Re-evaluation Decision RVD2026-05

DEET Plus Related Active Toluamides and Its Associated End-use Products

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Re-evaluation Decision for DEET Plus Related Active Toluamides and its Associated End-use Products

Under the authority of the *Pest Control Products Act,* all registered pesticides must be re-evaluated by Health Canada to ensure that they meet current health and environmental standards and have value. The re-evaluation considers data and information from pesticide manufacturers, published scientific reports and other regulatory agencies, as well as comments directly related to the proposed re-evaluation decision, such as comments directed to the Science evaluation, received during public consultations. Health Canada applies internationally accepted risk assessment methods as well as current risk management approaches and policies. More details, on the legislative framework, risk assessment and risk management approach, are provided under the Evaluation approach Section of this document.

DEET plus related active toluamides (hereafter referred to as DEET) is an insect repellent and is used in many domestic class, personal insect repellents and is applied to clothing or directly to skin. DEET is used to repel a number of biting and nuisance insects including black flies, biting midges, chiggers, deer flies, stable flies, mosquitoes, and ticks. It can be applied by towelette, spray pump, hand or pressurized spray. Currently registered products containing DEET can be found in the Pesticide Product Information Database and in Appendix I.

The Proposed Re-evaluation Decision PRVD2025-09, *DEET plus related active toluamides and its associated end-use products*[1] containing the evaluation of DEET and proposed decision, underwent a 90 day consultation period ending on 21 January 2026. PRVD2025-09 proposed continued registration of DEET and its associated end-use products in Canada. No additional risk mitigation measures are required as a result of the re-evaluation of DEET, however label amendments are required. These amendments are needed to bring labels up to current standards, to provide further clarity on how the products are to be used and, to ensure consistency. Label amendments include updated precaution and direction of use statements for both the technical grade and domestic-class end-use products.

Written comments were received related to the proposed re-evaluation decision, such as comments directed to the science evaluation were received during the public consultation period conducted in accordance with section 28 of the *Pest Control Products Act*. Commenters are listed in Appendix II and comments are summarized in Appendix III with responses from Health Canada. These comments were considered and did not result in revisions to the risk assessments. Therefore, this decision is consistent with the proposed re-evaluation decision as described in PRVD2025-09.

A reference list of information used as the basis for the proposed re-evaluation decision is included in PRVD2025-09, and further information used in the re-evaluation decision (RVD2026-05) is listed in Appendix V of this document. Therefore, the complete reference list of all information used in this final re-evaluation decision includes both the information set out in PRVD2025-09 and the information set out in Appendix V herein.

[1] "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*.

This document presents the final re-evaluation decision[2] for the re-evaluation of DEET, including the required amendments to protect human health and the environment, as well as label amendments required to bring labels to current standards. All products containing DEET that are registered in Canada are subject to this re-evaluation decision.

Re-evaluation Decision for DEET

Health Canada has completed the re-evaluation of DEET. Under the authority of the *Pest Control Products Act*, Health Canada has completed all required evaluations and consultations and has determined that the registration of products containing DEET is required to be amended, in accordance with paragraph 21(2)(a) of the *Pest Control Products Act*. An evaluation of available scientific information respecting the health and environmental risks and value of DEET found that all uses of DEET products meet current standards for protection of human health and the environment and have acceptable value when used according to the amended conditions of registration. Label amendments, as summarized below and listed in Appendix IV, are required.

Risk mitigation measures

Registered pesticide product labels include specific directions for use. Directions include risk mitigation measures to protect human health and the environment and must be followed by law. The required amendments, including any revised/updated label statements and/or mitigation measures, as a result of the re-evaluation of DEET, are summarized below. Refer to Appendix IV for details.

Human health

Label improvements to meet current standards:

- Updated precaution and direction of use statements for both the technical grade active ingredient and domestic-class end-use products.

Implementation of the re-evaluation decision

Regulatory Directive DIR2018-01, *Policy on Cancellations and Amendments Following Re-evaluation and Special Review* provides information and general timelines regarding the implementation of post-market decisions, (for example, up to 24-month timeline for label amendments and up to 36-month phase-out timeline for cancelled registrations), and Information Note: *Update on implementation of post-market decisions* provides additional information on phase-out measures for post-market decisions that include cancellations. The post-market decision considers potential health and environmental risks regarding the use of the pest control product, and its value, when establishing the implementation timelines.

The health considerations for the implementation timeline for this final decision are outlined below.

[2] "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act*.

Health considerations

In the case of the DEET re-evaluation only, given that the nature of the amendments are intended to update to current standards only and given the number of products involved in this re-evaluation, PRD will conduct a pilot project and will allow an additional year from the date of this decision to transition to newly amended labels. The required amendments for pest control products containing DEET must be implemented within 36 months after the publication date of this decision document. This implementation timeline is considered acceptable.

The implementation timeline of 36 months for the required amendments (label updates) for pest control products containing DEET is considered acceptable. These required amendments must be implemented within 36 months after the publication date of this decision document.

Amendment timeframe

Based on the above considerations, the required amendments (mitigation measures and label updates) for pest control products containing DEET must be implemented within 36-months from the date of this decision document.

Refer to Appendix I for details on specific products impacted by this decision.

Proportional effort

Active ingredients registered in Canada are categorized based on criteria in Health Canada's Policy on Proportional Effort. The categorization is used to inform Health Canada's allocation of resources related to pesticide reviews in alignment with the required level of regulatory effort. DEET plus related toluamides is categorized as lower proportional effort based on the health criteria and environmental criteria. The proportional effort categorization will be used to inform the scope and level of effort needed for future reviews.

Continuous oversight

Health Canada's policy on continuous oversight of pesticides and the associated information note describe the process for monitoring published scientific literature for active ingredients registered in Canada, and the criteria used to determine which active ingredients will be monitored when a final regulatory decision is made. The criteria in the information note have been met, therefore, scientific literature and regulatory information will be monitored as part of continuous oversight for this active ingredient.

Next steps

To comply with this decision, the required amendments (mitigation measures and label updates) must be implemented on all product labels no later than 36 months after the publication date of this decision document. Accordingly, both registrants and retailers will have up to 36 months from the date of this decision document to transition to selling the product with the newly amended labels. Similarly, users will also have the same 36-month period from the date of this decision document to transition to using the newly amended labels, which will be available on the Public Registry.

Refer to Appendix I for details on specific products impacted by this decision.

Other information

The relevant confidential test data on which the decision is based (as referenced in PRVD2025-09 and in Appendix V are available for public inspection, upon application, in Pesticides Regulatory Directorate's Reading Room. For more information, please contact the Pesticides Information Service.

Any person may file a notice of objection,[3] which must be based on scientific grounds, regarding this decision on DEET plus related active toluamides and its associated end-use products within 60 days from the date of publication of this Re-evaluation Decision through the Public Engagement Portal (Public Engagement Forms - Notice of Objection). The request for reconsideration must include the Notice of Objection form, the scientific explanation of the objection and the supporting scientific evidence in possession of the requestor that would not already be in Health Canada's possession or cite specific Health Canada documentation they wish to rely on as supporting evidence (for example, scientific reports) in the form of electronic copies of cited references. Each of the references provided or cited must be clearly associated with the objection it supports. Failure to provide a complete package may result in the Notice of Objection being considered ineligible for further consideration by Health Canada. For more information regarding the basis for objecting (which must be based on scientific grounds), please refer to the Pesticides and Pest Management portion of the Canada.ca website or contact the Pesticides Information Service.

[3] As per subsection 35(1) of the *Pest Control Products Act*

Evaluation approach

Legislative framework

The Minister of Health's primary objective under the *Pest Control Products Act* (or the Act) subsection 4(1) is to prevent unacceptable risks to individuals and the environment from the use of pest control products.

As noted in the preamble of the Act, it is in the national interest that the attainment of the objectives of the federal regulatory system continue to be pursued through a scientifically-based national registration system that addresses risks to human health, the environment and value both before and after registration and applies to the regulation of pest control products throughout Canada; and that pest control products with acceptable risk and value be registered for use only if it is shown that their use would be efficacious and if there is acceptable risk to human health and the environment, taking into account the conditions of registration.

For the purposes of the Act, the health or environmental risks of a pest control product are acceptable if there is reasonable certainty that no harm to human health, future generations or the environment will result from exposure to or use of the product, taking into account its conditions of registration, as per subsection 2(2) of the *Pest Control Products Act*.

Risk for the human health and environment, and value are defined under the Act subsection 2(1) as follows:

> **Health risk**, in respect of a pest control product, means the possibility of harm to human health resulting from exposure to or use of the product, taking into account its conditions or proposed conditions of registration.
>
> **Environmental risk**, in respect of a pest control product, means the possibility of harm to the environment, including its biological diversity, resulting from exposure to or use of the product, taking into account its conditions or proposed conditions of registration.
>
> **Value**, in respect of a pest control product, means the product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's (a) efficacy; (b) effect on host organisms in connection with which it is intended to be used; and (c) health, safety and environmental benefits and social and economic impact.

