (PEC)) is the model-calculated concentration in surface water and sediment. Calculation of the concentration of the active ingredient of a Plant Protection Product in surface water and sediment should include investigation of the possible emission routes to surface water and sediment.

The exposure concentration as result of drift is calculated with the TOXSWA programme according to the Plant protection products and Biocides Decree (Bgb) and as indicated in Appendix I of the Plant protection products and Biocides Decree (Bgb) [4].
The drift values used for exposure assessment used in NL framework are described in various drift tables (standard values and values with mitigation). These tables are included in Appendix 2 to this chapter.
The calculations are based on the maximum specified frequency and the minimum specified interval for the use in question.

For the simultaneous application of several active substances, *e.g.*, as combination formulation or as a tank mix, combination toxicology applies (see Appendix C to Chapter 6, Combination Toxicology). This has no consequences for the calculation of exposure concentrations, however.

The TOXSWA model (v1.2, GUI 1.0) is used for determination of the concentration of an active substance in a standard ditch by emission via drift. All processes and process parameters considered in TOXSWA, including drift percentage, are based on research relevant for the Netherlands. This means that the model is tailored to the NL situation. For determination of the PEC, agricultural use in compliance with the prescribed method of application (GAP) is assumed. Loading of surface water and sediment by agricultural use of Plant protection products is only based on drift of spray mist (drift).

The most important substance-related input parameters of the TOXSWA model are:
- Geometric mean DT50 for degradation rate in water at 20°C (days)
- Geometric mean DT50 for degradation rate in sediment at 20°C (days)
- Arithmetic mean K_{om} and corresponding arithmetic mean 1/n for suspended organic matter (L/kg) (if not available use K_{om} soil)
- Arithmetic mean K_{om} and corresponding arithmetic mean 1/n for sediment (L/kg) (if not available use K_{om} soil)
- Saturated vapour pressure (Pa) usually available at 20 or 25 °C
- Solubility in water (mg/L) usually available at 20 or 25 °C
- Molecular mass (g/mol)

A conversion factor of 1.724 is used to translate K_{oc} into K_{om}.

The degradation parameters should be derived in line with GD Degradation Kinetics [7] (SFO or pseudo-SFO). When no separate degradation half-lives (DegT50 values) are available for the water and sediment compartment (accepted level P-II values), the system degradation half-life (DegT50-system, level P-I) is used as input for the degrading compartment and a default value of 1000 days is to be used for the compartment in which no degradation is assumed. This is in line with the recommendations in the FOCUS Guidance Document on Degradation Kinetics.

The other model parameters are applied in accordance with the standard settings of the TOXSWA model.

For a summary of the risk assessment methodology for water and sediment we refer to the decision tree with explanatory notes, presented in Appendix 1 to this chapter. National drift values can be applied on the basis of article 8f of the Plant protection products and Biocides Decree (Bgb) [4]. The loading of surface water and sediment is calculated on the basis of the drift percentage values as presented in Appendix 2 to this chapter.

Artikel 8f. Driftcijfers

Bij de risicobeoordeling voor waterorganismen, vogels, zoogdieren, niet-doelwitarthropoden, niet-doelwitplanten of oppervlaktewater bestemd voor de bereiding van drinkwater, hanteert het college specifieke driftcijfers. Het college stelt deze cijfers vast en maakt hen bekend op zijn website.

2.3.2. Drinking water abstraction points

Surface water destined for the production if drinking water should meet the drinking water criterion. For most active substances in Plant protection products this drinking water limit is 0.1 µg/L.
For the assessment of surface water destined for the production of drinking water at **agricultural use** the methodology developed in the WG “Implementatie drinkwatercriterium” is followed (Adriaanse et al, 2008, Alterra report 1635 [8]). The methodology exists of 2 tiers: pre-registration modelling and post-registration monitoring (initially, in-between tiers would be developed, but only the first and highest tier are currently available).
The pre-registration modelling tier (first tier) is based on the model DROPLET [9] that starts with a FOCUS D3 edge-of-field scenario cf. FOCUS 2001 [10] but with Dutch drift values. From the edge-of-field concentration the concentration at the abstraction point is calculated by multiplying with factors accounting for e.g. (i) the relative crop area, i.e. the ratio of the area of the crop and the entire intake area, (ii) market share, reflecting that the pesticide is not used on the entire area of a crop, (iii) difference in timing of applications within the area of use, (iv) degradation and volatilisation from the edge-of-field watercourse to the abstraction point and (v) (in very specific case) additional dilution by a lake or incoming river.

The post-registration monitoring tier (highest tier) for the relevant substances, see below for interpretation) consists of an analysis of monitoring data on all abstraction points. A 90th percentile value is calculated for each individual abstraction point..

In fact, for all substances pre-registration modelling should be performed as a first tier. However jumping in tiers is possible.
The interpretation of Ctgb of the WG report/decision tree is therefore as follows:

- The analysis of post-registration monitoring data is only relevant for substances that have been indicated (on a yearly basis) as substances of concern by the VEWIN.
- For substances that have been on the market for over 3 years at the time of the assessment and are not included on the list of substances of concern, there is no need to analyse monitoring data or perform model calculations (a standard paragraph is added to the assessment)
- For new substances on the Dutch market (< 3 years) pre-registration modelling is needed. If modelled concentrations exceed the drinking water criterion, first, drift reducing measures should be proposed. If then the substance still exceeds the drinking water criterion but with a factor < 5, authorisation could be granted under condition of post-registration monitoring.

For the full text please refer to Alterra report 1635 and user manual DROPLET. A decision tree is presented in Appendix 3.

For the pre-registration assessment of surface water destined for the production of drinking water after **application to hardened surfaces** a separate methodology was developed by the WG “Implementatie drinkwatercriterium” (Linders et al., 2010, RIVM report 601450021 together with Corrigendum, Van der Linden in preparation [11])
See Appendix 3 for a short description.

The developed decision trees and models are not suitable for non-professional (agricultural) use since the area of use cannot be described adequately. Therefore as an approximation a more qualitative assessment is followed or the interim decision tree or RAT factor approach is used (see Appendix 3).

2.3.3 Refinement options for PEC calculations

Options to refine the risk assessment on the exposure side by decreasing the exposure concentrations are:
- Higher tier data on the fate of a substance in the aquatic environment (including sediment),
- Mitigation of the exposure by drift reducing technologies

The refinement on the substance fate might consider
1) properties of the active substance and the formulated product,
2) temporal and spatial scale of application of the product.

Supplementary research to establish the fate of the active substance(s) in representative aquatic (model) ecosystems (including sediment) should be in accordance with the requested use of the product and relevant for the Dutch agricultural and climatologic situation.

Another way to adjust (predicted) exposure concentrations is the prescription of the use of drift mitigating measures/techniques. These are described in Appendix 2 (Drift Tables)

Refined exposure calculations might be combined with an adequate risk assessment for aquatic organisms, as included in *Chapter 7. Ecotoxicology; aquatic*.

2.3.4. Use of monitoring data

2.3.4.1. Introduction

As highest tier, monitoring data can be used. Monitoring data are taking into account in the risk assessment, provided that these meet qualitative and quantitative requirements as described below.

