



Research Office
Legislative Council Secretariat

Fact Sheet

Regulation of drinking water safety in Singapore

FSC20/15-16

1. Introduction

1.1 In Singapore, the Ministry of the Environment and Water Resources is tasked with providing Singaporeans with a quality living environment and a high standard of public health. It also has a role in managing water as a strategic national resource. As such, the Ministry has established the National Environment Agency ("NEA") for improving and sustaining a clean and green environment in Singapore, as well as the Public Utilities Board ("PUB") for managing Singapore's water supply, water catchment and sewerage in an integrated way.¹

1.2 Singapore consumes about 1.8 million cubic metres of water per day. PUB is the main supplier of piped drinking water,² and there are some small water suppliers operating on off-shore islands providing less than 1 000 cubic metres of piped water per day. NEA regulates the quality of piped drinking water in accordance with the *Environmental Public Health (Quality of Piped Drinking Water) Regulations 2008* ("the *EPH Regulations*"). Meanwhile, PUB oversees the standards of water fittings³ and drinking water service installations within buildings pursuant to the *Public Utilities (Water Supply) Regulations*. This fact sheet aims to highlight the regulatory frameworks administered respectively by (a) NEA to monitor the quality of piped drinking water supplied; and (b) PUB to regulate water fittings and drinking water service installations.

¹ Both NEA and PUB are statutory boards and as such, they are granted with greater administrative autonomy and flexibility to assume their responsibilities.

² A household with piped water is the one with access to drinking water either via a tap in the premises of the household or from a public tap nearby.

³ Water fittings include pipes (other than water mains), pipe fittings, taps, meters, storage tanks, flushing cisterns and other similar apparatus used in connection with the supply and use of water.

2. Regulation of the piped drinking water quality

2.1 NEA has worked with different stakeholders to develop and spearhead various environmental initiatives and programmes to ensure a clean and sustainable environment for Singapore. These include: (a) pollution control; (b) solid waste management; (c) energy efficiency; (d) radiation protection and nuclear safety; (e) prevention and control of vector-borne diseases; (f) public hygiene and cleanliness; (g) management of hawker centres; and (h) meteorological services. There are 17 divisions and offices within NEA, of which the Drinking Water Unit under the Environmental Public Health Division⁴ is responsible for regulating the quality of piped drinking water pursuant to the *EPH Regulations*.

2.2 The Drinking Water Unit regulates the quality of piped drinking water supplied by PUB and other suppliers through conducting reviews of their water safety plans,⁵ auditing their water test results and inspecting drinking water plants. Against this, it has published a Code of Practice on Piped Drinking Water Sampling and Safety Plans to provide guidance to water suppliers on the preparation and implementation of water safety and water sampling plans.⁶

2.3 In addition to setting up the Drinking Water Unit, NEA has prescribed a set of water quality standards under the *EPH Regulations* based on international guidelines, including the World Health Organization Guidelines for Drinking-water Quality ("the WHO Guidelines"). NEA has also formed a Technical Committee on National Drinking Water Quality Standards to review and provide advice on the water quality standards. The Technical Committee comprises 10 local and two overseas experts from various fields such as water treatment, human health, toxicology and microbiology.

⁴ The Environmental Public Health Division is entrusted with maintaining a high standard of public health in Singapore by carrying out comprehensive ground surveillance, research and appropriate preventive measures.

⁵ A water safety plan is a plan describing the risk assessment and risk management measures that are in place to ensure the piped drinking water supplied complies with the water quality standards prescribed under the *EPH Regulations*.

⁶ A water sampling plan is a plan containing information regarding the sampling and testing of piped drinking water, including the parameters to be tested, test methods to be used, frequency of the tests, sampling locations and sampling protocol.

