

Section 9: Fate and behaviour in the environment

According to the guidance document, SANCO 10181/2013, for preparing dessiers for the approval of a chemical active substance

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Estimation of concentrations in surface water and sediment

Route and rate of degradation in air and transport via air Estimation of concentrations for other routes of exposure

Fate and behaviour in air

In agreement with the Rapporteur Member State, the product dossier is submitted following the dRR format. All points required under the SANCO 10181/2013 are covered, although their naming might differ slightly.

IIIA 9 FATE AND BEHAVIOUR IN THE ENVIRONMEN

This document reviews predicted environmental concentrations for the plant protection product IMS MSM + MPR OD 42 which contains the active substance iodosulfuror methyl-sodium (IMS) and mesosulfuron-methyl (MSM), and the crop safener metenpyr-diethyl MPR).

This product is the representative formulation for the renewal of approval of mesosulthron-methyl of European level. In its function as Document MCP for the EU to view process the assessment will focus only on the active substance mesosulfuron-methyl. A complete assessment to cover all active substances of the formulation will be provided at a later stage, as part of the post-AIR process for renewal of authorisations at member state tevel once mesosulfuron-methyl is re-approved under Regulation (EU) 1107/2009.

In general, formulants (inactive ingredients) present in a product do not influence to a relevant extent the behaviour of the active substances in the environment. An exemption is for slow release formulations but this is not the case for the present product. Therefore, data derived from tests with the individual active substances are considered representative for the behaviour of these substances in product IMS+MSM+MPR OD 42. Detailed information on these active substance studies is found reported in Document MCA, only brief overview summaries on fundamental results are given in the present document.

Intended application pattern

The formulation is intended for use as a post-emergent herbicide to control weeds in winter and spring cereals. The critical use pattern for this formulation is summarised as follows. A detailed use pattern can be found in Appendix 2 of this document.

Table 9-1: Intended application pattern for the representative uses of mesosulfuron-methyl in product IMS MSM-MPR OD 42

| Crop | application and | mber of blications | Application on terral [days] | Maximum label rate [L/ha] | Maximum ap individual [g a.s | treatment |
|--------------|---|--------------------|------------------------------|---------------------------------|------------------------------------|-------------------------|
| | | y S | | | iodosulfuron- methyl-sodium | mesosulfuron- methyl |
| Winter wheat | BBCH 26 \$2 | | , | 1.5 | 3 | 15 |
| Winterse | BBCH 2032 The of winter, beginning of yegetatian | 1 | - | 0.6 | 1.2 | 6 |

| Compound / Codes | Active substance and metabolites addressed in Chemical Structure | Explanation for Consideration | Ž | Considered for |
|---|--|--|---|--|
| Mesosulfuron -methyl / AE F130060 | H ₃ C SÓ ₂ SÓ ₂ N OCH OCH | active substance | | PECoil PECow PECsw PEC |
| AE F154851 | H ₃ C Số ₂ Số ₂ N N OCH ₃ OCH ₃ | aerobic soil: anaerobic soil: soil photolysis water sediment: horolysis; | >10%\ < 5%\ n.d <5%\ <5%\ n.d | PEC _{sw} PEC _{sw} PEC _{sw} PEC _{sw} |
| AE F160459 | H ₃ C Số ₂ N N OCH | aerobic soil; agaerobic soil: goil photolysis: water sediment: hydrolysis: aqu. photolysis: | \$5% >10% n.d. \$10% n.d. \$0 n.d. | PEC _{swil} PEC _{sw} PEC _{sw} & PEC _{sed} |
| AE F099095 | H ₂ N N OCH ₃ N OCH | | 5% n.d. <5% n.d. n.d. | PEC _{soil} PEC _{gw} PEC _{sw} & PEC _{sed} |
| AE F092974 | HANT OCH, TO CHANT OCH, TO CHA | aerobic soil: anaerobic soil: son photolysis: water/sediment: hydrolysis: aqu. photolysis: | >10% <5% n.d. <5% >10% n.d. | PEC _{soil} PEC _{gw} PEC _{sw} & PEC _{sed} |
| AE F160460 | H ₃ C SO ₂ N OCH ₃ | anaerobic soil: soil photolysis: water/sediment: | >5% >5% n.d. >5% n.d. n.d. | PEC _{soil} PEC _{gw} PEC _{sw} & PEC _{sed} |
| AE F140584 | COOCH ₃ H ₃ C SO NH ₂ SO NH ₂ | anaerobic soil: soil photolysis: | >5% <5% n.d. | PEC _{soil} PEC _{gw} PEC _{sw} & PEC _{sed} |
| | | water/sediment: hydrolysis: aqu. photolysis: | <5% >10% n.d. | |

| Compound / Codes | Chemical Structure | Explanation for Consideration | Considered for . |
|---------------------|---|---|---|
| AE F147447 | H ₃ C NH SO ₂ | aerobic soil: >5% anaerobic soil: >6% soil photolysis: 7.d. water/sediment: >10% hydrolysis: 10% aqu. photolysis: n.d. | PEC _{soil} PEC _{gw} PEC _{sw} PEC _{sw} |
| | Chemical Structure H ₃ C Sto Sto Structure H ₃ C Sto Structure H ₃ C St | | |

IIIA 9.1 Rate of Degradation in Soil

IIIA 9.1.1 Aerobic degradation of the preparation in soil

Aerobic soil metabolism: In laboratory studies using ¹⁴C-radiolabels positioned in the pyrimidal and phenyl moieties, two initial degradation routes were observed for mesosulfuron-methyl in aerobic soil: Cleavage of the methyl ester at the phenyl ring to result in AE F154851, and ether demethylation at the pyrimidine ring to yield AE F160459. As common successor product of both intermediates, AE F160460 may be formed via metabolic loss of the respective second methyl group. Moreover, breakdown of the molecule backbone occurs via chemically or microbially induced cleavage of die sulfonylurea bridge, which leads to the fragments AE F099095 and AE F092944 derived from the pyrimidine moiety, and AE F140584 and AE F140447 derived from the phenyl moiety. Of all above soil metabolites, however, only AE F154851 (max. 162°%), AE F099095 (max. 22.2°%), and AE F092944 (max. 10.1 %) reached major abundances in some, but not all, soils Terminal bioconversion of the residues led to formation of significant amounts of ¹⁴C-ourbon droxides max. 49 % or 18 % for pyrimidyl- and phenyl label, respectively, and non-extractable soil-bound residues (max. 64 % or 58 % for pyrimidyl- and phenyl-label, respectively) by the end of the incubation period.

Indirect photolysis on soil surface: Mesosulfuron-mothyl is not photodegraded to significant extent at wavelengths >290 nm on soil surfaces. Soil photolysis will therefore no contribute notably to elimination from the terresonal enormment, and will not lead to the generation of plevant degradates.

The proposed biotrans formation pathway for mesosulfuron-methyl in aerobic soil is shown in Figure 9.1.1-1. The identical scheme is proposed to apply as well for the degradation of mesosulfuron-methyl in aerobic water (sediment systems).

Figure 9.1.1-1: Proposed transformation scheme for mesosulfuron-methyl in the environment (soil and water/sediment)

To enable a kinetic description suitable for environmental exposure simulation purposes, an optimized compartmental model representation of the transformation scheme was developed, shown in Figure 9.1.1-2. The evaluation was based on experimental data from a total of 11 tests on 8 soils for the parent active substance, and an additional 8 tests on 4 soils dosed directly with two of the metabolites. A numeric summary of the resulting half-life information suitable for exposure simulations of the components plevant for assessment is given in Table 9.1.1-1.

Figure 9.1.1-2: Compartmental model for evaluation of the degradation of mesosulfuron-methyl in soil under aerobic conditions; the numbers attached to the arrows are the formation fractions for the respective metabolite Mesosulfuron-methyl 9.4% 17.9% 7.6% AE F099095 AE F160459 AE F154851 100% 100% AE F160460 Non extractable residues (NET) and O Non-extractable residues and CO2 Mesosulfuron-methy 17.2% AF 7099095 AE F092944

Table 9.1.1-1: Normalised DT50 values for mesosulfuron-methyl and its metabolites in aerobic soil. Values obtained from the same batches of soil LS2.2 were averaged before calculating mean values.

| Soil | | | | Д | T50 [da | vel | Ď | (W) | y v i |
|--|--|--|--|---|--|---|---|-----------------------------------|-------------------------------------|
| Son | | | | <u>D</u> | 150 [44] | <mark>, 5]</mark> | 0970911 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | ~ | |
| | f thyl | thy. | | | | | % | | , S |
| | Model used for Mesosulfuron methyl | Mesosulfuron methyl | <mark>851</mark> | <mark>65</mark> € | <u>\$60</u> | | 9 <mark>460</mark> | | |
| | Luse | in the second se | 1 51 | × × × × × × × × × × × × × × × × × × × | <mark>660</mark> ე | 8 <mark>76</mark> | | | * <mark>4</mark> 0 |
| | lode Seulf | Huse Huse | <u>AE F154851</u> | | Ş. | | | | |
| | <mark>∦est</mark> | Mes | Q. | | | | ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ | | |
| | | | | | | | | | <i>」</i> " —— <mark>——</mark> —— |
| SLI SLV | SFO | 12.2 54.3 109.7-1) | 13.6 30.1 % | K <mark>53.9</mark> (| 76.4 76.4 76.4 77.4 77.4 77.4 77.4 77.4 | 1 2 | (4 7.5 | n.d. | n .d. |
| SLV CHL | SFO DFOP | 54.3 109.7. ¹¹ 7.7. | √ <mark>30.1</mark> % √ 2 √ √ | n.d. | | 20 & | or n.g. | Mand a | n.d. |
| SLS | SFO | 109.7 Q | Ŭ <u>~~</u> ~ | ************************************** | ~~ ~ ~~ 47.6 ~ |) zze (| 2 _2 0 | nd | n-d- |
| SCL | SFO | | | | | | | ∑ <mark>h.∕d.</mark> | n.d. |
| FF | SFO | 33.4 15.4 | § 64 4 | 130 | 234 A | | 2 <mark>3-6</mark> | n.d. | n.d. |
| CLF | SFO 4 | 15.4° | <u>11 Q</u> | <mark>\$7.3</mark> ? | √ 77.4 ℃ | 69.4 | | ∜ <mark>n.d.</mark> | n.d. |
| LS 2.2 (pyr. label 20°C) | DFOP | <u>1</u> | \$\frac{\frac{\partial}{\partial}}{\partial}\tilde{0}} | ¥ <u>-</u> 20° | 79.5 | | 44.263 2 | n.d. | n.d. |
| LS 2.2 (pyr. label, 10°C) | SFØ | 99.92 | | | | | | n.d. | n.d. |
| Geom. LS 2.2 pyrimidyl | W <mark>-</mark> | 99.00 | | 723 | | & <mark>-</mark> O <mark>n.d.</mark> ' | • • • • • • • • • • • • • • • • • • • | | <mark>-</mark> 647 |
| LS 2.2 (ph. label 20°C) | SECTION SECTION | ************************************** | √ <mark>32>></mark> | 300 | g <mark>n.d.</mark> | nd | ∜ 16.9 <mark>–</mark> ² | <mark>–²</mark> 5.9 | 647 <mark>176</mark> |
| Geom. LS 2.2 pheny | | 37 3 | 72.9 | \$53.0 | n.d. | | <u>-</u> | | 337 |
| -AIIIa | | | 4.7 4.7 | | O É | | <u>-</u> | 4.0 | 60.6 |
| (metabolite appl.) | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | | " | | ř · | <u> </u> | '1.∀ | |
| (metabolite appl.) | ~ - | Š, F | <u></u> | | , | - | - | 7.1 | <mark>78.5</mark> |
| (Control of the control of the contr | **** ******************************** | | | Ÿ | <u> </u> | <mark>-</mark> | <u> </u> | 2.4 | 75.3 |
| 4a (metabolite appl.) | <u> </u> | | | | À . | | | | , J.J |
| (metabolite appl.) | | 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - 9 - | 3743 | 0 - 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | <u>-</u> | _ | · | 1.5 | 73.7 ¹⁾ |
| Geometric Mean | | 31.9 | 3700° | 70.1 | <mark>87.9</mark> | 60.4 ⁻⁴ | 25.6 | <mark>3.6</mark> | 97.7 |
| 1 / W | ((6) | | - 7/ | <u></u> | | | | | |

¹⁾DT50 calculated slow degradation rate of DFOP podel.

error too large) and not considered for calculation of mean.

¹⁻DT50 calcuted slow degradation tate of DFOP model.
2-1-Value statistically not acceptable (p(t test) or Clay error to
3-1-Derived from decline fit.
4-1-Maximum of two values used instead of geometric mean.
n.d. = not determined

| Soil | | | | DT | 50 [day | | * | | |
|--------------------------|--|---|-------------------------|--|--|----------------------|--|--|--------------------|
| | Model used for test substance | Mesosulfuron-methyl | AE F154851 | AE F60459 | 402-AE F09095 | AE F09294 | 20 AE F160460 | CZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ | CONTROLL STATES |
| SLI | SFO | 10.3 | 11.5 | . 79.3 n. 1 |) <mark>64.9</mark> ^ | n.a | 14 | n.⁄€₽ | n.d. |
| SLV | SFO | 39.8 | 22. | n d | | F | 7. n.d. (2. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. | n.d. | n.d. |
| CHL | DFOP | 80(5 1 | | Ø.d. | Q-2 | 21.9 20 | n.d. | n.d. | n.d |
| SLS | SFO | <mark>6.7</mark> | y - 2 | / [*] <mark>- 2</mark> | 7 43.4 7 | - 20 | _ _ | n.d. | nA. |
| SCL | SFO | Û <mark>57.%</mark> ~ | · - 25 | <u>-2</u> | | | | on.d. | On.d. |
| FF | SFO | 22,5 | ° <mark>57</mark> 7.4 | 106.3 | 234 | 🍣 <mark>− ²</mark> 🎺 | \$ 29.1 | n.d. | n.d. |
| CLF | STO | <u>≈</u> 11.9 | 34.6 | × 28.8 | 234 59.80 | 467 | <u>-</u> & | n.d. | n.d. |
| LS 2.2 pyrimidyl | ODFOP | رِّ <mark>155 اُلَّ 155 اِلْمَا الْمَا الْمِينِي الْمَا الْمَا</mark> | 646 | TO THE | 804 | | 2 | & <mark>n.d.</mark> | n.d. |
| LS 2.2 phenyl | FQMC | 30 8 1 | 2 9.8 | 61.9 | <mark>80,4</mark> ∠ <mark>n.d.</mark> _{>} , | n.d. | 14.1 | _ ² | _ 2 |
| AIIIa (metabolite appl.) | <mark>\$OFÖ/</mark> <u> </u> | | ♥ <mark>-</mark> ↓ • | - - | <u>-</u> \$\$ | |) <u>14.1</u> | 4.0 | 82.7 1 |
| AXXa (matabalita anni) | | | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | Ŏ <mark>-</mark> | \$ <mark>-</mark> } | , | <mark>7.0</mark> | 111.4 ¹ |
| 420 | W HS | | | | | \$ 7 | - | 2.4 | 203.0 1 |
| (metabolite appl.) | SF <mark>O</mark> / DFOP ⁵ | \$\frac{\partial}{2} | 31,5 | \$ <mark>-</mark> (| 5 <mark>-</mark> 0 | | <mark>-</mark> | 1.5 | 73.3 1 |
| Geometric Mean | - 2 | 30.3 [©] | 31.5 | 63 | 7191 | 46.7 ⁴ | 18.3 | 3.2 | 108.2 |

1) DT5 Calculated slow degradation rate of DFOP or HS model or from DT90 value of FOMC model.

3) Derived from decline At

5) SFO for APF140584; bis Pasic for AE F147447

IIIA 9.1.2 Anaerobic degradation of the preparation in soil

Mesosulfuron-methyl was found descadable in flooded anaerobic soil, with a half-life comparable to that observed inder aerobic conditions (geometric mean $DT_{50}=30.3$ days at 20 °C). The biotransformation led to the same components as observed in aeobic soils, except for the only negligible formation of CO_2 (CO_2) AR), inherent to anaerobic condition. The proposed metabolic route therefore is equivalent to that proposed for aerobic conditions (see Figure 9.1.1-1).

²⁾ Value statistically not acceptable (b/t-test) or Chi²-error too large) and not considered for calculation of mean.

⁴⁾ Maximum o@wo va@es used instead of geometric Gean.

Table 9.1.2-1: DT₅₀ values of mesosulfuron-methyl in anaerobic soil.

| Soil | Model used for Mesosulfuron- methyl | Mesosulfuron-methyl DT50 [days] |
|----------------|---|------------------------------------|
| SLI | SFO | 30.1 |
| SLV | SFO | 30,5 |
| Geometric mean | - | 30.3 |

IIIA 9.2

IIIA 9.2.1

Soil dissipation testing on a range of representative soils of mesosulfuron-methylafter a single, exaggerated rate application of the continuous forms of the methods of cultivation of the studies focused on the parent lata was kinetically evaluated conditions to the parent lata was kinetically evaluated to the parent lata was The degradation of mesosulfuron-methyl after a single, exaggerated rate application of 105% ha was investigated in Northern Europe (Germany, France, Great Britain) on two phots per trial, for spring or autumn use on bare soil, and in Southon Europe (France and Spairs) on one plot or trial, for a spring application situation. The regions and the methods of cultivation were typical for cereal crops. Analytical monitoring in the studies focused on the papent substance degradates were not traced.

The experimental data was kinetically evaluated according to FQCUS guidance, including a referencing to standard conditions for soil temperature (20°C) and soil moisture (field capacity) via the time-step normalisation approach. For the temperature normalisation a Q₁₀ value of 2.58 was used.

Normalised single first order T₅₀ values for mesoculfuron-metbyl ranged from 16.1 to 54.0 days, the overall geometric mean value was 34.6 days, including both the spring and the autumn applied studies. This data is consistent with the degradation behaviour observed for mesosulfuron-methyl in the set of laboratory studies, considering experimental variation in biological systems and the by factor 7× exaggerated use rate tested in field. As a Tier 1 approach all environmental exposure simulations for the present product will therefore be based solely on the broad and representative set of laboratory half-life information, being founded on a kinetic model description of the entire metabolic pathway scheme

No significant downward movement of mesos affuron-method in the soil profile was observed, for both application timings and all locations tested. The active substance was only sporadically detected in soil layers deeper than 10cm, and residites were low despite of the exaggerated application rate.

Soil residue testing

Soil residues relevant for succeeding cross can be predicted from soil dissipation data provided in IIIA 9.1.1 and 9.2.1 (see also IIIA 9.4). Therefore no further soil residue testing with the preparation is required.

oil accumulation testing

No addition studies have been performed. Concluded from PECplateau calculation presented in IIIA 9.65 mesosalfuron-methyl would not be expected to have relevant accumulation potential in soil.

IIIA 9.2.4 Aquatic (sediment) field dissipation

The mobility in soil of mesosulfuron-methyl and its metabolites relevant for assessment was studied by batch equilibrium tests on a variety of different soils. An overview of the data is presented in the tables below. These data did not indicate a correlation of soil adsorption with soil pN for any component.

For the only transient and short-lived degradate AFF140384 no experimental study was never worst-case default parameterisation for adsorption (Koc = 0) and concentration will therefore be used in exposure simulations for this component

I degradate A in for adsorption is e simulations for the For the only transient and short-lived degradate APF140884 no experimental study was performed a worst-case default parameterisation for adsorption (New = 0) and concentration dependency (1/m = 1) will therefore be used in exposure simulations for this component.

Table 9.3-1: Soil adsorption data of mesosulfuron-methyl and its metabolites relevant for assessment

| Common | | Kf | Koc | Kom | Freundlich |
|----------------------------|--|-----------------------|--|---------------------------------------|--|
| Compor | nent / Soil | [mL/g] | [mL/g] | [mL/g] | Freundsch exponent 1/n Ø |
| Mesosulfuron-me | ethyl | | | Q Q | |
| | • | 1.69 | 345 | 200.1 79.5 21.5 18.0 49.9 | 0.85 0.95 0.90 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 |
| | | 3.71 | 137 | 79.5 | |
| | | 0.41 | ₾37 | § 21.5 | J ~0.93 S |
| | | 0.71 | ₹ 31 | 18.0 | $\mathfrak{P}^{0.91}$ |
| | | 2.28 | ₹ 86 Ç | 49.9 | 0.91 0.90 0.92 0.93 0.90 0.93 |
| | | 0.24 | 337 31 86 26 | • 15.14 © 20.9 | , ' © 2 , © ' |
| | | 0.60 | 36 🥎 | 0 15.14 0 20.9 | 0.93 0 0.93 0 0.90 0.93 |
| | | 1.22 | | 9.3 | 0.90 |
| | | 0.56 | 26 Q 36 36 36 36 36 36 36 36 36 36 36 36 36 3 | 27.8 | 0.93 |
| | Median | | A8.0 A9.0 A | 27.8 C | 93 9.92 0.91 |
| | Arithmetic mean | | 92.5 | \$7.6 \$37.1 \$7 | Δ ×9 |
| | Geometric mean | | 92.3 | 37.1 | |
| AE F154851 | Geometric mean | 54 Ki | \$ \$5\$ O | \$6.8 \$35.4 \$35.4 | Ų" , Q |
| A – USA | Q, Y | 3.1 | ' > 985' 0 | \$6.8 \$35.4 \$26.8 | √ 0.92 |
| B – Germany | <i>O</i> 1 | √ 1° U. 17(m) | 7 9857 5 446 8 | 35.40 | © 0.94 |
| C - Germany | | /w/ II / > | 10 & ALA @.\ | 35.40 | 0.93 |
| | Arithmetic mean | | 65.0 | 26.74 3 9.6 37.7 4 | 0.94 |
| | Geometric mean | | 65.0 | 37.7 5 | 0.94 |
| AE F160459 | | | | | |
| | | 0/2/978 | y 11.2 ° | \$ 16/5 | 0.93 |
| | | 3797 | 15% | 9.1 | 0.94 |
| II | | 0.7630 | ₩ 106.2 | 9.1 9.4 12.2 | 0.93 |
| 8 | | 0.7590 | 3 44.0 S | 12.2 | 0.98 |
| | | | ് എവര ത്ര | 25.9 | 0.93 |
| | Arithmetic mean Geometriconean | | 19.3 1 | 12.6 11.2 | 0.94 0.94 |
| AE F099095 | A rithm Gran And And And And And And And And And An | 42.80 2.94 2.33 | | 11.2 | 0.51 |
| A – USA | | × 42.8 | 1360 | 788.9 | 0.83 |
| B – Germany | | 2 94 | \$\tag{226} | 131.1 | 0.84 |
| B – Germany C - Germany | | 2 94 2 33 × | 141 | 81.8 | 0.86 |
| .4 | Arithmetic mean | <u> </u> | . 576 | 334 | 0.84 |
| \$\bar{\pi}\$ | Geognetric mean | 72.80 2.94 2.33 | 351 | 204 | 0.84 |
| AE F092944 | Arithmetic mean Geometric mean Geometric mean Geometric mean | |)* | | |
| S 2.1 × | | Q2.47 | 211 | 122.4 | 0.69 |
| LS 2.2 | | W 2.59 | 89 | 51.6 | 0.86 |
| SL 2.3 | | 8.25 | 625 | 362.5 | 0.65 |
| Arizona A | | 8.23 4.05 a) | 663 a) | 384.6 a) | 0.52 a) |
| Arizona B | | 1.82 a) | 696 a) | 403.7 a) | 0.63 a) |
| SL V | | 4.11 | 395 | 229.1 | 0.78 |
| SL 2 | | 81.3 b) | 11289 b) | 6548.1 b) | 0.58 b) |
| Kanada 💍 | | 16.5 | 917 | 531.9 | 0.62 |
| | Arithmetic mean | | 447 | 260 | 0.72 |
| | Geometric mean | | 336 | 195 | 0.71 |

| Component / Soil | Kf [mL/g] | Koc [mL/g] | Kom [mL/g] | Freundlich。 exponent In |
|-------------------------------|-------------------------|---|----------------------------|---|
| AE F160460 | | | | Š, O |
| | 0.2069 | 11.5 | 6,7\$ 505 | Ø.9745 D |
| | 0.2258 | 9.4 | <i>9</i> 05 | 0.8692 |
| II | 0.3488 | 7.6 | 4.4 | 0.8692 0.8567 0.9524 0.86280 |
| | 0.0743 | 10.6 | £ 6.1 | 0.9524 |
| | 0.5329 | 31.3 | © 18.2 | 9.8628° |
| Arithmetic mean | | 4.1 | 4.4 6.1 18.2 8.2 | ~~° 0.9 0 ° ~ ~ (|
| Geometric mean | | 12.2 S | 7.1.♥ | \$ \$\text{\$\ext{\$\text{\$\exiting{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\exititt{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\exititt{\$\text{\$\text{\$\text{\$\text{\$\text{\$\exititt{\$\text{\$\exititt{\$\text{\$\text{\$\text{\$\text{\$\exititt{\$\text{\$\text{\$\exitit{\$\text{\$\texititt{\$\text{\$\exitit{\$\text{\$\text{\$\text{\$\ti |
| AE F140584 | | | | |
| generic worst case parameters | 0 📞 | | | ° 1.000 |
| AE F147447 | A û | | | |
| AXXa | 19. 097 × | 4.6 38 6.6 7.0 | 2.2 3.2 02.4 02.4 | - Z |
| | 0.096 0.086 0.096 | | 7 2.2 7 3 8 | |
| AIIa | \$\ 0. 08 \ | 7.0 | 3.8 | <i>Õ</i> |
| | | 7.0 | | |
| II | ♥ Ø0.181 Ø | | | |
| Arithmetic me | an 🎺 💮 | \$\frac{4\text{5}}{\text{5}} \frac{\text{5}}{\text{5}} | 3.0 | 1.00 |
| Geometrie | ean, S | ″5.1 " | ~ 2 9 | 1.00 |

- a) value excluded, not considered in the evaluation (EUDAR 2003, addendured
- b) variation not understood, not considered in the evaluation, (EU-DAR 2003, addendum);

IIIA 9.3.1 Column leaching

The potential mobility of mesosulfuron-methyl and its metabolites can be characterised based the adsorption/desorption/studies described under point 9.3 and environmental modelling simulations based hereon. No column leaching studies were therefore performed.

