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To Whom It May Concern:

Re: Proposed Re-evaluation Decision PRVD2019-05, Chlorpyrifos and Its Associated End-use Products: Updated Environmental Risk Assessment

These are the comments of the David Suzuki Foundation, the Canadian Association of Physicians for the Environment, Canadian Environmental Law Association, Équiterre and Environmental Defence on the proposed re-evaluation decision for chlorpyrifos (PRVD2019-05). Our organizations have a long history of advocacy for effective pesticide regulation to protect the environment and human health. Over all, we strongly support the proposed decision to cancel most uses of chlorpyrifos on the basis of the updated environmental risk assessment. Risks to pollinators, birds, mammals, aquatic invertebrates and fish are not acceptable. We urge PMRA to confirm immediate cancellation of these uses without further delay, especially considering that this evaluation has already been underway for more than 15 years. Further, and as detailed below, we believe a complete ban on chlorpyrifos is justified.

As a preface to our detailed comments on PRVD2019-05, we note with concern that lack of surface water monitoring data was identified as a limitation in the original environmental risk assessment published for consultation in 2003 (PACR2003-03) and that this critical data gap persisted for more than a decade. In regions for which robust monitoring data is now available, chlorpyrifos is being detected in surface waters at concentrations that frequently exceed levels of concern for invertebrates and fish. Recent assessments of aquatic risks from neonicotinoid insecticides, after decades of their extensive use, also concluded on the basis of newly available water monitoring data that risks are not acceptable, and the similarities suggest a troubling pattern: risk assessments underestimate environmental exposure in the absence of appropriate environmental monitoring data, obscuring environmental risks. Canada urgently needs a systematic and co-ordinated approach to ensure availability of robust environmental monitoring data, as well as pesticide use data, to support PMRA's exposure assessment calculations.

Also, we urge PMRA to proceed swiftly with the update to the health risk assessment of uses proposed for continued registration in PRVD2019-05, in particular mosquito control. Recent studies confirm risks to child neurodevelopment posed by exposure to organophosphates including chlorpyrifos.¹ A review of animal studies and epidemiological evidence by the State of California's Department of Pesticide Regulation in July 2018² prompted a recommendation by a scientific review panel to add chlorpyrifos to the list of toxic air contaminants in the state. Several U.S. states, including Hawaii and California, are now moving to ban all uses of chlorpyrifos due to health concerns. Canada should too.

International context

Although chlorpyrifos is currently authorized at the EU-level, it should be noted that eight of the 28 EU-member states (all OECD members) have not approved its use within their national boundaries and a ninth, the U.K., banned all but one use in 2016. As mentioned above, several U.S. states are moving to ban chlorpyrifos.

Pollinator risk assessment

PRVD2019-05 identifies potential risks to bees from foliar applications of chlorpyrifos but only considers exposures to bees foraging on the target crop/field. Ignoring the risk of exposure from spray drift, PMRA concludes risks to pollinators are minimal for applications on crops harvested before bloom, not attractive to pollinators or deflowered as a standard practice. For other crop applications with the potential for high pollinator exposure, PMRA concludes risks to pollinators are acceptable if chlorpyrifos is not applied during bloom. However, PMRA acknowledges, "Non-target plants may be exposed to chlorpyrifos by direct overspray and spray drift" (page 13) and estimates that 11 to 74 per cent of spray will drift one metre downwind from the application site during spraying, depending on the application method. A British study concluded that ground spraying of chlorpyrifos at typical application rates would result in exposures of honeybees at the LD₅₀ within 36–46 m of the application site at a wind speed of 4 m sec⁻¹ (14.4 km h⁻¹).³ Pollinators may therefore be exposed to spray drift, especially if bee-attractive plants (e.g., wildflowers) are growing in adjacent areas. As non-target plants often have different bloom cycles than the crops considered in the assessment, application timing restrictions are unlikely to reduce risks from this exposure pathway.

Furthermore, soil and soil-water exposures from both foliar and granular applications have not been assessed and may present risks to ground-nesting native bees.⁴ The timing restrictions contemplated in the assessment are unlikely to reduce risks from soil and soil-water exposure.

¹ I Hertz-Picciotto et al (2018). "Organophosphate exposures during pregnancy and child neurodevelopment: Recommendations for essential policy reforms." *PLOS Medicine*, 15(10).