An essential condition for the application of monitoring data in the evaluation of the permissibility of Plant protection products is that it must with reasonable certainty be possible to establish a likely causal relationship between the use in compliance with legal instructions for use and the monitoring concentration of a Plant Protection Product in the environment.

When such a relationship is lacking, monitoring data can have a warning function, making a study into the possible risks desirable. This also means that monitoring data in the context of the evaluation of the permissibility will have to meet a number of quality criteria such as, e.g., regarding the number of measurements, set-up of measurements etc.

Currently two existing types of data sets are taken into account for the assessment:
1. general surface water monitoring for water quality determination from an eco(toxico)logical perspective (water boards, gathered in Pesticide atlas, paragraph 2.3.4.2) and
2. monitoring of surface water destined for the production of drinking water (VEWIN data, paragraph 2.3.4.3).

Furthermore, general criteria were set up to assess the acceptability of other/additional monitoring data sets not described below (a reference to these criteria is made in paragraph 2.3.4.4).

2.3.4.2. Monitoring data for surface water (ecotoxicological quality)

Regular screening monitoring data of the various water boards are gathered in the Pesticides Atlas (www.bestrijdingsmiddelenatlas.nl). It is verified that the data in this Atlas comply with the criteria set below for Category 1 data. Furthermore, as part of the Decision Tree Water, a plausible cause analysis protocol is set up (De Werd & Kruijne, 2011 [12], methodology expected to be implemented in 2013), which also uses the Pesticide Atlas as data source for monitoring data.

The Pesticide Atlas on internet (www.pesticidesatlas.nl, www.bestrijdingsmiddelenatlas.nl) is used to evaluate measured concentrations of pesticides in Dutch surface water, and to assess whether the observed concentrations exceed threshold values.
Dutch water boards have a well-established programme for monitoring pesticide contamination of surface waters. In the Pesticide Atlas, these monitoring data are processed into a graphic format accessible on-line and aiming to provide an insight into measured pesticide contamination of Dutch surface waters against environmental standards.
In 2009, version 2.0 was released. This new version of the Pesticide Atlas does not contain the land use correlation analysis needed to draw relevant conclusions for the authorisation procedure. Instead a link to the land use analysis performed in version 1.0 is made, in which the analysis is made on the basis of data aggregation based on grid cells of either 5 x 5 km or 1 x 1 km. NB this correlation can therefore only be made based on monitoring data and threshold values up to and including 2006.

Data from the Pesticide Atlas are used to evaluate potential exceeding of the authorisation threshold and the MPC (*ad-hoc* or according to INS) threshold. N.B. For examination against the drinking water criterion, another database (VEWIN) is used, since the drinking water criterion is only examined at drinking water abstraction points.

If an exceeding of a harmonised threshold (authorisation threshold or MPC-INS) is observed, first an analysis of land use with the exceeding is made. If there is a correlation with the proposed use, an adequate risk assessment is required. The applicant should then substantiate that the proposed use does not contribute to the exceeding. If there is a correlation of exceeding with already authorised uses, this will be mentioned as a signal for future (re-) registrations of the product.

More elaborate guidance for the use of monitoring data with regard to potential consequences for authorisation will be provided by the Working Group “terugkoppeling monitoring naar toelating” (implementation expected in 2013, see developments).

2.3.4.3. Monitoring data at Drinking water abstraction points (drinking water quality)

The VEWIN assembles the monitoring data of all drinking water companies into a data set

comprising all drinking water abstraction points in surface water and supplies these data to Ctgb on a yearly basis. It is verified that the data of the VEWIN comply with the criteria set below for Category 1 data. Furthermore, the VEWIN data are designated by the WG drinking water criterion. A causal or statistical correlation with land use cannot be made because of the more diffuse source of the surface water reaching the drinking water abstraction points. Therefore this criterion of causality up to specific crops or applications is not applicable to this assessment. However, it should be clear that the source of the substance is agricultural before it will affect authorisations of PPP.

2.3.4.4. Additional monitoring data

When an applicant wishes additional monitoring data to be considered in the evaluation, these should meet certain criteria and the monitoring protocol should be discussed with the Ctgb on beforehand. The Ctgb criteria for taking additional monitoring data into account are described in Evaluation Manual version 1.

2.4. Approval

The evaluation of products on the basis of existing active substances already included in Commission Implementing Regulation (EU) No 540/2011 [3] or new substances has been laid down in Regulation (EC) No 1107/2009 [1]. Where no European methodology is agreed upon, a national methodology is applied as described in the Plant protection product and Biocides Decree (Bgb) [4].

2.4.1. Criteria and reference values

The concentration in surface water and sediment as determined according to the methods in this chapter are used for assessment of the risk to aquatic organisms. The ecotoxicological criteria and reference values have been laid down in the section Ecotoxicology; aquatic organisms.

The criterion laid down for surface water intended for drinking water production is that the concentration of any pesticide and the metabolites formed from that pesticide must be lower than 0.1 µg/L. A separate decision tree is available for this assessment (see Appendix 3).

2.4.2. Decision making

The procedure for taking a decision on approval regarding the risk to aquatic organisms has been elaborated in chapter 7 Ecotoxicology; aquatic.

The criterion laid down for surface water intended for drinking water production is that the concentration of any pesticide and the metabolites formed from that pesticide must be lower than the drinking water threshold laid down in the Drinking Water Directive (0.1 µg/L for organic substances).

2.5. Developments

- In the framework of the WG Water (more specifically, “blootstelling waterorganismen”, “emissies uit bedekte teelten”, and “terugkoppelen monitoring naar toelating”) the following new methodologies are currently under development. These will be implemented in the coming years. For the moment, assessment is based on either the old situation or on interim methodologies as described in this Chapter. Aspects that will (or might) change as a result of the Working Group’s progress:
    - drift differentiation for field crops (edge-of-field) based on minimum agronomic crop-free zone
    - introduction of drift matrix with drift reducing technologies (DRT) classes (for edge-

of-field exposure assessment) instead of separate techniques/drift values;
    - implementation/further development of certification of drift reducing technologies into the mentioned classes
    - drift data tall fruit dormant and full leaf distinction based on BBCH code instead of fixed date.
    - introduction of emission route via drainage from adjacent field
    - methodology for emission from greenhouses: A separate exposure model will be developed for
        - soil-bound cultivations
        - substrate cultivations.
    - Handling of monitoring data (protocol cause analysis) and introduction of Emission Reduction Plans as described in the “Gezonde Groei, Duurzame Oogst: Tweede Nota Duurzame gewasbescherming periode 2013 tot 2023”
    - Guidance for the input parameters for degradation in water
- Dust drift from seed treatments (not NL specific, see EU part of the Evaluation Manual for details)