IIIA 9.3.2 Lyameter studies

The fate and mobility of [2-14] Spyringdyl]-labelled mesosoffuron-methyl was investigated outdoors under actual use conditions in two lysimeter studies with undisturbed monoliths of sandy soils (depth 1.0 m, surface area 0.5 m.) Applications were made to winter wheat at a rate of 15 g/ha, twice in consecutive years. The treatment was fined either in spring (first study) or in autumn (second study).

Both studies confirmed that mesosylfurors methyl is short-lived and not mobile to relevant extent in field soils; neither the active substance for any metabolite identified in the route of degradation studies leached at concentrations reaching or exceeding 0.1 µg/L in annual average.

Polar material detected in feachate samples in slight excess of the trigger level could not be identified with the technology available at the time of lysimeter study conduct. A bioassay revealed no growth inhibition potential to the most sensitive aquatic plant species, *Lemna gibba*. Only later, a dedicated supportive experiment allowed via state-of-the art spectroscopy a retrospective assignment of the chemical structure of BCS-CV14885. The component was synthesized and assessed for groundwater relevance according SANCO 221/2000 guidance. In these tests, BCS-CV14885 was found cleary non-relevant, i.e. devoid of herbicidal activity, and of no genotoxic potential.

| Compound / Codes | Chemical Structure | Explanation for Consideration | Considered for |
|---------------------|--------------------|-------------------------------|---|
| BCS-CV14885 | | Detect in lysimeter leachate. | specific risk-envelopes assessment for ground- and surface water, cf. Document MCA |

Owing to the fact that BCS-CV14885 was not formed at quantities triggering identification in any of the standard soil metabolism studies and could only be addressed via special test design, the component could not be included in the regular environmental modelling pathway scheme for standard exposure assessments for products. Specific simulations to extrapolate the experimental findings of the lysimeter tests to other representative regions of European agriculture were made in Document MCA, estimating worst case PECgw and PECsw of BCS-CV14885 for spring and autumn uses of mesosulfuron-methyl in cereals at its maximum rate of 150g a.s./Ra once per seaon. The subsequent risk assessments for ground and surface water allowed for the conclusion of Safe use for a risk envelope covering all anticipated uses a mesosulfuron-methyl withon products; degradate BCS CV14885 was therefore considered not to qualify for regular assessment at product level, and in consequence was not included in the residue definition.

Field leaching studies IIIA 9.3.3

...ory study

...ation have been performed. De, ...on 1. The variour pressure are also

...dity — field study

... ficient information can

No volatility studies on the preparation have been performed. Details of the volatility of the active substance(s) are given in Section 1. The varour pressures are also reported in Section 9.9.



IIIA 9.4 Predicted Environmental Concentrations in Soil (PECs) for the Active Substance

Endpoints for PECsoil

Table 9.4-1: Comparison of EU endpoints and modelling input parameters for mesosulfur on-methyl

| End-Point | Active substance: me | esosulfuron-methyl | |
|-------------------------|-------------------------------------|--------------------|-----------|
| | Proposed EU endpoints [Document N2] | Value used fo | modelling |
| DT [dova] | | 1300 | 7 0 8 |
| DT ₅₀ [days] | 109.7 | | |

PECsoil modelling approach

Calculations were based on a simple first tier approach (Nicrosoft[®] Excel spreadsheet) considering even distribution of the compound in upper 0-5 cm soil layer. A standard soil density of 1.5 pcm³ was assumed. Crop interception will reduce the amount of a compound reaching the soil and is taken into account depending on the growth stage at application. The interception rates follow the recommendations for cereals given in the FQCUS groundwater guidance paper FOCUS 2002).

Metabolites were addressed via a model approach equivalent to that of parent substance, assuming virtual application of the metabolite at a rate derived from its maximum abundance observed in soil, and corrected for molecular weight difference to parent.

If not specified otherwise, the time-course of EC_{soil} and subsequently TWA_{soil} was derived based on simple first order kineties, using worst case soil half-life as the injut parameter.

| Report: | β; 2014;M=981618301 |
|--------------|---|
| Title: | Mesosulfuron-methyl (MSM) and metabolites (ECsoil EUR - Use in winter cereals |
| | Can ranope 0 % - % 0 2 % |
| Report No: | EnSa-4-0226 |
| Document No: | Mc481618-01-1 0 0 0 |
| Guidelines: | not applicable not applicable |
| GLP/GEP: | no in |

Methods and Materials

The predicted environmental concentrations in soil (PEC_{soil}) of mesosulfuron-methyl were estimated based on a first tier approach using a Microsoft Excel spreadsheet. A bulk density of 1.5 kg/L and a soil mixing depth of 5 cm were used as recommended by FOCUS (1997) and EU Commission (1995, 2000). From interception was taken into account according to the BBCH growth stage, as recommended by FOCUS (2002). Detailed application data used for simulation of PEC_{soil} were compiled in Table 9.4-2.

Application pattern used for PECsoil calculations of mesosulfuron-methyl **Table 9.4-2:**

| | | | Amount reaching | | | |
|-------------------------------|--|-----------------------------------|-----------------|------------------------|---------------|---|
| Individual crop | FOCUS crop used for interception | Rate per season [g a.s./ha] | Interval [days] | Plant interception [%] | BBCH Stage | soil per season application [g a.s./hat |
| Winter wheat GAP & Simulation | winter cereals | 1 × 15 | - &a | 50 | 20-32 | 1 × 75 |
| Winter rye GAP & Simulation | winter cereals | 1 × 6 | - 🔻 | 50 | 20-32 | 3.0 |

Substance Specific Parameters:

PEC_{soil} calculations were based on the maximum DT₅₀ of laboratory studies (109 7 days) at standard temperature and moisture, according to FOCIS (2000). Further compound specific input parameters are summarized below.

Input parameters of mesosulfuron-methyl for PECsoil (from Table CA).1.2, [Y-1) **Table 9.4-3:**

| Compound | Days | Max occur | Molar mass [g/mol] |
|-----------------------|--------------|-----------|-----------------------|
| mesosulfuron-methyl * | \$ °>√ 109.7 | | 503.5 |

Findings:

The maximum PECs values for nesoculturors methyl are summarised in the Table 9.4- 4. The maximum, short-term and long-term PEC soil values and the time weighted average values (TWAC soil) are provided thereafter (Table \$4-5).

Maximum PEC soil of mesosulfur of methol for the uses assessed

| ~ | | 70 |
|---------------------|--|--|
| Use partern | Winter cervals | Winter cereals |
| « 🦤 | 1/3 15 g & ./ha, 50% interception | 1×6 g a.s./ha, 50% interception |
| | Winter cereals Winter certains 15 g s. //ha, 50% interception //www.frage.com/ | [mg/kg] |
| mesosulfuron-methy | × .×0.010 , | 0.004 |
| mesosulfuron-metary | | |



Table 9.4- 5: PEC_{soil} (actual) and TWAC_{soil} of mesosulfuron-methyl

| | | Mesosulfuron-methyl | | | | | |
|------------|--------|--------------------------|------------------|---------------------------------|---|--|--|
| | Time | Winter | cereals | Winter cereals | | | |
| | [days] | 1×15 g a.s./ha, | 50% interception | ion 1 × 6 g a.s@na, 50% interce | | | |
| | | PECsoil | TWACsoil | PEC | TWACsod | | |
| | | [mg/kg] | [mg/kg] | [mg/kg] | | | |
| Initial | 0 | 0.010 | - | £0 7 0 704 | | | |
| | 1 | 0.010 | 0.000 | 0.004 | √ 2,004 √ √ √ √ √ √ √ √ √ √ √ √ √ | | |
| Short term | 2 | 0.010 | 0.010 | 0.004 | 9 0.004~ | | |
| | 4 | 0.010 | \$0.010 | 0.004 × | 0.004 | | |
| | 7 | 0.010 | <u>3</u> 0.010 | 0.004 | . 0. 00 4 C | | |
| | 14 | 0.009 | 0.010 × | 0.004 | Ø.004 👸 | | |
| | 21 | 0.009 | 0,009 | ~ 0.004 ~ | . ₹ 0.00 4 © | | |
| Long term | 28 | 0.008 | (20.009 T | 0.903 | [∞] 0.004 | | |
| | 42 | 0.008 | 0.009 | 8 .003 0 | √ 0÷ 0 04 ° | | |
| | 50 | 0.007 | Q Q Q Q Q | ∢ 0.00€> | ©.003 © | | |
| | 100 | 0.006 | √ | \$\tag{\pi} 0.0\text{0}2 \times | 0.003 | | |

Potential accumulation in soil:

The accumulation potential after long term use for measulfus n-methyl was also assessed. The results for a standard mixing depth of Jem are presented in Table 9.4-6.2

Table 9.4- 6: PEC_{soil} of mesosulfuron-methyl for the uses assessed, taking the effect of accumulation into account (standard mixing depth of 5 cm)

| Use Partern | Mesosulfuron-methyl |
|-------------------------------------|-----------------------------|
| | BEC _{soil} [mg/kg] |
| Winter cerears | platean 0.001 |
| 1 × 15 g a. Tha, 50% interception | |
| Winter cereals. | V Mateau C 0.001 |
| 1 × 6 🗞 a.s./ha, 50% interception 🔍 | %total*♥ 0.004 |

^{*} total = plateau (backgroun Concentration after multi-year use) + max PEC_{soji} (see Table 9.4-4)

Alternative PECsoil simulation using RMS requested modelling parameters:

| Report: | ÿ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; |
|--------------|--|
| Title: | Mesosulforon-methyl (MSM) and metabolites: PECsoil EUR - Use in winter cereals |
| Title. | Ling Europe |
| Report No: | EnSa415-0310 |
| Document No: | M-57/446-01-1 Q S |
| Guidelines: | not applicable; pot applicable |
| GLP/GEP: | <mark>no</mark> Ø S Q |

The document reports an alternative calculation of predicted environmental concentrations in soil, following the methodology presented under KIIIA 9.4/01, but based on a set of kinetic input parameters selected by the RMS.

Methods and Materials: reference is made to KIIIA 9.4/01, see summary before.



Table 9.4-7: Application pattern used for PEC_{soil} calculations of mesosulfuron-methyl

| | | | Applic | <mark>ation</mark> | | Amount reaching | |
|--|----------------|--------------|----------|--------------------|--------------------|-----------------|--|
| Individual | FOCUS crop | Rate | Interval | Plant | BBCH | soil per season | |
| crop | used for | per season | | interception | Stage | application (| |
| | interception | [g a.s. /ha] | [days] | [%] | Stage | g a.s./hat | |
| Winter wheat GAP & Simulation | winter cereals | 1 × 15 | - | 20 | 20-32 | . 1200 x | |
| Winter rye GAP & Simulation | winter cereals | 1 × 6 | | 20 | 20-32 _@ | 4.8 | |
| | | | | Q o. | | | |
| Substance Specific | | 4 . | , co | | | | |
| Table 9.4-8: Input parameters of mesosulfuron-methyl for PECsoil | | | | | | | |
| Compound Dates Max. occur. in soil Molar mass | | | | | | | |

Substance Specific Parameters:

Table 9.4-8: Input parameters of mesosulfuron-methyl for PECs

| | * | 0 20 | | |
|---------------------|------------------|-----------|-------------|--------------|
| Compound | DA ₅₀ | Max. veci | ır. in soil | Molar mass (|
| | | | | y Jg/moll |
| mesosulfuron-methyl | 6 155 × 5 | | | © 503.5 |

Findings:

Table 9.4- 9: Maximum PECsoil of mesosuffuron methyl for the uses assessed

| Use pattern | Winter ceres | Wife Wife | ter cereals a, 20% interception |
|-------------------|--------------|-----------|------------------------------------|
| | y (mg/kg) | | mg/kg] |
| mesosulfuron-meth | 0,016 | | 0.006 |

Table 9.4- 10: PEC (actual) and PWAC of mesosulfuron-methyl

| | <i>(</i> 0° × × × × × × × × × × × × × × × × × × × | <u> </u> | Megosulfu | 4 i | |
|--------------|---|---|--------------------------|----------------------------|------------------|
| | <u>~</u> | Winter 1 × 15 g a Cha, | , Mesosulfu | | |
| | Time | 🖇 💸 Winter | cereals | Winter | cereals |
| ⟨ ♥′ | days] | ¹ 1 ≯ 15 g a √ ha, | cereals 20% interception | 1×6 g a.s./ha, 20 | 0% interception |
| | | PEC. | | PECsoil | TWAC soil |
| | Tirûe karysi | | mg/kat | [mg/kg] | [mg/kg] |
| Initial @ | | 1 × 15 g a × 7ha, PE € 4 g g g g g g g g g g g g g g g g g g | | 0.006 | _ |
| Initial Q | | ~~ <mark>0.016</mark> ~ | 0.016 | 0.006 | 0.006 |
| Short term 3 | | | 0.016 0.016 | 0.006 | 0.006 |
| | 4 €0 | 0016 | 0.016 | 0.006 | 0.006 |
| | ~ 7 | [♥] ~ 0.016 € | 0.016 | 0.006 | 0.006 |
| 4 | √14 Å | 、% ['] 0.01 % ' | 0.016 | 0.006 | 0.006 |
| ~ | | 0.010 | 0.015 | 0.006 | 0.006 |
| Long term | 28 28 | 6014 | 0.015 | 0.006 | 0.006 |
| | | 0.013 | 0.015 | 0.005 | 0.006 |
| | 50 | 0.01 | 0.014 | 0.005 | 0.006 |
| | 28 28 242 2 50 3 108 | ©10.0 © | 0.013 | 0.004 | 0.005 |
| Long term | 7 50 5 108 T | | | | |
| | | | | | |
| | "O" | | | | |
| , O. | • | | | | |
| Ö | | | | | |
| | | | | | |

Potential accumulation in soil:

Table 9.4-11: PEC_{soil} of mesosulfuron-methyl for the uses assessed, taking the effect of accumulation into account (standard mixing depth of 5 cm)

| Use Pattern | PECsoil | Mesosuffuron-methyl (*) |
|------------------------------------|-----------|--|
| Winter cereals | plateau | <u>, </u> |
| 1 × 15 g a.s./ha, 20% interception | total* 🚕 | 0.020 |
| Winter cereals | plateau 😴 | 0.002 |
| 1 × 6 g a.s./ha, 20% interception | total* * | 0.00% 3 2 2 |

anitial PECs values

...ase refer to point IIIA 9.4.

IIIA 9.4.2 Short-term PECs values if -4 days after last application

Please refer to point IIIA 9.4.

IIIA 9.4.3 Long-term PECs values (from \$\pi\$-100 days after last application)

Please refer to point IIIA 9.4.

IIIA 9.5 Predicted Environmental Concentrations in Soil (PECs) for Relevant Metabolites

Endpoints for PEC_{soil}

Table 9.5-1: Comparison of EU proposed endpoints and modelling input parameters for mesosulturonmethyl metabolites

| End-Point | Active substance: presosulfuron-methyl |
|---|---|
| 2 | Proposed EU endpoints Value used for modelling |
| | Proposed EU endpoints Value used for modelling [Document N2] |
| AE F154851 | 64.3 |
| DT ₅₀ soil [days]* | 64.3 |
| Maximum occurrence in soil [%]** | % 16@ 5 16.2 V |
| AE F160459 | (4.5 (4.5 (4.5 (4.5 (4.5 (4.5 (4.5 (4.5 |
| DT ₅₀ soil [days]* | \$64.3 \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ |
| Maximum occurrence in soil [%]** | |
| AE F099095 | |
| DT ₅₀ soil [days]* | |
| Maximum occurrence in soil [%]** | 29.2 |
| AE F092944 Q' | |
| DT ₅₀ soil [days]* | 60,4 70.1 V 0 0 60,4 |
| Maximum occurrence in son [%]. | ¥ _{≈0} , 190.1 ⁴ √ ₂₀ , ⁴ √ 100.1 |
| AE F160460 | 44.2 44.2 44.2 8.6 |
| DT ₅₀ soil [days]* | 44.2 |
| Maximum occurrence in soil [%]** | * \$ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |
| Maximum occurrence in soil [%]* AE F140584 | |
| $D1_{50}$ Soll $ aavs ^*$ | Ø \$ 7.12 0 7.1 |
| Maximum occurrer in sof √[%]*** | |
| AE F147447 | 337 6.5 6.5 6.5 |
| DT ₅₀ soil [days P | 337 |
| Maximum occurrence in soik[%]** | 6.5 6.5 |

^{*} Table CA₈7 © 2.1.1-1

According to the definition of residue relevant for soil risk assessment, the following degradates were considered for PECsoil calculation: AE F154851, AE F160459, AE F099095, AE F092944, AE F160460, AE F140584 and AE F144472

| Report: | ©;;;;20,140,M-481618-01 |
|--------------|--|
| Title; 🗸 🗸 | Messalfuron-methy (MSA) and metabolites: PECsoil EUR - Use in winter cereals |
| | in Original in Ori |
| Report No: | EnSa-14-0226 |
| Document No: | M-480518-018-1 |
| Guidelines: | not applicable;not applicable |
| GLP/GEP | nò S |

Methods and Materials: PEC_{soil} for the metabolites were calculated using the approach, scenarios and application rates described for the calculations for the parent compound in Point 9.4. Compound specific parameters are summarised in Table 9.5-2.

^{**} Table 7.1.1.1-1



Table 9.5-2: Input parameters for PEC_{soil} for metabolites of mesosulfuron-methyl

| Compound | DT 50 | Max. occur. in soil* | Molar mass | Molar mass correction | Amount read season ap | ching soil per j oplication 0 |
|------------|--------|-------------------------|---------------|-----------------------|--------------------------|----------------------------------|
| | [days] | [%] | [g/mol] | factor | 15@a.s./ha | 6 g/a.s./ha |
| AE F154851 | 64.3 | 16.2 | 489.5 | 0.9722 | 1.18 | ♥ 0.47♥ |
| AE F160459 | 130 | 8.9 | 489.5 | 0.9722 | 0.65 | C 0.28 2 |
| AE F099095 | 234 | 29.2 | 198.2 | 0.3936 | 0.86 | Q 34 V |
| AE F092944 | 60.4 | 10.1 | 155.2 🖔 | 0.3082 | 0.23 👟 | ~~~0.09 °~ |
| AE F160460 | 44.2 | 8.6 | 475.5 | 0.9445 | 0.6 | \$\text{0.24} |
| AE F140584 | 7.1 | 7.1 | 32 2 A | 0.6403 | 0:34 | 934 (|
| AE F147447 | 337 | 6.5 | 2 90.3 | Q 5 ,766 | £0.28 g | Ø.11 "©" |

Findings: The maximum PEC_{soil} values for mesosulfuron-methyl metabolites are summarised in Table 9.5-3. The maximum, short-term and long-term PEC_{soil} values and the time weighted average values (TWAC_{soil}) are provided thereafter.

Table 9.5-3: Maximum PECsoil of metabolites of mesosulfuron-metayl for the uses assessed

| Use pattern | Winter cereals Winter cereals 1 × 1 to a.s./ha, 50% interception 1 × 6 g g/s/ha, 50% interception |
|-------------|---|
| | 1 × 150 a.s./ha, 50% interception 4 6 g a s./ha, 50% interception |
| | mg/kg/ A P [mg/kg], |
| AE F154851 | |
| AE F160459 | |
| AE F099095 | |
| AE F092944 | ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ |
| AE F160460 | <0.001 |
| AE F140584 | |
| AE F147447 | 0.001 |

Table 9.5-4: PEC (actual) and TWAC soil of mesosulfuron-methyl metabolite AE F154851

| <u> </u> | | | | | |
|----------------|-----------------|--|----------------|-----------------------------|-----------------|
| | | Winter | AE FL | 5 4851 | |
| | | Winter 🔍 | codeals 🎺 👢 🔘 | | cereals |
| | | 1 1 1 € 15 g a⊙/ha, 5 | coeals V O | 1×6 g a.s./ha, 5 | 0% interception |
| | Time (days) | PEC%il O | TWAGsoil | PEC soil | TWACsoil |
| | | [mg/kg] | [mg/kg] | [mg/kg] | [mg/kg] |
| Initial @ | (O) (C) | √ %.002 © ° . | ©, <i>©</i> , | < 0.001 | - |
| | | ~ 0 00a × a | % .002 | < 0.001 | < 0.001 |
| Short term | 2. | \$ 0,002 \$ | 2 0.002 | < 0.001 | < 0.001 |
| Short term | s.4Q 4 | Q 0.002 S | > 0.002 | < 0.001 | < 0.001 |
| , W | | 0.001 % 0.000 % | 0.002 | < 0.001 | < 0.001 |
| | 14 21 | 0.000 🛇 | 0.001 | < 0.001 | < 0.001 |
| • | 21"0" | 0,001 L | 0.001 | < 0.001 | < 0.001 |
| Long term | 28 Q | . [™] ≈ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ | 0.001 | < 0.001 | < 0.001 |
| Q ^v | 42 | 0.00 | 0.001 | < 0.001 | < 0.001 |
| L. | S 50,0° | <0.991 | 0.001 | < 0.001 | < 0.001 |
| | 42 50 100 | <0.001 | < 0.001 | < 0.001 | < 0.001 |
| Long term | | ÿ | | | |

Table 9.5-5: PEC_{soil} (actual) and TWAC_{soil} of of mesosulfuron-methyl metabolite AE F160459

| | | | AE F1 | 60459 | |
|------------|--------|--------------------------|-----------------------|-------------------------|-------------------------|
| | | Winte | r cereals | | cereals 🏈 🔗 |
| | | 1×15 g a.s./ha, | 50% interception | 1 × 6 g a.s@na, 5 | 0% interception |
| | Time | PECsoil | TWACsoil | PEC | TWACsoil |
| | [days] | [mg/kg] | [mg/kg] | [mg/kg] | mg/kg) |
| Initial | 0 | < 0.001 | - | Ø .001 | |
| | 1 | < 0.001 | <0.001 | ≈ 0.001 | |
| Short term | 2 | < 0.001 | <0.001 | <0.001 | \$\text{90.00} \text{1} |
| | 4 | < 0.001 | № 0.001 | | ~<0.0¢% (|
| | 7 | < 0.001 | △0.001 | <0.001 | ~<0@01 _@" |
| | 14 | < 0.001 | © ^y <0.001 | | S0.001 € |
| | 21 | < 0.001 | < 0.001 | <0.001 | √×0.00 1 √ |
| Long term | 28 | <0.001 | 20.001 | € 20 .001 € | [∞] <0.001 |
| | 42 | <0.001 | « < 0.0 0 1 | ≈ 0.001 © | < 0 €001 ° |
| | 50 | <0.001 | © <0.901 ° | 4 0.000 | Ø.001 Ø |
| | 100 | <0.001 | % 0.001, O | <0.001 & | <0.000 |

Table 9.5-6: PECsoil (actual) and TWAC for of mesosulfuron-methyl metabolice AE 1099095

| Initial | Time [dayš] | OIECON | cercolls 50% interception TWACsoil | Winter 1 6 g ass./ha, 5 PECkoil [ang/kg] | cereals % interception TWAC _{soil} |
|------------|---|---|------------------------------------|---|---|
| Tuitial | [dav&kař | OIECON | 50% interception TWACsoil | 1 6 g as /ha, 5 | 0% interception |
| Luizial | [dav&kař | OIECON | TWACsoil | PECsoil Q | TWACsoil |
| Taitial | [dav&kař | r 60 1 🛝 | | | - 5011 |
| Luitial | 1 0 10 | [mg/kg] | | | [mg/kg] |
| initiai | 2 4 | (*) 0 (20001 (*) | ₩ | (<0.001 [©]) | - |
| | | 0.001 | \$ 0.0 01 | 0.00 | < 0.001 |
| Short term | 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 | , Ø 0.0 0 ₽ | 0.001 0.001 0.001 | < 0,001 | < 0.001 |
| | 4 | 0.001 | *\sqrt{0.001}\sqrt{\qquad} | 9.001 | < 0.001 |
| <u>_</u> C | | 0 .001, % | 0.001 | 0.001 | < 0.001 |
| | ∂ 14 ✓ | 0.001 | © 0,5001 O | <0.001<0.001<0.001 | < 0.001 |
| , Q | 21 | 0.001 | (0.001 ₀ | © <0.001 | < 0.001 |
| Long term | 28 | © 0.001 | 0.001 | <0.001 | < 0.001 |
| | \$42 | 0.001 | 0.001 | < 0.001 | < 0.001 |
| | 50 4 | <u>~~~0.00</u> ₩ × | y' *0 .001 ≥ | < 0.001 | < 0.001 |
| | 100 | <0.001 | ≪0.00 % | < 0.001 | < 0.001 |
| | | 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.0001 | | | |



Table 9.5-7: PEC_{soil} (actual) and TWAC_{soil} of of mesosulfuron-methyl metabolite AE F092944

| | | AE F092944 | | | | |
|------------|--------|--------------------------|---------------------|-------------------------------------|---------------------|--|
| | | Winter | r cereals | | cereals | |
| | | 1×15 g a.s./ha, | 50% interception | 1 × 6 g a.s@na, 5 | 0% interception | |
| | Time | PECsoil | TWACsoil | PEC | TWACsod | |
| | [days] | [mg/kg] | [mg/kg] | [mg/kg] | mg/kg) | |
| Initial | 0 | < 0.001 | - | © .001 | | |
| | 1 | < 0.001 | <0.001 | ≈ 0.001 | | |
| Short term | 2 | < 0.001 | <0.001 | <0.001 | ₹ %0.001£j [. | |
| | 4 | < 0.001 | \$ 0.001 | [O [▼] <0.001 👟 | ~<0.0 % (| |
| | 7 | < 0.001 | <u></u> | > <0.001 _€ | ~<0@01 _@* | |
| | 14 | < 0.001 | <0.001 _∞ | $\mathcal{Q} < 0.00 \mathbb{Q}^{7}$ | S0.001 € | |
| | 21 | < 0.001 | < 0.001 | <0.001 | . ≪₹0.00 1 € | |
| Long term | 28 | < 0.001 | ©0.001 | ₹ \$ 9 ,001 ₹ | [∞] <0.001 | |
| | 42 | <0.001 | « < 0.001 | ≈ 0.001 ° | <0.001 ° | |
| | 50 | <0.001 | <i>\$</i> 0.901 ₹ | 4 | Ø.001 Ø | |
| | 100 | <0.001 | % 0.001,0 | <0.001 & | <0.000 | |

