Current as of June 21st, 2016

Substance Risk Evaluation for Determining Environmental Emergency Planning under the *Environmental Emergency Regulations* Set under the *Canadian Environmental Protection Act, 1999* (CEPA 1999)

Decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester (CAS No. 41556-26-7)

Risk Evaluation Conclusion:

- **Threshold quantity of 1.13 tonnes (minimum concentration 10%) due to aquatic toxicity**
- **Is a candidate for the *Environmental Emergency Regulations***

1.0 INTRODUCTION

The *Environmental Emergency Regulations*, developed under Part 8 of the CEPA 1999 (Government of Canada, 2011), establish a list of substances for which fixed facilities must notify Environment Canada that they store or use the substance on-site, by providing notices to Environment Canada, reporting when the substance is released into the environment, and developing an environmental emergency plan (E2 plan) for each substance stored or used at a fixed facility at or above specified threshold quantities.

To determine if a substance is a candidate to be added to the *Environmental Emergency Regulations*, Environment Canada developed a risk evaluation methodology based on the following hazard categories:

- Physical: flammable and combustible or oxidizing substances, or those having a potential to cause vapour cloud explosions or pool fires.
- Human Health: substances that are toxic by inhalation, are carcinogenic, or are corrosive.
- Environmental Health: substances that are: corrosive, persistent, bioaccumulative, or aquatically toxic.

For more information on the methodology for setting threshold quantities in the Environmental Emergency Regulations, please refer to Environment Canada (2015).

Decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester (CAS No. 41556-26-7) was selected for risk evaluation because it is a substance (under the Government of Canada's Chemicals Management Plan [http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=F638D9CF-1]) that, if spilled, could be immediately harmful to humans and/or the environment.

Following the risk evaluation, Environment Canada recommends that this substance be proposed for addition to Schedule 1 of the *Environmental Emergency Regulations* at a threshold quantity of 1.13 tonnes with a minimum concentration of 10%.

2.0 SUMMARY OF THE RISK EVALUATION

2.1 Physical Hazard: Flammable, Combustible or Oxidizing Substances

Because decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester has a flash point of 92°C (IUCLID, 2000) and has a boiling point of 485.55°C (Government of Canada, 2010), this substance does not have the possibility of a vapour cloud explosion.

Therefore, no threshold is set for this substance as a result of its potential for flammability or combustibility.

2.2 Physical Hazard: Potential for Pool Fires

Decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester has not been modeled for pool fire risks. Therefore, it is not known whether it is capable of causing a pool fire.

2.3 Human Health Hazard: Inhalation Toxicity

Because decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester does not have a vapour pressure greater than 10 mmHg (1.33 kPa) at 20°C (Government of Canada, 2010), the substance does not have sufficient volatility to constitute an inhalation danger.

Therefore, no threshold is set for the inhalation toxicity to humans.

2.4 Human Health Hazard: Carcinogenicity

Because decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester is not classified in any group of the International Agency for Research on Cancer (IARC, 2014) or the U.S. Environmental Protection Agency (U.S. EPA, 2005), and because the substance does not have a half-life longer than five years in any medium, no threshold is set for the carcinogenicity of this substance.

2.5 Human and Environmental Health Hazard: Corrosive Substances

The measured pH is greater than 2 and less than 11.5, therefore the substance is not considered corrosive and there is no associated threshold with this category.

2.6 Environmental Health Hazard: Persistent, Bioaccumulative, or Aquatically Toxic

Lethal concentration

The acute (short-term) aquatic toxicity for decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester has been determined to be slightly toxic based on modeling with a concentration (LC50 96 hours) of 11.7 mg/L (ECOSAR, 2004), where the threshold has been modified by water persistence.

Persistence

Environment Canada determined that decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester is moderately persistent in water according to our risk evaluation methodology (Environment Canada, 2015).

Bioaccumulation

Environment Canada determined that decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester is slightly bioaccumulative according to our risk evaluation methodology (Environment Canada, 2015).

Threshold

Following the evaluation of the aquatic toxicity, the threshold is set at 1.13 tonnes.

2.7 Assigned Concentration

Decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester is subject to the *Environmental Emergency Regulations* for aquatic toxicity. The minimum concentration assigned in the category for aquatic toxicity is either 10% (not a carcinogen) or 1% (a carcinogen). Since decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester is not carcinogenic, then the minimum concentration set for decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester is 10% (Environment Canada, 2015).

2.8 Assigned Threshold

Following the risk evaluation methodology developed under section 200 of CEPA 1999, the categories (flammability, combustibility, oxidizers, inhalation toxicity, aquatic toxicity, carcinogenicity, corrosiveness, pool fires) having the lowest scientific threshold will be compared against other risk management considerations. For example, the threshold will be compared to other provincial and federal legislation or voluntary programs that may already provide adequate management of the risk from an environmental emergency. Proposed thresholds may also be modified based on policy and other considerations as assessed during the public consultation period. For more information regarding the determination of thresholds, please refer to the *Implementation Guidelines for the Environmental Emergency Regulations 2011* (Environment Canada, 2011).

Other Considerations

At this time, there are no other considerations to take into account for this substance that would result in an increase or a decrease in the calculated threshold quantity.

Findings

A proposed threshold of 1.13 tonnes with a minimum concentration of 10% is assigned for decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester based on its assessed aquatic toxicity. The threshold quantity and its respective concentration will not be finalized until after public consultation.

3.0 CONCLUSION

Information concerning the quantities of decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester (CAS No. 41556-26-7) in use in Canada indicates that the substance does not exist in commerce. Following the risk evaluation and policy considerations of decanedioic acid, bis(1,2,2,6,6-pentamethyl-4-piperidinyl) ester and taking into consideration the quantities in use in Canada, Environment Canada recommends that this substance be proposed for addition to Schedule 1 of the *Environmental Emergency Regulations* under CEPA 1999 at a threshold quantity of 1.13 tonnes at a minimum concentration of 10%.

Even if the quantity of a substance in use is below the threshold quantity indicated in the *Environmental Emergency Regulations*, Environment Canada recommends that emergency planning be applied to this substance in order to minimize, or prevent, any impacts on humans or the environment in the event of a release of the substance.

4.0 REFERENCES

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5.0 FURTHER READING

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