Summary of Risk Assessment Conducted Pursuant to subsection 83(1) of the *Canadian Environmental Protection Act, 1999*

New Substances Notification 21535: 1-Hexanol, 2-ethyl-, reaction products with 1,6-diisocyanatohexane (Chemical Abstracts Service Registry Number 197393-84-3)

Regulatory decisions

Under the provisions for Substances and Activities New to Canada in Part 5 of the *Canadian Environmental Protection Act, 1999* (CEPA), and pursuant to section 83 of the Act, the Minister of the Environment and the Minister of Health have assessed information in respect of the substance and have determined that the substance is anticipated to enter the environment in a quantity or concentration or under conditions that constitute or may constitute a danger in Canada to human life or health if it is used in consumer products.

In order to ensure that the substance does not cause harm to the Canadian environment or human health, its manufacture and import are authorized subject to conditions as described in Ministerial Condition No. 21535 published in the *Canada Gazette* Part I, Vol. 157, No. 38 on September 23, 2023.

Substance identity

The notified chemical is 1-hexanol, 2-ethyl-, reaction products with 1,6-diisocyanatohexane (Chemical Abstracts Service Registry Number[1] 197393-84-3), and is considered a substance of Unknown or Variable composition, Complex reaction products or Biological materials (UVCB).

Notified and potential uses

The substance is proposed to be imported into Canada in quantities greater than 10 000 kg/yr for the notified use in industrial coating applications. Potential uses may include consumer paints and coatings.

Environmental fate and behaviour

Based on its physical and chemical properties, if released to the environment, the substance will tend to partition to soil and sediment. The substance will rapidly react with water to form high molecular weight compounds that are highly insoluble in water. However, the environmental products of hydrolysis are expected to be persistent in soil and sediment. The substance and its products of hydrolysis are not expected to bioaccumulate based on lack of

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bioavailablity due to their high molecular weight and water insolubility, which limit their ability to cross biological membranes.

Environmental risk assessment

Based on the available hazard information, the substance has low acute toxicity to fish (median lethal loading rate [LL_{50}] > 100 mg/L), low acute toxicity to aquatic invertebrates (median effective loading rate > 100 mg/L), low chronic toxicity to algae (no-observed-effect concentration > 10 mg/L) and low acute toxicity to earthworms (LL_{50} > 100 mg/kg dry weight). A predicted no-effect concentration was not calculated given the low potential for risk to the environment.

Environmental exposure from the notified activity is expected to be negligible. A predicted environmental concentration was not calculated due to the low potential for environmental exposure and low ecotoxicity. No potential activities that could significantly increase environmental risks compared to those notified were identified.

Based on the low potential for ecotoxicity and environmental exposure, the substance is unlikely to cause harm to the environment in Canada.

Human health risk assessment

Based on the available hazard information, the substance has a low acute toxicity by the oral route (median lethal dose [LD_{50}] > 2000 mg/kg body weight) and is expected to have a low acute toxicity by the dermal route (LD_{50} > 2000 mg/kg body weight) and a very high acute toxicity by inhalation route of exposure (median lethal concentration < 0.5 mg/L/4hr). It is expected to have high subchronic toxicity following repeated inhalation exposure in mammalian test animals (90-day no-observed-adverse-effect concentration [NOAEC] < 0.02 mg/L/6hr). It is an extreme dermal sensitizer (estimated concentration < 0.1% required to produce a stimulation index of 3 in a local lymph node assay). It is not mutagenic *in vitro* and is weakly clastogenic *in vitro* but not *in vivo*. Therefore, the substance is unlikely to cause genetic damage. The No Expected Sensitization Induction Level (NESIL) for dermal exposure was calculated to be 0.10-1 μg/cm^2. The NESIL is the level of exposure below which no skin sensitization induction is expected in exposed individuals.

When the notified substance is used in industrial coating applications, consumers may come into contact with end-use products containing the substance; however, direct exposure is not expected because the substance will be chemically reacted into a stable matrix once the product is cured and will be unavailable for uptake. Indirect exposure of the general population from environmental media is not expected given the specialized industrial use of the substance, which results in little or no release to the environment.

Potential uses of the substance may include paints and coatings available to consumers where direct exposure of the general population is expected to be mainly by contact with the skin at levels in the range of 1000-10 000 μg/cm^2/event or by aerosol inhalation at the levels in the

range of 1-10 mg/m^3. Indirect exposure of the general population through environmental media is expected to be at levels that do not pose a concern, similar to that of the notified use.

Based on the low exposure potential from intended uses, the substance is not likely to pose a significant health risk to the general population and is therefore unlikely to be harmful to human health when used as notified.

The target margin of exposure (MOE_T) was calculated to be 100 based on the available information. The MOE_T is the level of exposure at or above which there is no expected risk to the exposed population. The derived margin of exposure (MOE_D) is the ratio of the point of departure (POD) value to the available exposure doses and is compared to the MOE_T. Where the substance is used in consumer applications, the MOE_D calculated is in the range of 0.1-1 based on the POD, the NOAEC of the inhalation subchronic toxicity study in mammalian test animals. The skin contact level is also higher than the NESIL. Because the MOE_D is less than the derived MOE_T, and the skin contact level is higher than the NESIL, the substance is anticipated to be harmful to human health if it is used in consumer products.

The assumptions made in the assessment and the risk management measures applied are considered to be adequately protective for the general population as well as for subpopulations who may be more susceptible or highly exposed.

Assessment conclusion

The substance is suspected to constitute a danger to human health according to the criteria under paragraph 64 (c), but is not suspected to have a harmful effect on the environment according to the criteria under paragraph 64 (a) or (b) of the Act.

Due to the identified risk to human health related to the sensitization and inhalation toxicity if the substance is used in consumer products, a ministerial condition was issued to restrict the manner in which the notifier may manufacture or import the substance with conditions on its use in order to mitigate these potential risks. Ministerial Condition No. 21535 was published in the *Canada Gazette* Part I, Vol. 157, No. 38 on September 23, 2023.

A conclusion under CEPA, on this substance, is not relevant to, nor does it preclude an assessment against the hazard criteria for Workplace Hazardous Materials Information System that are specified in the *Controlled Products Regulations* or the *Hazardous Products Regulations* for products intended for the workplace.