3. APPENDICES

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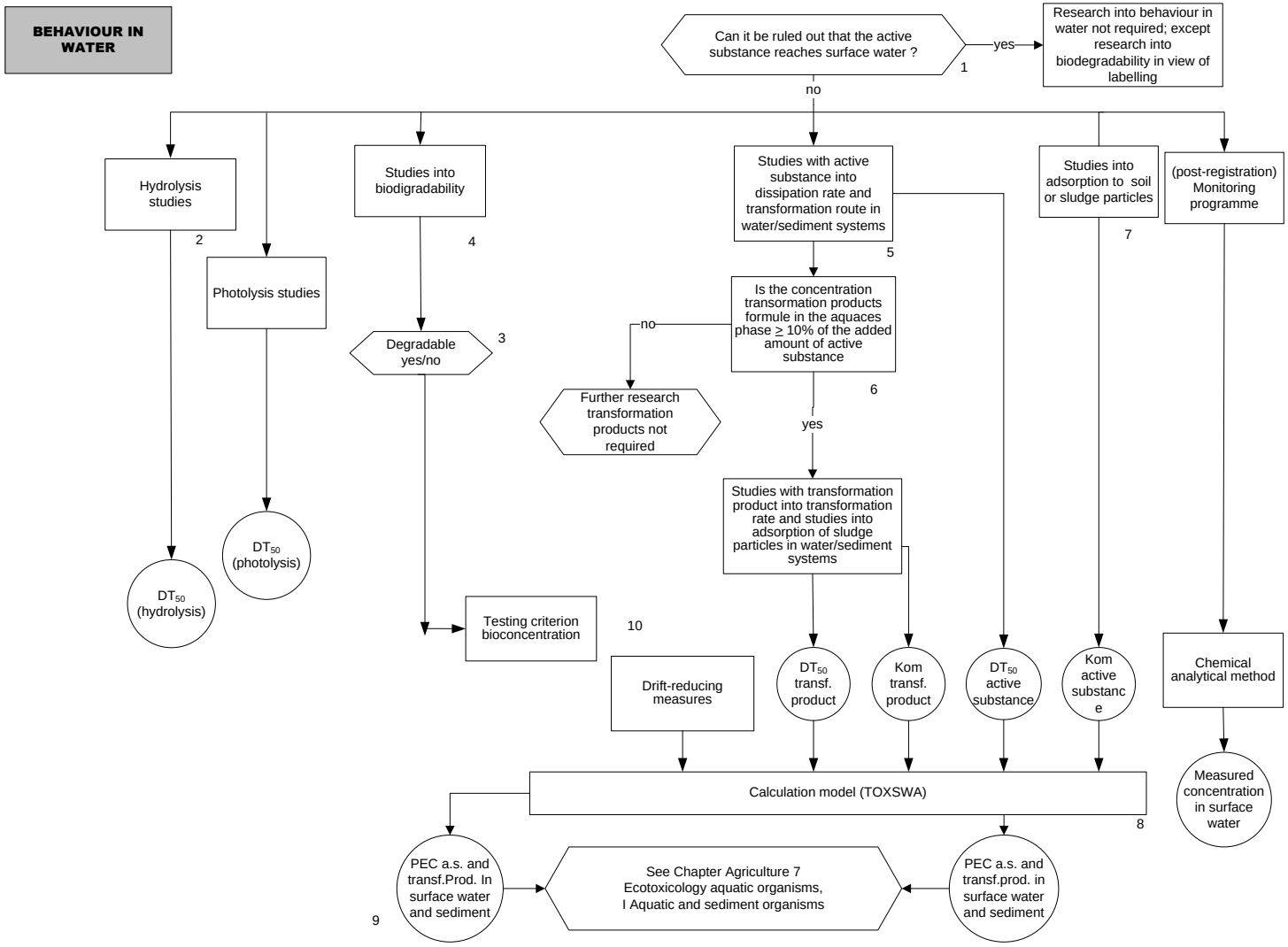
Appendix 1 Explanatory notes decision tree behaviour in surface water and sediment

1) For each active substance, information concerning behaviour in surface water and sediment (283/2013 7.2) must be provided, unless it can be demonstrated that it can be ruled out that the substance reaches surface water and sediment during good (agricultural) use of the product, according to the WG/GA (Statutory Use Instructions/Directions
For Use).
2) For the performance of the hydrolysis study, reference is made to question 283/2013 A2.09.1a and 7.2.1.1. This information is used as background information during the assessment.
3) Data on the photochemical degradation (283/2013 A2.09.2a/A2.09.3a and 283/2013 7.2.1.2 and 7.2.1.3) are used as background information in the assessment.
4) Data on “ready biodegradability” are required for testing the bioconcentration factor.
5) A study in water must be conducted into the dissipation (disappearance) of the active substance, and the transformation of the active substance into its degradation products (283/2013 7.2.2.). The routes through which the transformation processes take place, and the rates of the transformations must, where possible, be determined.
6) Toxicologically or ecologically relevant degradation products in the aqueous phase are degradation products formed in the aqueous phase of which the laboratory research into the degradation in a water/sediment system at any point in time showed an amount higher than or equal to 10% of the added amount of active substance. For these metabolites, data on the rate of degradation and bio-concentration are required.
   Toxicologically or ecologically relevant degradation products in the sediment phase are degradation products formed in the sediment phase of which the laboratory research into the degradation in a water/sediment system after 14 days showed an amount higher than or equal to 10% of the added amount of active substance. For these metabolites, data on the toxicity for sediment organisms are required.

7) The data obtained on adsorption to soil can be used (see 283/2013 7.1.3) for evaluation of the adsorption of the test substance to sludge in surface water and sediment..
8) The exposure (Predicted Environmental Concentration (PEC)) is the value calculated by a calculation model, taking into consideration the frequency of application. When calculating the concentration of a Plant Protection Product in surface water and sediment, the relevant emission routes of the product to surface water and sediment should be determined, and the concentration must then be calculated with the appropriate module. For the current Dutch assessment of Plant protection products, the emission route spray drift is considered (TOXSWA).
9) In the assessment diagram concerning the risk to aquatic organisms, the PEC is related to toxicity data of the different tested aquatic organisms, for which reference is made to the next Chapter 7 Ecotoxicology; aquatic.
10) The criterion for bio-concentration is associated with the degree of biodegradability ‘ready biodegradable’ / ‘not ready biodegradable’ of a substance.
11) The adequate risk assessment can yield supplementary data about the fate of the substance in the aquatic environment (including sediment) which may lead to adjustment of the calculated exposure concentration.


BEHAVIOUR IN WATER
Can it be ruled out that the active substance reaches surface water ?
1
yes
Research into behaviour in water not required; except research into biodegradability in view of labelling
no
Hydrolysis studies
2
Photolysis studies
Studies into biodigradability
4
Studies with active substance into dissipation rate and transformation route in water/sediment systems
5
Studies into adsorption to soil or sludge particles
7
(post-registration) Monitoring programme
Degradable yes/no
3
Is the concentration transormation products formule in the aquaces phase ≥ 10% of the added amount of active substance
6
no
Further research transformation products not required
yes
Studies with transformation product into transformation rate and studies into adsorption of sludge particles in water/sediment systems
DT50 (hydrolysis)
DT50 (photolysis)
Testing criterion bioconcentration
10
Drift-reducing measures
DT50 transf. product
Kom transf. product
DT50 active substance
Kom active substanc e
Chemical analytical method
Measured concentration in surface water
Calculation model (TOXSWA)
8
PEC a.s. and transf.Prod. In surface water and sediment
9
See Chapter Agriculture 7 Ecotoxicology aquatic organisms, I Aquatic and sediment organisms
PEC a.s. and transf.prod. in surface water and sediment

Appendix 2 Spray drift and emission percentages

National drift values can be applied on the basis of Article 8f of the Plant protection products and Biocides Decree (Bgb). Ctgb bases their assessment on average drift values determined by WUR-PRI.
Several changes are made with regard to the Evaluation Manual 1.0/1.1 according to Directive 91/414 due to recent developments.