² Department of Pesticide Regulation, California Environmental Protection Agency. *Evaluation of Chlorpyrifos as a Toxic Air Contaminant: Executive Summary*. July 2018.

https://www.cdpr.ca.gov/docs/whs/pdf/chlorpyrifos_exec_summary.pdf

³ Davis BNK, Williams CT. (1990). "Buffer zone widths for honeybees from ground and aerial spraying of insecticides." *Environ Pollut* 63:247–259.

⁴ Cutler G.C., Purdy J., Giesy J.P., Solomon K.R. (2014), "Risk to Pollinators from the Use of Chlorpyrifos in the United States." In: Giesy J., Solomon K. (eds) *Reviews of Environmental Contamination and Toxicology: vol. 231. Ecological Risk Assessment for Chlorpyrifos in Terrestrial and Aquatic Systems in the United States*. Heidelberg New York Dordrecht London: Springer, Cham.

While the proposed use cancellations will protect insect pollinators, the assessment should acknowledge risks from spray drift, and from soil and soil-water exposures. Application timing restrictions are inadequate to reduce these risks.

We also strongly disagree with the suggestion on page 12 that risks deemed unacceptable to managed bees could be acceptable for wild pollinators for certain crop applications. While risks to honeybees are better documented, native bees in some cases may be more vulnerable. A precautionary approach should apply.

Canadian water-monitoring data

In areas of the country for which robust surface water monitoring data are available, the measured levels of chlorpyrifos are alarming, more so considering that monitoring data typically underestimate peak exposure. We agree there is no reason to believe that detection patterns would be different in other areas where monitoring data are lacking. The available monitoring data reveal widespread environmental contamination, which adds to the toxic burden for species and ecosystems affected by multiple stressors (including exposure to other insecticides). Risks to the environment are not acceptable and have not been for many years; PMRA must immediately cancel agricultural uses of chlorpyrifos, and other uses that may contribute to surface water contamination, as required by the *Pest Control Products Act*.

Mosquito control

The assessment concludes that environmental risks from mosquito larvae control applications are acceptable because “the presence of aquatic biota in temporary standing pools is expected to be limited.” This assumption is not supported by research. A March 2009 study identified 86 insect species in temporary pools of water in an urban area.⁵ Field studies in North Carolina between 1974 and 1990 identified over 150 species of insects in temporary pools.⁶ A comparison of biota in temporary pools in the United Kingdom, Australia and northeastern North America found a wide diversity of insect species.⁷ This potential exposure pathway for non-target insects, as well as birds, requires further examination.

Also, risks from spray drift and leaching associated with mosquito control uses do not appear to have been assessed.

For adult mosquito control applications, the assessment concludes that risks to non-target terrestrial and aquatic biota are acceptable if chlorpyrifos is applied by ultra-low volume (ULV) applicators for adult mosquito control because spray droplets are very small and are likely to dissipate or evaporate while suspended in air. Risks to other insects (including pollinators) and birds in flight do not appear to have been assessed. Moreover, while ULV applicators *may* be used in mosquito control, they are not required. Environmental risks from mosquito control applications should be examined more closely –

⁵ Fontanarrosa, M. Soledad; Marta B. Collantes; and Axel O. Bachmann (2009). “Seasonal Patterns of the Insect Community Structure in Urban Rain Pools in Temperate Argentina.” *Journal of Insect Science*, 9(1).

⁶ HM Wilbur (1997). “Experimental Ecology of Food Webs: Complex Systems in Temporary Ponds.” *Ecology Journal*, 78(8): 2279–2302.

⁷ DD Williams (1998). “Temporary pools and their invertebrate communities.” *Marine Conservation*, 7(2).

without delaying cancellation of other uses/products. The latter should be confirmed immediately as an interim measure.

Greenhouse use

PMRA proposes to continue registration of greenhouse applications with an additional label restriction: “DO NOT allow effluent or runoff from greenhouses containing this product to enter lakes, streams, ponds or other waters.” We question whether this label restriction will be effective in reducing risks. Neonicotinoid pesticides used in greenhouses have been measured in nearby surface water, despite label warnings/restrictions intended to reduce risks to aquatic ecosystems. It is not clear whether monitoring data were available for surface water near greenhouse operations where chlorpyrifos is used to confirm actual environmental concentrations. We are also concerned that Health Canada and the PMRA lack capacity to properly monitor compliance and enforce label requirements. Given these uncertainties, cancelling greenhouse uses would be an appropriate precautionary approach.

Thank you for your consideration.

Sincerely,

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