When evaluating the health and environmental risks of a pesticide and determining whether those risks are acceptable, subsection 19(2) of the *Pest Control Products Act* requires Health Canada to apply a scientifically-based approach. The science-based approach to assessing pesticides considers both the toxicity and the level of exposure of a pesticide in order to fully characterize risk.

Risk and value assessment framework

Health Canada uses a comprehensive body of modern scientific methods and evidence to determine the nature as well as the magnitude of potential risks posed by pesticides. This approach allows for the protection of human health and the environment through the application of appropriate and effective risk management strategies, consistent with the purpose described in the preambular text set out above.

Health Canada's approach to risk and value assessment is outlined in A Framework for Risk Assessment and Risk Management of Pest Control Products.[4] A high-level overview is provided below.

i) Assessing Potential Health Risks

With respect to the evaluation and management of potential health risks, Health Canada's risk assessments follow a structured, predictable process that is consistent with international approaches and the Health Canada Decision-Making Framework for Identifying, Assessing, and Managing Health Risks.[5]

The evaluation of potential health risks begins with a consideration of the toxicological profile of a pesticide to establish reference doses at which no adverse effect is expected and against which the expected exposure is assessed. This includes, where appropriate, the use of uncertainty (protection) factors to provide additional protection that accounts for the variation in sensitivity among members of human population and the uncertainty in extrapolating animal test data to humans. Under certain conditions, the *Pest Control Products Act* requires the use of another factor to provide additional protection to pregnant women, infants, and children. Other uncertainty factors, such as a database deficiency factor, are considered in specific cases. More details related to the application of the uncertainty factors are provided in SPN2008-01.[6]

Assessments estimate potential health risks to defined populations[7] under specific exposure conditions. They are conducted in the context of the registered conditions of use, such as the use of a pesticide on a particular field crop using specified application rates, methods and equipment. Potential exposure scenarios consider exposures during and after application of the pesticide in occupational or residential settings, food and drinking water exposure, or exposure when interacting with treated pets. Also considered are the anticipated durations (short-, intermediate-

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4 PMRA Guidance Document, *A Framework for Risk Assessment and Risk Management of Pest Control Products* (https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/pesticides-pest-management/policies-guidelines/risk-management-pest-control-products.html)

5 *Health Canada Decision-Making Framework for Identifying, Assessing, and Managing Health Risks* - August 1, 2000 (https://www.canada.ca/en/health-canada/corporate/about-health-canada/reports-publications/health-products-food-branch/health-canada-decision-making-framework-identifying-assessing-managing-health-risks.html)

6 Science Policy Note: *The Application of Uncertainty Factors and the Pest Control Products Act Factor in the Human Health Risk Assessment of Pesticides* (https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/pesticides-pest-management/policies-guidelines/science-policy-notes/2008/application-uncertainty-factors-pest-control-products-act-factor-human-health-risk-assessment-pesticides-spn2008-01.html)

7 Consideration of Sex and Gender in Pesticide Risk Assessment (https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/pesticides-pest-management/fact-sheets-other-resources/consideration-sex-gender-pesticide-risk-assessment-infographic.html)

or long-term) and routes of exposure (oral, inhalation, or skin contact). In addition, an assessment of health risks must consider available information on aggregate exposure and cumulative effects.

ii) Assessing risks to the environment

With respect to the evaluation of environmental risks, Health Canada's environmental risk assessments follow a structured, tiered approach to determine the likelihood that exposure to a pesticide can cause adverse effects on individual organisms, populations, or ecological systems. This involves screening assessments starting with simple methods, conservative exposure scenarios and sensitive toxicity effects metrics, then moving on, where required, to more refined assessments that can include exposure modelling, monitoring data, results from field or mesocosm studies, and probabilistic risk assessment methods.

The environmental assessment considers both the exposure (environmental fate, chemistry, and behaviour, along with the application rates and methods) and hazard (toxic effects on organisms) of a pesticide. The exposure assessment examines the movement of the pesticide in soil, water, sediments and air, as well as the potential for uptake by plants or animals and transfer through the food web. The possibility for the pesticide to move into sensitive environmental compartments such as groundwater or lakes and rivers, as well as the potential for atmospheric transport, is also examined. The hazard assessment examines effects on a large number of internationally recognized indicator species of plants and animals (terrestrial organisms include invertebrates such as bees, beneficial arthropods, and earthworms, birds, mammals, plants; aquatic organisms include invertebrates, amphibians, fish, plants and algae) and includes considering effects on biodiversity and the food chain. Acute and chronic effects endpoints are derived from laboratory and field studies that characterize the toxic response and the dose–effect relationship of the pesticide.

The characterization of environmental risk requires the integration of information on environmental exposure and effects to identify which, if any, organisms or environmental compartments may be at risk, as well as any uncertainties in characterizing the risk.

iii) Value assessment

Value assessments consist of two components: an assessment of the performance of a pest control product and its benefits.

During re-evaluation, value is examined under current conditions and in light of alternative pest control methods (both chemical and nonchemical) that may have been developed since the pesticide was first registered. An assessment of the benefits associated with the pesticide may also be conducted to demonstrate its value in the current context, and to identify potential alternatives.

Risk management

The outcomes of the assessments of risks to human health and the environment, and the assessment of value, form the basis for identifying risk management strategies. These include appropriate risk mitigation measures and are a key part of decision-making on whether health and environmental risks are acceptable. The development of risk management strategies take

place within the context of the pesticide's conditions of registration. Conditions can relate to, among other things, the specific use (for example, application rates, timing, frequency and method of application), personal protective equipment, pre-harvest intervals, restricted entry intervals, buffer zones, spray drift and runoff mitigation measures, handling, manufacture, storage or distribution of a pesticide. If feasible conditions of use that have acceptable risk and value cannot be identified, the pesticide use will not be eligible for registration.

The selected risk management strategy is then implemented as part of the re-evaluation decision. The pesticide registration conditions include legally-binding use directions on the label. Any use in contravention of the label or other specified conditions is illegal under the *Pest Control Products Act*. Implementation of post-market decisions follow the framework articulated in the *Policy on Cancellations and Amendments Following Re-evaluation and Special Review*.[8]

Following a decision, continuous oversight activities such as post-market review, monitoring and surveillance, including incident reporting, all play an essential role to help ensure the continued acceptability of risks and value of registered pesticides.

[8] Regulatory Directive DIR2018-01, *Policy on Cancellations and Amendments Following Re-evaluation and Special Review* (https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/pesticides-pest-management/policies-guidelines/regulatory-directive/2018/dir2018-01-policy-cancellations-amendments.html).

Science evaluation update

1.0 Revised health risk assessment

1.1 Toxicology summary

The toxicology assessment for DEET was previously conducted and summarized in PRVD2025-09. During the consultation period, comments were received from members of the public with respect to the toxicology assessment, including concerns about the reduction of the PCPA factor in light of neurological effects reported in published pediatric case reports involving potential DEET exposure. The comments received did not result in changes to the toxicology assessment, magnitude of the PCPA factor, or the toxicology reference values outlined in PRVD2025-09. Detailed responses to comments are presented in Appendix III.

1.2 Dietary exposure and risk assessment

There are no food uses associated with the use of DEET. Residues of DEET in potential drinking water sources are not anticipated as a result of the insect repellent use. Therefore, no dietary exposure is anticipated.

No comments were received on the dietary assessment during the consultation period. Therefore, there are no changes from the PRVD2025-09.

1.3 Occupational and non-occupational exposure and risk assessment

In PRVD2025-09, risks were shown to be acceptable when DEET is used according to current label conditions of registration. Comments were received during the PRVD consultation period. These comments did not result in changes to the risk assessment. Risks continue to be acceptable as described in PRVD2025-09.

1.4 Aggregate exposure and risk assessment

In PRVD2025-09, aggregate risks were shown to be acceptable when DEET is used according to current label conditions of registration. Comments were received during the PRVD consultation period. These comments did not result in changes to the risk assessment. Risks continue to be acceptable as described in PRVD2025-09.

1.5 Cumulative assessment

As discussed in PRVD2025-09, no other pesticides in the same class of chemicals were identified and no information was identified to indicate that DEET shares a common mechanism of toxicity with other pest control products. Therefore, a cumulative health risk assessment was not required.

1.6 Health incident reports

Since the publication of PRVD2025-09 (in other words, from 23 May 2023 to 7 April 2026), six additional human incidents involving DEET were submitted to Health Canada. The human incidents occurred in the U.S. (2 incidents classified as death or major) and Canada (4 minor incidents). In the serious U.S. incidents, individuals were exposed to DEET during product application. However, the available case details (for example, lack of symptoms noted prior to death) were insufficient to confirm an association with the reported exposure. In Canadian minor incidents, the reported exposure scenarios involved accidental oral or ocular exposure as well as dermal or inhalation exposure to DEET during application. The reported minor effects included nausea, headache and eye or skin irritation. Overall, no new health concerns were identified following the updated evaluation of DEET incidents as the reported effects in Canadian incidents were mainly minor in severity. Nevertheless, DEET label clarifications are required to improve the clarity of existing statements and support appropriate use of DEET products.