Please note that for the drift values in large fruit, soft fruit and lane trees/tree nurseries (all side- and upward spraying) a transition period is established for dossiers submitted before February 2014. For these crops, the drift values from the Evaluation Manual according to Directive 91/414 version 1.1 Fate and behaviour in water can still be used until this date.

N.B. For grapes the assessment is based on the Evaluation Manual 1.1 drift values for large fruit (full-leaf situation) with drift mitigating options as described below, based on the currently established assessment practice (since 2011).

Applicants may want to use the new drift values and/or techniques in new applications for authorisation submitted before February 2014.

For non-professional use (downward spraying, new data) no transition period is established.

In Table 1 a general overview of spray drift percentages for standard situations (LOTV 2000) is described. For the spray drift values in fruit, the former drift table used the database of 1998. An update is now available to include all experimental spray drift data up to and including 2005.
However, as for the dormant stage it is recognized that newer data (2010) show a higher drift percentage, the dormant stage data from 1998 are maintained.

Furthermore the spray drift percentage for soft fruit was set to the full-leaf values for large fruit based on a literature inventory of actual drift data the small fruit cultivation in which it is demonstrated that the field crop drift value of 1 % is not protective. Pending actual measurements in small fruit, the full-leaf values for large fruit are taken as an approximation.

For high lane trees also new data (2010) have become available.

See Table 2 for a more detailed description.

Table 1 Spray drift percentages to be used (standard situations*) according to LOTV 2000

Application	Subdivision	Drift %	Remarks
Upward and sideward spraying techniques			
Fruit crops (large and soft fruit) – 3 m crop free zone**	without leaves (dormant)	16.6	Based on 1998 data
	With leaves (full leaf)	8.6	Based on 2005 data
Lane trees – 5 m crop free zone	“spillen” (closely spaced)	0.8	Based on 1998 data

	"opzetters" (widely spaced)	2.8	Based on 1998 data
	High lane trees	5.8	Based on 2010 data
Downward spraying techniques			
Field crops		1	Differentiation of the drift figures to cover crop-free zone is under development
Bush and hedge shrubbery		1	
Bulb growing		1	
Greenhouse applications		0.1	
Special applications	-mud-bank -dry ditch -Knapsack	100 100 1	 see explanatory notes
Applications without drift	See explanatory notes	0	

* Drift-mitigation measures will be discussed in more detail in the explanatory notes below.

** for small fruit (grapes, berries, …) the full leaf situation is used as an approximation for the exposure assessment, since

- the use of drift values from downward directed spraying is too best-case (inventory report Van de Zande J.C., M. Wenneker, A. de Bruine. 2011. Inventarisatie kleinfruitteelten en afleiden driftdepositie en maatregelpakketten*. PRI report 398.*)
- the full leaf values are comparable in order of magnitude with the EU drift values for vines (Rautmann)

Explanatory notes drift percentages

General

The proposed drift percentages are derived from research by the WageningenUR Plant Research International (WUR-PRI) and are geared to the existing regulations laid down in the Pollution of Surface Waters Act (PSWA), general administrative order (AMVB) to control specific designated discharges from field crops and livestock farming (2000, in short known as LOTV) and associated packages of measures. The LOTV will as of January 2013 be included in the "Activiteitenbesluit".

In LOTV 2007, various drift mitigation packages were defined for the large fruit cultivation. These packages aimed at a drift percentage of 1.5 % at maximum. However, the WUR-PRI data set shows that in reality those figures are somewhat higher. The Ctgb drift table was not yet harmonised with the LOTV 2007. In Table 2, both LOTV 2000 and LOTV 2007 options are mentioned with an indication which options are not in compliance with LOTV 2007 (or techniques that are not yet classified/certified by the TCT). Please note that Ctgb uses the same definitions for the drift mitigation techniques or management options as laid down in the LOTV.

On an individual basis an applicant/registration holder can request Ctgb to consider additional (drift-mitigation) measures and corresponding drift percentages for a particular application. These drift percentages must be supported by reliable scientific data.
The additional measures should be realistic and enforceable. Below, specific mitigation options are described per crop/application type.

Explanation per crop/application

Upward and sideward spraying

Fruit crops (including soft fruit)

Large fruit (pome- and stone fruit/top fruit)
Standard drift percentages are based on a crop-free zone of 3 meter (standard situation from LOTV 2000, see Table 1). However, in LOTV 2007 drift packages have been defined which aimed at a maximum drift % of 1.5 %. In reality, these packages correspond to drift values of up to 2.8 %. Therefore several options that were originally in the Ctgb drift table do not comply to LOTV 2007. For users of PPP it is obligatory to comply to the rules of the LOTV. Therefore the mitigation measures based on application techniques and crop free zones combinations that are not included in LOTV 2007 cannot be used in practice.

Applicants may consider this when using the drift mitigation measures as indicated in Table 2. For completeness also the old standard situation is included. A distinction is made between drift values in the dormant stage and in the full-leaf stage. This distinction is now fixed to the date of May 1st. In the near future, the drift curves will be based on BBCH codes (see developments).

The drift values for the full-leaf stage have been updated based on the extension of the WUR-PRI drift database [1]. Results of spray drift measurements up to 2005 are included. For the dormant stage, values from 1998 are retained (these values were not based on experiments but extrapolated based on an estimated factor with regard to the drift data set in full-leaf). The limited data set of experimental values in the dormant stages up to 2005 are lower than the 1998 extrapolated values. However, newer drift measurements have extended the data set of 2005 and the new data set shows higher values than the 2005 data alone. Therefore it is considered by WUR-PRI that for the moment the 1998 data should be retained for the dormant stage.
These values are valid for *fungicide* and *insecticide* treatments. See Table 2.

For *herbicide* use in fruit trees, downward spraying is applicable. New WUR-PRI values have recently become available[2] and these indicate a drift value of 0.026 % for “zwartstroken” below the trees and 0.07 % for the grass vegetation between the trees. See Table 2.

Another change in comparison with the drift table in Evaluation Manual 1.0 is the introduction of a crop-free zone of 4.5 meter next to the 3 meter, to provide additional room for the specific cultivation technique (orchard lay-out) in some regions of The Netherlands.

Soft fruit (berries and grapes)
An inventory report by PRI[3] revealed that the use of drift values valid for downward sprayed crops as described in earlier Evaluation Manuals is not defensible (anymore) for soft fruit.

[1] Van de Zande J.C. & Huijsmans J. 2012 Notitie update driftcijfers fruit voor een nieuwe Ctgb drifttabel. Intern PRI report 07-03-2012

[2] Stallinga, H., J.C. van de Zande, A.M. van der Lans, P. van Velde & J.M.G.P. Michielsen, 2012. Drift en driftreducerende spuittechnieken voor onkruidbestrijding in de boomteelt. Referentie techniek en driftreducerende spuitdoppen, Veldmetingen 2010-2011. Wageningen UR Plant Research International, Plant Research International Rapport 454, Wageningen.

[3] Van de Zande J.C., M. Wenneker, A. de Bruine. 2011. Inventarisatie kleinfruitteelten en afleiden driftdepositie en maatregelpakketten. PRI report 398.