Regulatory requirements for piped drinking water suppliers

2.4 Water suppliers are required to comply with the water quality standards prescribed under the *EPH Regulations*, which cover 101 parameters grouped under the following four categories:

- (a) microbial parameters such as *Escherichia coli*;
- (b) physico-chemical parameters such as colour, turbidity and pH;
- (c) radiological parameters; and
- (d) chemical parameters such as contaminants from pipes and fittings (such as lead), disinfectant, contaminants from treatment chemicals, inorganic chemicals (including heavy metals), pesticides used for public health purposes, and pesticides used for agricultural purpose.⁷

2.5 Apart from observing the statutory drinking water quality standards, water suppliers are also obliged to:

- (a) implement a water sampling plan and a water safety plan that are approved by NEA;
- (b) conduct water quality tests and submit test results to NEA in accordance with the approved water sampling plan;
- (c) notify NEA within 24 hours in case of failure to comply with the water quality standards and take appropriate remedial actions; and
- (d) keep records of the water sampling and water safety plans, test results and remedial actions taken for five to 10 years.

⁷ The acceptable limit for each of the parameters is specified under the water quality standards. For example, the maximum prescribed quantity for lead in water is 0.01 milligram per litre, which is the same as the provisional guideline value set by the World Health Organization.

2.6 To complement the statutory requirements, PUB has put in place a comprehensive sampling and monitoring programme to verify the water quality, from source to tap, in order to ensure that the water supplied is safe for consumption. Each year PUB conducts about 400 000 tests on water samples collected from various points in the water loop including reservoirs, NEWater plants,⁸ seawater desalination plants,⁹ water distribution network and waterworks. The sampling and analysis results of water quality are reviewed twice a year by an external audit panel comprising experts from various disciplines ranging from engineering and water chemistry to toxicology and microbiology. According to PUB, 100% of the water quality tests conducted between 2008 and 2014 could meet the requirements of the *EPH Regulations* and the WHO Guidelines.¹⁰

3. Regulation of drinking water service installations

3.1 In Singapore, water fittings for use in drinking water service installations are regulated by PUB in accordance with the *Public Utilities (Water Supply) Regulations*. The *Regulations* contain provisions governing, among other things, the quality and standards of water fittings, testing of water fittings, installation of hot water apparatus, and maintenance and security of water storage tanks.

3.2 Suppliers, retailers and installers are required to provide water fittings that comply with the standards and requirements stipulated by PUB,¹¹ as well as ensuring that installation and use of the water fittings in drinking water service installations conform to the *Public Utilities (Water Supply) Regulations* and the *Singapore Standard CP 48: Code of Practice for Water Services*.¹² A water fitting is deemed to comply with the stipulated standards if it is certified as complying with such standards by a conformity assessment body accredited by the Singapore Accreditation Council or its Mutual Recognition Arrangement partners.

⁸ There are four NEWater plants in Singapore producing high-purity reclaimed water, meeting up to about 30% of the country's current water demand.

⁹ There are two desalination plants in Singapore producing desalinated water to meet up to about 25% of the country's current water demand.

¹⁰ See The Public Utilities Board (2015a).

¹¹ For example, it is specified in the First Schedule of the *Public Utilities (Water Supply) Regulations* that no water fitting shall be made of lead or lead alloy.

¹² The *Singapore Standard CP 48: Code of Practice for Water Services* is published by the Standards, Productivity and Innovation Board, the national standards and accreditation body. It provides authoritative guidance on the design, installation, fixing and testing of drinking water service installations in all residential, commercial and industrial buildings or premises.

3.3 Management corporations and building owners are also required to ensure the proper maintenance and security of their water service installations, including water storage tanks. This requirement is to ensure that water conveyed through the water service installations is fit and safe for drinking at all times. According to the *Public Utilities (Water Supply) Regulations*, any person responsible for the maintenance of any part of a water service installation having a water storage tank shall engage, at least once a year, a licensed water service plumber to inspect, and where necessary to clean and disinfect, and certify the water storage tank. The requirement is to safeguard that (a) the water storage tank is fit and safe for the storage of water for human consumption; (b) the water contained in the tank is free from contamination; (c) water samples taken from the tank pass the appropriate chemical and bacteriological examinations; (d) the water storage tank is properly maintained; and (e) there is no leakage in the water service installation, including the water storage tank.