2.0 Revised environmental risk assessment

Additional water monitoring data were identified and confirmed the conclusions from PRVD2025-09. Water monitoring data supported the assumption that the highest concentrations in the environment are associated with wastewater treatment plants. Water concentrations at heavily used beaches may be comparable to wastewater treatment plants, but no Canadian studies were available to confirm this. Overall, the highest measured water concentrations in the environment are three orders of magnitude lower than the most sensitive effect metric available for aquatic species.

2.1 Environmental incident reports

There are three domestic animal incidents that have been screened but not assessed. None of these incidents involve the product being used according to label directions, and therefore they are not relevant to the intended use pattern and the environmental assessment.

2.2 Conclusion

The available monitoring data, which includes influent entering and effluent leaving wastewater treatment plants, show concentrations well below the available effects metrics for aquatic organisms. The data indicates no concerns for aquatic and terrestrial organisms in the environment and is consistent with the information considered in PRVD2025-09.

3.0 Value assessment

DEET is of value as an ingredient in personal insect repellents applied to clothing or directly to exposed skin. DEET is used to repel a number of biting and nuisance insects, including black flies, biting midges, chiggers, deer flies, stable flies, mosquitoes, and ticks. DEET works by reducing detection of users by the insects, thereby reducing the incidence of biting and disease transmission.

List of abbreviations

CHMS	Canadian Health Measures Survey
CI	confidence interval
DEET	N,N-diethyl-m-toluamide
g	gram
L	litre
mg	milligram
ng	nanogram
PCPA	*Pest Control Product Act*
PRVD	Proposed Re-evaluation Decision
RRD	Re-evaluation Decision Document
RVD	Re-evaluation Decision

Appendix I Registered Products Containing DEET in Canada

Table 1 Products containing DEET requiring (label) amendments[1]