Exact drift data are however not available for soft fruit. Therefore, for soft fruit (grapes and berries) the large fruit drift values are used. For all application periods, only the full-leaf values are used. This is done to acknowledge the difference between large fruit and small fruit as established by Rautmann and Ganzelmeier (basis for EU drift values) to some extent.
With regard to the crop-free zone it is concluded in the PRI 398 report that although according to the LOTV the obligatory distance to the ditch for small fruit is only 0.5 m, in practice the distance is about 3 meter. This is in line with the minimum distance set for large fruit. Therefore the use of the drift values of large fruit (minimal crop-free zone 3 m) is defensible at this stage.
The use of the full-leaf drift values for large fruit also for small fruit must be seen as a transition phase until sufficient actual measurements leading to separate drift values for soft fruit are available.

After consultation with WUR-PRI, the following drift mitigation options from Table 2 are considered realistic for use in soft fruit:
- all described drift reducing nozzles
- tunnel sprayer
- windbreak on the edge of the driving track and one-sided spraying of the last tree row

See Table 2 for a description of all drift-mitigation measures for large fruit.

Table 2: Spray drift values for various drift-mitigation measure in comparison with standard fruit growing situations

Drift percentage [%]				
Drift-mitigation measure top fruit	**Crop-free zone of 3 m**		**Crop-free zone of 4.5 m**	
	Without leaves (dormant)	with leaves (full-leaf)	Without leaves	with leaves
Standard orchard sprayer [x]	16.6	8.6	10.3	6.3
Standard orchard sprayer [x] + 6 m crop-free zone	6.9	4.7	n.a	n.a.
Standard orchard sprayer [x] + 9 m crop-free zone	3.6	2.7	n.a.	n.a.
Standard orchard sprayer [x] in combination with windbreak on the edge of the driving track and one-sided spraying of the last tree row	7.0	0.9	7.0	0.9
Standard orchard sprayer [x] and emission shield (2.5 m high)	6.7	3.4	6.7	3.4
Standard orchard sprayer [x] and one-sided spraying of last tree row	9.8	4.7	6.5	3.3
Tunnel sprayer	2.5	1.3	1.6	1.0
Sensor-controlled spraying	12.8	4.1	7.4	3.0
Cross flow fan sprayer with reflection shields	7.5	3.9	4.6	2.8
Venturi nozzle (90 % drift reduction)+ one-sided spraying last tree row and reduced air fan setting [xx]	1.3	0.36	0.6	0.26
Wanner equipment with reflection shield and standard nozzles [xxx]	4.8	3.4	3.3	2.8
Wanner equipment with reflection shield and 90% drift reducing nozzles (Lechler ID 90-015C) [xxx]	0.8	0.41	0.42	0.29
50% drift reducing nozzle and one-sided spraying	-[xxxx]	2.7	-[xxxx]	1.8

of the last tree row				
75% drift reducing nozzle and one-sided spraying of the last tree row	-[xxxx]	2.0	-[xxxx]	1.2
90% drift reducing nozzle and one-sided spraying of the last tree row	2.5	1.0	1.0	0.7
95% drift reducing nozzle and one-sided spraying of the last tree row	-[xxxx]	0.8	-[xxxx]	0.31
KWH k1500-3R2 VLOS 3-row sprayer with variable air support system and standard nozzles [xxxxx]	8.3	1.7	5.0	1.4
KWH k1500-3R2 VLOS 3-row sprayer with variable air support system and 90% drift reducing nozzles [xxxxx]	0.70	0.43	0.32	0.25
KWH k1500-3R2 VLOS 3-row sprayer with variable air support system and 90% drift reducing nozzles and low air setting (400 rpm pto) [xxxxx]	0.65	0.05	0.23	0.04

Herbicide use in orchards (downward spraying)			
		3 m crop free zone	**4.5 m crop free zone**
"Zwartstroken" (bare soil surface strip underneath tree)	Standard nozzle	0.026	0.023
	50% drift reducing nozzle + end nozzle	0.016	0.012
	90% drift reducing nozzle + end nozzle	0.007	0.007
	Shielded sprayer - standard nozzles	0.010	0.010
	Agricult LVS	0.04	0.035
"Grasstroken" (grass surface area in orchard)	Standard nozzle	0.07	0.07
	50% drift reducing nozzle + end nozzle	0.026	0.026
	90% drift reducing nozzle + end nozzle	0.008	0.008
	Shielded sprayer - standard nozzles	0.014	0.014
	Agricult LVS	0.07	0.07

x valid for cross-flow fan and axial fan orchard sprayer

xx fan setting off in dormant and low in full-leaf stage

xxx M. Wenneker, R. Anbergen, N. Joosten, J.C. van de Zande, 2006. Emissiereductie bij inzet van een Wannerspuit met reflectieschermen in de fruitteelt; PPO report nr. 2006-13

xxxx data not available yet

xxxxx Stallinga, H., M. Wenneker, J.C. van de Zande, J.M.G.P. Michielsen, P. van Velde, A.T. Nieuwenhuizen & L. Luckerhoff, 2012. Drift en driftreductie van de innovatieve drierijige emissiearme fruitteeltspuit van KWH. Veldmetingen 2011. Wageningen UR Plant Research International, Plant Research International Rapport 458, Wageningen.

For all drift reducing nozzles in orchards it should be considered that the drift values for these techniques were derived by treating the last 20 m of the orchard. Restriction sentences based on these techniques should therefore always be described for the last 20 meter.

NB At the moment there is discussion whether to include or exclude the conditions laid down in the LOTV in the registration procedure of plant protection products. Therefore, combinations of crop-free zones and techniques that are not in accordance with the packages defined in LOTV 2007 and/or that are not certified by the TCT are indicated with a grey shading. However they may be in line with the general policy aim to minimize drift emission. Users should always comply to the LOTV.

Growth of lane trees

For the growth of lane trees, separate drift percentages are used based on research by PRI, A distinction is made between the growth of “spillen” (spindles; closely spaced trees) and “opzetters” (transplanted trees; widely spaced trees) because of the differences in tree shape, and the resulting differences in drift emission. Spindles form dense rows (plant distance 30 cm), whilst transplanted trees are planted further apart (1 m plant distance), are taller, and often have bare lower trunk.

Recently the available PRI data set has been analysed to provide Ctgb with the following updated drift values, including drift reducing techniques[4]. See Table 3. These values are valid for fungicide and insecticide treatments. Again, as for fruit trees, combinations of crop-free zones and techniques that are not in accordance with LOTV 2007 and are not certified by the TCT are indicated with a grey shading.

For *herbicide* use in lane trees, downward spraying is applicable. New PRI values have recently become available and these indicate a drift value of 0.07 % for “zwartstroken” below the trees (soil is always kept bare). See Table 3.