Table 9.5-8: PEC_{soil} (actual) and TWAC of of mesosulfuron-methyl-metabolic AE 1960460

| Initial Short term Long term | Time (days) | [mg/kg] | | [mg/kg] | rereals 'miterception TWACsoil [mg/kg] <0.001 <0.001 |
|------------------------------|---|--|--|------------------|--|
| Initial Short term Long term | [days]/y | [mg/kg] | mg/kg | [mg/kg] | b% interception TWAC _{soil} [mg/kg] - <0.001 |
| Initial Short term Long term | [days]/y | [mg/kg] | mg/kg | [mg/kg] | [mg/kg] - <0.001 |
| Initial Short term Long term | [days]/y | | | 1,08 81 | <0.001 |
| Initial Short term Long term | 2 4 4 2 21 4 21 4 4 4 4 4 4 4 4 4 4 4 4 | | \$\\ \frac{\cdot 0.001}{\cdot 0.001}\\ \cdot \cdot \cdot 0.001\\ \cdot \cdot \cdot \cdot 0.001\\ \cdot | | |
| Short term Long term | 2 4 5 2 5 4 5 7 4 5 7 4 5 7 4 5 7 5 7 5 7 5 7 5 | \$0.00\(\begin{array}{c} \cdot | \$\frac{\cdot 0.001}{\cdot 0.001}\$\tag{\cdot 0.001}\$ | <0.001 | |
| Short term Long term | 2 4 4 2 1 21 | <0.001 <0.001 | \$0.001, © \$<0.001 | < 0.001 | <0.001 |
| Long term | 74 2 21 | <0.001 × (0.001 × (0.001) | *\foots\(\sigma\) \(\sigma\) \(\sigma\) | W 80 001 | |
| Long term | 74 V | \$\\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | .0.001 | y √ 9.001 | < 0.001 |
| Long term | 21 | | % <0.001 %. | 0.001 | < 0.001 |
| Long term | 21. | <0.001% | © 2001 0° | © <0.001 | < 0.001 |
| Long term | 21/ | <0.001 | (@0.00 <u>1</u> | <0.001 | < 0.001 |
| | 28 | > < 6. 9001 | <0.001 | < 0.001 | < 0.001 |
| ** | \$42 \$\frac{1}{2} | <0.001 | <0.001 | < 0.001 | < 0.001 |
| _ | 50 4 | ~<0.00Ψ × | j. \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | < 0.001 | < 0.001 |
| | 100 | © <0.0001 <u>"</u> | ≪0.00 % | < 0.001 | < 0.001 |
| | | | 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 | | |

Table 9.5-9: PEC_{soil} (actual) and TWAC_{soil} of of mesosulfuron-methyl metabolite AE F140584

| | | | AE F1 | 40584 | |
|------------|--------|--|-------------------------|---------------------------------|-----------------|
| | | Winter | cereals | | cereals |
| | | 1×15 g a.s./ha, $\frac{4}{5}$ | 50% interception | 1 × 6 g a.s@na, 5 | 0% interception |
| | Time | PECsoil | TWACsoil | PEC | TWACsod |
| | [days] | [mg/kg] | [mg/kg] | [mg/kg] | /mg/kg |
| Initial | 0 | < 0.001 | - | ₹ 0.001 | |
| | 1 | < 0.001 | <0.001 | ≈ 40.001 | |
| Short term | 2 | < 0.001 | < 0.001 | <0.001 | Ø0.001 |
| | 4 | < 0.001 | \$ 0.001 | [O [▼] <0.001 👟 | ~~<0.0 % |
| | 7 | < 0.001 | <u></u> | > <0.001 € | ~<0@01 _@" |
| | 14 | < 0.001 | ∞ ^y <0.001 ~ | $\mathcal{Q} < 0.00 \mathbb{Q}$ | 50.001 € |
| | 21 | < 0.001 | <0.001 | <0.001 | ××0.0040 |
| Long term | 28 | <0.001 | ©0.001 | ₹ \$ 9 .001 € | °> <0.001 |
| | 42 | <0.001 | « √ < 0.0 0 /1 | % 0.001 % | <0.001 ° |
| | 50 | <0.001 | Q.901 Q | <0.000b | Ø.001 Ø |
| | 100 | <0.0000 | √ % 001,© | <0.001 & | <0.00 |

Table 9.5-10: PECsoil (actual) and TWACso of of mesosulfuron methyl metabolite AE 1947447

| | | | ASE F1 | A7447 | <i>"</i> |
|------------|--------------------------|------------------------|--|---------------------|-----------------|
| | , | Winter Winter | | D' Waston | cereals |
| | ≪ | √ 1 × 15 g a.s. ma, : | 50% interception | 1 6 g æs./ha, 5 | 0% interception |
| | Time [day§]√ | OPEC. | TWACsoil | PECsoil S | TWACsoil |
| | [days̃] _≫ " | [mg/kg] | /mg/kg | [ang/kg] | [mg/kg] |
| Initial | W | © 0001 © | | <0.001 [©] | - |
| | | (\$0.00 kg) | \$ <0.001 | © < 0.0 Q 1 | < 0.001 |
| Short term | 2 & | ~ (0. 00 | 0.001. © | <0.001 | < 0.001 |
| | 4 | <0.001 | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | 9 .001 | < 0.001 |
| | | \$9 .001, % | <0.001 | 0.001 | < 0.001 |
| | ₩4 V | ~100.0° × × | © 20±001 © | <0.001 | < 0.001 |
| Long term | 21, | 2 < 0.0 0 1 | | < 0.001 | < 0.001 |
| Long term | 28 | © < 6 001 | <0.00 \\ \frac{1}{2} \qq | < 0.001 | < 0.001 |
| | ~ \$\frac{42}{2} \times | ∅<0.001 _© ° | <0.001 | < 0.001 | < 0.001 |
| | \$50 | | √ 💹 .001 🕮 🗀 💮 | < 0.001 | < 0.001 |
| | 100 | 2 <0.001 | 0.00 | < 0.001 | < 0.001 |

Potential accomulation in soil:

The accumulation potential after long form use was also assessed for mesosulfuron-methyl metabolites having the longest maximum DT₅₀, AE F-00459 AE F099095 and AE F147447. The results for a standard mixing depth of 5cm are presented in Table 9.5-11.

Table 9.5-11: PEC of of me osulfuron-methyl metabolites for the uses assessed, taking the effect of account at a mixing depth of 5 cm)

| Use Pattern | PECsoil | AE F160459 | AE F099095 | AE F147447 |
|-------------------------------------|-----------------|------------|------------|------------|
| Use rattern | FEC soil | [mg/kg] | [mg/kg] | [mg/kg] |
| Wigner cereals . V | plateau | < 0.001 | < 0.001 | < 0.001 |
| 1 x \$15 g a.s ha, 50% interseption | total* | 0.001 | 0.002 | 0.001 |
| Winter cereals | plateau | < 0.001 | < 0.001 | < 0.001 |
| 1 × 6@a.s./ha, 50% interception | total* | < 0.001 | < 0.001 | < 0.001 |

^{*} total = plateau (background concentration after multi-year use) + max. PEC_{soil} (see Table 9.5-3)



Alternative PECsoil simulation using RMS requested modelling parameters:

| Report: | | 15;M-517446-01 | | ¥ | |
|--------------|--------------------------------|-----------------|---------------|---------------|----------|
| Title: | Mesosulfuron-methyl (MSM) a | nd metabolites: | PECsoil EUR 🖓 | Jse in winter | rcereals |
| | in Europe | | | \sim | |
| Report No: | EnSa-15-0310 | | | | |
| Document No: | M-517446-01-1 | ĈA | | 4 1 | |
| Guidelines: | not applicable; not applicable | | W' | ک م | |
| GLP/GEP: | no no | | ő | 400 | |

The document reports an alternative calculation of predicted environmental concentrations in soil, following the methodology presented under KIII 9.5/01 before but applying a set of modelling. following the methodology presented under KIIIA 9.5/01 before, but applying a set of modelling pre to the second secon parameters requested by the RMS.

Methods and Materials: reference is made to M

Substance Specific Parameters

Input parameters for REC soil for metabolites of mesosplfuron-metho **Table 9.5- 12:**

| Compound | DT ₅₀ | Max. occur. | Molar mass | Molar mass | | ching soil per |
|------------|------------------------------|---------------------------|---------------------------|--------------------------|---------------------|----------------|
| | [days] | 1% | [g@mol] | factor & | 15 % a.s./ha | 6 g a.s./ha |
| AE F154851 | 207.4 | ₹16.2 | ¥89.5, × | 0 .972 2 √ | °≥ 1.89 | 0.76 |
| AE F160459 | 2144.8 | 8.9 | \$\$ <mark>489.5</mark> ₹ | a, 0.9722 | 1.04 | 0.42 |
| AE F099095 | \$\$ <mark>2,6}\$</mark> ₹ ? | 😽 29 2 ~ | × × × × × × × | | 1.38 | 0.55 |
| AE F092944 | ÿ <mark>82.7</mark> ∜ | ′ | ₹ 5.2 ≈ | 3082 | 0.37 | 0.15 |
| AE F160460 | 44.2 | © 8.6 & 0 | 475.50° | 3 0.9444 | 0.97 | 0.39 |
| AE F140584 | © 15.1 V | & 7.1 & | % 32 2 ₹ | 0.6403 | 0.55 | 0.22 |
| AE F147477 | 833/1 | e i <mark>gojo</mark> r i | ^{290.3} © | 2 Q. \$7 66 | 0.45 | 0.18 |

Findings:

Table 9.5-13: Maximum PEC Fof metabolites of mesosulfuron-methyl for the uses assessed

| Use pattern Winter cereals Vive a.s. Adv. 20% interception | Winter cereals 1×6 g a.s./ha, 20% interception |
|---|---|
| A Ping/kg C | [mg/kg] |
| | 0.001 |
| AE F154\$51 AE F160459 AE F160459 AE F160459 AE F160459 | <0.001 |
| AE F160459 AE F099095 AE F092944 AE F160460 AE F140584 AE F14744 AE F14744 AE F14744 AE F160460 AE F14744 AE F1474 AE F1474 | <0.001 |
| AE F092944 | <0.001 |
| AE F160460 | <0.001 |
| AE F1405840 | <0.001 |
| AE F14744 ⁸ | <0.001 |
| AE F1403840 | |

Table 9.5-14: PECsoil (actual) and TWACsoil of mesosulfuron-methyl metabolite AE F154851

| | | | AE F1 | 154851 | |
|----------------|-----------------|--------------------------|---|------------------------|-------------------------|
| | | Winte | r cereals | Winte | er cereals |
| | | 1×15 g a.s./ha, | 20% interception | 1 × 6 g a.s@na, | 20% interception |
| | Time | PEC soil | TWAC soil | PEC | TWACsoa |
| | [days] | [mg/kg] | [mg/kg] | [mg/kg] | mg/kg |
| Initial | 0 | 0.003 | | ×0.001 | |
| | 1 | 0.003 | 0.003 | 0.001 | X 4001 \$ |
| Short term | <mark>2</mark> | 0.003 | 0.003 | 0.001 | y <mark>90.001</mark> % |
| | <mark>4</mark> | 0.002 | √ 0.003 | (0.001 × | 0.000 |
| | <mark>7</mark> | 0.002 | <u>J</u> 0.002 | ∑ <u><0.001</u> | < 00001 © " |
| | <mark>14</mark> | 0.002 | 0.002 | <i>@</i> | € 0.001 |
| | <mark>21</mark> | 0.002 | 0.002 | ~ <0,001 ~ | |
| Long term | <mark>28</mark> | 0.002 | 20.002 | € <mark>\$9.001</mark> | < 0.001 × < 0.001 |
| | <mark>42</mark> | 0.002 | %\1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | 6.001 | < 0. 001 ° |
| | <mark>50</mark> | 0.002 | , © 002 ° ° | 4 0.000 | ©.001 © Y |
| | 100 | 0.002 | 9 .002 | <0.901 < | √ < 0.0 0 |

Table 9.5-15: PECsoil (actual) and TWAC of of incresosulturon-methylanetabolite AE 1060459

| Time | | | | Q | | 2- | | | <u>~~</u> _ | - \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ |
|--|--|------------|--|-----------------------|--------------------|-----------------|-----------------------------------|----------|-------------|---|
| | | | | 7, | | | <u> </u> | 60459 | | , |
| | | | | | Winter | cer@als | | | Konter c | e y eals |
| | | | | ୬ <mark>1 %</mark> 15 | g a.s./ha, | 20% into | ercéption 🤎 | 1 | s./ha, 20⁴ | % interception |
| 0.001 | 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 | | Time 🉈 | \bigcirc 11 | EC _{soil} | V TV | AC _{soil} | PE Csoi | , Ò | |
| 0.001 | 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 | | days | . [m | g/kgl & | An An | ng/k g ∮∞ | W Img/kg | | |
| 0.001 | 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 | Initial | . <mark>0</mark> . | | 801 O | | | -0.001 | | |
| 0.001 | 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 | - IIIIII | | | 001 | (A) | γ <mark>οδ1</mark> Ο ^ν | <0.001 | | < 0.001 |
| 0.001 | 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 | Short term | 2 2 x | A 50 | <u>001</u> (//) | | 7001 @n | | | |
| Complete | 14 0.00 | Short term | 1 O | | 00 V | | 0.001 | 2001 | | |
| Long term, 28 0.001 0.00 | Long term () | | | \(\frac{1}{8}\) | 001 | | 001 | 0.001 | | |
| Long term 1 | Long term 21 | | | | 2001 | | 001 | 0.001 | | |
| Long term 28 | 28, C 9601 C 0.001 C 0 | | 21 | | .001 V | | 001 | <0.001 | | |
| Section Sect | Comparison Com | | 21 | | OUL P | , "4 | 0.001 | <0.001 | | |
| | | Long term | 28, a | Ç V | (901 ° | | | <0.001 | | |
| | | Ky' | ,42 | /) 0 | .001 🔊 " | | 0.001 | < 0.001 | | |
| | | | <u>≈</u> 0 50 √ ° | 0 | 3 QQD. | y' s | k.001 △ | < 0.001 | | |
| | | | 2 100 100 100 100 100 100 100 100 100 10 | <i>©</i> ' <(| 1 <u>0</u> 01 20 | ř V | 0.002 | < 0.001 | | < 0.001 |
| | | | | | | | · | | | |

Table 9.5-16: PECsoil (actual) and TWACsoil of of mesosulfuron-methyl metabolite AE F099095

| | | | AE F099095 | | | | | | |
|----------------|-----------------|-----------------|------------------|------------------------------|----------------------|--|--|--|--|
| | | Winte | r cereals | Winte | r cereals | | | | |
| | | | 20% interception | 1 × 6 g a.s@na, | 20% interception | | | | |
| | Time | PEC soil | TWAC soil | PEC | TWACsort | | | | |
| | [days] | [mg/kg] | [mg/kg] | [mg/kg] | /mg/kg | | | | |
| Initial | 0 | 0.002 | | 40. 001 | | | | | |
| | 1 | 0.002 | 0.002 | ≈ 0.001 | ₹0,001 \$ | | | | |
| Short term | <mark>2</mark> | 0.002 | 0.002 | | , | | | | |
| | <mark>4</mark> | 0.002 | № 0.002 | _O [▼] <0.001 < | | | | | |
| | <mark>7</mark> | 0.002 | <u> 3</u> 0.002 | √ < 0.001 √ | | | | | |
| | <mark>14</mark> | 0.002 | 0.002 | ⊘ ,≪0.00₽″, | Ø ≥ 0.001 | | | | |
| | <mark>21</mark> | 0.002 | 1 · 0,002 .40% | <u></u> | <u></u> | | | | |
| Long term | <mark>28</mark> | 0.002 | | | <0.001 | | | | |
| | <mark>42</mark> | 0.002 | % U.U@ | | < 0.001 ° | | | | |
| | <mark>50</mark> | 0.002 🐴 | © 002 Q | . 1 | 9.001 ° | | | | |
| | 100 | 0.001 | √ | Q 901 % | ₹0.000° | | | | |

Table 9.5-17: PECsoil (actual) and TWAC for of mesosulfuron-methylanetabolite AE 1992944

| ı | 1 | Q ' | | - | | | ~ | | <i>-</i> |
|----------------|---|---|-------------|--|----------------|-------------|------------------|------------|-----------------|
| | <u>_</u> | | Vinter cere | | E FO | 92944 | » <u>"</u> |) (| |
| | 4 | V 1 × 15 g a. | Vinter cer | oals 🎺 | | Š Č | Won | ter cereal | s terception |
| | <u> </u> | ″ <mark>1 ≽ 15 g a.</mark> | s∦ha, 20% | intercep | tion | . 30 | varione /ha | i, 20% int | terception |
| | Time [day͡ɤ] √ | ⊘PEC ∞ | | TWAC _s | oil | | EC%oil | . [P] T | WACsoil |
| | [days] | (mg/kg | | /mg/kg |) | | Ecsoil ng/kgl | ,* | mg/kg] |
| Initial | days _y | © 0.001 0.001 0.001 0.001 0.001 | | intercep TWAC, mg/kg | % | | 0.001 | | - |
| | | ₹0.001 | | ≪© √001 | 0 | | 0.001 | | < 0.001 |
| Short term | 2 4 | ~ (0. 96) | , 1 | ₹ 0.001 | @ | ي. < | 2 ,001 | | < 0.001 |
| |) | <0.001 | 7 | 0.001 <0.00 | | | 0.001 | | < 0.001 |
| <u> </u> | 2 4 4 2 | ₩.00 ¥ | , O' J | < 0.001 | | | 0.001 | | < 0.001 |
| O* | 14 | 100.00 | Y , Q | £0 .001 | O [*] | _@ < | 0.001 | | < 0.001 |
| , Q | <u> </u> | <0.001 | | ©0.001 | | જેઁ ≦ | 0.001 | | < 0.001 |
| Long term | 28 × | ₹ 0001 | | > <0. 00 1 | | ĩ < | 0.001 | | < 0.001 |
| | ×42 × 1 | × <0.001 | | <0.001 | | < | 0.001 | | < 0.001 |
| , | 50 5 0 | < 0.004 | | <0.001 <0.001 <0.001 <0.001 | | <u><</u> | 0.001 | | < 0.001 |
| | 7 100 | 6.0001 | 4.0° | ₹0.00 | ۶ | < | 0.001 | | < 0.001 |
| Long term | 21 28 32 30 50 7 100 7 7 7 7 7 7 7 7 7 7 7 7 7 | | | | | | | | |
| | | | | ð | | | | | |
| | »- | | | S | | | | | |
| | | | | , | | | | | |
| 4 n | 7 A | | | | | | | | |
| | | Y Q | | | | | | | |
| @ . \ | · · · · · A | ,U (| 4 | | | | | | |
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| | | | | | | | | | |



Table 9.5-18: PEC_{soil} (actual) and TWAC_{soil} of of mesosulfuron-methyl metabolite AE F160460

| | | | AE F160460 | | | | | | |
|----------------|-----------------|--------------------------|---------------------------------------|---|---------------------------|--|--|--|--|
| | | Winte | r cereals | | r cereals | | | | |
| | | 1×15 g a.s./ha, | 20% interception | 1 × 6 g a.s@na, 2 | 20% interception | | | | |
| | Time | PEC soil | TWAC soil | PEC | TWACson | | | | |
| | [days] | [mg/kg] | [mg/kg] | [mg/kg] | mg/kg | | | | |
| Initial | 0 | 0.001 | | ₹ 0.001 | | | | | |
| | 1 | 0.001 | 0.001 | ≈ ∞0.001 | <u>√</u> 0001 √ | | | | |
| Short term | <mark>2</mark> | 0.001 | 0.001 | <0.001 g | ¥ % <mark>90.001</mark> k | | | | |
| | <mark>4</mark> | 0.001 | √ 0.001 | _O [▼] <0.001 ✓ | 0.00 | | | | |
| | <mark>7</mark> | 0.001 | <u> 3</u> 0.001 4 | 5 ≤ 0.001 1 1 1 1 1 1 1 1 1 1 | <0001 © ^v | | | | |
| | <mark>14</mark> | 0.001 | 0.001 | @ <mark><0.00₽</mark> | © 0.001 g | | | | |
| | 21 | <u>\0.001</u> | 0,001 102 | ~ <0,001 ~ | √ ₹0.00 | | | | |
| Long term | <mark>28</mark> | <0.001 | 8 0.00 1 - | | <0.001 | | | | |
| | <mark>42</mark> | <0.001 | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | | < 0. 001 ° | | | | |
| | 50 | <0.001 | √0,601 ° | . 1 | 9.001 ° | | | | |
| | 100 | <0.001 | 30.001 | | <0.000 | | | | |

Table 9.5- 19: PEC_{soil} (actual) and TWAC of of mesosulfuron-methylanetabolic AE F 40584

| | | - ² | S. Wind | | ØE F | 140584 | | ** |
|----------------|---|----------------------|-----------------------|---|----------------------------|---|------------------------|--------------------------|
| | , |) 1 <u>* 1</u> | | | \$ | 140584 | Winter c | ereals 6 interception |
| | <u></u> | 🥒 <mark>1 🍇 1</mark> | 5 g a. s.∜h a. | , 20% inte | rception/ | . 1 % 6 a a | s./ha, 20 ^t | % interception |
| | Time () [days] | | PEC soil | , 20% inte | ACsoil | PEC% | | TWAC _{soil} |
| T | [days] | 4 1 | mg/kg] (| y Am | g/kg) | 1-08 8 | | [mg/kg] |
| Initial | | √ ¥ | ©.001 © | | 7 01 | | | - -0.001 |
| Short term | 71 ° | | <0.001 _€ / | | 001 @/ | () -0.0 dy | | <0.001 <0.001 |
| Short term | 2 4 2 4 3 4 | (Y | 0.001 0.001 | | .001 © .001 © .001 © | 2 × × × × × × × × × × × × × × × × × × × | | <0.001 |
| | | ~~ | Ø.001 0 | J 4 < 0 | .001 | 0.001 | | < 0.001 |
| 8 | 14 \$ | 9 | 100.0 | | .001 | © <0.001 | | < 0.001 |
| , <i>Q</i>) | <u> </u> | 4 Q | <0.0401 % | 2 0 | .001 | <pre>< 0.001</pre> <pre>< 0.001</pre> <pre>< 0.001</pre> <pre>< 0.001</pre> | | < 0.001 |
| Long term | 28) | S. | £ 901 | _ | .001 | < 0.001 | | < 0.001 |
| Long term | 2 2 | 7) | <0.001 _€ , | , O. <0 | . 0 01 | < 0.001 | | < 0.001 |
| | ₹ 50 ₹ | Q · | <0.00 ⁽¹⁾ | \$\tau' \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | .001 | < 0.001 | | < 0.001 |
| | 100 | | 0.001 | 9 <0 | .00 | < 0.001 | | < 0.001 |
| Q) | |)" (| | . 0 | Ĩ. | | | |
| ~9~ | | | | | | | | |
| | Ö | ,\$9` | | | | | | |
| | | Q . | | | | | | |
| 4 n | | | | | | | | |
| | | | Q ^ | Ş' | | | | |
| C. | 7,1 | | 0 4 | <i>y</i> | | | | |
| Z, | | | * Q | | | | | |
| | | J. | | | | | | |
| F. | | | . 4 | | | | | |
| . 2 | | 0 | | | | | | |
| | | , | | | | | | |
| | | | | | | | | |
| * O | | | | | | | | |
| Long term | 21 28 28 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Table 9.5-20: PEC_{soil} (actual) and TWAC_{soil} of of mesosulfuron-methyl metabolite AE F147447

| | | | <mark>∧ 17 - 17</mark> 1 | 147447 | r cereals |
|----------------|-----------------|-----------------|---------------------------------------|---|--|
| | | ** 7* | | | r careals |
| | | | r cereals | | r cereals |
| | | | 20% interception | | 20% interception |
| | Time | PEC soil | TWAC soil | PEC | TWACsof |
| | [days] | [mg/kg] | [mg/kg] | [mg/kg] | mg/kg) |
| Initial | 0 | < 0.001 | | ₹ 0.001 | |
| | 1 | < 0.001 | <0.001 | ≈ ∞0.001 | ₹0,001 \$\text{\$\sqrt{\cong}\$} |
| Short term | <mark>2</mark> | < 0.001 | < 0.001 | © <0.001 | |
| | 4 | < 0.001 | ≈ \$0.001 | ູດ [▼] <0.001 ≪ັ | (0.0 € |
| | <mark>7</mark> | < 0.001 | <u> 3[©]<0.001</u> | √ < 0.001, | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
| | <mark>14</mark> | < 0.001 | © * <0.001 | % 0.00₽ | 6 0.001 € |
| | 21 | < 0.001 | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | ~ <0,001 ~ | √ × × × 0.00 × × × × × × × × × × × × × × |
| Long term | <mark>28</mark> | <0.001 | 0.001 | £° ≤0001 € | <0.00¶ |
| | 42 | <0.001 | « <0.001 | | < 0.001 ° ° |
| | 50 | <0.001 | . Ø <mark><0.901</mark> ♀ | | 9.001 ° |
| | 100 | <0.001 | √″ % .001 © | \bigcirc | <0.000 |

Potential accumulation in soil:

Triggered by the RMS selection of kinetic input data to PECsol calculation the potential for accumulation in soil is assessed for components AFF154851 ₹ F169459, 🗱 F0999095, and AE F147447.