Research Office
Information Services Division
Legislative Council Secretariat
26 February 2016
Tel: 2871 2143

Fact sheets are compiled for Members and Committees of the Legislative Council. They are not legal or other professional advice and shall not be relied on as such. Fact sheets are subject to copyright owned by The Legislative Council Commission (The Commission). The Commission permits accurate reproduction of fact sheets for non-commercial use in a manner not adversely affecting the Legislative Council, provided that acknowledgement is made stating the Research Office of the Legislative Council Secretariat as the source and one copy of the reproduction is sent to the Legislative Council Library.

References

1. *Environmental Public Health (Quality of Piped Drinking Water) Regulations 2008*. (2010) Available from: <http://statutes.agc.gov.sg/aol/search/display/view.w3p?page=0;query=DocId%3A%22c6503669-7d36-4a1a-836a-459a3ad88cdc%22%20Status%3Ainforce%20Depth%3A0;rec=0> [Accessed February 2016].
2. National Environment Agency. (2008) *Code of Practice on Piped Drinking Water Sampling and Safety Plans*. Available from: <http://www.nea.gov.sg/docs/default-source/public-health/code-of-practice-on-piped-drinking-water-sampling-and-safety-plans.pdf?sfvrsn=2> [Accessed February 2016].
3. National Environment Agency. (2010) *Regulatory Perspective on Development of Piped Drinking Water Safety Plan in Singapore*. Available from: <http://www.slideserve.com/crescent/lam-chun-hsiang-drinking-water-unit-dwu-national-environment-agency-singapore> [Accessed February 2016].
4. National Environment Agency. (2014a) *Regulatory framework for piped drinking water safety plans in Singapore*. Available from: [http://www.wsportal.org/uploads/Presentation%20in%20PDF%20format/Reg%20framework%20for%20PDWSP%20in%20Spore%20\(APWSPN%20Symposium%20Jun%202014\)%20by%20Pranav%20Joshi.pdf](http://www.wsportal.org/uploads/Presentation%20in%20PDF%20format/Reg%20framework%20for%20PDWSP%20in%20Spore%20(APWSPN%20Symposium%20Jun%202014)%20by%20Pranav%20Joshi.pdf) [Accessed February 2016].
5. National Environment Agency. (2014b) *Towards a Sustainable Future – Sustainability Report FY13*. Available from: <http://www.nea.gov.sg/docs/default-source/corporate/annual-report/nea-sr-fy2013.pdf> [Accessed February 2016].
6. National Environment Agency. (2015) *Piped Drinking Water Supply*. Available from: <http://www.nea.gov.sg/public-health/potable-water-management> [Accessed February 2016].
7. *Public Utilities (Water Supply) Regulations*. (2015) Available from: <http://statutes.agc.gov.sg/aol/search/display/view.w3p?page=0;query=CompId%3Ae14596dd-2344-480e-90fd-bbf50eb07843%20ValidTime%3A20160104000000%20TransactionTime%3A20160104000000;rec=0> [Accessed February 2016].

8. The Public Utilities Board. (2014) *Innovation in Water – Singapore*, vol. 6, June, pp. 10-12. Available from: http://www.pub.gov.sg/mpublications/Lists/WaterInnovationPublication/Attachments/13/Vol_6.pdf [Accessed February 2016].
9. The Public Utilities Board. (2015a) *Our Water: The Flow of Progress – Annual Report 2014/2015*. Available from: http://www.pub.gov.sg/annualreport2015/docs/PUB%20AR_2014-15.pdf [Accessed February 2016].
10. The Public Utilities Board. (2015b) *Water Supply*. Available from: <http://www.pub.gov.sg/general/watersupply/Pages/default.aspx> [Accessed February 2016].