Table 3: Drift values for various drift-mitigation techniques in comparison with standard lane trees growing situations

Drift percentage [%]		
Drift-mitigation technique lane trees	**Crop-free zone of 1.5/2 m (agronomic minimum zone)**	**Crop-free zone of 5 m (LOTV)**
High lane trees (>5 meter)	**2 m**	
Standard axial sprayer (TXB8003)	17.1	5.8
Mast sprayer (XR80015)	11.0	4.9
Mast sprayer (Venturi ID90015)	9.8	1.6
Standard axial sprayer + 5 m crop free*	2.3	0.9
Mast sprayer (XR80015) + 5 m crop free*	2.2	1.7
Mast sprayer (Venturi ID90015) + 5 m crop free*	0.12	0.09
Transplanted trees	**2 m**	
Standard axial sprayer	10.4	2.8***
Standard axial sprayer + 5 m crop free*	1.1	0.33
Axial sprayer + 50 % drift reducing nozzles**	5.4	1.1
Axial sprayer + 75 % drift reducing nozzles**	4.8	1.5
Axial sprayer + 90 % drift reducing nozzles**	6.7	0.72
Axial sprayer + 95 % drift reducing nozzles**	2.5	0.19

[4] Van de Zande J. & Huijsmans J. 2012 Notitie update driftcijfers laanbomenteelt voor Ctgb. Intern PRI report 07-03-2012

Spindle trees	**2 m**	**1.5 m**	
Standard axial sprayer	2.7	3.4	0.76
Standard axial sprayer + 5 m crop free*	0.28	0.35	0.09
Axial sprayer + 50 % drift reducing nozzles**	1.2	1.5	0.32
Axial sprayer + 75 % drift reducing nozzles**	1.1	1.2	0.43
Axial sprayer + 90 % drift reducing nozzles**	0.17	1.2	0.05
Axial sprayer + 95 % drift reducing nozzles**	0.17	0.43	0.05

Herbicide use in tree nursery (downward spraying)		
soil surface underneath trees and up till 0.50 m from edge of surface water	standard nozzle	0.07
	50% drift reducing nozzle + end nozzle	0.026
	90% drift reducing nozzle + end nozzle	0.008
	shielded sprayer - standard nozzles	0.014
	Agricult LVS	0.07

* in this 5 m crop free zone only non-sprayed crops of the same height can be grown. These crops are eligible from CIW report referred to in the explanatory notes of LOTV, Article 13: *Op grond van het vijfde lid moet voor de opwaarts bespoten boomkwekerijgewassen, zoals laan- en parkbomen, een teeltvrije zone van tenminste 500 cm worden aangehouden. In de teeltvrije zone mogen gewassen geteeld worden waarin geen gewasbeschermingsmiddelen worden gespoten. Dit komt overeen met de CIW-aanbevelingen[1] voor de vergunningverlening, waarin bovendien een lijst van gewassen is opgenomen die niet bespoten worden.*

[1] Commissie Integraal Waterbeheer, 1998, Protocol opwaarts spuiten (laan)bomen.

** extrapolated from fruit

*** in the absence of actual Dutch drift data, but in line with the upward spraying character, this percentage is also used for the spraying of hop (fungicides and insecticides).

NB At the moment there is discussion whether to include or exclude the conditions laid down in the LOTV in the registration procedure of plant protection products.
Therefore, combinations of crop-free zones and techniques that are not in accordance with LOTV and/or that are not certified (yet) by the TCT are indicated with a grey shading. However they may be in line with the general policy aim to minimize drift emission. Users should always comply to the LOTV.

Downward spraying

Field Crops (including bush and hedge shrubbery)
Drift percentage: 1%.

In the first tier assessment, the starting point is the obligatory use of 50% drift-reducing nozzles in the edge of the field (last 14 m of the field) in combination with a maximum sprayer boom height of 0.50 m above crop canopy and the use of an end nozzle to prevent overspray and a crop-free zone of 1.5 m adjacent to the water body, in compliance with the LOTV. For this situation, a drift emission of 1 % is available, based on spray drift data of WUR-PRI for potatoes with a crop-free buffer zone of 1.5 m (LOTV obligatory minimum for potatoes and other intensively cultivated crops). Currently this drift value is also used for all other field crops with downward spraying, irrespective of the specific (agronomic) crop-free buffer zone. In reality, crops are separated in the LOTV into three main groups based on their minimal obligatory crop-free zone (cereals: 25 cm, intensively cultivated crops: 75 cm and remaining crops: 50 cm).
In the decision tree currently under development by the WG Water, drift differentiation

between crops on the basis of crop-free buffer zones will be implemented on the basis of WUR-PRI data. These differentiated drift values will be implemented in the new exposure model for the Dutch edge-of-field ditch (implementation expected in 2013).

If drift reduction is necessary to meet the ecotoxicological threshold values, the use of 75 % or 90 % drift reducing nozzles and/or other drift reducing technologies can be requested by the applicant.

Currently, the corresponding drift values used for the assessment are 0.5 % (75 % reducing nozzles) and 0.2 % (90 % reducing nozzles) for all field crops, based on the current 1 % at 50 % drift reducing nozzles for all field crops.

Furthermore, it is possible to consider additional measures with accompanying drift percentages on an individual basis for each application and crop combination on the basis of specific drift research by WUR-PRI submitted by the applicant.

Eligible drift reducing nozzles and techniques, classified according to drift reduction classes, are listed on the website of Helpdesk Water: http://www.helpdeskwater.nl/algemene-onderdelen/structuur-pagina'/zoeken-site/@3575/lijst-driftarme/

Bush and hedge shrubbery
Drift percentage: as for field crops (1%)
WUR-PRI has indicated that in the LOTV this crop is considered to be sprayed with boom sprayers like a common field crop, and that the same percentage can be used based on the same assumptions as described above.
In practice, however, a specific spraying technique is often used in specific regions(i.e. on small parcels in the Boskoop region), *i.e.*, a hand-held spray boom. From field experiments (IMAG Nota 98-31[5]) the following drift values are available:
1.2 % for standard nozzle.
0.6 % for 50 % drift reducing nozzle or a shielded standard spray nozzle.

These values are also applied for non-professional applications with a knapsack (assuming a crop-free zone of 0.50 m).

If a request is made to Ctgb for individual applications, the use of this technique can be taken into consideration in the assessment for authorisation. The drift table contains the drift percentage that corresponds with the obligatory measure from the LOTV (hence 1 % as for common field crops).

Flower bulb growing
Drift percentage: as for field crops (1%) based on the same assumptions as for field crops

Greenhouse Applications
For the exposure particularly by condensation water and volatilisation, an overall emission value of 0.1%, simulated as spray drift input, is used for the calculation. Considering the basis for this percentage, studies are required. Currently a WG is working on the development of a model that can take into account the (pulse) emission from greenhouses with the corresponding emission values (expected finalisation 2013). A separate exposure model will be developed for soil-bound and substrate cultivations.

[5] Driftreductie in de lage boomteelt bij een bespuiting met een handgeduwde spuitboom, een afgeschermde spuitboom en een dichte afscherming op de perceelsrand, IMAG nota 98-31

Special Applications

- For mud-banks and dry-ditch beds, a drift value of 100 % applies.
- Knapsack (handheld equipment)
  For hand held equipment (*rugspuit/spuitlans*) a drift percentage of 0.6 % is assumed when a 50 % drift reducing nozzle or a shielded standard spray nozzle is used. For knapsack application without mitigation a value of 1.2 % applies. These values are based on a crop free zone of 0.50 m. This technique is mostly used in applications by non-professional users (*particulier gebruik*)
  For non-professional application with small spraying cans a value of 0.5 % is used

Applications without drift

A drift percentage of 0% applies for:

1) Enclosed spaces (not greenhouses):
   a. storage cells and
   b. shower rooms and comparable enclosed spaces;
2) witloof/chicory (forcing)
3) Specific field applications:
   a. application of granules using a specially mounted granule sprinkler,
   b. drenching,
   c. dipping,
   d. foaming,
   e. placing of bait,
   f. injection of soil/plant,
   g. treatment of plant base
   h. smearing,
   i. jointing,
   j. treatment of furrow,
   k. dosing pistol or comparable apparatus, and
   l. seed treatment.