Table 9.5- 21: PECsoil of mesosulfuron-methyl metabolites for the uses assessed, taking the effect of accumulation into account (standard mixing depth of 5 cm)

| Use Pattern | PEC _{soil} | AE F154851 | AE F 600459 | ^ AE_F099095 | AE F147447 |
|-------------------------------|---------------------|-------------|------------------|--------------------|-------------------|
| ese l'accella | | mg/kg a | | [mg/kg] | [mg/kg] |
| Winter cereals 🔊 | Blatean | Q001 | S<0.00 | <mark>0.001</mark> | 0.002 |
| | C rocar. | · 8 — (b) | 0.002 | 0.003 | 0.002 |
| Winter cereals 1 × 6 gas./ha. | plateau 🖗 | <u> </u> | <0.001 | < 0.001 | < 0.001 |
| 20% interception | total | Q.001 S | <0.001 √0.001 | 0.001 | < 0.001 |

Short-tecm IIIA 9.5.2

See under IIIA

days after last application)

ong-term PECs values (from 7-100 days after last application)

Predicted Environmental Concentrations in Ground Water (PECgw) **IIIA 9.6** EU endpoints for PECgw

| IIIA 9.6 Predicted Environmental Concentrations in Ground Water (PECgw) | | |
|---|--|---|
| EU endpoints for PECgw | | |
| Le chapoints for I Legw | | |
| | | |
| Table 9.6-1: Comparison of propo | sed EU endpoints and modelling input p | arameters for mesosylfuron |
| Table 9.6-1: Comparison of proposed EU endpoints and modelling input parameters for mesosylfuron methyl and its metabolites | | |
| End-point | Active substance: mes | swilfuron-methyl S |
| | Proposed EU endpoints | Value used for prodelling |
| | [Document N2] | |
| Mesosulfuron-methyl | | |
| Aqueous solubility [mg/L] | ¥83 Q 2 | ° 4 (483 ° (° |
| Vapour pressure [Pa] | Ø5 × 10 ⁻¹² | \$\sqrt{30.50} \times \text{10}\sqrt{12} \times\$ |
| DT ₅₀ soil [days] (geomean, lab) | 31.9 | 31 9 |
| K _{oc} / K _{om} [L/kg] (median) | 48/27.8 2 | 48/27.8 |
| 1/n (arith. mean) | 20 .910 0 0 | Ø.910 \$\tag{\circ}\$ |
| Plant uptake factor | | |
| AE F154851 | | |
| Aqueous solubility [mg/L] | 200000 | √ ② 200000 ○ |
| Vapour pressure [Pa] | 0 4 10 × 10 V | Ø × 10€8 |
| DT ₅₀ soil [days] (geomean, lab) | 37.1 | \$\int 37.4\int |
| K _{oc} / K _{om} [L/kg] (arith. mean) | © 68.3 © 9.6 © | 68.3 739.6 |
| 1/n (arith. mean) | 940 | 9 2940 |
| Plant uptake factor | | 0 |
| Formation fraction (arith. mean) | 0.179 | <i>□</i> |
| AE F160459 | | |
| Aqueous solubility [mg/L] | © 0° 25000° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° | 10000 |
| Vapour pressure [Pa] | \$\frac{1}{2}\tag{8.8}\times \frac{10^{-8}}{2}\tag{9.8} | 6.8×10^{-8} |
| DT ₅₀ soil [days] (geomean, tab) | 700 | 70.1 |
| $K_{oc} / K_{om} [L/kg]$ (a) th. mean $1/n$ (arith mean) | 21.8712.6.2 | 21.8 / 12.6 |
| 1/11 (dittil. illedity) | 9.940 | 0.940 |
| Plant uptake factor C | | 0 |
| Formation fraction (arith. mean) 0.094 0.094 | | |
| AE F099095 Aqueon Solubility [mg/] | 190 % | 190 |
| V | \$1.0 · · · 10-5 | 1.9 × 10 ⁻⁵ |
| Vapour pressure [Pa] DT ₅₀ soil [days] (geomean, lab) K _{oc} / K _{om} [L/kg] (arith, mean) | 1.9 × 10 · 2 · 3 · 5 · 6 · 6 · 6 · 6 · 6 · 6 · 6 · 6 · 6 | 87.9 |
| $K_{oc} / K_{om} [L/kg]$ (with mean) | 576/334 | 576 / 334 |
| 1/n (arith. mean) | | 0.840 |
| Plant uptake actor | 0 0.8400 7 | 0.840 |
| Formation fraction (arith. mean) | 0.8400 | 0.076 |
| AE F092044 | | 0.070 |
| Aqueous solubility [ng/L] | 5200 | 5200 |
| Vapour pressure [Pal | 2.6×10^{-2} | 2.6 × 10 ⁻² |
| DT soil [days] (geomean ah) | 60.4 | 60.4 |
| K _{oc} / K _{om} [L/kg] (geometry tab) | 447 / 260 | 447 / 260 |
| 1/n (arith. mean) | 0.72 | 0.72 |
| Plant uptake actor | 0 | 0 |
| Formation Fraction (arith mean) | 0.172 | 0.172 |
| AE F1:00460 | | |
| Aqueous solubility [mg/L] | 100000 | 100000 |
| Vapour pressure [PD] | 5.6×10^{-7} | 5.6×10^{-7} |
| DI ₅₀ soil days] (geomean, lab) | 25.6 | 25.6 |
| K _{oc} / K _{opn} [L/kg] (arith. mean) | 14.1 / 8.2 | 14.1 / 8.2 |
| 1/n (arith. mean) | 0.900 | 0.900 |
| Plant uptake factor | 0 | 0 |

| End-point | Active substance: mesosulfuron-methyl | |
|--|---------------------------------------|---|
| - | Proposed EU endpoints | Value used for modelling |
| | [Document N2] | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ |
| Formation fraction (arith. mean) | 1.000 (from AE F154851) | 1.000 (from AE F13,4851) 10 |
| | 1.000 (from AE F160459) | 1000 (from AE 1460459) |
| AE F140584 | | <i>O'</i> , , , , , , , , , , , , , , , , , , , |
| Aqueous solubility [mg/L] | 100 | A 190 S S |
| Vapour pressure [Pa] | 1.3×10^{-6} | 1,3 × 10 × |
| DT ₅₀ soil [days] (geomean, lab) | 3.6 | 3.6 |
| K _{oc} / K _{om} [L/kg] (default value) | 0.0 / 0.0 | 0.0 0.0 |
| 1/n (default value) | 1,000 | 1:000 |
| Plant uptake factor | | |
| Formation fraction (maximum) | Ø .704 | °0.70 ₽ © |
| AE F147447 | | |
| Aqueous solubility [mg/L] | 150000 🗸 | \$ 150000 |
| Vapour pressure [Pa] | 10×10-0 | " 10 × 10 * ° |
| DT ₅₀ soil [days] (geomean, lab) | 97.7 | 97.28 |
| K _{oc} / K _{om} [L/kg] (arith. mean) | 5.278.0 | 5.2/3.0 |
| 1/n (default value) | 1000 N 1000 | Ç |
| Plant uptake factor | | |
| Formation fraction (maximum) | 0.097 (from AE F140584) | © 0.097 From AF F140584) |

PECgw modelling approach - FQCUSgw scenario simulation

The predicted environmental concentrations in groundwater (PEC_{gw}) for the active substances were calculated using the simulation models PEABL and PELMO following the recommendations of the FOCUS working group on groundwater scenarios

The leaching calculations were run over 26 years, as proposed for pesticides which may be applied every year. The first six years are a warm up' penod; only the last 20 years were considered for the assessment of the leaching potential. The 80th percentile of the average annual groundwater concentrations in the percolate at 1 moreth under a treated plantation were evaluated and were taken as the relevant PEC values. In respect to the assessment of a potential groundwater contamination this shallow depth reflects a worst case. The effective long-term groundwater concentrations will be even lower due to dilution in the groundwater layer.

According to FOCUS, the calculations were conducted based on geomean soil half-lives, referenced to standard temperature and moisture conditions. Crop interception will reduce the amount of a compound reaching the soil and therefore this has been taken into account depending on the growth stage at application. The interception rates follow the FOCUS recommendations.

IIIA 9.6.1 Active substance

For the implementation of the complex soil degradation pathway of mesosulfuron-methyl in the groundwater exposure model PEARL and PELMO, a set of separate simulation runs had to be performed in order to overcome technical limitations of the models¹. The overall groundwater assessment consists of the following three calculations, which are reported in separate documents:

Kinetic evaluation of the soil degradation of mesosulfuron-methyl leads to situation where the sum of formation fractions of all metabolites formed directly from parent is larger than one. This is typical for degradation studies with substances



- 1. FOCUS PEARL with parent and all metabolites, corresponding calculations are presented in KIIIA 9.6.1/01.
- 2. FOCUS PELMO (pathway 1) with parent and metabolites AE F154831, AE F160639. F099095, AE F092944, and AE F160460 (in order to keep sum of formation fractions for metabolites generated from the parent below 1), corresponding calculations are presented KIIIA 9.6.1/02.
- 3. FOCUS PELMO (pathway 2) with parent and metabolites DE F140584 and AE order to address the remaining part of the soil degradation pathway), corres calculations are presented in KIIIA 9.6.1/09.

| Report: | 3; ;2004;M-48/1632-01 |
|--------------------|--|
| Title: | Mesosulfuron-methyl (MSM) and metabolites PECgwFOCUS PEARL EUR |
| | (combination) - Use in winter cereals in Europe |
| Report No: | EnSa-14-0363 |
| Document No: | M-481632-01-1 |
| Guidelines: | not applicable of applicable of a policies o |
| GLP/GEP: | |

undergoing cleavage since the (A) distribution of the applied radio Whow of molar equivalents) in time and not the mass flow is observed and kinetically evaluated.

In PELMO, reaction-specific DT5 Pi.e., for the respective parent-metabolite pair) are calculated based on the DT50 of the

parent and formation fraction of the respective metabolite. The process is as follows

- calculate parent rate constant from k(par) = ln(2) / DT50(par)

- calculate pathway rate constant with the formation of the respective metabolite from k(par-met) = k(par) * ff(met)

repeat previous

It is apparent that if sum of all formation fractions is (let's denote it +x) then the sum of parent rate constants k(sum) (k(par_met)) + k(par_met) + ... (par) (ff(met)) + ff(met2) + ...) = k(par) * (1+x)

This leads to the situation where the rate constant of the parent k (cum) as defined in the simulation is larger than the rate constant of the parent which was obtained from the kuntuic evaluations. As a consequence, since k = ln(2)/DT50, the DT50 of the parent substance will be shorter than intended

In order to overcome this problem, we splitted the calculation so that the sum of the formation fractions in the individual run does not exceed 1. The remaining flow is directed into the sink compartment in order to ensure the correct parent DT50. As a result, there are 2 PELMO PECgw cylculations concerning parent (concentrations of parent are the same in both simulations which serves as Consistency check) and individual parts of the degradation scheme which are calculated using correct and consistent degradation parameters

In PEARL this effect is accounted to automatically by the model and therefore, all metabolites can be addressed in a single model row. In case that the sum of the formation fractions is greater than 1, the model just warns the user that "this seldom occurs. This does not influence the calculations in any way and leads to correct and consistent results for all of the substances.

For technical reasons, the results are split into 3 separate reports which are to be seen as individual building blocks of the overall PECgw assessment.

| Report: | °; ;; ;2014;M-48 | 1633-01 | |
|--------------------|---|----------|--------|
| Title: | Mesosulfuron-methyl (MSM) and metabolites: PEO | | MO EUR |
| | (pathway 1, combination) - Use in winter cereals in | n Europe | |
| Report No: | EnSa-14-0364 | ~ | |
| Document No: | M-481633-01-1 | Ž, | |
| Guidelines: | not applicable;not applicable | ©' | |
| GLP/GEP: | no | 4 | |

| Report: | 4; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; | , Ĉ |
|--------------------|---|------|
| Title: | Mesosulfuron-methyl (MSM) and metabolites: PECSW FOCUS PECMO FOR | |
| | (pathway 2) - Use in winter cereals in Europe | |
| Report No: | EnSa-14-0229 | |
| Document No: | M-481624-01-1 | , Ø' |
| Guidelines: | not applicable; not applicable of the state | J |
| GLP/GEP: | no o o o o o o o | 1 |

Materials and Methods:

The predicted environmental concentrations in groundwater (PEQw) for mesocal furon-method were calculated using the simulation model FOCUS PEARL (version 4.4.4) and FOCUS PELMO (version 5.5.3). Detailed application data used for simulation of PEC $_{\rm gw}$ were compiled in Table 9.6 $^{\circ}$ 1.

Table 9.6.1-1: Application partern used for PECgy calculations

| Individual crop | FOČVS crap Queed for Surferception | ۵a.Q | Applic Interval | | BBCH Stage | Amount reaching soil per season application [g a.s./ha] |
|-------------------------------|--------------------------------------|----------|--------------------|-----|---------------|--|
| Winter wheat GAP & Simulation | winter cereals | 1 × 15.0 | , | | 20-32 | 1 × 7.5 |
| Winter ry GAP & Simulation | Winter cereals | 1 × 6.0 | | 500 | 20-32 | 1 × 3.0 |

Application timing: The spring application in whiter cereals according to GAP is done at the end of winter, at the beginning of the vegetation period (i.e. when the temperature is high enough to expect crop and weed growth) anto well-developed crop. No pre-defined event dates are implemented in the FOCUS model that would directly translate this cropping ituation into discrete calendar dates for each groundwater scenario setting. Therefore, the following approach was used to define suitable scenario-adapted application dates: the simulated treatment was referenced relative to the tabulated crop emergence date of the carliest emerging spring crop (i.e. not necessarily cereals) that was defined by FOCUS for the respective cenario. An application day 14 days before that date was then selected, which is considered an adequate representation for the start of the vegetation period in the respective scenario environment. An overview of the date selections is found compiled in the table below.

Table 9.6.1-2: Application dates per scenario as used for the simulation runs

| Scenario | Kejerence aate: | Winter cereals, spring application at the end of winter, at the beginning of the vegetation period | |
|----------|------------------------|--|------------|
| A 22 | scenario | Application date selected | Julian day |
| | spring cereals: 10 Mar | 24 Feb | 55 |
| | carrots: 10 Mar | 24 Feb | 55 |
| | spring cereals: 18 May | 04 May | 124 |

| Scenario | Reference date: FOCUS listed emergence of earliest spring crop per | Winter cereals, spring application at the end of winter, at the beginning of the vegetation period | | | |
|----------|--|--|----------------|--|--|
| | scenario | Application date selected | Julian day 🖔 🥤 | | |
| | carrots: 10 Mar | 24 Feb | 55 4 9 | | |
| | field beans: 15 Mar | 01 Mar | 60 | | |
| | sugar beet: 20 Mar | 06 Mar | | | |
| | carrots: 28 Feb | ∦A Feb 🎝 | 45 7 2 | | |
| | cabbage: 01 Mar | ₹5 Feb | 0 46 0 × v | | |
| | potatoes: 01 Mar | 15 Feb | 467 4 | | |

Substance specific and model related input parameters for the different PEC calculations are summarised in the following tables.

- 1. Calculation 1: FOCUS PEARL with parent and all metabolites (Table 9.6.1-3).
- 2. Calculation 2: FOCUS PELMO with parent and metabolites AE \$154857, AE \$160459, AE F099095, AE F092944, and AE F160460
- 3. Table 9.6.1-4).
- 4. Calculation 3: FOCUS PELMO with parent and metabolites AE F190584 and AE F147447 (
- 5. Table 9.6.1-5).

Soil degradation of mesosulfuron-methyl and its metabolites was based on geometric mean DT_{50} as derived from laboratory studies, normalized to 20°C and 100% field capacity according to FOCUS (2000). The modelled degradation pathway scheme was identical to that of the underlying kinetic evaluation; arithmetic mean or maximum formations fractions were considered for the metabolites. Soil adsorption was described by median Koc / Kom for the parent active substance, or arithmetic mean values for all other components with experimental data from batch equilibirum studies available. For metabolite AE F140584, a worst case default value of zero soil adsorption was used in the absence of experimental data. For concentration dependency, arithmetic mean Freundlich exponents were used, or a default value of 10° 0 in the absence of experimental information.

Ignoring the systemic action of mesosulfuron-methyl, a worst case default for plant uptake (PUF = 0) was assumed for parent active substance and all metabolites in this first tier calculation.

² As supportive information for comparison purposes requested by RMS France (ANSES), a second set of simulation runs was made based on alternative formation fractions. These were derived strictly formally, considering in the averaged results only formation fractions where they are associated with a statistically significant DT₅₀ value of the next generation metabolite. This will reduce the number of individual values contributing to metabolites AE F154851, AE F099095, and AE F092944; rejecting total of 5 values.

In effect, this would lead to only mall changes as dollows:

 Notifier recommended approach
 Strictly formal approach

 parent → AE F09095
 0.179 (n=8)
 0.203 (n=7)

 parent → AE F092944
 0.076 (n=8)
 0.092 (n=5)

 parent → AE F092944
 0.172 (n=3)
 0.238 (n=2)

The results of these supportive calculations are provided in the Appendices sections to reports KIIIA 9.6.1/01 and KIIIA 9.6.1/02. (not applicable for report KIIIA 9.6.1/03 due to the selection of metabolites covered herein)



Table 9.6.1- 3: Substance specific and model related input parameter for <u>PEARL PEC_{gw} calculation</u> of mesosulfuron-methyl and its metabolites (model parameters not listed are kept as default) – Calculation 1

| | ı | | | | \ |
|--|---------------|-----------------------------|---|---|---|
| Parameter | Unit | Mesosulfuron- methyl | AE F154851 | AE F160,459 | AE F 999095 |
| Molar Mass | [g/mol] | 503.5 | 489.5 | 489.5 | 198.2 |
| Solubility (20 °C) | [mg/L] | 483 | 200000 | √1 0000 | 196 |
| Vapour Pressure (20 °C) | [Pa] | 3.50E-12 | 1270E-08 | 6.80E-08 | 1,9 0E -05 |
| Freundlich Exponent | | 0.910 | 7 0.940 | Ø 0.940 C | 840, © |
| Plant Uptake Factor | | 0.0 | 0.0 | 0.0 | |
| Walker Exponent | | 0.7 | 0.7 √ 0.7 | 0.940 0.0 0.7 | |
| PEARL Parameters | | <u></u> | P | M459 | |
| Substance Code | | MSM 🗞 | M851 . | M459 (| ♥1095,©° |
| DT_{50} | [days] | 31.9 | 6° 37,40° × | 7 0.1 0 | 87.90 |
| Molar Activ. Energy | [kJ/mol] | 65.40 | Ø 65.4 % | 65.4 | 65.4 |
| K _{om} | [mL/g] | 27.8 | \$9.6 D | 12.6 | 3√ 3√ 3 √ 3 √ 3 √ 3 √ 3 √ 3 √ |
| Parameter | Unit | AE F092944/ | AE F160460 | △ AE E 40584 | AE F1474 |
| Molar Mass | [g/mol] | 155.2 | 4759 100000 4 500E-070 | 322.4 | |
| Solubility (20 °C) | [mg/L] | 52,000 | 100000 🗸 | 100 | \$\frac{29025}{50000}\$\frac{150000}{5000}\$ |
| Vapour Pressure (20 °C) | [Pa] | 2.60 × 02 × \$ | \$.\$0E-Q70° | 2 1.30 € 06 & | 1. Ø 0E-08 |
| Freundlich Exponent | | 0.720 | 0000 | 1.30 \$06 | \$ 1 000 |
| Plant Uptake Factor | ** | , © 0.0 © | | 90.0 | 0.0 |
| Walker Exponent | | 0.7 | 0.906 | 0.7 | 9 0.7 |
| PEARL Parameters | | | | | D' 0.7 |
| Substance Code | | M 1944 | " M460 | M584 🔎 | M447 |
| DT_{50} | days | © 60.45° | L 25√6 € | 3.6 | 97.7 |
| Molar Activ. Energy | [kJ/mor | © 65€ % | © . 65.4 % | 65.40 | 65.4 |
| K _{om} | [m20/g] | ✓ 260.0 . × | √×8.2 ©″ | 0.0% | 3.0 |
| | 1. O | 0.1 70 MSM → N | M8.0 | · • · · · · · · · · · · · · · · · · · · | |
| Š, | | 0.694 MSM -> N | Ú | | |
| | , ~ | © 0,076 MSM -> 4 | 4095 × | J ⁱ | |
| Degradation fraction from | ' → t© | ©0.172∕MSM 🙈 🕅 | 19440° (3 ³ ° | Ø n | |
| (FOCUS PEARL) ³ | | 0.704 MSM> N | ∕ 15 8 4 | V J | |
| | | 1/4851 - M460 | | | |
| | | €M459 ₅ > M46 | | | |
| | | , 0.09 7 № 1584 🥱 N | л4 4 7 | | |
| (FOCUS PEARL) ³ | Y S | | | | |
| | A & | | | | |
| | \ | | | | |
| | | | ~ | | |
| . 4 | | | | | |
| - T | | | Ű | | |
| S S | | | 7 | | |
| . L. | A 6 | | | | |
| Y | | Q | | | |
| | | | | | |
| 3 Alternative set formation | | 9 Q | M460 25.6 65.4 78.2 1850 1940 1940 1950 1944 1950 1950 1944 1950 1950 1950 1950 1950 1950 1950 1950 | Erongo (ANCEC) | 1 0 |
| A Hornotivo cottot tormotian | trodtwone tor | warman autoria and and atra | va waarraatad bri DMC | | raa alaa faatmata 2. |

³ Alternative set of formation fractions, for supportive calculation requested by RMS France (ANSES) – see also footnote 2:

| Degradation fraction from to | 0.203 MSM -> M851 |
|------------------------------|--------------------|
| (FOCUS CEARL) | 0.094 MSM -> M459 |
| | 0.092 MSM -> M095 |
| | 0.238 MSM -> M944 |
| | 0.704 MSM -> M584 |
| , SO | 1 M851 -> M460 |
| | 1 M459 -> M460 |
| | 0.097 M584 -> M447 |

Other model input parameters used for the ANSES calculations are summarized in Table 9.6.1-3.

Table 9.6.1- 4: Substance specific and model related input parameter for <u>PELMO (pathway 1) PEC_{gw}</u> calculation of mesosulfuron-methyl and its metabolites (model parameters not listed are kept as default) – Calculation 2

| Parameter | Unit | Mesosulfuron-methyl | AE F154851 | AE F160459 489.5 489.5 0.940 0.00989 2.58 21.8 |
|--|---|---|--|---|
| Molar Mass | [g/mol] | 503.5 | 489.5 | AE F1007859 |
| Solubility (20 °C) | [mg/L] | 483 | "(| 489,5 - 0.940 0.7 0.00989 21.8 21.8 |
| Vapour Pressure (20 °C) | [Pa] | 3.50E-12 | 0.940 | |
| Freundlich Exponent | | 0.910 | 0.940 | 0.940 L |
| Plant Uptake Factor | | 0.0 | Q.Øv" | |
| Walker Exponent | | 0.7 | 8 77 | Z |
| PELMO Parameters | | a C | 0.940° 0.97 0.97 | |
| Substance Code | | AS | Q Alo | B1 4 |
| Rate Constant | [1/day] | 0.02573 | | ~~ 0.0 6 0989 € |
| Q_{10} | | € 2.58 €° | 0.0 \$68 2.58 68.3 | 2.58 |
| K_{oc} | [mL/g] | 2.58 ° 48.0 ° × | 68.3 | 21.8 |
| Parameter | Unit | 48.0 | 68.3 66.3 66.5 66.5 66.5 66.5 66.5 66.5 66 | XE F169460 & |
| Molar Mass | [g/mol] | AE F099095 1982 | 1,55.2 | 0.990 0.70 0.70 0.70 0.70 |
| Solubility (20 °C) | [mg/L] | | L & - '> | |
| Vapour Pressure (20 °C) | [Pa] | | | Ø Q - O |
| Freundlich Exponent | 0 | 0.840 | 0,729 | S 0.9990 |
| Plant Uptake Factor | | 0.0 | () () () () () () () () () () | 0.7 |
| Walker Exponent | 9 | Q | 0.7 | , 0.7 |
| PELMO Parameters | | 0.0 0.7 0.7 | 0.001148 × 2.58 | 45.5 - 0.990 0.7 B2 |
| Substance Code | | C1 0.00789 | DP D | B2 |
| Rate Constant | ∑[1/day] y | 0.00789 °° | 0.01148 | 0.02708 |
| Q_{10} | | | (N) 2.30 ₁ , N | 2.38 |
| K _{oc} | [matag] 👌 | 576.9 C | [™] 📞 447.0 ° | 14.1 |
| Degradation fraction from (FOCUS PELMO) ⁴ | [mat] | 0.0038900 AS -> AT | 447.0 | (S) 14.1 |
| | | 0.0020400 AS - B1 0.0016500 AS - C1 0.0037400 AS - D1 0.0104100 AS - BB | | / |
| <i>,</i> | (O' , *Y' | Ø.0016500 A\$\$ C1. | | |
| | , ~ & | 0.0037400 AS' -> D1'' | | |
| Degradation fraction from | | 0.00104100 AS -> ©BF | R/COZ O | |
| (FOCUS PELMO) ⁴ "O" | | 0.0016500 AS B1 0.0016500 AS C1 0.0037400 AS -> D1 0.00704100 AS -> BF 0.0186800 A1 B2 0.0078900 B1 -> B2 0.0078900 G1 -> SBF 0.0270800 B2 SBF | | |
| | | 0.0098900 B1 -> B2 | | |
| 200 | | | | |
| | | 0.0414800 D1 -> <bf< td=""><td>₹/Ç0⁄2</td><td></td></bf<> | ₹/ Ç 0⁄2 | |
| 3 | | ∞0.0270 80 0 B2 | R/CO ₂ | |
| Q j | | |) * | |
| Degradation fraction from (FOCUS PELMO) ⁴ | \$ <u>`</u> ``````````````````````````````````` | 0.00 (8900 B1 -> SIN 0.0114800 D1 -> <bf 0.0270800 B2 >> <br< td=""><td></td><td></td></br<></bf | | |
| | | | | |
| 4 | o' ş | | | |
| Ø, íd | | y Ži Ž | | |
| | , a ~ | | | |

⁴ Alternative set of formation fractions. For supportive calculation requested by RMS France (ANSES) – see also footnote 2:.

| Degradation fraction from → to | ₽0044100 AS -> A1 |
|--------------------------------|--|
| (FOCUS PELMO) | , 0.0020400 AS -> B1 |
| | 0.0020000 AS -> C1 |
| | 0.0051700 AS -> D1 |
| | $0.0081000 \text{ AS} -> < BR/CO_2$ |
| | 0.0186800 A1 -> B2 |
| | 0.0098900 B1 -> B2 |
| | 0.0078900 C1 -> 2 |
| , Ö | $0.0114800 \text{ D1} \rightarrow \text{SBR/CO}_2$ |
| C T | 0.0270800 B2 -> 2 |
| | |

Other model input parameters used for the ANSES calculations are summarized in Table 9.6.1- 4.