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
18068	Technical Grade Active Ingredient	Aurorium LLC.	DEET Insect Repellent	Liquid	98.14%
23785	Technical Grade Active Ingredient	Clariant Corporation	N,N-Diethyl-M-Toluamide	Liquid	98.5%
32282	Manufacturing Concentrate	Aurorium LLC.	DEET Insect Repellent 30 Bulk	Emulsifiable Concentrate Or Emulsion	30%
27162	Domestic	753146 Alberta Ltd. O/A Ultrasol Industries	Odorless Foam Tick & Mosquito Repellent	Pressurized Product	10%
29019	Domestic	753146 Alberta Ltd. O/A Ultrasol Industries	Doktor Doom Maximum Strength Mosquito, Tick & Pesky Fly Repellent 30% DEET	Pressurized Product	30%
33485	Domestic	753146 Alberta Ltd. O/A Ultrasol Industries	Doktor Doom Premium 30% DEET Tick & Mosquito Repellent Wipes	Impregnated Fabric	30%
34725	Domestic	753146 Alberta Ltd. O/A Ultrasol Industries	Doktor Doom Tick Repellent For Clothing + (Plus)	Pressurized Product	30%
24662	Domestic	9272-9771 Quebec Inc.	Ungava Insect Repellent 30% DEET Cream	Emulsifiable Concentrate Or Emulsion	30%
27534	Domestic	9272-9771 Quebec Inc.	Ungava Cream 7% DEET For Kids	Emulsifiable Concentrate Or Emulsion	7%
27955	Domestic	9272-9771 Quebec Inc.	Ungava 30% DEET Pump Spray	Solution	30%
28564	Domestic	9272-9771 Quebec Inc.	Ungava No Fragrance	Emulsifiable Concentrate Or Emulsion	30%
28565	Domestic	9272-9771 Quebec Inc.	Mosquito Screen Insect Repellent Pump Spray	Solution	30%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
28649	Domestic	9272-9771 Quebec Inc.	Mosquito Screen Insect Repellent For Kids Cream 7% DEET	Emulsifiable Concentrate Or Emulsion	7%
28800	Domestic	9272-9771 Quebec Inc.	Ungava Insect Repellent	Pressurized Product	25%
31548	Domestic	9272-9771 Quebec Inc.	Ungava Insect Repellent Pump Spray-Children	Solution	7.5%
26653	Domestic	Acuity Holdings, Inc.	Konk DEET Max Insect Repellent	Pressurized Product	30%
35371	Domestic	Aerokure International Inc.	Ungava Insect Repellent	Pressurized Product	25%
35372	Domestic	Aerokure International Inc.	Ungava 30% DEET Pump Spray	Solution	30%
27792	Domestic	Aurorium LLC.	DEET Insect Repellent 10	Emulsifiable Concentrate Or Emulsion	10%
27793	Domestic	Aurorium LLC.	DEET Insect Repellent 30	Emulsifiable Concentrate Or Emulsion	30%
30576	Domestic	Business Helpers' Depot Inc.	Sure Guard 5% DEET Insect Repellent	Pressurized Product	5%
30577	Domestic	Business Helpers' Depot Inc.	Sure Guard 15% DEET Insect Repellent	Pressurized Product	15.0%
30579	Domestic	Business Helpers' Depot Inc.	Sure Guard 30% DEET Insect Repellent	Pressurized Product	30%
31762	Domestic	Business Helpers' Depot Inc.	Sureguard Personal 2 Hrs Insect Repellent	Pressurized Product	5%
31765	Domestic	Business Helpers' Depot Inc.	Sureguard Personal 3 Hrs Insect Repellent	Pressurized Product	7%
31767	Domestic	Business Helpers' Depot Inc.	Sureguard Personal 4 Hrs Insect Repellent	Pressurized Product	11%
31775	Domestic	Business Helpers' Depot Inc.	Sureguard Personal 5 Hrs Insect Repellent	Pressurized Product	15.0%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
31778	Domestic	Business Helpers' Depot Inc.	Sureguard Personal 6 Hrs Insect Repellent	Pressurized Product	22%
31818	Domestic	Business Helper' Depot Inc.	Sureguard 4hr Insect Repellent Pump Spray	Solution	11%
31819	Domestic	Business Helpers' Depot Inc.	Sureguard 6hr Insect Repellent Pump Spray	Solution	22%
32537	Domestic	Business Helpers' Depot Inc.	Sure Guard Insect Repellent - 22% DEET	Pressurized Product	22%
32538	Domestic	Business Helpers' Depot Inc.	Sure Guard Insect Repellent - 30% DEET	Pressurized Product	30%
26642	Domestic	Canadian Tire Corp. Ltd.	Muskol Insect Repellent Aerosol	Pressurized Product	23.5%
26912	Domestic	Canadian Tire Corp. Ltd.	Muskol Insect Repellent Pump Spray	Solution	30%
29497	Domestic	Canadian Tire Corp. Ltd.	Muskol Insect Repellent Lotion	Emulsifiable Concentrate Or Emulsion	30%
33618	Domestic	Canadian Tire Corp. Ltd.	Muskol Backcountry Repellent 30% DEET	Pressurized Product	30%
33873	Domestic	Canadian Tire Corp. Ltd.	Muskol Backcountry Tick Repellent	Solution	30%
33874	Domestic	Canadian Tire Corp. Ltd.	Muskol Family & Kids III Insect Repellent	Pressurized Product	10%
33875	Domestic	Canadian Tire Corp. Ltd.	Muskol Family & Kids II Insect Repellent	Solution	10%
33876	Domestic	Canadian Tire Corp. Ltd.	Muskol Insect Repellent VIII	Solution	25%
35288	Domestic	Canadian Tire Corp. Ltd.	Muskol Active Insect Repellent	Pressurized Product	15.0%
35291	Domestic	Canadian Tire Corp. Ltd.	Muskol Family & Kids Insect Repellent IV	Pressurized Product	15.0%
25543	Domestic	Chasse-Moustique Buzz-Up	Buzz-Up Insect Repellent For Use On Kids	Solution	7.5%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
27205	Domestic	Chasse-Moustique Buzz-Up	Buzz-Up Lotion Insect Repellent	Emulsifiable Concentrate Or Emulsion	30%
32791	Domestic	Chasse-Moustique Buzz-Up	Buzz-Up Insect Repellent - 30% DEET	Pressurized Product	30%
27254	Domestic	Croc Bloc Products Inc.	Croc Bloc Insect Repellent II Towelettes	Impregnated Fabric	30%
27355	Domestic	Croc Bloc Products Inc.	Croc Bloc Insect Repellent Heavy Duty	Pressurized Product	30%
27613	Domestic	Croc Bloc Products Inc.	Croc Bloc Insect Repellent Pump Spray Lite	Solution	9.8%
35699	Domestic	Croc Bloc Products Inc.	Croc Bloc Insect Repellent Pump Spray Lite I	Solution	7.5%
35700	Domestic	Croc Bloc Products Inc.	Croc Bloc Insect Repellent Heavy Duty I	Pressurized Product	30.1%
35711	Domestic	Croc Bloc Products Inc.	Croc Bloc Insect Repellent Pump Spray I	Solution	30%
24975	Domestic	Daki Ltee	Bug-Z-Away Gel	Solution	10%
25368	Domestic	Daki Ltee	Bug-Z-Away Spray	Solution	10%
25567	Domestic	Daki Ltee	Bug-Z-Away Intense Spray	Solution	29.37%
28692	Domestic	Daki Ltee	Bug-Z-Away Intense Gel	Solution	30%
27671	Domestic	Dentec Safety Specialists Inc.	Skeetsafe Insect Repellent Towelettes - Adult	Impregnated Fabric	25%
27672	Domestic	Dentec Safety Specialists Inc.	Insect Repellent Towelettes - Children	Impregnated Fabric	10%
28869	Domestic	Dentec Safety Specialists Inc.	Skeetsafe Insect Repellent 30 Pump Spray - Adult	Solution	30%
28870	Domestic	Dentec Safety Specialists Inc.	Skeetsafe Insect Repellent 10 Pump Spray-Child	Solution	10%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
28871	Domestic	Dentec Safety Specialists Inc.	Skeetsafe Insect Repellent 25 Pressurized Spray-Adult	Pressurized Product	25%
35386	Domestic	Dentec Safety Specialists Inc.	Skeetsafe Insect Repellent 25% Pressurized Spray	Pressurized Product	25%
35388	Domestic	Dentec Safety Specialists Inc.	Skeetsafe Insect Repellent 30% Pump Spray	Solution	30%
32857	Domestic	Empack Spraytech Inc.	Emzone 30% DEET - Skin Friendly Insect Repellent - Maximum Protection Continuous Spray	Pressurized Product	30%
32859	Domestic	Empack Spraytech Inc.	Emzone 15% DEET - Skin-Friendly Insect Repellent - Continuous Spray	Pressurized Product	15.0%
32940	Domestic	Empack Spraytech Inc.	Emzone 30% DEET Insect Repellent Lotion	Emulsifiable Concentrate Or Emulsion	30%
32990	Domestic	Empack Spraytech Inc.	Emzone 30% DEET Insect Repellent Wipes	Impregnated Fabric	30%
30555	Domestic	Federated Co-Operatives Limited	Co-Op Gold Insect Repellent (25% DEET)	Pressurized Product	25%
31575	Domestic	Federated Co-Operatives Limited	Co-Op Gold Insect Repellent Spray For Kids	Solution	5%
32323	Domestic	Intec Pharmacal Inc.	Coleman 7.5% DEET Insect Repellent Pump	Solution	7.5%
32324	Domestic	Intec Pharmacal Inc.	Coleman 10% DEET Insect Repellent Aerosol	Pressurized Product	10%
32745	Domestic	Intec Pharmacal Inc.	Coleman Insect Repellent Lotion	Emulsifiable Concentrate Or Emulsion	30%
32776	Domestic	Intec Pharmacal Inc.	Coleman Insect Repellent 30% DEET Aerosol	Pressurized Product	30%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
32777	Domestic	Intec Pharmacal Inc.	Coleman Insect Repellent 30% DEET Pump	Solution	30%
32778	Domestic	Intec Pharmacal Inc.	Coleman Insect Repellent Dry Aerosol	Pressurized Product	15.0%
34020	Domestic	Intec Pharmacal Inc.	Bug Out! 30% DEET Aerosol	Pressurized Product	30%
34046	Domestic	Intec Pharmacal Inc.	Bug Out! 30% DEET Lotion	Emulsifiable Concentrate Or Emulsion	30%
28498	Domestic	Kuus Inc.	Mosquito Shield Kids & Family Three Hour Insect Repellent	Pressurized Product	10%
28636	Domestic	Kuus Inc.	Mosquito Shield Family Formula Insect Repellent Pump Spray 7.5	Solution	7.5%
28843	Domestic	Kuus Inc.	Mosquito Shield Active Formula Insect Repellent Pressurized Spray	Pressurized Product	15.0%
28844	Domestic	Kuus Inc.	Mosquito Shield Kids Formula Insect Repellent Pump Spray	Solution	5%
28846	Domestic	Kuus Inc.	Mosquito Shield Active Formula Insect Repellent Pump Spray	Solution	15.0%
28988	Domestic	Kuus Inc.	Mosquito Shield Wilderness Formula Insect Repellent Pump Spray	Solution	30%
28989	Domestic	Kuus Inc.	Mosquito Shield Wilderness Formula Insect Repellent Pressurized Spray	Pressurized Product	30.1%
28990	Domestic	Kuus Inc.	Mosquito Shield Family Formula Insect Repellent Pump Spray	Solution	7.5%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
28991	Domestic	Kuus Inc.	Mosquito Shield Northern Formula Insect Repellent Pressurized Spray	Pressurized Product	25%
30751	Domestic	Kuus Inc.	Mosquito Shield Maximum Protection Combat Formula	Pressurized Product	30%
30992	Domestic	Kuus Inc.	Mosquito Shield Wilderness Formula Insect Repellent Lotion	Emulsifiable Concentrate Or Emulsion	30%
31423	Domestic	Kuus Inc.	Mosquito Shield Wilderness Formula 1 Insect Repellent	Solution	30%
31601	Domestic	Kuus Inc.	Mosquito Shield Combat Formula I Insect Repellent	Solution	30%
34697	Domestic	Kuus Inc.	Savvy Insect Repellent 30% DEET	Pressurized Product	30.1%
30239	Domestic	Le Groupe Jean Coutu (Pjc) Inc.	Personnelle Insect Repellent Aloe Vera Pump	Solution	7.5%
30247	Domestic	Le Groupe Jean Coutu (Pjc) Inc.	Personnelle For Kids Insect Repellent Spray	Solution	5%
34917	Domestic	Le Groupe Jean Coutu (Pjc) Inc.	Personnelle Insect Repellent[1]	Pressurized Product	25%
27646	Domestic	Les Produits De Controle Superieur Inc/ Superior Control Products Inc	K-O Insect Repellent	Pressurized Product	30%
28288	Domestic	Les Produits De Controle Superieur Inc/ Superior Control Products Inc	Superieur Insect Repellent Pump Spray 30%	Solution	30%
27244	Domestic	Lloyds Laboratories Inc.	Lloyds Insect Repellent Pressurized Spray II	Pressurized Product	25%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
30308	Domestic	Novella Brands Inc.	Dermaguard Skin-Friendly Insect Repellent Woods	Pressurized Product	15.0%
30309	Domestic	Novella Brands Inc.	Dermaguard Skin-Friendly Insect Repellent Maximum Protection	Pressurized Product	30%
30310	Domestic	Novella Brands Inc.	Dermaguard Skin-Friendly Insect Repellent Family	Solution	10%
30311	Domestic	Novella Brands Inc.	Dermaguard Skin-Friendly Insect Repellent Sport	Solution	15.0%
30314	Domestic	Novella Brands Inc.	Dermaguard Skin-Friendly Insect Repellent For Kids	Solution	5%
30315	Domestic	Novella Brands Inc.	Dermaguard Skin-Friendly Insect Repellent Foam	Pressurized Product	10%
30853	Domestic	Novella Brands Inc.	5% Dermaguard Skin Friendly Insect Repellent - Kids/Family Continuous Spray	Pressurized Product	5%
30859	Domestic	Novella Brands Inc.	15% Dermaguard Skin Friendly Insect Repellent - Woods/Sport Continuous Spray	Pressurized Product	15.0%
30860	Domestic	Novella Brands Inc.	30% Dermaguard Skin Friendly Insect Repellent - Maximum Protection Continuous Spray	Pressurized Product	30%
30997	Domestic	Novella Brands Inc.	Dermaguard Skin-Friendly Insect Repellent Maximum Protection/Woods	Solution	30%
31147	Domestic	Novella Brands Inc.	Kombat Insect Repellent For Kids	Solution	5%
31148	Domestic	Novella Brands Inc.	Kombat Insect Repellent 30% DEET Maximum Defence	Pressurized Product	30%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
31150	Domestic	Novella Brands Inc.	Kombat Insect Repellent 5 % DEET Family	Pressurized Product	5%
31151	Domestic	Novella Brands Inc.	Kombat Insect Repellent 15% DEET Active Sport	Pressurized Product	15.0%
31152	Domestic	Novella Brands Inc.	Kombat Insect Repellent Sport	Solution	15.0%
31155	Domestic	Novella Brands Inc.	Kombat Insect Repellent Family	Solution	10%
31438	Domestic	Novella Brands Inc.	Kombat Personal Insect Repellent - 15% DEET - For Gardeners	Pressurized Product	15.0%
32964	Domestic	Novella Brands Inc.	Kombat 30% DEET Insect Repellent Wipes	Impregnated Fabric	30%
33057	Domestic	Novella Brands Inc.	Kombat 30% DEET Mosquito Repellent Wipes	Impregnated Fabric	30%
33119	Domestic	Novella Brands Inc.	Kombat 30% DEET Insect Repellent Lotion	Emulsifiable Concentrate Or Emulsion	30%
21411	Domestic	PLZ Corp.	K-G Insect Repellent IV	Pressurized Product	20%
21832	Domestic	PLZ Corp.	K-G Quick Breaking Insect Repellent Foam I	Pressurized Product	10%
26540	Domestic	PLZ Corp.	K-G Insect Repellent IX	Pressurized Product	30%
26541	Domestic	PLZ Corp.	K-G Insect Repellent X	Pressurized Product	15.0%
26542	Domestic	PLZ Corp.	K-G Insect Repellent XI	Pressurized Product	25%
26543	Domestic	PLZ Corp.	K-G Insect Repellent VIII	Pressurized Product	10%
27552	Domestic	PLZ Corp.	K-G Insect Repellent Pump Spray 30%	Solution	30%
27606	Domestic	PLZ Corp.	K-G Insect Repellent Pump Spray 7.5%	Solution	7.5%
28581	Domestic	PLZ Corp.	K-G Insect Repellent Pump Spray 5%	Solution	5%
28582	Domestic	PLZ Corp.	K-G Insect Repellent Pump Spray 10%	Solution	10%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
32646	Domestic	PLZ Corp.	K-G Insect Repellent Ix Max	Pressurized Product	30%
32647	Domestic	PLZ Corp.	Insect Repellent Pump Spray 30%-Max	Solution	30%
32738	Domestic	PLZ Corp.	K-G Insect Repellent X-Dry	Pressurized Product	15.0%
32156	Domestic	Primmed B.V.	Care Plus DEET 30% Insect Repellent Pump Spray	Solution	30%
31241	Domestic	Quality Home Products	Quality Home Products Insect Repellent 25% Pump Spray	Solution	25%
33598	Domestic	Quality Home Products	QHP Insect Repellent	Pressurized Product	25%
15583	Domestic	S. C. Johnson And Son, Limited	Off! Pump Spray Insect Repellent	Solution	15.0%
21299	Domestic	S. C. Johnson And Son, Limited	Off! Familycare Lotion Insect Repellent For Use On Kids	Emulsifiable Concentrate Or Emulsion	7.5%
22258	Domestic	S. C. Johnson And Son, Limited	Off! Deep Woods Pump Spray Insect Repellent	Solution	25%
23099	Domestic	S. C. Johnson And Son, Limited	Off! Skintastic Spray Insect Repellent	Solution	7%
23487	Domestic	S. C. Johnson And Son, Limited	Off! Deep Woods For Sportsmen 1 Insect Repellent	Pressurized Product	30.34%
24368	Domestic	S. C. Johnson And Son, Limited	Off! Skintastic Spray Insect Repellent For Use On Kids	Solution	5%
24723	Domestic	S. C. Johnson And Son, Limited	Off! Deep Woods 3 Insect Repellent	Pressurized Product	25%
27097	Domestic	S. C. Johnson And Son, Limited	Off! Insect Repellent Foam	Pressurized Product	10%
27112	Domestic	S. C. Johnson And Son, Limited	Off! Deep Woods Pump Spray Insect Repellent 4	Solution	25%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
27324	Domestic	S. C. Johnson And Son, Limited	Off! Family Care Spray Insect Repellent Family - Summer Splash	Solution	7%
27325	Domestic	S. C. Johnson And Son, Limited	Off! Family Care Spray Insect Repellent For Use On Kids - Tropical Fresh	Solution	5%
27474	Domestic	S. C. Johnson And Son, Limited	Off! Active Insect Repellent	Pressurized Product	15.0%
27895	Domestic	S. C. Johnson And Son, Limited	Off! Deep Woods Insect Repellent Towelettes	Impregnated Fabric	25%
28058	Domestic	S. C. Johnson And Son, Limited	Off! Active Pump Spray Insect Repellent	Solution	25%
28648	Domestic	S. C. Johnson And Son, Limited	Off! Family Care Insect Repellent Smooth & Dry	Pressurized Product	15.0%
30097	Domestic	S. C. Johnson And Son, Limited	Off! Deep Woods Insect Repellent Dry	Pressurized Product	25%
30598	Domestic	S. C. Johnson And Son, Limited	Off! Deep Woods For Sportsmen Insect Repellent Dry	Pressurized Product	25%
33752	Domestic	S. C. Johnson And Son, Limited	Off! Familycare Spray Insect Repellent For Use On Kids - Floral Fresh	Solution	5%
27938	Domestic	Shoppers Drug Mart/Pharmaprix	Life Brand Insect Repellent Pressurized Spray	Pressurized Product	15.0%
27939	Domestic	Shoppers Drug Mart/Pharmaprix	Life Brand Insect Repellent Aloe Vera Pump Summer Fresh	Solution	7.5%
28182	Domestic	Shoppers Drug Mart/Pharmaprix	Life Brand Insect Repellent Spray For Kids Fresh Scent	Solution	5%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
28897	Domestic	Shoppers Drug Mart/Pharmaprix	Life Brand Insect Repellent	Pressurized Product	25%
31385	Domestic	Shoppers Drug Mart/Pharmaprix	Life Brand Insect Repellent 25% Pump Spray	Solution	25%
32894	Domestic	Shoppers Drug Mart/Pharmaprix	Life Brand Sport Insect Repellent	Pressurized Product	30%
27406	Domestic	Tender Corporation	Ben’s 30 Wilderness Formula	Solution	30%
27614	Domestic	Tender Corporation	Ben’s Tick & Insect Repellent Wipes	Solution	30%
28547	Domestic	Tender Corporation	Ben’s 30 Wilderness Formula Eco-Spray	Solution	30%
28901	Domestic	Tender Corporation	Ben’s Family Eco-Spray	Pressurized Product	10%
28902	Domestic	Tender Corporation	Ben’s Family Wipes	Impregnated Fabric	10%
28903	Domestic	Tender Corporation	Ben’s Family Spray	Solution	10%
28904	Domestic	Tender Corporation	Ben’s Family Lotion	Solution	10%
28906	Domestic	Tender Corporation	Ben’s 30 Spray	Solution	30%
14326	Domestic	The Great Woods, LLC.	Great Outdoors Insect Repellent Lotion	Emulsifiable Concentrate Or Emulsion	30%
27072	Domestic	The Great Woods, LLC.	Great Outdoors Insect Repellent Pressurized Spray	Pressurized Product	25%
29646	Domestic	The Great Woods, LLC.	Great Outdoors Insect Repellent Spray Kids	Solution	5%
29970	Domestic	The Great Woods, LLC.	The Great Outdoors Insect Repellent Spray[1]	Pressurized Product	30%
30807	Domestic	The Great Woods, LLC.	Great Outdoors Insect Repellent Spray	Solution	7.5%