Developments

Differentiated drift percentages for downward sprayed crops

As mentioned above, it is anticipated that Ctgb will switch to differentiated percentages for each crop tuned to the minimum agronomic crop-free zone based on a drift matrix that is properly substantiated by new scientific insights. Implementation of these differentiated percentages will be upon instruction from the ministries to use the new Dutch exposure surface water model DRAINBOW.

Distinction bare-full leaf situation in fruit

Change of date distinction to BBCH/growth stage distinction for fruit (WG water). This will also be implemented upon instruction from the ministries to use the new Dutch exposure surface water model DRAINBOW.

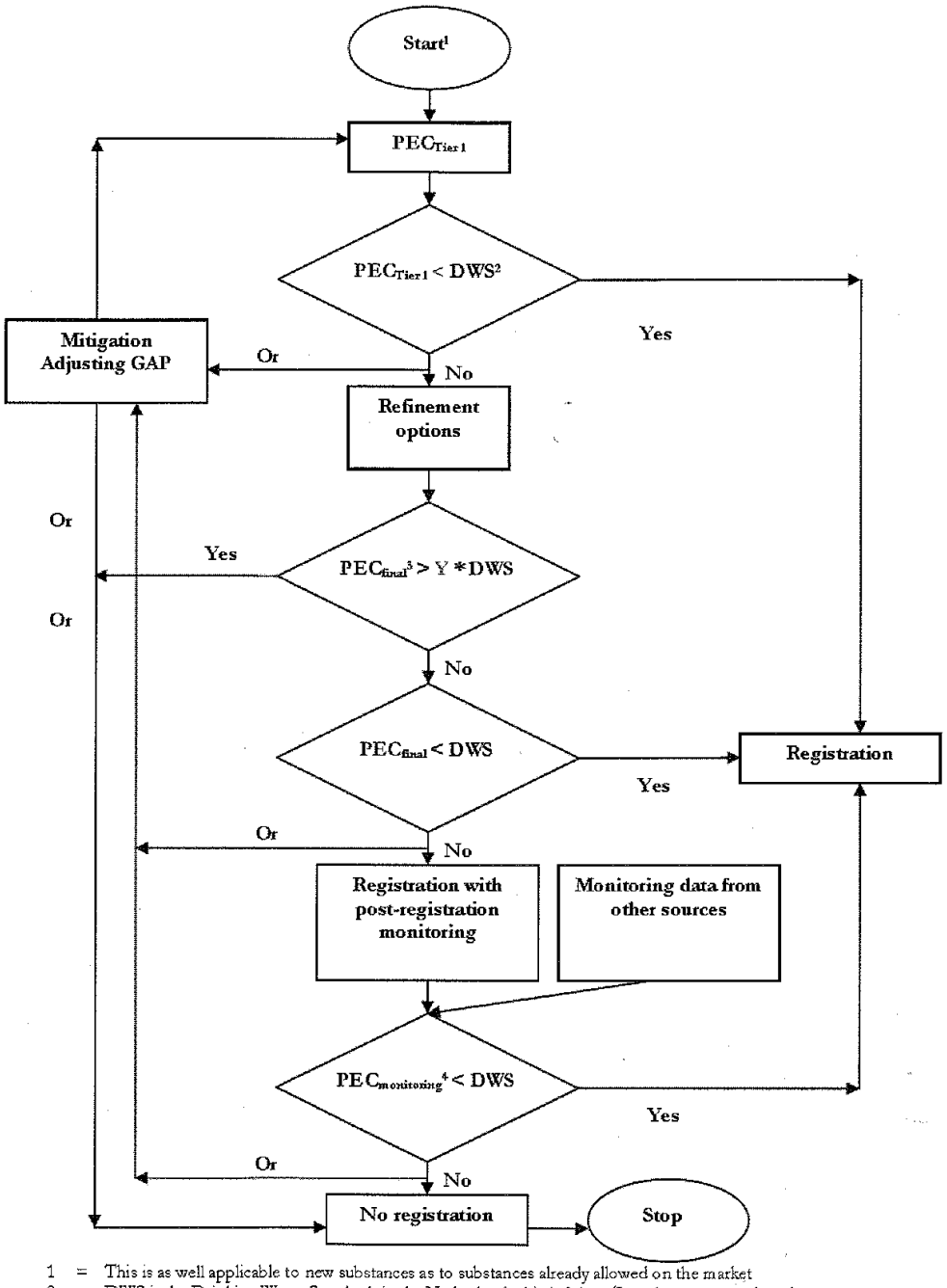
Appendix 3 Decision tree Drinking Water Criterion

PROFESSIONAL USE

1. AGRICULTURAL CROP TREATMENTS

For the assessment of the drinking water criterion, Ctgb uses the decision tree as developed by the Working Group Implementation Drinking Water Criterion [8] from January 2010 onwards.

The decision tree from the report is presented below:



1 = This is as well applicable to new substances as to substances already allowed on the market
2 = DWS is the Drinking Water Standard; in the Netherlands this is 0.1 µg/L at the moment when the report was issued
3 = In case no refined assessment has been applied the PEC_{final} is $PEC_{Tier\ 1}$
4 = Before making a decision it has to be analysed whether the substance is of Dutch origin or not

Tier I calculation:

The equation to calculate the pesticide concentration in the surface water at the abstraction points ($PEC_{Tier\ I}$) reads:

$$PEC_{TierI} = \sum_{all}^{crops} ((PEC_{FOCUS\_NL,D3} \cdot f_{corrFOCUScen}) f_{use\_intensity}) \cdot f_{timing} \cdot f_{dissipation} \cdot f_{add\_dilution}$$

With:

$PEC_{Tier\ I}$ PEC in surface water at location where it is abstracted for drinking water preparation (µg/L)

$PEC_{FOCUS\_NL,D3}$ global maximum PEC edge-of-field for the FOCUS D3 scenario based upon Dutch drift deposition data (µg/L)

$f_{corrFOCUSscen}$ correction factor for implicit choices concerning contributing areas made in FOCUS D3 scenario (-)

$f_{use\_intensity}$ factor considering the use of the pesticide (-)

f_{timing} factor considering the difference in timing of application within the area of use (-)

$f_{dissipation}$ factor considering the dissipation from the edge-of-field watercourse to the abstraction point (-)

$f_{add\_dilution}$ factor considering additional dilution, e.g. by considerable water flows entering the intake area, or by lakes via which water travels to the abstraction point

Further detailed explanation of these terms is given in Adriaanse et al (2008) [8].

Tier II evaluation of monitoring data:

The quality criteria to which monitoring data should comply are elaborated in paragraph 5.2.6 of Alterra report 1635. The procedure of evaluation of monitoring data described applies to post-registration monitoring data but can be extrapolated to the evaluation of existing (VEWIN) monitoring data (paragraph 5.3) since no clear guidance is given there.