Table 9.6.1- 5: Substance specific and model related input parameter for <u>PELMO (pathway 2) PEC_{gw}</u> calculation of mesosulfuron-methyl and its metabolites (model parameters not listed are kept as default) – Calculation 3

| Parameter | Unit | Mesosulfuron-methyl | AE F140584 | AE F147447 |
|---------------------------|------------------|---|----------------------------|---------------------------|
| Molar Mass | [g/mol] | 503.5 | 322.4 | 296,3 |
| Solubility (20 °C) | [mg/L] | 483 | - , °O | ~- × |
| Vapour Pressure (20 °C) | [Pa] | 3.50E-12 | - 🔑 | .0" - 6 |
| Freundlich Exponent | | 0.910 冷 | 1.000 | 1.000 |
| Plant Uptake Factor | | 0.0 | Q © ' | |
| Walker Exponent | | 0.7 | | |
| PELMO Parameters | | , O | | |
| Substance Code | | AS | [™] Al‰° √ | $A2^{\circ}$ $A2^{\circ}$ |
| Rate Constant | [1/day] | 0.02573 | 90.19 2 54 | 0.00709 |
| Q_{10} | | €2.58 ° | 2.58 ° | (D) ×2.58 × (J) |
| Koc | [mL/g] | ©48.0 © × | | 5.24 |
| | | 0.0153000 $3 -> A$ | | |
| Degradation fraction from | \rightarrow to | 0.0064300 AS ->>BF | VCO_2^{\vee} A | |
| (FOCUS PELMO) | 710 | 0.0186800 A1 A2 | | |
| (FOCOS I ELMO) | d | 0.1738600 AAJ-> <br< td=""><td>¥CO₂√ × "Q</td><td></td></br<> | ¥CO₂√ × "Q | |
| | | [™] 0.0070900 A2 -> ≨BA | VCO2 CO STORY CO | |

Findings:

PEC $_{gw}$ were evaluated as the 80^{th} percentile of the mean annual leadbate concentration at 1 m soil depth. All PEC $_{gw}$ values (Calculations 1-3) for mesosulfaron-methyl are given in Table 9.6.1- 6.

Table 9.6.1- 6: PECgy PEAR & PELMO) of mesos diffuron-methyl in winter cereals

| | | Mesosulf | on-methyl 🥷 | |
|----------------|-----------------------------|-----------------------------|-------------------------------------|------------------|
| | Winter | cereals 😽 🧳 | | cereals |
| , 0 | 1 × 15 g a.s√ha , 50 | % interception | √ 1 × 6 √g a.s./ha, 5 | 0% interception |
| | | Ø ELMO (| P EARL | PELMO |
| l & | Calculation 1 [*] | Galculation 2&3* | Calculation 1* | Calculation 2&3* |
| FOCUS Scenario | PEC _{gw} | PEC _{gw} | PEC _{gw} | PECgw |
| | | , Qug/L] 🗸 , | © [μg/L] | [µg/L] |
| | 0.002 | √ 0.002 _√ △ | <0.001 | 0.001 |
| | <u>a</u> 0,023 & | 0.023 | 0.007 | 0.007 |
| | Q .007 007 | ¥ 0.008 \$ | 0.002 | 0.003 |
| | 0.015 | ~ 0.018 | 0.004 | 0.005 |
| | ~ 0.038 <u>~</u> | 0.052° | 0.009 | 0.010 |
| | Ø ₽ 009 € | \$ \ 0 , 0 11 | 0.003 | 0.003 |
| | Ø.011 🛴 🏅 | [∞] ~©0.017 | 0.003 | 0.005 |
| | <0.000r | <0.001 | < 0.001 | < 0.001 |
| | © <00001 | <0.001 | < 0.001 | < 0.001 |

^{*}Calculation 1, 2 and 3 - for compound specuric input parameters see Table 9.6.1-3,

Table 9.6.1- 4

Table 9.6.1-

Conclusion:

PECgw does not reach or exceed the parametric limit value of $0.1~\mu g/L$ in any of the simulation scenario. There are no concerns for groundwater from the use of mesosulfuron-methyl in accordance with the use pattern for the representative formulation.



Document MCP: Section 9 Fate and behaviour in the environment Iodosulfuron-methyl-sodium + Mesosulfuron-methyl +Mefenpyr-diethyl OD 42 (2+10+30 g/L)

Alternative PECgw simulation using RMS requested modelling parameters:

| Report: | u; ;2 | 2015;M-517436-01 | | |
|--------------------|---|------------------|-------------|----------|
| Title: | Mesosulfuron-methyl (MSM) an EUR(combination) - Use in wint | | Z. | |
| Report No: | EnSa-15-0312 | | <i>10</i> 7 | |
| Document No: | M-517436-01-1 | | 4 . Č | |
| Guidelines: | not applicable; not applicable | ČA Š. | | |
| GLP/GEP: | no | | | ~O' , O' |

| Report: | 1; ;20,5,M-517440-0, | |
|--------------------|--|------------|
| Title: | Mesosulfuron-methyl (MSM) and metabolites: PECgwFOCUSP | ELMO EUR 🎺 |
| | (pathway 1, combination) - Use in winter cereals in Farope | |
| Report No: | EnSa-15-0313 & ذ ذ V | |
| Document No: | M-517440-01-1 O' O' N N N N | · |
| Guidelines: | not applicable; not applicable Q | |
| GLP/GEP: | | |

| Report: | 12015;M.\$17442.91 |
|--------------------|--|
| Title: | Mesosulfuron methyl MSM) and metabolites, PECgov FOCOS PELMO ELIC |
| | (pathway 2) Use in winter cereal in Europe O |
| Report No: | EnSa-15-0814 V V V V V V |
| Document No: | M-517\$\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ |
| Guidelines: | not applicable, not applicable or visit in the control of the cont |
| GLP/GEP: | |

The documents report an alternative calculation of predicted environmental concentrations in groundwater, following the methodology presented under KIIIA 9.6.1/01 to /03 before, but applying a set of modelling parameters requested by the RMS.

Materials and Methods: reference is made to KallA 9.6.1/01 65/03, & summary before.

Table 961-7: Application partern used for RECgy calculations

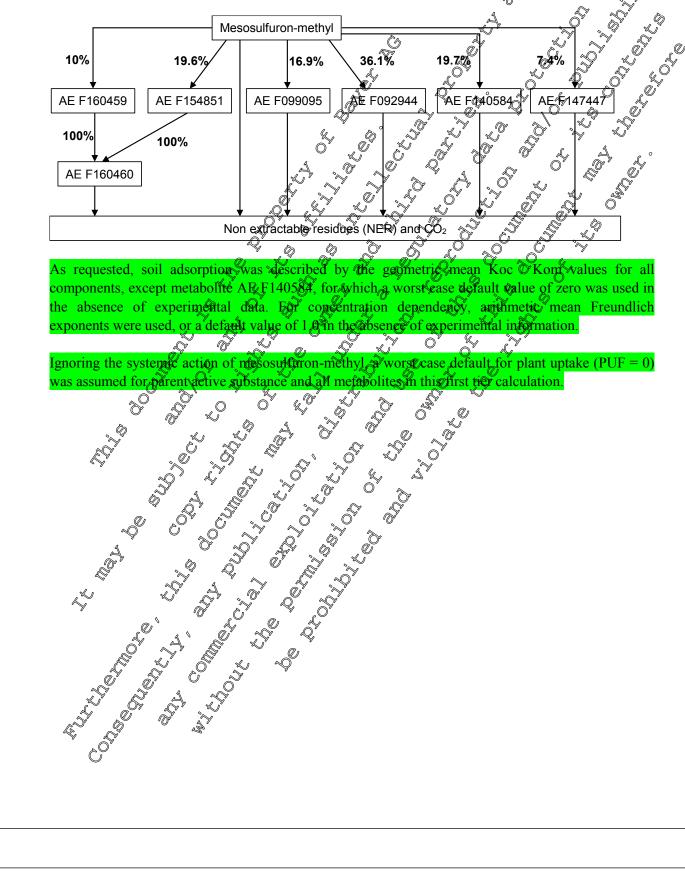
| Individual 🗳 | FOCUS crop | Rate ? | Applic Interval | | BBCH | Amount reaching soil per season |
|-------------------------------|----------------|-------------|--------------------|---------------------|-------|---------------------------------|
| crop | Paterception > | ≽Ber season | 5 5 | interception [%] | Stage | application [g a.s./ha] |
| Winter wheat GAP & Sunulation | winter cereals | | | 20 | 20-32 | 1 × 12.0 |
| Winter rye GAP & Simulation | winter ecreals | 1 6.0 | | 20 | 20-32 | 1×4.8 |

Application timing: reference is made to KIIA 9.6.1/01 to /03, see summary before.

Substance specific and model related input parameters for the different PEC_{gw} calculations are summarised in the following coles.

- Calculation 1: FOCUS PEARL with parent and all metabolites (Table 9.6.1-8).
- 2. <u>Calculation 2:</u> FOCUS PELMO with parent and metabolites AE F154851, AE F160459, AE F099095, AE F092944, and AE F160460 (Table 9.6.1-9).
- 3. <u>Calculation 3:</u> FOCUS PELMO with parent and metabolites AE F140584 and AE F147447 (Table 9.6.1-10).

Soil degradation of mesosulfuron-methyl and its metabolites is described based on a set of knietic parameters requested by the RMS. The degradation pathway scheme used for modelling is hown below, including the formations fractions considered for the metabolites.



As requested, soil adsorption was described by the geometric mean Koc Kom values for all components, except metabolite ARF140584, for which a worst case default value of zero was used in the absence of experimental data. For concentration dependency, arithmetic mean Freundlich exponents were used, or a default value of 1 A in the absence of experimental information.

Ignoring the systemic action of mesosultimon-methyl worst case default for plant uptake (PUF = 0) was assumed for parent active substance and all metabolites in this first tier calculation.

Table 9.6.1- 8: Substance specific and model related input parameter for <u>PEARL PECgw calculation</u> of mesosulfuron-methyl and its metabolites (model parameters not listed are kept as default) – Calculation 1

| ueraun |) – Caiculatio | <u>n 1</u> | | | |
|--|---------------------------|--------------------------|---|--|---|
| Parameter | Unit | Mesosulfuron- methyl | AE F154851 | AE F160,459 | AE F699095 |
| Molar Mass | [g/mol] | 503.5 | 489.5 | 489.5 | 198.2 7 198.2 7 |
| Solubility (20 °C) | [mg/L] | 483 | 200000 | 20000 | , O ^v 1967 |
| Vapour Pressure (20 °C) | [Pa] | 3.50E-12 | 1.70E-08 | 5.80E-08 0.940 | 1.90½-05 0.840 0.00 |
| Freundlich Exponent | | 0.910 | 70.940 | 0.940 | 9 .840 |
| Plant Uptake Factor Walker Exponent | | 0.0 0.7 | 0.0 0.7 | | 0.00 |
| PEARL Parameters | | <mark>0.7</mark> | 0.0 | | |
| Substance Code | | MSM 🔊 | N 105 f | $ \mathscr{Q}' _{M459} = \mathbb{Q}$ | 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, |
| $\overline{\mathrm{DT}_{50}}$ | [days] | 42.4 C | ~° 52,€° ≪ | 84.9 65.4 | 104x6 |
| Molar Activ. Energy | [kJ/mol] | 65.4 | 52.8 × 52.8 × 65.4 × 77.7 | 65.4 | 65.4 |
| K _{om} | [mL/g] | 37.1 | 37.7 | 0 11.2 | 204.0 |
| Parameter Mass | Unit | AE (F) 92944 | AF F160460 | AE F140584 | AE F 1474 y 7 |
| Molar Mass Solubility (20 °C) | [g/mol] [mg/L] | \$133.4 5300 | | 3/22.4 S | ∠ 290.3° √ 150900 |
| Vapour Pressure (20 °C) | [Pa] | 2.601/-02 × | 5 60F-070 | 130km6 | 1.00E-08 |
| Freundlich Exponent | | 0.720 | 0.906 | 1.301306 1.000 0.0 | . 1.000 |
| Plant Uptake Factor | | 0.0 | | 90.0 0 1 | , 1.000 , 0.0 |
| Walker Exponent | | % 0.7 · · · | 0.906/ 0.007 24 | 322.4 100 Ø 1.301 06 1.000 Ø 0.7 | √ 0.7 |
| PEARL Parameters | V | | 5 00E-07 0.996 0.70 0.70 0.70 | | |
| Substance Code DT ₅₀ | | * 1944 @ | M460 20 3 | M584 © | M447 162.8 |
| MATA CE | '≫[days] ⟨, [kJ/m͡o]'] | ~ 65@ | | 65.40 | 65.4 |
| K ~ | [man] [man] | Ø 65⊕ ? ♥ 1950 Ø | © | | 2.9 |
| Q [*] | 4 8 | 0.196 MSM >> 1 | M850 | | |
| | | 0. ¥0 0́ MSM -> 1 | M8507 | | |
| |) | 90,169 MSM ->4 | V1095 | ∜ v | |
| Degradation traction traction | | 0.36 MSM & 1 | M9440' 0 1 | | |
| (FOCUS FEARL) | | 0.137 MSM -> 1 | M447 & 0 | | |
| | | €M851 <> M46 | | | |
| ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ | | 1 M459 -> M46 | | | |
| . 3 | | | | | |
| | | | 7 Q | | |
| |) | | v | | |
| | | | | | |
| | | | | | |
| | | | 7 | | |
| | o | | | | |
| ** | | I M459 -> M446 | | | |
| | · * | | | | |
| | | j. _W | | | |
| | | ~Q | | | |
| | | | | | |
| | | | | | |
| Degradation fraction from from (FOCUS PEARL) | | | | | |
| | ~ | | | | |
| Ö | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Table 9.6.1- 9: Substance specific and model related input parameter for PELMO (pathway 1) PECgw calculation of mesosulfuron-methyl and its metabolites (model parameters not listed are kept as default) – Calculation 2

| Dangmatar | I It4 | Magagulfuran mathal | AT D154051 | AE F169,459 |
|---|-----------------|--|--|---|
| Parameter Molar Mass | Unit [g/mol] | Mesosulfuron-methyl 503.5 | AE F154851 489.5 | (S O O O O O O O O O |
| Solubility (20 °C) | [mg/L] | 483 | 467.J | 48925 0.9407 0.9407 0.00816 |
| Vapour Pressure (20 °C) | [Pa] | 3.50E-12 | 4 | 0.940 0.940 0.940 0.960 0.96816 |
| Freundlich Exponent | [14] | | 0.940 | 0.940 |
| Plant Uptake Factor | | | 0.0 | |
| Walker Exponent | | 0.0 | 87 | |
| PELMO Parameters | | 0.7 AS 0.04653 | Albo | |
| Substance Code | | AS | Albo° | A BI W |
| Rate Constant | [1/day] | 0.042633 | 0.01913 | B1 0,00816 0 2/.58 |
| Q ₁₀ | | <u></u> <u>√2.58</u> ° | 2.58 | 2.58 |
| K _{oc} | [mL/g] | \$2.58 \(\infty \) 64.0 \(\infty \) \$\\ \infty \\ \inft | € 65.0 65.0 | 19.3 |
| Parameter | Unit | AE F099095 | 0.0 (§ 13 § 258 65.0 (§ 65.0 | XE F169460 \$ |
| Molar Mass | [g/mol] | 1982 | 1,35.2 | 48.5 6 4 5 6 |
| Solubility (20 °C) | [mg/L] | | | |
| Vapour Pressure (20 °C) | [Pa] | 1982 0.846 0.0 0.0 | | |
| Freundlich Exponent Plant Uptake Factor | | 0.840 V | | 9.990 |
| Walker Exponent | Q. | | | \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ |
| PELMO Parameters | | 1982 | | 473.5 0.990 0.7 0.7 |
| Substance Code | | 0.00789 2.58 | TO DO | O' B2 |
| Rate Constant | 1/day | 0.00789 | 0.0148 × | B2 0.02366 2.58 0 12.2 |
| Q_{10} | | Q 2.58 Ly | 0.01/148 × 2.58 | 2.58 |
| K _{oc} | | 351 Ç | × 336 × . | 12.2 |
| Q | | 0.0032000 Active Sul | ostanee -> A | |
| | | Active Sul | ostance -> B1 | |
| Į į | | 0.0027600 Active Sul 0.0059000 Active Sul | Stance C1 | |
| | to o | 0.0059000 Active Sut | stance >-> DK | 1 |
| Degradation rate from | to O | 0.9002840@ Active Stut | ostatie -> &BR/CO2 | |
| (FOCUS PELMO) | | 0.0131280 A1 B2 | | |
| Degradation rate from (FOCUS PELMO) | | 0.0081640 B1 -> B2 | | |
| | | ∛ 0.0078900 €¥ -> <bf 0,£1480€£D1 -≥ <bf< td=""><td></td><td></td></bf<></bf | | |
| (FOCUS PELMO) | | >0.0236570 B2 S < BR | | |
| | 4 0,000 | (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | 0 CO2 → | |

Table 9.6.1- 10 Substance specific and model related input parameter for PELMO (pathway 2) PECgw calculation of mesosulfuron-metryl and its metabolites (model parameters not listed are kept as default). Calculation of mesosulfuron-metryl and its metabolites (model parameters not listed are

| Parameter ~ | y <u>4 Unit</u> | Mesosulfuron-methyl | AE F140584 | AE F147447 |
|-------------------------|-----------------|-----------------------|------------------------|---------------------|
| Molar Mass S | g/mal | Q 2003.5 | 322.4 | 290.3 |
| Solubility (20 °C) | | 7, * (483 | | <u> </u> |
| Vapour Pressur | | 2.3.50E-12 | | <mark></mark> _ |
| Freundlich Exponent | | 0.910 | 1.000 | 1.00 <mark>0</mark> |
| Plant Uptake Pactor V | | 0.0 | <mark>0.0</mark> | <mark>0.0</mark> |
| Walker Exponent | | 0.7 | <mark>0.7</mark> | 0.7 |
| PELMO Paramoters | | | <u></u> | |
| Substance Code | · 8 % | AS | A1 | A2 |
| Truye Constant | 🏂 [1/day] | 0.01635 | 0.16045 | 0.00426 |
| Q ₁₀ | | <mark>2.58</mark> | <mark>2.58</mark> | <mark>2.58</mark> |
| K _{oc} & | [mL/g] | 64.0 | 0.0 | 5.1 |
| Degradation rate from - | to | 0.0032200 Active Subs | | |
| (FOCUS PELMO) | | 0.0012100 Active Subs | | |
| (1 CCCS 1 ELIVIO) | | 0.0119200 Active Subs | stance -> <td></td> | |



| 0.1604510 A1 -> <th>_</th> <th>1</th> | _ | 1 |
|--|---|----|
| 0.0042590 A2 -> <th></th> <th></th> | | |
| | | Ξ, |

Findings:

Table 9.6.1- 11: PECgw (PEARL & PELMO) of mesosulfuron-methyl in winter €cereals

| Findings: Table 9.6.1-11: PEC _{gw} (PEARL & PELMO) of mesosulfuron-methyl in winter cereals Winter cerea | | 0. | 1604510 A1 -> <th><mark>02</mark></th> <th></th> | <mark>02</mark> | |
|--|------------------------------------|----------------|---|-----------------------|--|
| Winter cereals Winter cereals 1 × 15 g a.s./ha, 20% interception PEARL PELMO PEARL PELMO PEARL PELMO PEARL PELMO PECgw PECg | | | | | <i>©</i> ° % |
| Vinter cereals Winter cereals I × 15 g a.s./ha, 20% interception D 6 g a.s./ha, 20% interception | | | | <u></u> | |
| Vinter cereals Winter cereals I × 15 g a.s./ha, 20% interception D 6 g a.s./ha, 20% interception | idings: | | | T | 4 .4 |
| Vinter cereals Winter cereals I×15 g a.s./ha, 20% interception D×6 g a.s./ha, 20% interception | ble 9.6.1- 11: PEC _{gw} (| PEARL & PELMO |) of mesosulfuron-met | hyl in winter cereals | |
| I × 15 g a.s./ha, 20% interception D 6 g a.s./ha, 20% interception | | | | | Colonia Coloni |
| PEARL PEMIO PEARL PELMO | | | Cereais | | |
| Calculation 1* Calculation 2&3* Calculation 2 | | | | | 10% interception () |
| PEC _{gw} | | | . 11 | | PELMO O |
| | | Calculation 1* | | Calculation D | Calculation 28/3/ |
| 0.006 Q 004 Q 0.015 Q 0.001 Q 0.001 Q 0.005 Q 0.015 Q 0.005 Q 0.015 Q 0.005 Q | CUS Scenario | | PECgw | Z PEC _{gy} | PEC _{gw} |
| 0.049 | | | | μg/k) | ^γ 'γ <mark>μg/L</mark> γ |
| 0.015 | | | A M 052 0 | | - Y |
| 0.033 | | - % | | * () 0040 S | 0.005 |
| 0.057 | | - A/ | ************************************** | 0.004 | 0.0033/2 |
| | | 0.033 | A * W | 0.090 O | 0.010 |
| 0.025 | | 0.037 | 0.003 × y | W 007 &: | 100g20 |
| | | 0.020 | 0.02 | 7 0.0070 | ~, · · · · · · · · · · · · · · · · · · · |
| 20001 % | | 0.022 | 0.054 0.001 | 0.000 Q <0.001 | |
| | | | 0.001 | 0.001 € 1.001 × | 0.001 |

* Calculation 1, 2 and 3 - for compound specific input parameters see Table 9.6.1-8. Table 9.6.1-9 and Table 9.6.1-10

Conclusion:

PECgw does not reach or exceed the parametric limit value of 0.1 µg/L in any of the simulation scenarios. There are no concerns for groundwater from the use of mesosoffuron-methyl in accordance with the use pattern for the representative formulation.

Relevant merabolites

PECgw for mesosulfuron-methy metabolites?

According to the definition of residues plevant for groundwater risk assessment, the following degradates were considered for PECgw calculation. AE F154851, AE F160459, AE F099095, AE F092944, AE F160460, AE \$140584 and & F1,40447.

| Report: | 5; ;2014;M-481632-01 |
|---|--|
| Title: | Mesosulfuron-methyl (MSM) and metabolites: PECgw FOCUS PEARL EUR |
| () () () () () () () () () () | (combination) Use in Winter cereals in Europe |
| | EnSa 4-0369 |
| Document %: & | M_881632€01-1 © |
| Guidelines: | not applicable;not applicable |
| CT DIOTE | Ano 🌣 |



| Report: | h; ;2014;M-4 | 81633-01 | |
|--------------|--|-------------------|-------|
| Title: | Mesosulfuron-methyl (MSM) and metabolites: F | PECgw FOCUS PELMO | O EUR |
| | (pathway 1, combination) - Use in winter cereals | s in Europe | O EUR |
| Report No: | EnSa-14-0364 | * | |
| Document No: | M-481633-01-1 | Z. | |
| Guidelines: | not applicable; not applicable | O' | |
| GLP/GEP: | no | 4 | |

| Report: | | Ũ |
|--------------------|---|--------|
| Title: | Mesosulfuron-methyl (MSM) and metabolites: PEGW FOCUS PECMO FOR |) |
| | (pathway 2) - Use in winter cereals in Europe | ~ @ |
| Report No: | EnSa-14-0229 | 1 |
| Document No: | M-481624-01-1 | Ų" |
| Guidelines: | not applicable; not applicable | |
| GLP/GEP: | no O O S S S S | |

Materials and Methods: The PEC_{gw} for mesos affuron method metabolites were calculated using the approach, scenarios and application rates described for the parent active substance in section 9.6.1. Compound specific input data are summarized in Table 9.6.1-3 (Calculation 1.4EARL), in

Table 9.6.1-4 (Calculation 2, PELMO – pathway 1), and in

Table 9.6.1-5 (Calculation 3, PLLMO pathway 2)

Findings: The 80th percentile PEC values for the metabolites are given in the following tables for the use in winter cereals.

Table 9.6.2-1: PECA (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F154851

| | | AF 15 | 548 5 1 ⁸ , S | |
|----------------|---|---------------------|---------------------------------|-----------------|
| | D' Winter of | reals 🛴 🔪 | Winter Winter | cereals |
| | 15 g a.s./ha, 5 | 0% interception | | 0% interception |
| , Ø | PEARL A | PELMO 0, | PEARL | PELMO |
| FOCUS Scenario | Calculation | Calculation Q | Čalculation 1 | Calculation 2 |
| FOCUS Scenario | PEC _{gy} | PEC _{gw} | PEC _{gw} | PECgw |
| ~ | $^{\circ}$ $^{\prime}$ [μ g/ $^{\circ}$] $^{\circ}$ | √ [μg/ ½ } Δ | μg/L] | [µg/L] |
| | ∆ 0,003 √ | 0.002 | < 0.001 | 0.001 |
| <i>O</i> n | © .015 ° | ≫ № 016 🔊 | 0.005 | 0.005 |
| | 0.006 | 0.007 | 0.002 | 0.002 |
| | 0.001 | 0.052 | 0.004 | 0.004 |
| y | Ø A 017 © | Ø, Ø 18 | 0.006 | 0.006 |
| Ø. ~ | Ø.007 _~ | ° ,≈©0.009 | 0.003 | 0.003 |
| 4 | 0.000 | 0.010 | 0.002 | 0.004 |
| | © <0.001 ¥ | © <0.001 | < 0.001 | < 0.001 |
| w ` | 9.001 | < 0.001 | < 0.001 | < 0.001 |

⁵ Results of supportive calculations using alternative set of formation fractions, as requested by RMS France (ANSES): Only small (max. $\Delta > 0.009$ ug/L) to negligible numeric differences in PECgw for the concerned metabolites and successor component of F160460; changes remain without impact of on regulatory conclusions.