Registration Number	Marketing Class	Registrant	Product Name	Formulation Type	Guarantee
30808	Domestic	The Great Woods, LLC.	Great Outdoors Insect Repellent Pressurized Spray	Pressurized Product	10%
34496	Domestic	The Great Woods, LLC.	Great Outdoors Dry DEET Spray	Pressurized Product	15.0%
35737	Domestic	The Great Woods, LLC.	Great Outdoors Insect Repellent Pressurized Spray Maximum Defense	Pressurized Product	30%
27642	Domestic	World Famous Sales Of Canada Inc.	World Famous DEET-X Insect Repellent	Pressurized Product	30%

[1]As of 29 May 2026, excluding discontinued products or products with a submission for discontinuation.

Appendix II List of commenters to PRVD2025-09

List of commenters' affiliations for comments submitted in response to PRVD2025-09.

Category	Commenter
Registrant	DEET Task Force
Industry	Canadian Consumer Specialty Products Association
General Public	N/A
General Public	N/A

Appendix III Comments and responses

Health Canada received 4 written comments during the public consultation for the DEET directly related to the proposed re-evaluation decision. Commenters' affiliations are listed in Appendix II. These comments were considered during the final decision phase of this re-evaluation. Summarized comments and Health Canada's responses to them are provided below.

1.0 Comments related to the health risk assessment

1.1 Toxicology

1.1.1 Comment expressing concern for the neurotoxic potential of DEET and effects in sensitive subpopulations, including children.

A member of the public raised concerns about rare but serious neurotoxic effects reported in children in a published summary of pediatric case reports (Briassoulis, G. et al., 2001, PMRA No. 3860554) and suggested that the uncertainty factors applied in Health Canada's DEET risk assessment may not fully protect sensitive populations.

Health Canada Response

The cited publication (PMRA No. 3860554) was previously considered by Health Canada to support the evaluation of possible patterns of adverse effects in human incident data. This study provides a summary of 18 case reports of possible DEET-associated neurological effects in children as reported in the published literature. The reported cases, in children from six countries, included both potential dermal and oral exposures. Similar clinical signs were observed across patients in this study and were consistent with adverse effects on the nervous system, including seizures, coma, and ataxia.

Case reports are inherently limited in their ability to establish causality as they lack control groups, standardized exposure assessments, and systematic evaluation of confounding factors. In addition, reliance on retrospective exposure information may introduce recall bias, particularly in cases involving severe or unusual clinical outcomes. It is also important to consider that within the context of the high global usage rate of DEET products in the general population, including in children, these 18 case reports represent very rare events. Based on all of these considerations, this publication was considered to be of limited relevance for hazard characterization and did not impact the overall risk assessment.