In short, the procedure is as follows (for details see Alterra report 1635). Ideally the monitoring data should comply with the following criteria (set up for post-registration monitoring purposes for new substances):

-13 measurements should be available for each drinking water abstraction point each year for the calculation of a 90-percentile value for each calendar year.

- if (due to exceptional circumstances) less than 13 measurements per year are available, the maximum value should be taken and should be below 0.1 µg/L

- if 12 measurements are available per year, the maximum value should also be taken and should be below 0.15 µg/L (explained in note *b* on page 68 of the report)

However, Ctgb considers that it is the responsibility of the water quality managers to decide whether to monitor a specific substance. Hence, any missing data for one or more specific abstraction point(s) for a potentially problematic substance cannot lead to a request for additional information from the applicant.

The 90-percentile value over a 5-year period is to be calculated for each abstraction point. If the 90-percentile over the 5-year period exceeds the threshold, an adequate risk assessment should be provided.

Next to the 90-percentile for 5 years, an analysis per year can be done if sufficient data are available. If the 90-percentile value for one year exceeds the threshold, a problem analysis should be provided.

No overall 90-percentile over the various drinking water abstraction points is calculated. Each individual abstraction point should meet the drinking water limit.

The Ctgb uses the possibility of jumping to higher tiers for the assessment of the drinking water. This means that in practice three categories of substances are distinguished:

1. **New substances** on the Dutch market (< 3 years authorised in NL): A Tier I PEC is calculated according to the methodology in Alterra report 1635. A Tier II cannot be performed yet as there are no monitoring data for new substances. If Tier I fails (with less than a factor 5 exceeding), post-registration obligation will be imposed in order to collect Tier II data for future evaluations of the substance. *(if the VEWIN during the authorisation period indicates that the substance is regarded as a substance of concern on the basis of new, adequate and sufficient monitoring data the substance will move to the third category)*

2. Old (> 3 years authorised in NL) **substances of no concern**: if there are no indications from the VEWIN that the substance is a potential problem for drinking water production, then no Tier I calculations are deemed necessary. The substance meets the drinking water criterion based on the Tier II information (as the available VEWIN monitoring data indicate no problems). *(if the VEWIN during the authorisation period indicates that the substance is regarded as a substance of concern on the basis of new, adequate and sufficient monitoring data the substance will move to the third category)*

3. Old (> 3 years authorised in NL) **substances of concern**: the VEWIN indicated that the substance is a potential problem for drinking water production by including it on a yearly updated list on the basis of monitoring data. In this case, Tier II is used directly (jumping of Tier I) the available monitoring data of the VEWIN of the most recent 5 years at all drinking water abstraction points will be analysed on the basis of the criteria set out in the Alterra report.

The list of substances of concern is yearly updated by VEWIN and published on the VEWIN website (http://www.vewin.nl/probleemstoffen).

For further details refer to Alterra report 1635 [8].

2. USE ON HARDENED SURFACES

Alterra report 1635 only provides guidance for agricultural applications (direct emission to edge-of-field ditches). For emission via STP, no generic methodology is available. For the specific use on hardened surfaces, an assessment methodology is provided to the Ctgb (Linders et al, 2010 with corrigendum by Van der Linden, in prep.) [11].

This methodology takes into account, among other parameters, the ratio of hardened surfaces and total area, the fraction treated area, and flow velocity in the catchment area. This methodology is used for new substances with proposed uses on hardened surfaces. For old substances the above described procedure in Alterra report 1635 is followed.

NON-PROFESSIONAL USE

The developed decision trees and models described above are not suitable for non-professional (agricultural) use since the area of use cannot be described adequately.

Therefore the interim decision tree of the Ctgb, as laid down in C-163.5, still applies as a first tier in those situations for new substances (< 3 years on the Dutch market). For full text of C-163.5 see Evaluation Manual version 1.0.

In the interim decision tree, in short, the PIEC in the edge-of-field ditch according to TOXSWA is used as a basis for further calculations. A dilution factor of 10 and a travelling

time of 14 days is taken into account to predict the concentration at the drinking water abstraction point. The applicant may also submit a RAT factor approach.
For non-professional use on hardened surfaces, this approach is not entirely applicable. Therefore a qualitative assessment is performed on a case-by-case basis.

For old substances the above described procedure in Alterra report 1635 is followed.

4. REFERENCES

1 Regulation (EC) No 1107/2009, http://eur-lex.europa.eu/Notice.do?checktexts=checkbox&val=504604%3Acs&pos=1&page=1&lang=en&pgs=10&nbl=1&list=504604%3Acs%2C&hwords=&action=GO&visu=%23texte

2 Directive 91/414/EEC, http://eur-lex.europa.eu/Notice.do?checktexts=checkbox&val=172911%3Acs&pos=3&page=1&lang=en&pgs=10&nbl=3&list=447073%3Acs%2C185439%3Acs%2C172911%3Acs%2C&hwords=&action=GO&visu=%23texte

3 Commission Implementing Regulation (EU) No 540/2011, http://eur-lex.europa.eu/Notice.do?checktexts=checkbox&val=574460%3Acs&pos=6&page=1&lang=en&pgs=10&nbl=6&list=646199%3Acs%2C628324%3Acs%2C615541%3Acs%2C607847%3Acs%2C607130%3Acs%2C574460%3Acs%2C&hwords=&action=GO&visu=%23texte

4 Bgb: Plant protection products and Biocides Decree. See www.overheid.nl/wetten

5 Commission Regulation (EU) No 283/2013, http://eur-lex.europa.eu/Notice.do?val=724582:cs&lang=en&list=729945:cs,724582:cs,&pos=2&page=1&nbl=2&pgs=10&hwords

6 Commission Regulation (EU) No 284/2013, http://eur-lex.europa.eu/Notice.do?val=724566:cs&lang=en&list=729902:cs,724566:cs,&pos=2&page=1&nbl=2&pgs=10&hwords=

7 FOCUS (2006) "Guidance Document on Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration" Report of the FOCUS Work Group on Degradation Kinetics, EC Document Reference Sanco/10058/2005 version 2.0, 434 pp

8 Adriaanse et al.(2008) Development of an assessment methodology to evaluate agricultural use of plant protection products for drinking water production from surface waters. Alterra report 1635.

9 Van Leerdam, R.& Adriaanse, P. 2009 (draft) Evaluation of agricultural use of plant protection products for drinking water production from surface waters in the Netherlands - User's manual of DROPLET to calculate concentrations at drinking water abstraction points.

10 FOCUS (2001). "FOCUS Surface Water Scenarios in the EU Evaluation Process under 91/414/EEC". Report of the FOCUS Working Group on Surface Water Scenarios, EC Document Reference SANCO/4802/2001-rev.2. 245 pp.

11 Linders, J.B.H.J.; Van der Linden, A.M.A.; Stienstra, Y.J. 2010. Surface water intended for the abstraction of drinking water after use of plant protection products on hard surfaces – Evaluation of plant production products, RIVM report . With corrigendum by Van der Linden (2012)

12 De Werd H.A.E. & R. Kruijne (eds). 2011. Interpretation of surface water monitoring results in the authorisation procedure of plant protection products in the Netherlands; including a draft protocol for causal analysis of surface water quality problems caused by plant protection products. Alterra report 2011-02