AE F154851: max. 0.019 μg/L (PEARL) / 0.021 μg/L (PELMO)

AE F160460: max. 0.107 μg/L (PEARL) / 0.112 μg/L (PELMO)

AE F099095: max. <0.001 μg/L (PEARL) / <0.001 μg/L (PELMO)

AE F092944: max. $<0.001 \mu g/L (PEARL) / <0.001 \mu g/L (PELMO)$



Table 9.6.2- 2: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F160459

| | | AE F10 | 60459 | |
|-----------------------|----------------------------|------------------------|----------------------|-----------------------------|
| | Winter | | Winter | cereals |
| | 1×15 g a.s./ha, 5 | 0% interception | 1 × 6 g a.s./h@; 5 | 0% intercoption 🚕 |
| | PEARL | PELMO | PEARL | PEEMQ 🔊 |
| | Calculation 1 | Calculation 2 | Calculation 1 | Calculation 2 |
| FOCUS Scenario | PECgw | PECgw | PEC | PECO |
| | [µg/L] | [μg/L] 🖔 | [µg/L] | [μg/]L] |
| | 0.046 | 0.044 💖 | 0.017 | 2017 V |
| | 0.085 | 0.086 | 0.032 | 0.033 |
| | 0.079 | 0.082 | Q 0,029 K | 0.000 |
| | 0.056 | Ø.066 | ≫ ©.021 ° | © (%) 025 (%) |
| | 0.058 | & 0.061° S | (J) 0.0220 C | 0.024 |
| | 0.039 | 0 0.050 | ~ 0.005 ~ | 0.019 |
| | 0.037 | 3 .040 0 | Q 0.014 | 0 0015 |
| | 0.010 | 0.014 | y 2 9.0030 √ | 0.005 |
| | 0.034 | 0.023 | Ö [™] 0.013 | ≈ 0.00 9 |

Table 9.6.2-3: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F099095

| | | Vinter cereals Tha, 50% interception PELMO Calculation 2 |
|---|-----------------------|--|
| FOCUS Scenario | | ha, 50% interception PELMO Calculation 2 |
| FOCUS Scenario | | PELMO n 10 Calculation 2 |
| FOCUS Scenario | | PELMO n 10 Calculation 2 |
| FOCUS Scenario | | n 10 Calculation 2 |
| | C N N N | |
| μg μg | Cgw Y O PECgw (| PECgw |
| | Cgw O PECgw [µg/L] | β [μg/L] |
| (0.001) (0.001 | 001 . Q ~Y < 0. ABY | < 0.001 |
| 0.001 | 001 001 | < 0.001 |
| | 001 <0.001 001 | < 0.001 |
| © \$0.001 © 0.001 | 001 | < 0.001 |
| \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ | 001 < < 0.001 | < 0.001 |
| | 001 <0.001 <0.001 | < 0.001 |
| <0.0 0 01 | < 0.001 | < 0.001 |
| | 001 0 <0.001 | < 0.001 |
| 0.001 ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° | 001 <0.001 | < 0.001 |
| | | |

Table 9.6.2-4: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F092944

| | | AE F09 |)2944 ⁴ | |
|----------------|---------------------|---------------------|--------------------|-------------------------|
| | Winter | | | cereals 7 |
| | 1 × 15 g a.s./ha, 5 | 0% interception | | 0% intercontion |
| | PEARL | PELMO | PEARL | PEEMQ 🔊 |
| | Calculation 1 | Calculation 2 | Calculation 1 | Calculation 2 |
| FOCUS Scenario | PEC_{gw} | PECgw | PEC | PEC |
| | [µg/L] | [μg/L] 💍 | [kg/L] | W [mg/L] S |
| | < 0.001 | <0.001 | © 0.001 | 9 .001 |
| | < 0.001 | <0.001 | ©<0.001 × | .0.00 . \$ |
| | < 0.001 | < <u>0</u> ,001 | Q <0.001 L | (0.00°) (0.00°) (0.00°) |
| | < 0.001 | 20 0.001 | Ø:001 Q | © <9,001 ° € |
| | < 0.001 | <0.001 | r √×0.0046 ? | 0.001° |
| | < 0.001 | <0 0 001 × 5 | \$ <0.001 | <0.001 |
| | < 0.001 | % .001 | <00001 | <0 000 01 √° |
| | <0.001 | > > 0.001 > | ₹ 0.001 | ©.001 © |
| | <0.001 | <0.007 | ~ <0.0 % | <0.001 |

Table 9.6.2- 5: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite XE F160460.

| *** | | |) ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' |
|---|-------------------------|---------------------------------|---|
| Q X | AEG 10 | 60460 Winter 1 % g a,s ha, 5 | &, |
| Win | 0 | ceceals | |
| $1 \times 15 \text{ g a.s./h}$ | | | 9% interception |
| PEARL | PELMO N | ÉPEARTE & | ř PELMO |
| FOCUS Scenario PECgw Jug/D | Calculation 2 | Calculation 1 | Calculation 2 |
| FOCUS Scenario | | KEC _{gw} | PECgw |
| | المالماللات الا | Wug/Ll'y | [µg/L] |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 103 PECgw 7 103 | 0.018 | 0.015 |
| © \ 0.098 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | L 103 | 0.016 0.036 0.030 | 0.037 |
| 0.098 | 0.089 | @0.030 | 0.031 |
| 0.062 | 0.073 | ₩ 0.022 | 0.025 |
| E 2069 2 | 0.070 0.073 0.053 | 0.022 | 0.027 |
| © .043 | Q.053 V | 0.016 | 0.019 |
| 0.040 | 0.048/ | | 0.018 |
| | 7 0.0P1 S | 0.003 | 0.004 |
| Q \$.026 C | ©019 S | 0.009 | 0.007 |
| 0.084 0.069 0.040 0.040 0.026 0.026 0.026 0.026 0.026 | | | |
| | | | |

Table 9.6.2- 6: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F140584

| | | | | a. Š |
|----------------|-----------------------------|---------------------|-----------------------|---------------------|
| | | AE F14 | 40584 | |
| | Winter | cereals | Winter | cereals |
| | 1×15 g a.s./ha, 50 | 0% interception | 1 × 6 g a.s./ha/ 5 | 0% intercontion 🚕 🛚 |
| | PEARL | PELMO | PEARL | PELMO 🏈 |
| | Calculation 1 | Calculation 3 | Calculation 1 | Calculation 3 |
| FOCUS Scenario | PECgw | PECgw | PECgw | PECO |
| | [µg/L] | [μg/L] 💍 | [µg/L] | [Mg/L] S |
| | 0.001 | 0.001 | 0.001 | 9.001 J |
| • | 0.014 | 0.045 | 0.005 | 0.006 % |
| | 0.027 | 02041 | Q 0,010 K | 0.0 © 6 |
| | 0.004 | Ø.006 | ≫ . Ø .001 ~ ₩ | © @ 002 |
| | 0.008 | (0.012° | () (0.003° () | 0.004 |
| | 0.003 | 0° 9. 0 05 | <0.0001 | 0.002 |
| | 0.005 | Ø.012 Ø | 0.002 | 0 0004 |
| | <0.001 | 0.00i > 8 | × 10.0010 × | , <0.001, ° |
| | <0.001 | (%) 0.0 0 /1 | 0.00Y | <0.00 |

Table 9.6.2-7: PECgw (PEARL & PELMO) of mesosulfacon-methyl metabolite AE F147447

| | _ , , , , | | | <u> </u> | | |
|----------------|------------------------|------------------------------|---------------------|----------------|--|--|
| | | ALTI4/44/ | | | | |
| | Winter | Freals | Winter Winter | cereals | | |
| | 1 × 15 g a.s./ha, 5 | 0% interception | | % interception | | |
| | 🎤 PEARL 🝳 | PELMO 🔊 | PLANAL ~ | PELMO | | |
| | √, Calculation 3 | Calculation 3 | Calculation 10 | Calculation 3 | | |
| FOCUS Scenario | OPEC _S | ₽ECgv (| O PEC _{gw} | PECgw | | |
| FOCUS Scenario | (μg/ b) | [~] [μg/ L) | μg/L] ["] | [µg/L] | | |
| | 0,085 | 0,073 | 0.03A | 0.029 | | |
| | 0.106 | © * 091 | 0.042 | 0.036 | | |
| | 0.163 | \$\times 0.124\$\times 0 | ©0.065 | 0.049 | | |
| | 0.059 | 0.0 % | 0.024 | 0.028 | | |
| | 0,059 | Q 056 | 0.023 | 0.022 | | |
| × % | ∫ ~\0.05 4 , ~\ | 0.069 | 9 0.021 | 0.027 | | |
| | | 0.048 | 0.020 | 0.019 | | |
| | A 0033 | 0.032 | 0.013 | 0.013 | | |
| Q ₁ | Q 20.077 C | 3 .051 | 0.030 | 0.020 | | |

Conclusion: For the product use in winter rye of g a G/ha), PEC $_{gw}$ does not reach or exceed the trigger value of G. I $\mu g/L$ for any of the metabolites in any of the FOCUS groundwater scenarios; thus the risk is acceptable for groundwater with no further assessment required.

For the productose in winter wheat (\$\mathbb{G}\$ g as \$\sqrt{ha}\$), PEC_{gw} of metabolites AE F160460 and AE F147447 was predicted to reach or exceed the trigger of 0.1 \mug/L for 1/9 or 2/9 of the FOCUS groundwater scenarios, respectively. The maximum predicted concentrations in groundwater recharge were 0.103 \mug/L for AE F160460 and 0.163 \mug/L for AE F147447.

An assessment of the potential relevance in groundwater for these components is therefore made following the guidance given in SANCO 221/2000. Details hereon are found in Document N4, only a brief summary is provided below:

Screening for herbicidal activity:



Both components were assayed for herbicidal activity in greenhouse tests (see KCA 3.6/03), and were found not to retain comparable target activity as the parent active substance.

Screening for genotoxicity:

Both components were assayed in a standard battery of genotoxicity and motagenicity tests in vero (see KCA 5.8.1/01 to /06) and were found clearly devoid of mutagenic potential.

Screening for toxicity:

The active substance mesosulfuron-methyl has not been classified as being toxic of very foxic reproductive toxic or carcinogenic; there is no indication that the metabolites would bear any specific risks for toxicity. No further toxicity assessment is therefore triggered to metabolites.

Metabolites AE F160460 and AE F147447 milfil the criteria for being considered 'non-relevant for groundwater' at Step 4 of the guidance. For simulated PEC_{gw} below the trigger level of 0.75 μg/L no quantitative consumer risk assessment is deemed necessary.

In overall conclusion, there are no concepts for groundwater with regard to metabolites from the intended use of mesosulfuron-metable in the present formulation.

Alternative PECgw simulation using RMS requested modelling parameters:

| Report: | us 2915;M-917436401 () |
|--------------|---|
| Title: | Mesosuffuron-methyl (MSM) and metabolites. PECe FOCUS PEARL |
| | EUR(combination) Use in winter sereals in Europe |
| Report No: | |
| Document No: | № 1-517436-01-19 |
| Guidelines: | not applicable; not applicable |
| GLP/GEP | |

L

| Reports | $\sqrt{\frac{9015;M=5174400-01}{120000000000000000000000000000000000$ |
|--------------|---|
| Title: | Mesosulfuron-meth (MSM) and metabolities: PECgw FOCUS PELMO EUR |
| | (pathway Combination) Use in winter cereals in Europe |
| Report No: | 1 |
| Document No. | M-517440-01-0 0 0 |
| Guidelines: | notapplicable;notapplicable |
| GLP/GEP: | |

| Report: | φ , |
|------------|---|
| Titley | Mesosulfuron-methyl (MSM) and metabolites: PECgw FOCUS PELMO EUR |
| | (pathway 2) - Use in winter cereals in Europe |
| Report No: | [®] BnSa-1Ø-0314♥ |
| | M-56442-01-1 @ |
| Guidelines | ngCapplicable;novapplicable |
| GLP/GLP: | |

The documents report an alternative calculation of predicted environmental concentrations in groundwater, following the methodology presented under KIIIA 9.6.2/01 to /03 before, but applying a set of modelling parameters requested by the RMS.



Materials and Methods: reference is made to KIIIA 9.6.2/01 to /03, see summary before.

Findings:

Table 9.6.2- 8: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite Ap F154851

| Winter cereals | | | AE F1 | 54851 | |
|--|-----------------------|----------------------------|----------------------------|------------------------|---------------------------|
| PEARL PELMO PEARL PELMO Calculation 1 Calculation 2 Calculation 1 Calculation 2 PECgw | | Winter | cereals | Wint | ((▼)) ⊗_V ≤1 |
| PEARL PELMO PEARL PELMO Calculation 1 Calculation 2 Calculation 1 Calculation 2 PECgw | | 1×15 g a.s./ha, 2 | 0% interception | 1 × 6 g a.s./ha | , 20% interception S |
| PECgw PECg | | PEARL | PELMO | | PQMO |
| | | Calculation 1 | Calculation 2 | Calculation 1 | Calculation 2 |
| 0.019 | FOCUS Scenario | | PK egw | PECgw | PECM |
| 0.062 | | μg/L | Org/L | i jig/L Q | O ^V Ug/L |
| 0.062 0.065 0.023 0.023 0.033 0.033 0.001 0.0023 0.0023 0.0023 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 | | 0.019 | 0.015 | <mark>∕√0.006</mark> ~ | 0.005 |
| 0.044 | | 0.062 | 0.965 | 0.022 | Ψ <mark>0.023</mark> |
| 0.044 | | 0.033 | 1 1 1 1 1 1 1 1 1 1 | | |
| 0.032 | | 0.044 | 0.052 | | |
| 0.030 0 0.001 0 0.001 0 0.001 0 0.001 0 0.001 | | 0.060 🔊 | 0.064 C | 0.024 | |
| 0.001 0.001 0.001 0.001 | | 0.032 | (%) 0x038 % | 0.0 <u>M</u> |) 0.019 |
| | | 0.030 | 9.036 | © 00010 S | 06913 |
| 0.010° , 9 9 0.065° , 9 4 0.065° , 0 0.002 | | <0.000 | | | № . № 0.001 |
| | | | 0.005 | 0.09 | |

Table 9.6.2-9: PECgw (PEARL & PELMO) of mesosulfuron-methyl metobolite AE F160459

| | | | | | J |
|----------------|---|------------------------------|---|--|-----------------------------|
| | | | AFFI | 50459 V S | |
| | / S' y | nter cereals ha, 20% into | | Winter | · cereals |
| | 1×15 gas. | /ha ///0/_ int? | rception | 1 ⊗ 6 g a.s√ha, 2 | 20% interception |
| | PEARL | S P | ELMO & | PEARL | PELMO |
| | Calculation | 1 Cal | culation 2 | Calculation 1 | Calculation 2 |
| FOCUS Scenario | Calculation PECgw [µg/L] | Y Q | ELOTO cultition 2) BEC grown [µg/kg) | 1 ⊗6 g a.s /ha, 2 PEARL Calculation 1 PECgw μg/L | PEC _{gw} [μg/L] |
| Q | « 04 3 2 | | 0.197 @1 | ∞ 0.046 | 0.044 |
| | 203 k | | | | 0.079 |
| | 0.128 0.128 0.128 0.094 0.094 | | 0.201 | 0.080 | 0.076 |
| | 0.128 | | 0.105 | 0.049 | 0.059 |
| | 27 27 | | 6 129 | 0.049 | 0.050 |
| | Ö<u>0.094</u> | | 90.123 ¹⁰ | 0.036 | 0.047 |
| | 0.09 | | 0.00 | 0.035 | 0.035 |
| | 0.040 | | 0<048 | 0.015 | 0.018 |
| | % 115 | | 0 ⁄.074 | 0.043 | 0.028 |
| | 0.128 0.128 0.094 0.093 0.093 0.093 0.115 | | | | |

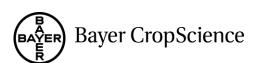


Table 9.6.2-10: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F099095

| | | AE FO | 99095 | |
|-----------------------|------------------------------|-----------------------|-----------------------------|--|
| | Winter | cereals | Winter | cereals |
| | 1×15 g a.s./ha, 2 | 20% interception | 1 × 6 g a.s./ha; 2 | 0% intercotion |
| | PEARL | PELMO | PEARL | PEMO 🏈 |
| | Calculation 1 | Calculation 2 | Calculation 1 | Calculation 2 |
| FOCUS Scenario | $\mathbf{PEC_{gw}}$ | $\mathbf{PEC_{gw}}$ | PECgw | PECO |
| | [µg/L] | <mark>[μg/L]</mark> 🖔 | [µg/L] | Market Control of the |
| | < 0.001 | <0.001 | 0.001 | 9.001 × × |
| | < 0.001 | 0.06 | <u>√</u> 0< <u>₹0.001</u> × | J 20.00€ |
| | < 0.001 | < 0.001 | Q <0.001 X | <0.001 C |
| | < 0.001 | ©.001 | ₩ 20 .001 % | O' <0,001 |
| | < 0.001 | 0.001° | | > |
| | < 0.001 | 0.001 | <0.001 | <0.001 |
| | < 0.001 | 30.001 | <0.001 | ° <02901 √ |
| | <0.001 × | √° ××0.001 × ∞ | √ <u>4€0.001</u> | , <u>\$7.001</u> |
| | <0.001 [*] | <0.001 | 1 6 < 0.00 3 | ₹ ≪<0.004 ₽* |

Table 9.6.2-11: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F092944

| | Y | , Ø | Q | _O' | 6-7-1-O-2 | <u> </u> | ** |
|----------------|---|-------------|-----------------|-------------------------|--|----------------|--------------------------|
| | O | | <i>®</i> | AFØF (| 92944 | Winter | & |
| | I × 15 g a PEARL Calculatio | Winter∞ | ce reals | ~ ~ | 92944 | y Inter | CECAIS |
| | 1×15 g as | s./ha, 🏖 | 0% inter | ception | 1.86 | g a,s,/ha, 2£ | % interception |
| | » PEART | , B | ₽E PE | LMO 🧠 | A PE | AND V | PELMO |
| | Calculatio | n_1 | Calcu | LMO Mation 2 | & Calcu | lation 18 | Calculation 2 |
| FOCUS Scenario | PÉC _{gw} | J. | | EC _{gw} | O | ZCgw 🌂 🌷 | PEC _{gw} |
| Q | PĚCgw μg/ [] | | برا 💸 | ECgy Y | 4. | ZCgw y g/L] | [µg/L] |
| | ○ <0.001 | L 18 | ^ _/ | 0.001 . © | ĺ 🎺 <mark><0</mark> |).Q 9 1 | < 0.001 |
| FOCUS Scenario | <0.001 <0.001 <0.001 | Q . | | 001 | | 10 01 | < 0.001 |
| | Ø 0.001 Ø 0.001 |) <u> </u> | | 0.004 | \$ 050 | 0.001 | < 0.001 |
| *0 | <0,001 | 4 | | 0.001 | V <0 | 0.001 | < 0.001 |
| | 6.001 | | <u> </u> | 0.001 0.001 0.001 | \$ 000 000 000 000 000 000 000 000 000 0 | 0.001 | < 0.001 |
| , | © <u>20.001</u> | ~ < | » » <u>9</u> | 0.001 | * | 0.001 | < 0.001 |
| <u></u> | <0.001 | ~~ <u>~</u> | ₹ √ <(|).00¥ ==== | <0 | 0.001 | < 0.001 |
| | <u> </u> | W | 40° <(| 0.001 | <0 | 0.001 | < 0.001 |
| @n | ₽″ 3 9.001 | | | 7.001 🔊 | <0 | 0.001 | < 0.001 |
| | \$\frac{\sqrt{\sq}}}}}\sqrt{\sq}\sqrt{\sqrt{\sqrt{\sq}\sq}}\sqrt{\sint\signgt{\sqrt{\sqrt{\sq}}}}}\sqrt{\sint}\sint\sign{ | | | | | | |

Table 9.6.2- 12: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F160460

| | Winter | AE F1 cereals | Winter | cereals |
|-----------------------|----------------------------|-----------------------|----------------------------|----------------|
| | 1×15 g a.s./ha, 2 | 0% interception | 1 × 6 g a.s./ha/ 2 | 0% intercotion |
| | PEARL | PELMO | PEARL | PE MQ |
| | Calculation 1 | Calculation 2 | Calculation 1 | Catculation 2 |
| FOCUS Scenario | $\mathbf{PEC_{gw}}$ | $\mathbf{PEC_{gw}}$ | PECEN | PEC® Z |
| | [µg/L] | <mark>[μg/L]</mark> 🖔 | [µg/L] | LY [Mg/L] S |
| | 0.130 | 0.124°V | 0.047 | 2 2045 V V |
| | 0.248 | 0.266 | 0.092 | 20.099 3 4 |
| | 0.241 | Q 2 255 | Q 0,085 X | 0.0 92 |
| | 0.150 | QQ.174 | 6 057 4 | O' 00065 O' |
| | 0.159 | 0.164° | 7 <mark>0.060</mark> 7 2 | 0.062 |
| | 0.109 | 0.043 | \$ 0.00 \$ | 0.053 |
| | 0.109 | M21 0 | 0040 | 0 000 A |
| | 0.032 × | 0.044 × | √ △ <mark>0.012</mark> √ √ | , 40015 V |
| | 0.098 | 0.067 | 0.035 | 0.024 V |

Table 9.6.2- 13: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F140584

| Winter cereals Winter cereals Winter cereals X 15 g & s. /ha, 20% interception X 6 g a, 3/ha, 20% interception PELMO PELMO PELMO PELMO PELMO PELMO PELMO PELMO PELMO PECgw PECgw PECgw PECgw PECgw PECgw Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L Pug/L |
|--|
| 1 × 15 g & s./ha 20% inferception 1 × 6 g asha, 29% interception PELMO PECgw PECgw PECgw PECgw PECgw PECgw Pug/L Pug |
| PEARL PELMO PEARL PELMO Calculation 1 |
| Calculation 1 Calculation 3 Calculation 3 Calculation 3 PECgm PEC |
| |
| 0.001 |
| 0.001 |
| 0.001 |
| 0.020 0.028 0.008 0.016 0.003 |
| 0.028 |
| 0.002 |
| |
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| 30.001 30.001 30.001 30.001 30.001 |
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Table 9.6.2- 14: PECgw (PEARL & PELMO) of mesosulfuron-methyl metabolite AE F147447

| | | AE F1 | 47447 | |
|-----------------------|-------------------------|---|-----------------------------|------------------------------------|
| | Winte | er cereals | Winter | r cereals |
| | 1×15 g a.s./ha | , 20% interception | 1×6 g a.s./ha/ 2 | 20% intercotion |
| | PEARL | PELMO | PEARL | PELMQ 🏈 |
| | Calculation 1 | Calculation 3 | Calculation 1 | Calculation 3 |
| FOCUS Scenario | $\mathbf{PEC_{gw}}$ | $\overline{\mathrm{PEC}_{\mathrm{gw}}}$ | PECgw | PEC® Z |
| | [µg/L] | <mark>[μg/L]</mark> 🖔 | [rg/L] | W [Mg/L] S |
| | 0.224 | 0.207 | 0.089 | Q082 V |
| | 0.217 | 0.186 | 0.087 | 0.074 |
| | 0.337 | 0.242 | Q 0,135 | 0.0 0 |
| | 0.119 | 0°.141 | 9,048 Q | 6 056 6 07 |
| | 0.114 | 0.113 | 7 0.046 7 6 | 0.045 |
| | 0.130 | 0.202 | 0.052 | 0.064 |
| | 0.111 | 2 .108 | 0044 | $ \bigcirc^{y} 0_{A} A^{z} $ |
| | 0.116 | √√ °>√0.098> > | △ 0.046 | 0.039 |
| | 0.239 | 7 0.163 L | 0.095 | 0.06 5 |

Conclusion: The maximum predicted concentrations in groundwater recharge of metabolites. AE F160459, AE F160460 and AE F14744% reach or exceed the parameteric togger value of 0.1 μg/L for some use and FOCUS groundwater scenario combinations. The overall maximum PEC_{gw} values were 0.216 μg/L for AE F160459, 0.266 μg/L for AE F160460, and 0.337 μg/L for AE F147447.

An assessment of the potential relevance is groundwater for these components is therefore made following the guidance given in SANCO 221/2009. Details hereon are found in Document N4, only a brief summary is provided below.

Screening for berbicider activity:

All three components were assayed for herbicidal activity in greenhouse tests (see KCA 3.6/03), and were found not to retain comparable target activity as the patient active substance.

Screening for genotexicity,

AE F160460 and AE F147447 were assayed in a standard battery of genotoxicity and mutagenicity tests in-vitro (see KCAS.8.1/6) to /96), and were found clearly devoid of mutagenic potential.

AE F160459 is characterised by a close chemical similarity with the parent compound mesosulfuron-methyl, and with metabolite AE F160460, the only structural difference between the molecules being the presence or absence of methyl substituents. As all the in vitro genotoxicity studies with mesosulfuron-methyl, as well as with metabolite AE F160460, were clearly negative when tested both with and without the metabolic activation mix 89, it can be concluded that also AE F160459 is devoid of mutagenic potential. Moreover, AE F160459 is a rat metabolite of mesosulfuron-methyl, and as such has been indirectly tested in the in vitro genotoxicity studies in presence of metabolic activation mix 89, which is added in vitro to mimic the metabolism of test substance that would occur in vivo in mammals. AE F60459 was also present in all apical rat studies, including the chronic toxicity and carcinogenicity and reproduction toxicity studies on mesosulfuron-methyl.



Screening for toxicity:

The active substance mesosulfuron-methyl has not been classified as being toxic or very toxic. reproductive toxic or carcinogenic; there is no indication that the metabolites would bear any specific risks for toxicity. No further toxicity assessment is therefore triggered for metabolites.

Metabolites AE F160459, AE F160460, and AE F147447 fulfil the criterial for being considered. relevant for groundwater' at Step 4 of the guidance. For simulated PEC below the prigger leve 0.75 µg/L, no quantitative consumer risk assessment is deemed necessary.

In overall conclusion, there are no concerns for groundwater with regard to metabolites from the intended use of mesosulfuron-methyl in the present formulation.

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IIIA 9.6.3 Additional field testing

No additional field testing was required.

IIIA 9.6.4 Information on impact on water treatment procedures

No impact of mesosulfuron-methyl on sewage treatment processes was concluded based on results of an inhibitor test of activated sludge restriction.

Pseudomonas putida, a representative based.

The possibility of impact of mesosul foron-mothyl conducts on drinking water treatment was analysed in a statement summarised below:

| | | | | | (U) | |
|--------------|-------------------------|------------------|----------------|------------------------------------|--------------------|------------|
| Report: | | ° . | ;20¥5;N | <mark>1-5)</mark> 0337 -0 1 | | |
| Title: | O Conce | ntrations of mes | wulfuren-meth | yl and its meta | abolites in drinki | ng water - |
| ď | Staten | | 4 . Q . Z | | U | |
| Report No:🛇 | M ₂ 510 | 0337-61-1 | | | , | |
| Document No: | MJ-510 | 03307-01-1 | S. | | | |
| Guidelines: | % not sp | ecified; not spe | cified 💭 🔒 . ` | | | |
| GLP/GEP: | ∾ ″ <mark>n.a.</mark> √ | / N | | 2 | • | |

Z Based on the predicted environmental concentrations for representative uses of mesosulfuron-methyl, an estimate was made for the concentrations of parent active substance and metabolites to be expected at ground- and surface water abstraction points for the production of drinking water.