To evaluate the neurotoxic potential of DEET, Health Canada considered several toxicology studies in laboratory animals that specifically assessed nervous system toxicity. As summarized in PRVD2025-09, these studies encompassed a range of dosing regimens and exposure scenarios. Registrant-submitted studies conducted in rats that assessed effects in the nervous system included both acute (single-dose) exposures to adults and repeated exposures beginning in utero and continuing throughout development and adulthood. A short-term repeat-dose dermal neurotoxicity study in rats identified in the published literature was also considered. Health Canada also considered several in vitro and epidemiological studies as part of the weight of evidence to assess the neurotoxic potential of DEET.

Furthermore, as noted in PRVD2025-09, the toxicology database for DEET included the full complement of studies required to assess potential toxicity to infants and children, including a two-generation reproductive toxicity study in rats and guideline developmental toxicity studies in rats and rabbits. No indications of nervous system toxicity were observed in the young in these studies.

Based on a review of the available evidence, Health Canada concluded that the neurotoxic potential of DEET was adequately characterized and that there was no indication of increased sensitivity of the young to neurotoxic effects. Potential age-related sensitivity was considered in the selection of appropriate assessment factors, including the PCPA factor and the target margins of exposure. Overall, the available database was considered adequate to assess any potential age-related differences in sensitivity to DEET exposure. Details of these considerations are provided in PRVD2025-09.

1.2 Occupational and non-occupational exposure

1.2.1 Comments concerning the use of registered domestic-class products in occupational settings.

Health Canada concluded that occupational exposure is limited because no commercial-class DEET products are registered. However, domestic-class products are commonly used in occupational settings such as forestry, military training, field research, and outdoor recreation services. Workers in these environments may apply DEET products multiple times daily over extended seasonal periods. Health Canada's exposure assessment relies on usage assumptions derived largely from United States studies and does not explicitly model cumulative multi-day exposure, sweat-enhanced dermal absorption, or potential inhalation exposure in enclosed or semi-enclosed workspaces.

Health Canada response

The risk assessment for DEET addresses the use of domestic-class products by adults in occupational settings. The highly refined standard dermal assessment conducted as part of the previous re-evaluation (RRD2002-01) included high-end dermal deposition values (g DEET applied to skin per application) from studies conducted in the United States in high pest pressure environments (for example, camps), multiple applications per day, and assumed daily exposure over an intermediate-term (1–6 months) duration. Risks were shown to be acceptable for the currently registered use pattern (for example, maximum product concentration of 30% DEET).

The acceptability of the health risks related to the current use pattern was verified using real-world Canadian biomonitoring data. Biomonitoring provides an integrated estimate of exposure through all potential routes (inhalation, dermal and oral) and by all possible pathways (for example, food, drinking water and indoor uses) and better reflects behavioural and physical sources of variability. In the observational biomonitoring study conducted by Health Canada, children applied DEET based repellents as they normally would in overnight camp settings. These Ontario camp settings were high exposure environments due to high pest pressure and reflected real world conditions, including multiple applications, co-application of sunscreen, sweating, and minimal to no bathing. Urine samples were collected on the 2nd day of camp or later to ensure the daily sample reflected multi-day exposures, although this was conservatively

assumed to occur from a single day's use of DEET product. These urine concentrations were used in a reverse dosimetry approach (exposure reconstruction) to estimate daily exposure values, which were assumed to occur over an intermediate-term (1–6 months) duration. Risks were shown to be acceptable, even for the high exposure group. While this study was conducted with children, it was considered to address other sub-populations (for example, adults) and exposure scenarios (for example, occupational settings) as the study was conducted in a high pest pressure environment, the majority of children did not wash or shower during the monitoring time, and children have a higher surface area to body weight ratio compared to adults. In addition, occupational workers may wear more clothing than children in a camp setting to protect from the sun and physical hazards, which would add to the conservatism of the scenario.

As the biomonitoring study was observational, it may have captured exposure for children applying DEET products in enclosed or semi-enclosed environments. However, use of DEET products in this way is not appropriate. The label indicates that these products are not to be applied in enclosed areas. This is to minimize potential inhalation exposure.

1.2.2 Comments concerning a lack of Canadian biomonitoring data.

Health Canada relies primarily on international usage surveys and biomonitoring-based reverse dosimetry to estimate exposure. While this approach provides an integrated exposure estimate, it cannot distinguish between different behavioral patterns or product interactions. No large-scale Canadian biomonitoring studies have measured DEET or its metabolites in adults or children, limiting the ability to validate exposure assumptions under Canadian climatic and usage conditions.

Health Canada response

As discussed in comment 1.2.1, Health Canada used Canadian biomonitoring data to verify the acceptability of the health risks calculated using international use data and also to validate exposure assumptions under Canadian climatic and usage conditions. Biomonitoring data provides an integrated estimate of exposure through all potential routes and by all possible pathways and better reflects behavioural and physical sources of variability. It accounts for the different behavioural patterns and interactions with product that may increase or decrease exposure (for example, sunscreen).

Two types of Canadian biomonitoring data were available for DEET. The Health Canada, targeted biomonitoring study (discussed in comment 1.2.1) and the Canadian Health Measures Survey (CHMS). CHMS is a large-scale, nationally representative survey that collects information and biological samples from people living in Canada. Both the large-scale, nationally representative and smaller-scale, targeted biomonitoring data indicated that risks were acceptable for people living in Canada using DEET products under Canadian climatic and usage conditions. This supported the outcome of the standard risk assessment conducted using chemical-specific data and exposure models. Given that risks were acceptable for the standard risk assessment and under real-world Canadian conditions, further investigation to distinguish between different behavioral patterns or product interactions was not necessary.

1.2.3 Comments concerning the representativeness of the exposure and risk assessment for children.

Children may have higher exposure than adults when the same amount of product is applied, due to higher dermal permeability. Although Health Canada proposes age-specific use limits, these rely largely on dermal absorption values derived from adult data. Incorporating pediatric-specific absorption coefficients and behavioral exposure patterns like hand-to-mouth contact, would provide a more protective assessment.

Health Canada response

The exposure assessment for DEET is representative of children. Available child-specific DEET data were incorporated into the assessment to the extent possible. In the standard assessment, child-specific factors (for example, body weight) and a hand-to-mouth assessment were included. In the reverse dosimetry approach, the biomonitoring data was from a child-specific study. The measured urine concentrations are representative of child-specific behavioural patterns and physical differences (for example, greater surface area to body weight ratio compared to adults). These urine concentrations were used in a reverse dosimetry approach (exposure reconstruction) to estimate daily exposure values. This approach used child-specific pharmacokinetic studies to determine urinary excretion fraction and absorption rate values specific to children.

The toxicology assessment for DEET also specifically addressed potential toxicity to infants and children. As noted in PRVD2025-09, the toxicology database for DEET included all required studies for assessing potential toxicity to infants and children, including potential prenatal and postnatal toxicity. Specifically, the database included a two-generation reproductive toxicity study in rats and developmental toxicity studies in rats and rabbits, which are the core studies required to evaluate potential effects following prenatal and postnatal exposure. A non-guideline repeat-dose neurotoxicity study in rats in which offspring were assessed for evidence of neurotoxicity following exposure in utero and extended dosing throughout development and adulthood was also available. Relevant information from the published literature was also considered as part of the weight of evidence to further characterize the potential for toxicity to infants and children.

The child-specific assessments conducted for the DEET re-evaluation accounted for child behavioural patterns and physical characteristics to the extent possible in the exposure assessment, as well as for potential toxicity to infants and children in the hazard assessment. Therefore, the exposure and risk assessments are considered to be protective of infants and children.

1.2.4 Comments concerning the use of DEET in conjunction with sunscreen, which may increase systemic exposure.

Experimental studies have indicated that dermal absorption of DEET may be increased when co-applied with sunscreen ingredients such as oxybenzone and avobenzone. Health Canada did not quantitatively model this combined use scenario in the exposure assessment.

Health Canada response

The effect of sunscreen on absorption of DEET was considered in the re-evaluation of DEET.

As discussed in previous responses in Section 1.2, data from the Health Canada targeted biomonitoring study was used in the re-evaluation of DEET. In this study, children reported specific behaviours in their activity journal, such as whether they applied sunscreen or hand sanitizer after applying a DEET product. When analyzing the data, study authors looked for correlations between these behaviours and biomarker urine concentrations. The study authors reported there were slightly higher biomarker urine concentrations (not statistically significant) for participants who reported using sunscreen and/or hand sanitizer at the same time that DEET was applied.

Urine concentrations from this study were used in the dose reconstruction (reverse dosimetry) approach with human pharmacokinetic data to estimate the dermal (administered) DEET dose on the surface of the skin. The calculations required for the reverse dosimetry approach using DEET biomonitoring data are the opposite of those used for standard exposure assessments.

