Microplastic Contaminants of Emerging Concern (CECs) in South African Water Resources

THE KNOWLEDGE HUB

What are microplastics?

Two types of microplastics exist: primary and secondary microplastics. Primary microplastics are purposely produced for commercial applications while secondary microplastics are formed due to the degradation of large plastic products (macroplastics). The class microplastics are plastics with diameters ranging between 0.1 um and 5 mm. Microplastics can be made of different polymers based on their application and are found in various shapes (fibers, filaments, foams and fragments).

Where do microplastics originate from?

As a result of improper waste disposal, macro-plastic waste slowly degrades into microplastics due to environmental conditions such as UV rays from the sun, temperature changes and other human activities. Microplastics are also introduced into the aquatic environment through wastewater drainage from industries and households.

What are the dangers associated with microplastics?

Traditional microplastics are non-biodegradable, therefore their accumulation in the environment is inevitable. As the levels of microplastics increase, aquatic animals ingest them. Once ingested, microplastics obstruct digestive tracts, alter feeding behavior and limit the desire of aquatic organisms to eat, all of which can inhibit their growth and reproduction. Microplastics are also able to adsorb other pollutants, thereby causing secondary exposure of other emerging contaminants.

How to prevent contamination of water resources with microplastics

- Monitor the production/synthesis of polymers and implement recycling methods.
- Evaluate all imported products and monitor their usage.
- Encourage the production/use of biodegradable plastics.
- Regulate the amount of microplastic waste released in wastewater by industries.
- Avoid improper waste disposal of plastics.
- Report any illegal dumping or suspected plastic contamination to local authorities.

How to remove microplastics in water

- The use of membrane filters fitted on taps to remove floating microplastics in water.
- Reverse osmosis and distillation of water to remove suspended particles.
- Use of carbon block filters to adsorb carbon containing matter in water.

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