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

Significant New Activity No. 18020: Hexanedioic acid, mixed 4-methyl-2-propylhexyl and 5-methyl-2-propylhexyl and 2-propylheptyl esters;
Chemical Abstracts Service Registry No. 1043888-25-0

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 that Act, the Minister of the Environment and the Minister of Health have assessed information in respect of the substance. The Ministers have determined that it is not anticipated to enter the environment in a quantity or concentration or under conditions that:
(a) have or may have an immediate or long term harmful effect on the environment or its biological diversity, or
(b) constitute or may constitute a danger to the environment on which life depends, or
(c) constitute or may constitute a danger in Canada to human life or health.

However, a significant new activity (SNAc) notice was adopted based on uncertainties regarding potential human health impacts of the substance in relation to certain new activities. SNAc Notice No. 18020 outlines information requirements for those activities and was published in the *Canada Gazette* Part I, Vol. 149, No. 23 – June 6, 2015. Notification is required prior to commencement of those activities identified as a potential risk to ensure the substance undergoes further assessment and risk management consideration.

Substance Identity

The substance is a chemical that can be classified as a mixed alkyl adipate diester.

Notified Activities

The substance is proposed to be manufactured in or imported into Canada for industrial use.

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. Based on information for half-life in soil and sediment, the substance is not expected to persist in the environment. The substance is not expected to bioaccumulate to a significant extent, based on low predicted bioaccumulation factor (BAF) and bioconcentration factor (BCF) values.

Ecological Assessment

Based on the available ecological hazard information on the substance and surrogate data on di(2-ethylhexyl) adipate (DEHA), a structurally similar chemical, the substance has low (LC_{50} and EC_{50} > 100 mg/L) acute toxicity with no effects up to its water saturation limit in fish, invertebrates and algae. However, based on surrogate data on DEHA, the substance has high (NOEC and LOEC < 0.1 mg/L) chronic toxicity in invertebrates. The predicted no effect concentration (PNEC) was conservatively calculated using a maximum acceptable toxicant concentration (MATC) from the most sensitive organisms and is considered to have high inherent toxicity. This value was used to estimate the ecological risk.

The notified and other potential activities in Canada were assessed to estimate the environmental exposure potential of the substance throughout its life cycle. Based on available information, the predicted environmental concentrations are estimated to be low.

Based on the low exposure, the substance is not suspected to cause ecological harm in Canada.

Human Health Assessment

Based on the available human health hazard information, the substance has a low potential for acute toxicity by the oral route of exposure (LD_{50} > 2000 mg/kg bw), is a slight irritant to skin (PII between 0.6-1.5), and a minimal irritant to eyes (MMS between 2.3 and 15). The substance showed a weak result in a test for dermal sensitization (EC3 > 10%). The substance was non-mutagenic in a test for bacterial reverse mutation. Therefore, the substance is considered unlikely to cause genetic damage. However, the notified substance is structurally similar to DEHA, which is linked to high reproductive and developmental toxicity (NOAEL= 200 mg/kg bw per day). Therefore the notified substance may show the same hazard potential.

When used in industrial applications as notified, direct exposure of the general population is not expected. In addition, indirect exposure of the general population from environmental media such as drinking water is expected to be low. Based on the absence of direct exposure and low level of indirect exposure, 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 under the notified use.

DEHA is used in consumer products including personal care products (i.e. any cosmetic or drug as defined in section 2 of the *Food and Drugs Act* or in any natural health product as defined in subsection 1(1) of the *Natural Health Products Regulations*). Based on its similarity to DEHA, it is possible that the notified substance may find use in similar applications, which may result in increased direct exposure of the general population via frequent and sustained dermal contact. Based on the potential for similar toxicity and exposure, the substance could become harmful to human health in these applications. Consequently, more information is necessary to better characterize potential health risks.

Other Considerations

DEHA was addressed in Batch 11 of the Challenge. The final screening assessment report, published in 2011, concluded that DEHA met the criteria under 64(a) and (c) of CEPA, indicating that the substance was entering or may enter the environment in a quantity or a concentration or under conditions that cause or may cause harm to the environment and a danger to human life or health. A Risk Management Approach was published in 2011 to cover environmental and health concerns.

However, a review of the evidence was published in a subsequent State of the Science report (2013) which concluded that DEHA no longer meets the criteria of paragraph 64(a) of CEPA. Therefore no risk management is required for ecological purposes.

Following commitments in the Risk Management Approach to address health concerns, DEHA was listed on Health Canada's *List of Prohibited and Restricted Cosmetic Ingredients* (Cosmetic Ingredient Hotlist).

Assessment Conclusion

When used as notified, the substance is not suspected to be harmful to human health or the environment according to the criteria under section 64 of CEPA. However, it is suspected that a significant new activity in relation to the substance may result in the substance meeting the criteria under paragraph 64(c).

Due to the potential risk to the general population related to reproductive and developmental toxicity, if the substance is used in cosmetics, drugs and natural health products, a SNAc notice was issued to obtain information to ensure that the substance, in relation to these potential activities, undergoes further assessment. SNAc Notice No. 18020 was published in the *Canada Gazette* Part I, Vol. 149, No. 23 – June 6, 2015.

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 *Hazardous Products Regulations* for products intended for workplace use.