- Standard exposure assessments estimate the skin surface (dermal) dose using inputs from exposure studies and application rates. A dermal absorption value is then used to estimate the systemic (internal) dose. Using a higher dermal absorption value (for example, enhanced by the co-application of sunscreen) in a standard assessment would result in a higher systemic dose and more conservative risk estimates.
- For the DEET reverse dosimetry approach, the urine concentration in the biomonitoring data represents the systemic dose. Human pharmacokinetic data were used to convert the urine concentrations into a dermal dose estimate. In this approach assuming dermal absorption is enhanced by the co-application of sunscreen would result in lower surface exposure estimates and less conservative risk estimates.

The residential aggregate exposure and risk assessment accounts for the use of sunscreen by using data from the Health Canada biomonitoring study, where participants used DEET as they normally would in camp conditions, including the co-application of sunscreen. The reverse dosimetry approach used to estimate exposure addresses the potential use of sunscreen by users and risks would not be underestimated.

Combination sunscreen-pesticide products are not registered for use in Canada. Information on best practices when using sunscreen and personal insect repellent products at the same time is included on Canada.ca. The guidance recommends that sunscreen be applied first, followed by the insect repellent. This is consistent with the scientific study that found absorption of DEET in children was not enhanced when applied after sunscreen.

1.3 Incident reports

1.3.1 Comments concerning neurotoxic effects of DEET following accidental ingestion or misuse.

Health Canada response

Personal insect repellents containing DEET are safe when used in accordance with label directions, including use of an appropriate concentration based on the user's age. Review of DEET incidents indicates that reported nervous system effects were generally not serious (for example, headache) and resolved quickly without medical treatment, while serious clinical outcomes, such as seizures, were very rare. However, incident reports do not consistently provide sufficient detail to confirm whether products were used in accordance with label directions. As a result, clear and well-communicated label directions and precautionary statements remain an important mechanism to support appropriate DEET product use and reduce the likelihood of misuse or inadvertent exposures. In this context, label clarity was improved by aligning existing label statements with the re-evaluation decisions outlined in Re-evaluation Decision Document RRD2002-01, *Personal insect repellents containing DEET*, while addressing inconsistencies across DEET product labels and maintaining established health-protective statements to support clear and effective communication for appropriate product use.

1.3.2 Comments concerning a more structured and transparent process for considering incident data and determining when label changes are justified.

Health Canada response

During a re-evaluation, label amendments are informed by a risk-based review of available scientific information, including reported incident data. Label amendments may be required either to address identified risks or to ensure existing label statements continue to be clear, consistent, and understandable, thereby supporting appropriate use of domestic class products. While the DEET incident report review did not identify any new or significant risks to human health, it did identify opportunities to improve clarity and consistency of existing label statements on DEET products. Accordingly, label clarity was improved by aligning existing label statements with the re-evaluation decisions outlined in Re-evaluation Decision Document RRD2002-01, *Personal insect repellents containing DEET*, while addressing any inconsistencies across DEET product labels and maintaining established health-protective statements to support clear and effective communication for appropriate product use.

1.3.3 Comments concerning the reliance on absolute numbers rather than relative incidence rates to justify labeling changes, as well as the adoption of a structured, internationally recognized signal-detection framework.

Health Canada response

As described in the *Report of Pesticide Incidents for 2018-2020* (under Appendix 1 – How Incident Reports are Evaluated), Health Canada evaluates pesticide incident data using a weight of evidence approach that integrates information from multiple sources and lines of evidence rather than relying on a single source. This includes consideration of the volume and severity of reported incidents, the likelihood and relevance of the reported exposure scenario, the route of

exposure and/or the timing of symptom onset (temporal plausibility), information reported in other cases of poisoning or toxicological studies related to the pesticide (biological plausibility), product use patterns, regulatory or labelling actions taken in other jurisdictions and, where relevant, the incident frequency relative to sales volume. While sales data may provide contextual information, they do not always reliably reflect actual consumer exposure or product use and therefore, are not used in isolation. This integrated approach is consistent with internationally recognized post-market vigilance principles, which emphasize interpretation of the incident data beyond absolute numbers alone. These principles also account for the quality and completeness of incident reports and known limitations such as under-reporting. When an integrated post-market assessment approach is applied to the review of DEET incidents, the overall evidence indicates that health concerns are minimal (typically not serious and resolved quickly without medical treatment) despite the absolute number of incident reports received. The review, however, did identify opportunities to improve and clarify existing label directions or precautionary statements to support appropriate DEET product use, including additional information intended to inform consumers about effects that may occur in rare cases following product use.

1.3.4 Comments concerning the proportionality of the proposed label changes relative to the incident evidence, and the expectation that such changes should result in incident reduction.

Health Canada response

Re-evaluation of pest control products is undertaken to confirm continued acceptability of risk and ongoing alignment with current regulatory standards. While the review of the DEET incidents indicated that the reported health effects are generally minor in severity, re-evaluation is informed by a broader assessment of scientific information and regulatory standards, including ensuring that label statements remain clear, consistent and aligned across products to support appropriate use. In this context, refining existing label statements to improve clarity and consistency is a standards-based outcome of the re-evaluation and is not contingent on the frequency or severity of the reported DEET incidents. Accordingly, label amendments are not undertaken with the expectation of directly reducing incident reports; rather, they are intended to maintain alignment with regulatory standards and support clear effective communication of product use information. For DEET products, label clarity was improved by aligning existing label statements with the re-evaluation decisions outlined in Re-evaluation Decision Document RRD2002-01, *Personal insect repellents containing DEET*, while addressing any inconsistencies across DEET product labels and maintaining established health-protective statements, to support clear and effective communication for appropriate product use.

1.3.5 Comments concerning the scope and volume of proposed label text additions, including feasibility, clarity, potential impacts on comprehension, packaging constraints, and operational burden. Comments also request consideration of plain-language indicators in place of statements perceived to over-signal hazard, and the application of human-factor principles.

Health Canada response

In developing the final label amendments for DEET products, Health Canada revised many of the label statements proposed in PRVD2025-09. These changes take into consideration the input received during consultation, publicly available Health Canada information on Personal Insect Repellants, and observed inconsistencies across DEET product labels. For example, to reduce confusion regarding what products are appropriate for use on 12 year old children, the label language restriction was revised to "13 years of age or older" for products with 10% DEET or greater. The revised label statements also incorporate the relevant statements from the previous re-evaluation decision (Re-evaluation Decision Document RRD2002-01, *Personal insect repellants containing DEET*). This enabled refinement and consolidation of label statements to improve clarity, reduce duplication and maintain established health-protective statements, which will facilitate clear and effective communication for appropriate product use. The final label statements are outlined in Appendix IV.

2.0 Comments related to the environmental risk assessment

2.1 A comment was received expressing concern that existing water monitoring data are limited and that cumulative environmental exposure could be an issue during peak recreational periods. The commentor cited a study by Picinni-Zambelli et al., (2025), suggesting that genotoxic and reproductive effects on aquatic organisms may be associated with concentrations of DEET in surface waters.

Health Canada response

For Use-Site Category 26 (human skin, clothing and proximal sites), Health Canada assumes limited environmental exposure. Environmental fate data is not required and an environmental risk assessment is not conducted for personal care products. However, as water monitoring data were available for DEET, the available environmental data were assessed. Although limited, the available water monitoring data indicate that concentrations of DEET are multiple orders of magnitude below reported toxicity values for aquatic organisms, including the most sensitive groups/species. The monitoring data available includes effluent from wastewater treatment plants, which is expected to have higher concentrations than surface water bodies. Therefore, the values used in the DEET assessment are considered worst-case scenarios and are protective of cumulative exposure during peak recreational periods.

The cited paper (Picinini-Zambelli et al., 2025) clearly states in Section 3.2.1 that the study referenced "did not establish a direct correlation between the observed effects and a specific agent". The paper attributes the observed genotoxic and mutagenic effects to the complex mixture of contaminants present in the environmental samples.

A review of the study cited by the authors (Picinini et al. (2022)) determined that the genotoxic and mutagenic impacts observed could not be connected to the presence of DEET. Water samples tested in this study had no detectable oxygen and high levels of a multitude of chemicals. A review of these two papers has determined they are not relevant to the Health Canada environmental review for DEET.

2.2 Concerns were expressed regarding potential effects on nontarget organisms, specifically pets and pollinators. No specific exposure pathways or new environmental data were provided; concerns were qualitative and precautionary.

Health Canada response

Terrestrial organisms, including pollinators, are expected to have negligible exposure to DEET. Terrestrial organisms could be exposed through use of surface waters, however, concentrations of DEET in surface waters are orders of magnitude below the effects metrics for any available aquatic invertebrate. Aquatic organisms are expected to be the most sensitive to pesticides in surface water because their exposure is higher than that of any terrestrial organisms. Overall, the available data indicates no concerns for aquatic and terrestrial organisms in the environment.

Appendix IV Label amendments for products containing DEET

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Information on labels of currently registered products should not be removed unless it contradicts the following label statements.