From this assessment it was concluded that the substance concentrations potentially entering processes for driviking water the atment would only be min wal, i.e. by far less than 0.1 μg/L, and would therefore be highly unikely to result in the formation of gignificant levels of by-products that would require human or animal health risk assessment.

Therefore was concluded that further information on the effect of water treatment processes on the nature of cesidue present in surface water and groundwater are not required.

IIIA 9.7 Predicted Environmental Concentrations in Surface Water (PECsw) for the Active Substance

Summary of fate and behaviour of mesosulfuron-methyl in water

Abiotic hydrolysis: Mesosulfuron-methyl is only slowly hydrolysed in steril buffer solutions at at pH 4, 25 °C). The hydrorytic pathway involves environment) or AE F147447 (neutral and alkaline environment). As a minor pathway under alkaline conditions, additionally hydrolysis of the methyl ester function may occur, to result in small and of AE F154851. neutral to alkaline pH (DT₅₀ = 253 d at pH 7, 25 °C, and 318 d at pH 9, 25 °C), but degrades more

Aqueous photolysis: Mesosulfuron-methyl is not phonodegraded to significant extent at wavelengths >290 nm in sterile buffer solution. Direct photolysis will therefore not contribute notably to elimination from the aquatic environment, and will not lead to the generation of relevant degradates?

Water/sediment: Mesosulfuron-methy was found in crobially degraded to two fested acrobic sediment/water systems. The proposed route of degradation is consistent with the route of degradation in aerobic soil, all components shown in Figure 9.1.1-1 were also identified in the water / sediment study. The products of predominant abundance were AE F160459, AE F147447, and AE F160460, which reached maximum abundances of 21.6% AR . 20.9% AR, and 8.4.% AR in the total systems, Terminal bioconversion leginto the formation of non-extractable residues, and ¹⁴C Sarbon dioxic.

The study was kinetically evaluated according FOCUS (2006), an overview of this information provided in the table below: respectively (Table CA 7.2-1). All further degradates remained below 5, %AR ampling day 140. Terminal bioconversion lection of non-extractable residues, and 14C-carbon dioxide.

Table 9.7-1: Total system DT₅₀ values and maximum abundances of mesosulfuron-methyl and its metabolites in aerobic water/sediment

| Max. abundance [%AR] | (100) | 4.9 | 216 | Ø.9 & | 3.2 | 8 4 | %1.9 | 10.9 |
|----------------------|-------------------------|------------|------------|---------|--------------|--------------------------------|---------|------------------------|
| Endpoint a) | 45.8 | 38% | ₹/.5 | (1000) | 25 .9 | _ۣ ڳُ38.3 ِ | (1000) | 205 |
| (pyrimidyl label) | 23.3 | Ø8.2 (\$\) | 16,8 | nfi⁄d. | On.d | 16.2 16.3 238.3 238.3 | ja.d. | O - p) |
| (phenyl label) | 33.1 | 10.8 | | n.d. | .√ b) | ~ 16.2 | o n.d | ngd. |
| (pyrimidyl label) | 70.3 | 98.5 | 64.8 | n.d. | Z 25.9 | 250 | n.d. | 1 . |
| (phenyl label) | 81.2 | 255 | 1 4 | n.d. | | \$7.1 | O n.d | 205 V _{b)} |
| | (days) | (days) | (day®) | (days) | ∜(days) | (d a 0s) | (days) | Qdays) |
| | Mesosi | AEF | AE FI | AE FO | ONE FIC | AE FI | (()/L_ | Odays) |
| | Mesosulfuron- methyl | F154851 | AE F160459 | F099095 | F092944 | ر مالا AE F160460 | 140584 | N 24-1 |
| Test system | | | | | | | | |

a) geomean for more than 1 value worst case default of 1000 days where no reliable DT50 derived becomponed not traced by radioabel position

nd.: no reliable value determinable

Endpoints for PEC

Table 9.7- 2: Comparison of proposed EU indpoints and modelling input parameters for mesosulfuronmethy.

| End-point | | osulfuron-methyl |
|--|-------------------------------------|---------------------------------|
| Eug-boint | Proposed EU endpoints Document N2 | Value used for modelling |
| Mesosulfuron-method & | | |
| Aqueous solubility mg/L | \$\tag{\pi} 483 \times | 483 |
| Vapour pressure [Pa] | 35×10-15 31.9 | 3.5×10^{-12} |
| DT ₅₀ soil [days] (geomean, lab) | 31.9 | 31.9 |
| Aqueous solubility mg/L Vapour pressure [Pa] DT ₅₀ soil [day (geomean, lab) K _{oc} [L/kg] (median) K _{om} [L/kg1 (median) | 48° 27.8 | 48 |
| | 27.8 | 27.8 |
| 1/n (arith mean) | 27.8 20.910 | 0.910 |
| Plant uptake factor | | 0 |
| DT water/sed. total system days | Q \$ 45.8 | 45.8 |
| DT ₅₀ water [days] \ | 45.8 | 45.8 |
| DT ₅₀ sediment (rays) | 45. (Step 1&2) / 1000 (Step 3) | 45.8 (Step 1&2) / 1000 (Step 3) |

PECsw prodelling approach: FOCUSsw Scenario Calculation

The calculation according FOCUS methodology is a tiered approach with up to four steps. Generally, different potential entry routes of a substance into surface water like spray drift, run-off, erosion and drainage are considered, and in each step PEC values in water and in sediment are calculated.



Step 1: In this, the most conservative step, all inputs are considered as a single generic loading to a static worst case water body, distributed between water and sediment within 1 day, and a worst-case PEC_{sw} and PEC_{sed} is calculated.

Step 2: A refinement is made to the Step 1 approach, whereby individual loadings into the water book from different entry routes are considered. Two scenarios are introduced to represent Northern and Southern Europe, but no specific crop scenarios are defined.

Step 1 & Step 2 simulations are run with the FOCUS Steps 1-2 Calculator tool.

Step 3: A more detailed exposure assessment based of 0 realistic worst-case scenarios ionade. The scenarios are divided into six scenarios where drainage is the relevant entry route and four where runoff is relevant; spray drift is considered for all sceparios. Three water bodies of differing size and hydrology have been defined, stream, pond and ditch. The scenario settings are each representative of certain agricultural conditions in Europe with respect to weather, wil, cross and water bodies, so that, o an appropriate subset of scenarios relevant to a specific country and crop can be defined.

The simulations are done using the models PRZM (for entries due to run-off and prosion) MAGRO (for inputs due to drainage) and TOX5WA (for simplation of the behaviour in the water body). The FOCUS SWASH tool is a utility which enables an automatic input of relevant data into the three simulation models.

Step 4: A higher-tier refinement to the Step 3 PE results is made on a case-by-case basis, e.g. via considering specific mitigation measures or interesting certain scenario modifications specifically applicable to the respective product use.

PEC_{sw} calculations for mesosultor on-methyl

| Report: | 3; ; ; ; ; ; 2014; ; 2481626-01 |
|--------------|---|
| Title: | Mesosulfuron-methyl (MSM) and metabolites: PECsw, sed FOCUS EUR - Use in winter gereals in Furone |
| , Q | I in winter releasing the arobe |
| Report No: | E6Sa-14-0230 & |
| Document No: | M-48) 626-01-1 S S |
| Guidelines: | not applicable;not applicable 🍼 🛴 |
| GLP/GEP: | ng S |

Materials and Methods:

Predicted environmental concentrations in surface water and sediment (PEC_{sw} and PEC_{sed}) of Detailed application data used for simulation of PEC_{sw} were compiled in Table 9.7Table 9.7-. mesosultaron-methyl have been calculated for the use in winter cereals in Europe, via the tiered

Table 9.7-3: Application pattern used for PEC_{sw,sed} calculations (FOCUS Step 1&2)

| | 70 CT1C | | Applic | ation | | Amount reaching |
|-------------------------------|--|------------------------------------|-----------------|-----------------------------|--------------------|---|
| Individual crop | FOCUS crop used for interception | Rate per season [g a.s. /ha] | Interval [days] | Plant interception [%] | BBCH Stage | soil per season application [g a.s./ha] |
| Winter wheat GAP & Simulation | cereals, winter (arable crops) | 1 × 15 | >. | average crop acover (50%) | 20-32 | |
| Winter rye GAP & Simulation | cereals, winter (arable crops) | 1 × 6 | - 🔻 | average crop cover (50%) | 20-32 _@ | 3.0 |

Application timing: The spring application in winter cereals according to GAP is done at the end of winter, at the beginning of the vegetation period i.e. when the temperature is high enough to expect crop and weed growth), onto well-developed grop.

At FOCUS Step 2 the application period in the model was set to "October to February", which will also represent the worst case of the available tiping periods.

At FOCUS Step 3 actual application dates are generally determined by the PAT (pesticide application timer) included within SWASH, which selects an appropriate actual application date to ensure at least 10 mm of rainfall in the first 10 days after application, and at the time less than 2 mm of rain per day in a five day period around the date of application. However, no predefined event dates are implemented in the FOCUS model that yould directly translate the above described cropping situation into discrete PAT windows for each surface water scenario setting. Therefore, the following approach was used to define suitable scenario adapted application dates: the simplated treatment was referenced relative to the tabulated crop emorgence date of the earliest energing spring crop (i.e. not necessarily cereals) that was defined by FQCUS for the respective scenario. Start of the PAT window was then set to 14 days before that date, which is considered an adequate representation for the start of the vegetation period in the respective scenario environment. An overview of the resulting date selections used in Step 3 is found compiled in the tables below

Table 9.7-4: Spring emergence trates of earliest crops in the FOCUSsw scenarios

| Scenario | Location S | Crop C | Emergence date | Julian date |
|--------------|------------|------------------------------|----------------|-------------|
| D1 @ | | © Spring@ereals® | 05-May | 21-Apr |
| D2 ~ | | spring cereals ^{a)} | 15-Mar a) | 01-Mar a) |
| D3 🚄 | | spring cereals | 01-Apr | 18-Mar |
| D4 | | Tield beans | 15-Apr | 01-Apr |
| D5 | | spring@ereals | 15-Mar | 01-Mar |
| ₹1216 | | root vegetables | 25-Feb | 11-Feb |
| R1 | | Seld beans | 10-Apr | 27-Mar |
| R2 | | bulb vegetables | 28-Feb | 14-Feb |
| R3 | | root vegetables | 26-Feb | 12-Feb |
| R3 O | | root vegetables | 26-Feb | 12-Feb |

a) no crop with emagence in spring defined; D5 data used instead

Table 9.7-5: Application dates of mesosulfuron-methyl for the FOCUS Step 3 calculations

| Parameter | Winter cereals (1 | 1 × 15 g a.s./ha) | Winter cereals (| 1 × 6 g a.s./ha |
|----------------|--|----------------------------|----------------------------|--|
| PAT start date | | | | ~ · · · · · · · · · · · · · · · · · · · |
| rel./absolute | Abso | lute | Absol | lute 💇 💍 |
| Appl. method | ground | spray | Found | spray 👸 🔊 |
| (appl. type) | (CAM | 1(2) | (CAN | 12) 🛇 |
| No of appl. | 1 | | 1 | |
| PAT window | | Ö | | |
| range | 30 |) | 36 | lute spray 12) \$\frac{1}{2}\$ |
| Appl. interval | 1 | 4 | | |
| Application | PAT Start Date | Appl. Date | PAT Start Date | Appl. Date |
| Details | (Julian Day) | ppi. Date | (Julian Dag) | Appl. Date of |
| D1 | 21-Apr | 25-Apr 25-Mar 17 Mar | 21-Apr | Q3-Apr |
| | (111) | | | |
| D2 | 01-Mar | 2-Mar | Mar o | 12-Mar |
| 7.0 | (60) | | (60) | O TO |
| D3 | 18-Mar 🧳 " | Mar S | 18-Mar & | I'/-MaxCy |
| D4 | $(77) \mathcal{O}^{v} \mathcal{O}^{v}$ | | | 17-Mac 18-Apr 77-Mar 27-Feb |
| D4 | 01-Apr | rs-Apr | (0)-Apr (91)- 01-Mar | 18-Apr |
| D5 | | 07Mor \$ | (91) N | 7 7√07-Mar |
| D3 | 0QMar | 07 Mar | 0 01-1691 C | / -iviai |
| D6 | | 27-Feb√ | Al-Feb | 27-Feb |
| D0 | (42) | l e a | Ø₁-1 CU ∞² (42) Ø | 27-100 |
| R1 s | | 26-Apr | 27-Mar 2 | 26-Apr |
| * | ② 29-Mar _Q ✓ (86) 4 | 20-Api | 186) | 20 1101 |
| R3 👟 | (86) 12-Feb | 1 9-Feb | 412-Feb | 19-Feb |
| | | | 0 (43) | |
| R4 & | √ . Ø Feb | 0.25 Mar 20 | 12-Feb | 02-Mar |
| | (43) | V Waviar V | 12- y eb | |

Application type: For both uses application type CAN 2 was selected: crop canopy, default soil incorporation depth DEPU for non foliage intercepted chemical is 4 cm; distribution: linearly decreasing with death.

Substance specific input parameters for the FOCOS Step 1-3 calculations are listed in Table 9.7-.

Soil degradation of mesoculfuror-methor and its metabolites was based on geometric mean DT_{50} as derived from laborators studies, normalized to 20°C and 100 % field capacity according to FOCUS (2000).

Soil adsorption was described by median Kor. Kom for the parent active substance, or arithmetic mean values for all other components with experimental data from batch equilibirum studies available. For metabolite AE FM0584 worst case default value of zero soil adsorption was used in the absence of experimental data. For concentration dependency, arithmetic mean Freundlich coefficients were used, or a default value of 1.0 in the absence of experimental information.

For description of substance degradation in the water/sediment, according to FOCUS (2003) the total system degradation DT₅₀ is used for Step 1-2 calculations. In Step 3 calculations, total system degradation DT₅₀ is used for the water phase and default DT₅₀ of 1000 days for the sediment phase. A default half-life of 1000 days is assumed as well for components where the experimental data did not allow for the derivation statistically reliable kinetic parameters.

Ignoring the systemic action of mesosulfuron-methyl, a worst case default for plant uptake (PUF) was assumed for parent active substance and all metabolites in this first tier calculation.

Table 9.7- 6: Substance parameters used for mesosulfuron-methyl at FOCUS Steps 1-3

| Parameter | Unit 🙈 | Mesosulfuron-methyl V |
|---|-------------------|--|
| General | Unit | Mesosulfuron-methyl 5 |
| Molar Mass | g/mol , , , | 503,5 |
| Water Solubility (pH 7, 20 °C) | mg/L _a | 483 4 0 |
| Vapour Pressure (20 °C) | Pa | 483 35E-12 0.0 |
| Plant Uptake Factor | 2 0 | |
| Wash-Off Factor PRZM | €1/cm ° | |
| Wash-Off Factor MACRO | | |
| Sorption | | 35E-12 4 0.0 0.0 0.5 0.5 0.5 0.5 0.5 0.5 |
| Koc | ml/g ~ | 48 |
| Freundlich Exponent | | |
| Freundlich Exponent Degradation Soil Total System Water | of days days | 48 0.9 31.9 45.8 45.8 45.8 (Step 182) / 1006 (Step 3) 0.7 |
| Soil | days y | ~ \$1.9 £ 6 |
| Total System | days | 45.85 |
| Water | Q Qays Q | |
| | days J | 5.8 (Step 1&2) / 1006/(Step 3) |
| | | 0.7 |
| Max Occurrence | | |
| Water / Sediment | | |
| Soil Effect of Temperature | J/mol 5 | 1 4 6 5 5 5 5 5 5 5 5 5 5 |
| Effect of Temperature | | |
| Activation Energy | J/mol 5 | © *65400 |
| Soil Effect of Temperature Activation Energy Exponent Q ₁₀ | 1/K | ♥ |
| Q_{10} | | 2.58 |

Findings: Ø

tues for mesosulfuron-methyl at Steps 1 and 2 are Steps 1 and 2: The max given in Table 9.7

and PECsec values for mesosulfuron-methyl at Steps 1&2 **Table 9.7-7:**

| | | v 0° | |
|----------------------------------|----------------|-------------------|---------------------------|
| | | Mesosulfur | on-methyl |
| Use pattern | FQGUS scenario | PEC _{sw} | PEC _{sed} |
| | | © [μg/L] | [µg/kg] |
| | Step L 2 20 | 4.837 | 2.256 |
| Winter cereals XX × 15 g a.s./ha | Step 2 V | | |
| X × 15 g a.s./ha | N EW Single | 1.202 | 0.567 |
| | S-EU Si@gle | 0.986 | 0.465 |
| & A \ a | Step 1 ~ | 1.935 | 0.902 |
| Winter cereals | Step 2 | | |
| Winter cereals 1 × 6 s.a.s./ha | NEU Single | 0.481 | 0.227 |
| | S-EU Single | 0.395 | 0.186 |

maximom PEC_{sw} and PEC_{sed} values for relevant FOCUS Step 3 scenarios are given in

Table 9.7- 8: Maximum PEC_{sw} and PEC_{sed} of mesosulfuron-methyl for all scenarios at Step 3 after application to winter cereals

| Use pattern | Mesosulfuron-methyl | | | | | |
|----------------|---------------------|---------------------------------|--------------------|-----------|-------------------------------|----------------------|
| | Winter | Winter cereals, 1 × 15 g | | Winter | cer@ls, 1 × 6 g | g a.s@ha 🚕 |
| FOCUS scenario | Entry | PECsw | PECsed | Entry | PECsw | ₹PEÇ |
| | route* | [µg/L] | [µg/kg] | route* 🧳 | 『[μg/L] | μg/kg] |
| D1 (ditch) | S | 0.161 | 0.261 | S | 0.063 | . ØØ106 ≪J |
| D1 (stream) | S | 0.118 | 0.153 🕭 | S | 0.047; </td <td>~~0.062°</td> | ~~0.062° |
| D2 (ditch) | D | 1.601 | 0.9047 | D | 0.57 | © 0.363 |
| D2 (stream) | D | 1.010 | 0.522 | ID | 0:366 | ° 0,2070 «€ |
| D3 (ditch) | S | 0.096 | Ø919 | s . | 0.038 | Ø 008 Ø |
| D4 (pond) | D | 0.024 | 70 .058 | D Q | ©0.008° | 0.022 |
| D4 (stream) | S | 0.079 | © 0.024 | S S | [™] 0.Q3√ | , 0. 009 |
| D5 (pond) | S | 0.011 🐇 | 0. 0 324 .< | D S | 0,004 | 0.040 |
| D5 (stream) | S | 0.078 | √\$010 × | S S | Ø.031 € | 2 0.004 。 |
| D6 (ditch) | S | 0.1024 | ~0.025© | Q S | 0.0410 | Ø0.01 0 % |
| R1 (pond) | R | 0.066 | ~ \(0.00\) | R → | 0.002 | 0.004 |
| R1 (stream) | R | 0 70 × | > 0@016 √ | | 0043 | <i>0</i> © 07 |
| R3 (stream) | R | Q,325 ₆ \(\sigma^2\) | 046 | ≪ĭR Ö | Ø.130 % | 0.019 |
| R4 (stream) | R | 0.246 | × 0.046 | R | \$\infty 0.10@ | , © 0.020 |

^{*} Entry route: letters S, D, and R correspond to the dominant entry path - spory drift arainage, and rupoff

| Report: | d; |
|--------------|---|
| Title: | Mesosulturon-methyl (NSM) Graphical outputs of prediced environmental |
| | Concembrations in surface water - Use in Winter Greats in Europe |
| | EnSa-15-0033 |
| Document No: | M-508737-01-1 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ |
| Guidelines: | not applicable not applicable > 5 |
| GLP/GEP: | no V |

Predicted environmental concentrations of the active substance mesosulfuron-methyl and its metabolites for the use in winter cereals in Europe were calculated and reported in the document EnSa-14-0230 (BCB document number M-48/026-010), KHIA 9.7/01).

The present report supplements the original document and provides graphical presentation of time resolution of PECsw concentration scalculated according to the FOCUS Surface Water (SW) approach (FOCUS 2003) at Step3 level. For each of the scenarios, 2 graphic files are provided. The overall time evolution of the respective concentration over the whole course of the TOXSWA simulation and a detailed view at the period around the observed maximum (1 week before the maximum and 8 weeks after the maximum) are shown. These information may support ecotoxicologal risk assessments, where timecourse information is considered of importance in addition to the maximum concentrations listed above.

Alternative PECsw simulation using RMS requested modelling parameters:



| Report: | 4; ;2015;M-517481-0 | <mark>)1</mark> | |
|--------------------|--|---------------------|--------------|
| Title: | Mesosulfuron-methyl (MSM) and meta- - Use in winter cereals in Europe | abolites: PECs 💸 se | ed FOCUS EUR |
| Report No: | EnSa-15-0311 | 29 | |
| Document No: | M-517481-01-1 | \$\tag{\psi} | |
| Guidelines: | not applicable; not applicable | W . | |
| GLP/GEP: | no | O X | |

The document reports an alternative calculation of predicted environmental concentrations in surface water, following the methodology presented under KLRA 9.701 and 02 before, but applying a set of modelling parameters requested by the RMS.

Materials and Methods: reference is made to MIIA 9.7./01. See summary before

Table 9.7-9: Application pattern bsed for PECsw,sed calculations (FOCOS Step) &2

| Individual crop | FOCUS crop used for interception | Ig ops. / nag y | Interval (days) | arion S O BBEH interception Stage | |
|-------------------------------|----------------------------------|-----------------|--------------------|-------------------------------------|----------|
| Winter wheat GAP & Simulation | | | | average crop cover (20%) | 1 × 12.0 |
| Winter rye GAP & Simulation | ereals winters (araloe crops) | 1 ×6 | | over 20% 20-32 | 1 × 4.8 |

Application timing

For FOCUS Step 2, reference is made to KIIIA 9.7/01, see summary before

For FOCUS Step 3, the procedure used was identical to that of the previous simulation KIIIA 9.7./01, nevertheless more extensive description is provided here below for better clarity:

Agronomically and in-line with the GoP, the spring application in winter cereals is done at the end of winter, at the beginning of the vegetation period (e. when the temperature is high enough to expect crop and weed growth), onto well-developed crop. However, in the FOCUS model no pre-defined event dates are implemented for winter cereals that would directly translate the above described cropping situation into discrete PAT windows for each surface water scenario setting. Therefore, the following approach was used to define seenario adapted application dates: the simulated treatment was referenced relative to the tabulated crop emergence date of the earliest emerging spring crop that is defined by FOCUS for the respective scenario. Start of the PAT window was then set to 14 days before that FOCUS event date date, which is considered an adequate representation for the start of the vegetation period in the respective scenario environment.

For technical reason, this relative timing can only be implemented in the model in form of manually entered 'absolute' PAT start dates, since the used auxiliary for referencing ('earliest emerging spring crop') is not indentical to the simulated crop winter cereals, and also may vary between scenarios.

An overview of the date selections resulting is found compiled in the tables below:

Table 9.7- 10: Spring emergence dates of earliest crops per sceanrio used as reference for application timing definition in the FOCUSsw scenarios

| Scenario | Location | Crop | Emergence date | Julian date |
|-----------------|---------------------------|-------------------------|-----------------------|---|
| D1 | | spring cereals | 05-May | 21 - % pr |
| D2 | | spring cereals a) | 15-Mar | 01 -M ar ^{a)} 🍣 |
| D3 | | spring cereals | 01-Apr | 48-Mar |
| D4 | | field beans | 15 _z Apor | , 0 <mark>01-A6</mark> |
| D5 | | spring cereals | 15-Mar | 01-Mar |
| $\overline{D6}$ | | root vegetable | 25-Feb | |
| R1 | | field beans, | 10-Apr | 27-Mac √ |
| R2 | | bulb vege t® les | 28-Feb O | [™] 14- F • • • • • • • • • • • • • • • • • • • |
| R3 | | root vegetables | 26-Feb 5 | 12-Feb |
| R4 | | root vegetables | 26-Feb | O' JP-Feb |
| | rganas in apring defined: | Tool vegetables | | |

Table 9.7-11: Application dates of mesosylfuron-methyl derived for rise in FOCUS Step 3 calculations

| | | | <i>V</i> | | |
|--|--|----------------------------|-------------------|-----------------|--|
| Parameter | Winter e re | | z/a.s./ha) | Winter ce | ays to emergence date of ing crop per sceanario, a Cabsolute' dates cennical peason) |
| PAT start date | relative: £14 da | ysto emerge | ence date of | relative: -14-d | ays to mergence date of |
| rel./absolute | earliest sprin | ig crop∂per s | ceapario, 🍣 | Carliest Spri | ing crop per sceanario, |
| | @(entered | as 'aboolute' | Gates (| (ercered | as Dabsolute' dates |
| | g for∕ted | chnical reas | n) | for te | echnical (eason) |
| | | | ~ | for te |) |
| Appl. method | | ound spray | J | | round spray |
| (appl. type) | | (CAM ² 2) | | c V | CAM 2) |
| No of appl. | | 9 | | | |
| PAT window | | eund saray (CAMP2) P | | 0' 4 | |
| Appl. interval | FAT SUM DA | 7 30 1 7 3 | Ÿ \$ | | 30 1 |
| No of appl. PAT window range Appl. interval Application Details | ATT Spart Du | teo A | opl. Date 250 Apr | PAT Start D | |
| D2 D3 D3 | (Julian Day) 21-App (11) (11) (11) (10) (17) (17) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (14) (17) (1 | | 250Åpr | 21-Apr | 25-Apr |
| | | | | | |
| No Political Pol | 01-Mar | | 12-Mar & | 01-Mar | 12-Mar |
| | (f) (780) (g) | | & A' | (60) | |
| D3 S | Ø/8-Mar | | | 18-Mar | 17-Mar |
| | | | 7 (F) | (77) | 10 A |
| D4 O | O O O - PADI | | 18-Apr | 01-Apr (91) | 18-Apr |
| | 01-Mar 660) 78-Mag (776) 04-Apr 04-Apr 01-Mar | | Mar. | (91) 01-Mar | 07-Mar |
| D6 P1 | 2 (60) | | y-iviai | (60) | 07-iviai |
| D6 27 | 11 Feb | | 27-Feb | 11-Feb | 27-Feb |
| | \$\square \qquare \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq \qqq \qqqq | V LY | | (42) | |
| R1 , Õ | 11 Feb (42) 27-Mar | " | 26-Apr | 27-Mar | 26-Apr |
| | (86) | 0 Y | - | (86) | • |
| RZ ~ ^ ` | 12Feb | | 19-Feb | 12-Feb | 19-Feb |
| | (43) | | | (43) | |
| RI RA RA | (42) (27-Mar (86) (12-Feb (43) (43) | | 02-Mar | 12-Feb | 02-Mar |
| | (43) | | | (43) | |

In a pre-submission meeting between experts BAYER-ANSES of Jan. 30th, 2014, that approach for application timing definition in the FOCUS models environment was presented and extensively discussed between modelling experts. The proposed scenario-specific application dates for the AIR process were set to 2 weeks before the emergence of the first crop at end-of winter in the respective scenario.





