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Title: Drugs of abuse in drinking water - a review of current detection methods, occurrence, elimination and health risks

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1 **Drugs of abuse in drinking water - a review of current**
2 **detection methods, occurrence, elimination and health risks**

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10 Highlights:

- 11 • Drugs of abuse are reported at trace levels (ng/L) in raw and drinking waters globally
- 12 • Current drinking water treatments cannot completely remove some drugs of abuse
- 13 • Human health risks regarding the long term exposure of these contaminants in drinking
14 water cannot be ruled out
- 15 • Studies regarding the analysis of new emerging drugs in drinking water are needed
- 16 • A review of analytical methodologies for the determination of drugs of abuse in drinking
17 water shows that SPE and LC-MS/MS is generally used

18

19 **Abstract**

20

21 This review focuses on the of drugs of abuse in drinking water, as their presence is of increasing
22 global concern, as trace levels of these compounds have previously been detected. Even though
23 these levels are not toxic, with long term exposure via drinking water, they have the potential to
24 bio accumulate and be in toxic to humans. In addition, transformation of these compounds
25 during water treatment processes and their effect need further investigation as there are recent
26 reports highlighting the increased toxicity to freshwater species. Currently there is limited
27 information available on the detection of emerging drugs, therefore high resolution mass
28 analyser could be a suitable alternative for non-target screening. Depending on the water
29 treatment method used, the level of drugs of abuse detected can vary. Therefore, water

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