1.0 Label amendments relating to the health risk assessment

1.1 Label amendments for DEET technical products

Reg. No. 18068

The active ingredient statement on the label must be revised to:

ACTIVE INGREDIENT:
DEET (N,N-Diethyl-m-toluamide) … 98.97%
Related active toluamides … 0.15%

For technical grade active ingredients:

The following signal word and hazard statements should appear on the principal display panel of the label:

- The signal word “WARNING”
- The skull and crossbones symbol in an inverted triangle border shape (see image below) should appear on the principal display panel in close proximity to the hazard statement “POISON”



- The following hazard statements should appear on the label:

  “EYE AND SKIN IRRITANT”

On the secondary display panel, ensure the following statements are included in the PRECAUTIONS section:

"Harmful if swallowed. Causes eye irritation. DO NOT get in eyes. May irritate the skin. Avoid contact with skin."

In the FIRST AID section, ensure the following statements are included:

First aid	
If swallowed	Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.
If on skin or clothing	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15–20 minutes. Call a poison control centre or doctor for treatment advice.
If inhaled	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.
If in eyes	Hold eye open and rinse slowly and gently with water for 15–20 minutes. Remove contact lenses if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.
	Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

1.2 Label amendments for DEET domestic-class end-use and the manufacturing concentrate products

The required label statements for end-use products are outlined in Table 1 below. This table includes statements from the previous re-evaluation (RRD2002-01) that continue to be required. As indicated above, they do not include all label statement requirements for individual end-use products. Information on labels of currently registered products should not be removed unless it contradicts or duplicates information from the label statements below.

Table 1 Label statements for DEET end-use products, including relevant statements from RRD2002-01

Concentration	**All concentrations**	**Products with 11–30% DEET**	**Products with ≤10% DEET**	**All concentrations**			**All concentrations**
Formulation	**All formulations**	**All formulations**		**Aerosol (pressurized product) and pump spray (liquid solution)**	**Towelette (wipes)**	**Lotions/ creams**	**Products that have the potential to be flammable or may damage synthetic, plastic or painted surfaces**
Primary panel	-	• Only for ages 13 and older	• Only for 6 months and older	-	-	-	-
Use directions	• Apply sparingly only when necessary and not under clothing. • Reapply after X hours if necessary[1] • EITHER: Repels mosquitoes for X hours.[1] Also repels black flies, biting midges, deer flies, stable flies, ticks, chiggers [any or all of these names	-	• **DO NOT** apply to children's hands.	• TO APPLY TO FACE: Spray your own hands and apply, avoiding eyes and mouth • Do not spray in enclosed spaces.	• When applying to face, avoid eyes and mouth	• When applying to face, avoid eyes and mouth	-

Concentration	All concentrations	Products with 11–30% DEET	Products with ≤10% DEET	All concentrations			All concentrations
Formulation	**All formulations**	**All formulations**		**Aerosol (pressurized product) and pump spray (liquid solution)**	**Towelette (wipes)**	**Lotions/ creams**	**Products that have the potential to be flammable or may damage synthetic, plastic or painted surfaces**
	are acceptable] OR: Repels mosquitoes, black flies, biting midges, deer flies, stable flies, ticks, chiggers [any or all of these names are acceptable][2]						
Precautions	• Skin reactions (for example, itchy skin, rash) may occur in rare cases • **DO NOT** apply over cuts, wounds, irritated or sunburned skin.	• **DO NOT** use on children less than 13 years old or allow them to handle this product.”	• Adult supervision advised for applications on children. • Do not use on infants under 6 months of age. • In 6 months to 2 year	• **DO NOT** spray directly to face	-	-	Label statements, warning the consumer of the noted physical and chemical hazard. For example o FLAMMABLE: statements must be revised, as follows: ▪ Add all required statements regarding

Concentration	All concentrations	Products with 11–30% DEET	Products with ≤10% DEET	All concentrations			All concentrations
Formulation	**All formulations**	**All formulations**		**Aerosol (pressurized product) and pump spray (liquid solution)**	**Towelette (wipes)**	**Lotions/ creams**	**Products that have the potential to be flammable or may damage synthetic, plastic or painted surfaces**
			olds, do not apply more than once a day. Not for daily use. • In 2–12 year olds, Do not apply more than 3 times per day.				flammability related to the product, if required and not currently present. ▪ **Remove** : "Keep treated surfaces away from fire or open flame until dry." ▪ **Add**: "Keep treated surfaces, includes skin or clothing, away from fire or open flame until dry." ○ **Remove**: all variations of the following statement "Do

Concentration	All concentrations	Products with 11–30% DEET	Products with ≤10% DEET	All concentrations			All concentrations
Formulation	**All formulations**	**All formulations**		**Aerosol (pressurized product) and pump spray (liquid solution)**	**Towelette (wipes)**	**Lotions/ creams**	**Products that have the potential to be flammable or may damage synthetic, plastic or painted surfaces**
							not apply on or near acetate, rayon, or other synthetic fabrics, plastics, watch crystals, leather, painted or varnished surfaces including automobiles. May damage synthetic surfaces and other finishes." ○ **Add**: "DO NOT APPLY ON OR NEAR: acetate, rayon, or other synthetic fabrics, plastics, watch crystals, leather, painted or varnished

Concentration	All concentrations	Products with 11–30% DEET	Products with ≤10% DEET	All concentrations			All concentrations
Formulation	**All formulations**	**All formulations**		**Aerosol (pressurized product) and pump spray (liquid solution)**	**Towelette (wipes)**	**Lotions/ creams**	**Products that have the potential to be flammable or may damage synthetic, plastic or painted surfaces**
							surfaces including automobiles. May damage synthetic surfaces and other finishes.”
First Aid	If swallowed: Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an	-	-	If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.	-	-	-

Concentration	All concentrations	Products with 11–30% DEET	Products with ≤10% DEET	All concentrations			All concentrations
Formulation	**All formulations**	**All formulations**		**Aerosol (pressurized product) and pump spray (liquid solution)**	**Towelette (wipes)**	**Lotions/ creams**	**Products that have the potential to be flammable or may damage synthetic, plastic or painted surfaces**
	unconscious person. In case of overexposure to skin or clothing: Take off contaminated clothing, if applicable. Rinse skin immediately with plenty of water for 15–20 minutes. If irritation or other adverse effects develop, call a poison control centre or doctor for treatment advice. If in eyes: Hold eye open and						

Concentration	All concentrations	Products with 11–30% DEET	Products with ≤10% DEET	All concentrations			All concentrations
Formulation	**All formulations**	**All formulations**		**Aerosol (pressurized product) and pump spray (liquid solution)**	**Towelette (wipes)**	**Lotions/ creams**	**Products that have the potential to be flammable or may damage synthetic, plastic or painted surfaces**
	rinse slowly and gently with water for 15–20 minutes. Remove contact lenses if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice. Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.						

"-" = no additional required statements

[1] See table entitled "Calculated Complete Protection Time (CPT)" values for 5–30% DEET against mosquitoes." Any reapplication intervals or protection times different from those indicated in the CPT table would have to be supported by data or scientific rationales in a submission to Health Canada.

[2] The use on labels of any pest names other than those in this table would have to be supported by data or scientific rationales in a submission to Health Canada.

Calculated Complete Protection Time (CPT) values for 5-30% DEET against mosquitos

%DEET Technical	Calculated complete protection time (CPT) in hours
5–6% DEET	2 hours
7–10% DEET	3 hours
11–14% DEET	4 hours
15–21% DEET	5 hours
22–30% DEET	6 hours

Appendix V References considered following publication of PRVD2025-09

Information Considered in the Toxicological Assessment

Additional Information Considered

Published Information

Document Number	Reference
3860554	2001, Briassoulis, G. and M. Narlioglou and T. Hatzis, Toxic encephalopathy associated with use of DEET insect repellents: a case analysis of its toxicity in children. Human and Experimental Toxicology, Volume 20, Pages 8 to 14. DACO: 4.8

Information Considered in the Environmental Assessment

Additional Information Considered

Published Information

Document Number	Reference
3850213	2025, Picinini-Zambelli, J, AL Hilario Garcia & J Da Silva. Emerging pollutants in the aquatic environments: A review of the genotoxic impacts. Mutation Research-Reviews in Mutation Research 795, pg 108519. DACO: 12.5.8
3850214	2022, Picinini, J, R Farias Oliveira, A L Hilario Garcia, G Nunes da Silva, V Cristina Sebben, GM Soares de Souza, J Ferraz Dias, D Silva Correa, & J da Silva, In vitro genotoxic and mutagenic effects of water samples from Sapucaia and Esteio streams (Brazil) under the influence of different anthropogenic activities. Mutation Research – Genetic Toxicology and Environmental Mutagenesis 878:503484. DACO: 12.5.8
3850221 3850223	2025, Gewurtz, S.B., A.S. Auyeung, S. Teslic, S.A. Smyth, Pharmaceuticals and personal care products in Canadian municipal wastewater and biosolids: occurrence, fate, and time trends 2010-2013 to 2022. Environmental Science and Pollution Research. 62:5022-5039. DACO: 12.5.8