Table 9.7- 14: Maximum PEC_{sw} and PEC_{sed} of mesosulfuron-methyl for all scenarios at Step 3 after application to winter cereals

| Use pattern | Mesosulfuron-methyl Y | | | | | | | |
|--------------------|-----------------------|----------------------------------|-----------------------------------|----------------------|-----------------------------|--------------------------|--|--|
| | Winter | Winter cereals, 1 × 15 g a.s./ha | | | Winter cer@ls, 1 × 6 g a.so | | | |
| FOCUS scenario | Entry | PEC _{sw} | PEC _{sed} | Entry | PECsw | PECSO | | |
| | route* | [µg/L] | $[\mu g/kg]$ | route* | " ຶ <mark>[μg/L]</mark> | [µg/kg] | | |
| D1 (ditch) | D | 0.187 | 0.407 | D & | 0.075 | 9 , 021 65 | | |
| D1 (stream) | D | 0.132 | 0.237 🖒 | D V | 0.053×√² | 0.096° | | |
| D2 (ditch) | D | 1.328 | 0.98 0 % | D _O | 0.51 | 20.387 A | | |
| D2 (stream) | D | 0.837 | 0.568 | | 0:322 | 0,225 (4) | | |
| D3 (ditch) | <mark>S</mark> | 0.096 | , © 22 | S | 0.038 | 8 009 | | |
| D4 (pond) | D | 0.035 | 0.096 | | 0.013 | 0.036 | | |
| D4 (stream) | <mark>S</mark> | 0.080 | © 0.039 | S | 0.032 | 0.014 | | |
| D5 (pond) | <mark>S</mark> | 0.016 | 0.039 0.042 0.019 0.0300 | | 0,0 06 | °≥√ 0:947 | | |
| D5 (stream) | <mark>S</mark> | 0.081 | [₄ 6019 % | i ä <mark>s</mark> | 0 .032 ₁ | 20.008 。 | | |
| D6 (ditch) | <mark>S</mark> | 0.10 <mark>2</mark> 4 | 0.030° | l Q S | 0.0410 | ⊘ 0.01 2 √ | | |
| R1 (pond) | <mark>R</mark> | 0.06 | 9 0.Q1) | r <mark>r</mark> → ` | 0.0410 | 0.005 | | |
| R1 (stream) | R | 0 √11 ~ | ⁸ 000 18 ° √ | | | 2 0€008 | | |
| R3 (stream) | R | Q 327 | 052 | | 130 | 0.021 | | |
| R4 (stream) | R | 0.266 | % 0.05€ V | R | 0.108 | é <mark>0.024</mark> | | |

^{*} Entry route: letters S, D, and R correspond to the dominant entry path – spony drift Mainag and runoff

Graphical outputs of predicted environmental concentrations in surface water:

The model report provides in its Appendix 9.4 graphical presentations of the concentration timecourses of PECsw, calculated according to the FOCUS surface Water procedure at Step 3 level. For each of the scenarios, two graphic files are provided: The overall time evolution of the whole TOXSWA simulation, and a detailed view at the period around the observed maximum (ca. 1 week before the maximum) to 8 weeks after the maximum) are shown. These information may support ecotoxicologal risk assessments, where time course information is considered of importance in addition to the maximum concentrations listed above. Diagrams of interest for risk assessment will be shown in the ecotoxicological section.

IIIA 9.7.1 Initial PECsw value for static water bothes

See comment under Point 9.7.

IIIA 9.7.2 🌄 Initial PLCswyalue for slow moving water bodies

See compart under Point 9.7

Short-term PE@sw values for static water bodies (1-4 days after last application).

See comment under Point 9

IIIA 9.7.4 Short-term PECsw values for slow moving water bodies (1-4 days after ast application)

See comment under Point 9.7.

IIIA 9.7.5 Long-term PECsw values for static water bodies (7-42 days after last application)

See comment under Point 9.7.

Long-term PECsw values for slow moving water bodies (7-42 days after ... IIIA 9.7.6 last application)

IIIA 9.8

Table 9.8-1:

| Please refer to | point IIIA 9.7. | | |
|---------------------------|--------------------------|--|---|
| | | | ace Water (PECsw) for ameters for mesoscillurous sosulfuron-methyl value used for modelling |
| IIIA 9.8 | Prodicted Environ | amontal Concontrations in Surf | ado Wator (PKF sw) For |
| 111A 9.0 | Metabolites | | ate water (1 Deswitter |
| | Wictabolites | | |
| | | . * | |
| Endpoints fo | r PEC _{sw} | 407 | |
| | | | |
| Table 9.8- 1: | Comparison of propos | sed endpoints and modelling input para | ameters for mesosulfuron |
| | methyl metabolites | | |
| End-point | | Active substance: me | Soculfuron-methyl & |
| Ena-point | | Proposed El Pendroints | Value used for modeling |
| | | Document N2 | |
| AE F154851 | | | |
| Aqueous solu | bility [mg/L] | 2000@7 ~ ~ | Z 20000@ |
| Vapour pressu | | 1.7%10-8 | 1.7 % 10-8 |
| | ys] (geomean, lab) | Z | 37.1 |
| | g] (arith. mean) | 683/396 | 683/39.6 |
| 1/n (arith. mea | | 0.940 | 0.940 |
| Plant uptake f | | | 0 |
| | ed. total system [days] | | 38.6 |
| (geomean) | ays] (geomean) | | 38.6 |
| | t [days (geomean) | 366 | 38.6 |
| | nce in water sed. [%] | 249 3 01 × | 4.9 |
| Max. occurre | | 16.2 | 16.2 |
| AE F160459 | | | |
| Aqueous soon | bility [mg/L] | 100000 | 10000 |
| Vapour pressi | | 68 × 10° Y | 6.8×10^{-8} |
| | /s] (geomean, lab | 70.1 | 70.1 |
| | g] (arith. mean) | 21.8412.6 | 21.8 / 12.6 |
| 1/n (arith. mea | | 0.940 | 0.940 |
| Plant uptake f | | 7 0 7 | 47.3 |
| (geomean) | Ptotal System [Cays] | 47.3 | 47.3 |
| | ays] (geomean) | 47.3° 47.3° 47.3° | 47.3 |
| DT co sed men | t [days] kgenmear® | ¥ 47.3 | 47.3 |
| Max.,occurrer | nce in water / sed. [%] | 21.6 | 21.6 |
| Max occurren | nce in soil [% | Q \$\frac{1}{2} \tag{8.9} | 8.9 |
| AE F099095 | | | |
| Aqueous solu | | y Q 190 | 190 |
| Vapour press | Dre [Pa] | 1.9 × 10 ⁻⁵ 87.9 | 1.9 × 10 ⁻⁵ |
| DT ₅₀ soil day | ys] (geomean Tab) 🗸 | 87.9 | 87.9 |
| | g] arith. mean) | 576 / 334 | 576 / 334 |
| 1/n (arith. mea | | 0.840 | 0.840 |
| | ed. total system [days] | 1000 | 1000 |
| (default value | | 1000 | 1000 |
| | ays] (default value) | 1000 | 1000 |
| | t [days] (default value) | 1000 | 1000 |
| | nce in water / sed. [%] | 0.9 | 0.9 |
| | <u> </u> | • | |



| End-point | Active substance: mes | sosulfuron-methyl | | |
|--|---|------------------------------------|--|--|
| _ | Proposed EU endpoints | Value used for modelling | | |
| | [Document N2] | | | |
| Max. occurrence in soil [%] | 29.2 | 29.2 | | |
| AE F092944 | | | | |
| Aqueous solubility [mg/L] | 5200 | 5200 | | |
| Vapour pressure [Pa] | 2.6×10^{-2} | 2.6 × 10 ⁻² × 6 | | |
| DT ₅₀ soil [days] (geomean, lab) | 60.4 | V | | |
| K _{oc} / K _{om} [L/kg] (arith. mean) | 447 / 250 0 | 447/26V O | | |
| 1/n (arith. mean) | 0,72* | 25.9 25.9 | | |
| Plant uptake factor | | | | |
| DT ₅₀ water/sed. total system [days] | 25.9 Q 0 | ° 25.9 ° 25.9 | | |
| (max. value) | 25.9 Q Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z | 25.9 | | |
| DT ₅₀ water [days] (max. value) | 25.9 | 25.9 | | |
| DT ₅₀ sediment [days] (max. value) | 25.9 3 | 1 ³ ♥ 35 ⁴ 0 | | |
| Max. occurrence in water / sed. [%] | 3.2 0 | 25.9 3.2 10.4 | | |
| Max. occurrence in soil [%] | 3.2 | | | |
| AE F160460 | | 10.4000 | | |
| Aqueous solubility [mg/L] | \$00000 \$\frac{1}{2} \tag{0} | 10.2 10.00000 | | |
| Vapour pressure [Pa] | 25.6 25.6 2000 25.6 25.6 | 6 × 167 25% 14.1 7 8.2 | | |
| DT ₅₀ soil [days] (geomean, lab) | 25.6 | \$\tilde{\pi} 25.\tilde{\pi} | | |
| K _{oc} / K _{om} [L/kg] (arith. mean) | 2 14 (7 8.2 b) 14 (7 900 s) 2 c) | 14.178.2 | | |
| 1/n (arith. mean) | 3 .900 3 | % % 9 9 9 9 9 9 9 9 9 9 | | |
| riani uptake factor | | 0 | | |
| DT ₅₀ water/sed. total system [days] | 38.9 | 38.3 | | |
| (geomean) | \$ \$38.3 \$\tau\$ | | | |
| DT ₅₀ water [days] (geomean) | \$ 0° \$\frac{3}{3}8.3.0° \(\lambda \) \(\lambda \) | 38.3 | | |
| DT ₅₀ sediment [days] (geomean) | 3827 | 38.3 | | |
| Max. occurrence in water / sed. [%] | | 8.4 | | |
| Max. occurrence in soil [%] | \$.6 \$ \$ | 8.6 | | |
| AE F140584 | | <u></u> | | |
| Aqueous solubity [mg/L] | 1.32 10-6 | 100 | | |
| Vapour pressure [Pa] | 1.30 10-6 | 1.3×10^{-6} | | |
| Vapour pressure [Pa] DT ₅₀ soil (days] (geomean lab) K _{oc} / K _{om} L/kg] (defaut value) | 3.6 | 3.6 | | |
| K _{oc} / K _{wy} [L/kg] (default value) | | 0.0 / 0.0 | | |
| | 1 69 49 1000 49 | 1.000 | | |
| Plant uptake factor | 1000 | | | |
| DT ₅₀ water/sed. the last system [date] | 10 2 | 1000 | | |
| (default value) | | | | |
| | 1900 | 1000 | | |
| DT ₅₀ sediment [days] (default value) | 2000 2000 21.9 | 1000 | | |
| | Ü 1.9 | 1.9 | | |
| Max. occurrence in sol [%] | | 7.1 | | |
| AE, F¥47447 | 150000 | | | |
| Agueous solubility [mg/L/p | 150000 | 150000 | | |
| Vapour pressur@Pa] | 1.0×10^{-8} | 1.0×10^{-8} | | |
| DT ₅₀ soil [days] (geomean, lab) | 97.7 | 97.7 | | |
| K _{oc} / K _{om} [Lorg] (arith. mean) | 3.2 / 3.0 | / 3.0 | | |
| 1/n (default value) | 1.000 | 1.000 | | |
| Plant uptake factor | 0 | 0 | | |
| DT ₅₀ water/sea total system [days] | 205 | 205 | | |
| (mast. value) | | _ | | |
| DF ₅₀ water [days] (max. value) | 205 | 205 | | |
| DT ₅₀ sediment [days] (max. value) | 205 | 205 | | |
| Max. occurrence in water / sed. [%] | 10.9 | 10.9 | | |
| Max. occurrence in soil [%] | 6.5 | 6.5 | | |



PEC_{sw} for mesosulfuron-methyl metabolites

According to the definition of residues relevant for surface water risk assessment, the following degradates were considered for PECgw calculation: AE F154851, AE F160459, AE F099095, F092944, AE F160460, AE F140584, and AE F147447.

| Report: | t; ; | ;2014;M-481626; | |
|--------------------|--------------------------------|----------------------|---------------------|
| Title: | Mesosulfuron-methyl (MSM) a | nd metabolites: PECs | w,sed FOCUS EUR Use |
| | in winter cereals in Europe | | |
| Report No: | EnSa-14-0230 | ~ ,O* | |
| Document No: | M-481626-01-1 | V | |
| Guidelines: | not applicable; not applicable | | |
| GLP/GEP: | no | | |

Materials and Methods: PEC_{sw} and PEC_{sed} for the metabolites of mesosulfuron-metabolites calculated using the approach, scenarios and application parent compound in Point 9.7.

Substance specific parameters for the mesosulfuron-meth 9.8-2.

Substance parameters used for mesosulfution-methyl metabolities at Steps 1&2 level **Table 9.8-2:**

| Parameter | Unit | AE - \$15485\$ | AF F160459 | AE F099095 | × AE F09 2 944& | √AE F160 46 0 | AE F140584 | AE F147447 |
|---------------------------------|----------|-----------------------------------|----------------------|-----------------------------|---------------------------|-------------------------|---------------|---------------|
| Molar Mass | g/mol | 48993 | J 489.5 Š | 198,2 | 155.2 [©] | 475%5 | 322.4 | 290.3 |
| Water Solubility | mgÆ | 200000 🛭 | 10000 | <u></u> \$\$\$\$\$0 ₽\$\$\$ | © 520 0 , | 100000 | 100 | 150000 |
| K _{oc} | m\ /g | &68.3 _€ | 21,8 | ₹576 Þ | . 4 <i>1</i> 07 | 14.1 | 0 | 5.2 |
| Degradation Q | | | W. S. | | | • | | |
| Soil | ∛days∜ | 37.1 | 70.1 | 8759 | 060.4 P | 25.6 | 3.6 | 97.7 |
| Total System | days | 38.6 å | ³ √ 47.8√ | 1900 @ | 278 | 38.3 | 1000 | 205 |
| Water | Cays | \$\$38.6 £ | 47.3 | \$1000\T | 25.9 | 38.3 | 1000 | 205 |
| Sediment | ¶days ‰ | 38,6 | Ø√7.3 × | 1000 | °25.9 | 38.3 | 1000 | 205 |
| Max Occurrence |) | | ,0' , <i>\</i> ' | 4 | 1 | | | |
| Max Occurrence Water / Sediment | % | J4 .9 🗸 | 21,60 | V 0.9 🖔 | 3.2 | 8.4 | 1.9 | 10.9 |
| Soil | | \$16.2 _{\textstyle{\pi}} | 89 | S 29.2S | 10.1 | 8.6 | 7.1 | 6.5 |

Steps 1&2: PEC_{sw} and PEC_{sed} values of me sosulto on-methyl metabolites at FOCUS Steps 1&2 for the use in winter cereals are summarised in Table 9.8-3 (PEC_{sw}) and Table 9.8-4 (PEC_{sed}).

Table 9.8-3: Maximum PEC_{sw} of mesosulfuron-methyl metabolites at Steps 1&2

| | | AE | AE | AE | AE | AE | AE | A | |
|------------------|-------------|--------------|---------|----------------|---------|---------|--------------|-----------------|---|
| Cron | Caanaria | F154851 | F160459 | F099095 | F092944 | F160460 | F140584 | F147447 | Ü |
| Crop | Scenario | PECsw | PECsw | PECsw | PECsw | PEC | PECsw | PECsw | |
| | | [µg/L] | [µg/L] | [µg/L] | [µg/L] | [µg/L] | [µg/L] / | y [μg/ J | |
| | Step 1 | 0.728 | 0.449 | 0.326 | 0.099 | 0.410 | 0.229 | 0,195 | ş |
| Winter cereals | Step 2 | | | | | | , O' | | 0 |
| 1 × 15 g a.s./ha | N-EU Single | 0.173 | 0.128 | 0.039 | 0.024 | 0.100 | 0.028 | 0 .054 | , |
| | S-EU Single | 0.140 | 0.108 | 0.063 | 0.020 | 0.082 | Ø.023≪ | 0.04 | |
| | Step 1 | 0.291 | 0.180 | £0.130 | 0.040 | 0.164 🐇 | 0.092 | 0.078 | , |
| Winter cereals | Step 2 | | 40 | D ^v | | ٥ | | | 1 |
| 1 × 6 g a.s./ha | N-EU Single | 0.069 | 0.051 | 0.032 | 0.010 | 0.046 | 0 911 | 0.022 | |
| | S-EU Single | 0.056 | 0.043 | 0.025 | ₹0.008 | 0.033 | 0.009 | 0.04 | |

Table 9.8-4: Maximum PEC_{sed} of mesosulfuron-nethyl metabolites at Steps 1&2

| Crop | C | AE F154851 | AF F160459 | ~, AE | F092944 | QE . F }6046€ | ⊘ AE *F140 \$ 84 | AQ F147447 |
|------------------------|-------------|--------------------|---------------------------------------|------------------------|--------------------|--------------------------------|----------------------------|---------------|
| | Scenario | PEC _{sed} | PECsed | PEC sed | PEC _{sed} | PEC | PECsed | PECsed |
| | | ∦ug/kg]@ | / [μg/k⁄g/] | [µˈg/kg] | õg/k g | [µg/Þg] | [g/kg] | P[μg/kg] |
| | Step 1 | ₽0.49 & | 0@92 | ∂ 1.872 | 0.4306 | 056 | | 0.010 |
| Winter cereals | Step 2 | 45° | ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ | \$,\(\vec{v}\) | | | & | |
| 1 × 15 g a.s./ha | N-EU Single | | ♥ 0.02/ | 0.43/5 | 20.107 | 0.014 | < © 001 | 0.003 |
| | S-EU Single | &0.094 <u></u> | 0.02/3 | ® 364 | ~~0.08 6 ~ | 0.691 | <i>©</i> ≤0.001 | 0.002 |
| | Step 1 | 0.193 | 0.037 | ۵.749 م | 0.174 | № 023 ≪ | J<0.001 | 0.004 |
| Winter cereals | Sten 2 * | * | 00.01 | | 4 . | | | |
| 1×6 g a.s./ha | N-EU Single | 0,047 | 0.01 | 0.482 | ©.043& | 0.006 | < 0.001 | 0.001 |
| | Sold Single | ÇÖ.038. | 0.00 | 0.146 | 0.03P | 0.005 | < 0.001 | < 0.001 |

Step 3: No calculations at Step 3 were made for the metabolites of mesosulfuron-methyl, since no refinement was required to pass acotoxicological risk assessments.

Alternative PECs simulation using RMS reguested modelling parameters:

| Report: One of the control of the co |
|--|
| Title: A. Mesosulfgron-methyl MSM and metabolites: PECsw sed FOCUS EUR |
| and the state of t |
| se in winter cereas in Europe |
| Report No: EnSa-15-02-1 |
| Document No: M-21748 201-1 0 |
| Guidelines: O not applicable; not applicable |
| GLP/GEP: O no |

The document reports an alternative calculation of predicted environmental concentrations in surface water following the methodology presented under KIIIA 9.7/01 before, but applying a set of modelling parameters requested by the RMS.

Materials and Methods: reference is made to KIIIA 9.7./02.

Substance specific parameters:

Table 9.8- 5: Substance parameters used for mesosulfuron-methyl metabolites at Steps 1&2 level

| Parameter | Unit | AE F154851 | AE F160459 | AE F099095 | AE F092944 | AE F160460 | AE F140584 | E147447 |
|------------------|----------------|------------------|--------------------|-----------------|------------------------|---|---------------|-------------------------|
| Molar Mass | g/mol | 489.5 | 489.5 | 198.2 | 155.2 | 475. 5 © | 322.4 | © 290.25 |
| Water Solubility | mg/L | 200000 | 10000 | 190 | 5200 | 100000 | 100 | 150000 |
| Koc | mL/g | <mark>65</mark> | 19.3 | 351 | 336 | 12.2 | 0 | 5.1 |
| Degradation | | | | | | | ~~ | |
| Soil | days | 52.8 | 84.9 | 104.Co | 39.8 | 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 29.3 | 4.3 | 162.8 |
| Total System | days | 56.4 | 87.9 | 1000 | 1000 | 325.9 | 9000 S | 1000 K |
| Water | days | 56.4 | 87.9 | 1000 | 1000 [©] | 325.9 | √ 1000 | 4000 (C) |
| Sediment | days | 56.4 | 87.9 | _4 4 000 | 1000 | 325.9 C | 1900 | <mark>_ උ1000</mark> ල් |
| Max Occurrence | | | | | * | | | |
| Water / Sediment | <mark>%</mark> | <mark>4.9</mark> | 21.0 | 0.9 0.9 | 3.2 | 84 | 1.9 | 10% |
| Soil | <mark>%</mark> | 16.2 | <mark>8.9</mark> ‰ | 29 .2 | ૐ <mark>10.</mark> ൂ%′ | ₹8.6 | 7.f ≫ | 5.8 |

Findings:

Table 9.8- 6:

| Findings: | | | | | | S. | | |
|--------------------------------|-----------------------------|-----------------------|-----------------------------|----------------------------------|---------------------|------------------------|----------------|------------------------------------|
| Table 9.8- 6: | Maximum PEC _{sw} o | of mesosulfui | ron-methy | l metabolij | tës at St ep | os 1 & 2 | | |
| Crop | Scenario S | AE© F154851 F | 160459 F | AE (5) 7099095 I PECsw (4) | AE 5002944 | AE F160469 PECsw | AE THE CSW | AE F147447 PEC _{sw} |
| | | μg/L | 1 E C.w. [μ g]Σ] | [Ag/L] | μg/b | | Ç[μg/L] | rec _{sw} [μg/L] |
| Winter cereals | Step 1 Step 2 | 0.73¶ | 451 | 0.392 | 0.169 L | 0.411 | 0.229 | 0.175 |
| 1 × 15 g a.s./ha | NÆU Single | 9.281 0.22 0.22 | 0.190 | 0.1/53 0.122 @ | 0.041 | 0.156 0.127 | 0.049 0.040 | 0.074 0.061 |
| Winter cereals 1 × 6 g a.s./ha | Step I O Y Step Sin Qe | <u> </u> | 0.076 | 0.15 | 9 017 | 0.164 | 0.092 | 0.070 |
| 1 × 6 g a.s./na | SEU Single | | Q:963 6 | 0.049 | 0.043 | 0.063 | 0.020 | 0.030 |

Maximum Paced of mesosulfuront-methyl metabolites at Steps 1&2

| , | | ĄĖ | Æ E | O'AE | AE | AE | AE | AE |
|-------------------------|-------------|------------------|----------------------|---------|----------------|----------------|----------------|----------------|
| | Scenario S | F154851 | F160459 | | F092944 | F160460 | F140584 | F147447 |
| Crop © | Scenatio 3 | ₽EC sed ℂ | PECQ | PEC sed | PEC sed | PEC sed | PEC sed | PEC sed |
| ~Q | 0 0 2 | yμg/kg | [µ g /kg] | Mug/kg] | [µg/kg] | [µg/kg] | [µg/kg] | [µg/kg] |
| 4 | Step 1 | 0.4 | 2081 V | 1.374 | 0.361 | 0.049 | < 0.001 | 0.009 |
| Winter cereals | Step 20 | 4 | | , | | | | |
| 1×15 g a.s./ha | NeEU Single | 30.181 |). 0. 03 9 | 0.536 | 0.138 | 0.019 | < 0.001 | 0.004 |
| | SEU Single | | QCQ30 | 0.429 | 0.111 | 0.016 | < 0.001 | 0.003 |
| // | Step 1 0 C | 0.188 | 9.033 | 0.550 | 0.145 | 0.020 | < 0.001 | 0.003 |
| | | | | | | | | |
| 1×6 g a.s./ha | N= U Single | 40.073 | [♥] 0.015 | 0.215 | 0.055 | 0.008 | < 0.001 | 0.002 |
| | S-EU Saigle | 0.058 | 0.012 | 0.172 | 0.044 | 0.006 | < 0.001 | 0.001 |

Step 3: No calculations at Step 3 were made for the metabolites of mesosulfuron-methyl, since no refinement was required to pass ecotoxicological risk assessments.



IIIA 9.8.1 Initial PECsw value for static water bodies

See comment under Point 9.7.

IIIA 9.8.2 Initial PECsw value for slow moving water bodies

See comment under Point 9.7.

IIIA 9.8.3 Short-term PECsw values for static vater bodies 1-4 days after last application)

See comment under Point 9.7.

Short-term PECsw values for slow moving water bodies 1-4 days after last application)

See comment under Point 9.7.

IIIA 9.8.5 Long-term PECsw values for static water bodies 7-42 days after last application)

See comment under Point 9.7.

IIIA 9.8.6 Long-term PECsw values for slow moving water bodies 7-42 days after last application of the state of the state

See comment under Point 9.7

IIIA 9.8.7 Additional field testing

No additional field studies on the formulation have been performed or are required

IIIA 9.9 Fate and Behaviour in Air.

Based on the very low vapour pressure (3.5 10⁻¹² Pa, 20 °C) mesosulfuron-methyl is virtually non-volatile and would not be expected to volatilise Any mesosulfuron-methyl that might nevertheless reach the atmosphere would be steadily degraded, e.g. by hydroxyl radical reaction. According to the methodology developed by Atkinson, a gas phase atmospheric half-life of 1.8 hours was calculated for a typical OH radical concentration of 0.5 × 10° radicals/cm?

IIIA 9.9.1. Spray droplet size spectrum – laboratory studies

This is not an EC data requirement / not required by Directive 91/414/EEC.

III A. 9.9.2 Drift – field evaluation

This is not an E@ data requirement / Not required by Directive 91/414/EEC.

IIIA 9.10 SOUTHER Special Studies

IIIA 9:90.1 Laboratory studies

This is not an EC data requirement / not required by Directive 91/414/EEC.

IIIA 9:10.2 Field studies

This is not an EC data requirement / not required by Directive 91/414/EEC.