



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

### OPINION PIECE

#### Ecosystem bears the brunt of cigarette butts

09 June 2016, The New Age

Millions of cigarette butts that are thrown around contain toxic chemicals that poison South Africa's water resources, a research by a high school student has found.

Statistics that were released by the Tobacco Institute of South Africa five years ago indicate that 6,3 million adult South Africans smoke, which accounts for 21 billion cigarettes that are smoked annually. Invariably, the presence of cigarette butts in our water affects our ecosystem negatively.

Abigail Murphy, a Grade 11 pupil at Outeniqua High School in George, Western Cape, presented her startling findings before a panel of experts at the SA Youth Water Prize competition that is hosted by the Department of Water and Sanitation annually.

The toxic chemicals, Murphy found, can percolate into water when the cigarette butts are dropped, flicked or dumped into our environment, with potentially devastating effects. During her presentation she produced a litre bottle which contained clean tap water with five cigarette butts in it. The butts had been in the water for about a week and turned the water into a yellowish stinking liquid that is undrinkable.

She started her research during a walk in her area when she noticed lots of butts lying around that were washed down the storm water drains by the rains. The butts ended up in a wetland near her house where after they were washed down by a small stream nearby. The toxins in the butts had polluted the water in the wetland so badly that it cannot be consumed.

Murphy may not have won the coveted first prize at the competition, but her groundbreaking research has the impact of influencing behavioural change among smokers and may lead the government to consider legislating against littering with cigarette butts, making it a serious offence that may result in heavy fines and/or imprisonment.

After her research, Murphy concluded that people, smokers especially, need to be educated about the hazardous effects that cigarette butts can have on the country's water resources.

"Hopefully, they will stop the bad habit of flicking butts over their fences or through the windows of their cars," she said.

According to Ocean Conservancy data gathered during their annual International Coastal Cleanup in 2014, just over 3,2 million cigarettes and cigarette butts were collected from beaches and inland waterways all over the world. Of these, 2720 butts were collected in South Africa, making cigarette butts accountable for one in five collected items and the most prevalent form of litter on earth. Over 4,5 trillion cigarette butts litter worldwide each year.

The statistics become worrisome if we consider that cigarette butts that are discarded in parking lots, alongside sidewalks and in street gutters far away from our water resources, inevitably make their way through storm water drains and ultimately into rivers and other water resources.



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Even more disturbing, argues Murphy, is that according to the Americans for Non-Smokers Rights group, many people – especially smokers – think that cigarette butts are biodegradable and non-harmful. Cigarette butts are made of cellulose acetate, a plastic that may break down into smaller pieces, but will never biodegrade.

A research that was conducted in 2011 shows that a typical cigarette butt thrown on the ground can stay there for 25 years, giving enough time for toxic chemicals trapped in the used filter to leak out into water. In fact, once they are introduced into water, cigarette filters almost immediately begin to leak their toxic chemicals such as arsenic, acetone, ammonia, benzene, cadmium, formaldehyde, lead and toluene. So fatal are these chemicals that they are able to kill all they come into contact with.

A fact sheet produced by Citizens for Clean Open Spaces states that a cigarette butt not only contains remnants of the tobacco portion of cigarettes, but also 165 toxic chemicals which leach into the environment and end up in our water resources. The chemicals that leach from cigarette butts contribute to non-point source pollution. Non-point source pollution relates to a variety of human activities on land that cannot be identified from a single source.

According to the Environmental Protection Agency's aquatic bioassay evidence suggests that one cigarette butt in two liters of bottled water is "very toxic to water fleas".

More effects of some of the toxins found in cigarette butts include death, inhibition of growth, photosynthesis and reproduction, behavioural effects on fish, as well as environments that show limited species abundance and diversity.

Other effects include infertility in fish, altered behaviour, change in appearance and shortened aquatic lives. Furthermore, even when plants are exposed to some these chemicals, especially benzene, their growth may be slowed and they may even die.

However, asked by the panel what did she do with her finding as a way of a solution, Murphy said that she was a victim of bureaucracy in her own municipality. She tried to meet with some municipality officials with a view to starting a campaign in George that would make it illegal to discard cigarette butts anywhere in town. In addition, she wanted to start a campaign of picking up all cigarette butts in plastic bags in George that would be burnt in an inferno.

"Most people are fully aware of the serious health risks that smoking poses to the human body. Unfortunately, many are not aware of the detrimental effects that cigarette butts can have on our water resources," Murphy concluded.

**By Themba Khumalo**

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