



## **Frequently Asked Questions**

### **Flash Floods**

*Last Updated (23 July 2018)*

## **Drainage FAQs**

### **Subsection: Managing Flash Floods**

#### **1. What is a flash flood?**

A flash flood is localised flooding which typically subsides within an hour.

Click [here](#) to find out more about stormwater management in Singapore.

#### **2. Where are the flood-prone areas in Singapore?**

Flood prone areas are low-lying areas with a history of flooding.

Click [here](#) to find out more about our flood prone areas.

#### **3. What should I do if I am caught in a flood/flash flood?**

Pedestrians should be alert. Move immediately to higher ground and stay there till the flood subsides. Be aware of your surroundings, especially if there are open drains, and refrain from walking through flood waters.

Motorists should avoid driving into flooded areas if possible, as low visibility can obscure the depth of floodwaters. If floodwaters rise around the vehicle, abandon the vehicle and move to higher ground.

If you are indoors, protect your belongings by storing them on higher ground. Do not touch electrical equipment or switches if you are wet or standing in water.

Click [here](#) for more information on safety advisory.

#### **4. What should I do when I see rising waters from the sanitary floor trap in my house during flooding?**

Inform PUB by calling our 24-hr Call Centre at 1800-CALL-PUB (1800-2255 782). House owners can also consider installing a one-way valve at the last inspection chamber which will close to stop the accidental backflow of used water from the public sewer into the sanitary drainage system and hence prevent the overflowing at the floor trap.

## **5. What is PUB doing to help those who are affected by the floods?**

During flood events, PUB will respond to public requests for assistance to pump out floodwater. PUB also provides technical advice to residents and building owners on installing permanent flood protection measures and conducts regular briefings on completed and upcoming drainage works. Residents can also contact appointed PUB staff should they require any assistance or information.

Click [here](#) for more information on protection measures.

## **6. Can PUB install drainage pumps to prevent flooding in the low-lying areas?**

It might not be feasible to install drainage pumps in many of the low-lying areas. Land has to be set aside, to build a pumping station, which is hard to obtain in land-scarce Singapore.

## **7. What is PUB's key strategy for alleviating floods?**

PUB adopts three key strategies for flood management in Singapore. These include providing adequate drainage ahead of new developments; implementing flood protection measures; and continual drainage improvement.

Click [here](#) to find out more about PUB's flood management strategies.

## **8. What is PUB doing to manage flash floods in Singapore?**

Rainfall data have shown an increasing trend in the intensity of rainfall and frequency of intense rain since 1980. Recognising the impact of the greater weather uncertainties as well as increasing urbanisation, PUB has revamped its drainage management approach to strengthen Singapore's flood resilience.

PUB has adopted a holistic approach that will add flexibility and adaptability to Singapore's drainage system to cope with higher intensity storms. Through the "Source-Pathway-Receptor" approach, measures are not only carried out along the *Pathway* (e.g., through widening and deepening of drains and canals), but also implemented at the *Source* where stormwater runoff is generated (e.g. through on-site detention) and at the *Receptor* where floods may occur (e.g. through platform levels, crest protection and flood barriers).

Since January 2014, developers of new and redeveloped sites are required to implement "source solutions" to slow down surface runoff and reduce the peak flow of stormwater into the public drainage system. These on-site measures could include detention tanks and/or green features.

In 2011, PUB also raised the minimum land reclamation, platform and crest levels for new developments and redevelopment sites under its revised Code of Practice on Surface Water

Drainage. These “receptor” measures provide additional flood protection for buildings and key infrastructure.

*\* MSS data, based on records from 28 stations, from 1980 to 2015.*

## **9. Why do we still experience floods in Singapore?**

Flash floods can occur due to a combination of factors such as:

- Peak runoff exceeding what the drain is designed to handle
  - When the intensity of the storm is higher than what the drainage system is designed to handle, the large amount of runoff within a short period can overwhelm the drains and overflow to adjacent areas.
- Localised topographic characteristics
  - Localised depressions on the roads and on the ground are naturally prone to water accumulation. In low-lying areas, options to reduce flooding are sometimes limited because the deepening of drains, especially those leading to the sea, would need to tie in with downstream levels.
- Clogged drainage systems
  - Drains can get choked with leaves, litter and other debris that get washed into them during storms.

## **10. Does poor maintenance of our drains and canals contribute to floods?**

PUB has a stringent maintenance regime and works closely with its contractors to ensure that drains are checked and cleared regularly.

Where necessary, PUB carries out structural repairs of drains, canals and waterways to ensure that they continue to function effectively.

Regular cleansing of the canals, drains and waterways is carried out by the Department of Public Cleanliness (DPC) of the National Environment Agency to integrate the cleaning functions of public areas.

Click [here](#) for more information on drainage cleansing and maintenance.

## **11. Can we solve the flood problem by widening and deepening drains and canals?**

While having larger drains and canals helps, there is a limit to how wide drains can be as land is also needed for other uses. There is also a limit to digging deeper drains as a minimum gradient is required for effective conveyance of stormwater to the reservoirs.

## **12. Is climate change a contributing factor to the recent floods?**

With climate change, we can expect to see a trend of more frequent and intense rainfall events. This could bring about more localised flash floods. Even as PUB makes the necessary investments in infrastructure to cope with more volatile weather, it is not possible to eliminate floods. The intensity of rainfall within a short duration is the critical factor in determining whether the drainage capacity will be overwhelmed during a storm, and result in a flashflood.

PUB has adopted a holistic “Source-Pathway-Receptor” approach that will add flexibility and adaptability to the drainage system.

Click [here](#) to find out more about stormwater management in Singapore.

## **13. How does Marina Barrage help in flood alleviation?**

The Marina Barrage is a dam built across the Marina Channel to keep seawater out. It is part of a comprehensive flood control scheme to alleviate flooding in the low-lying areas of the city, such as Chinatown, Boat Quay, Jalan Besar and Geylang.

During heavy rain, when the reservoir water level is higher than the sea level, up to nine crest gates at the dam can be opened to discharge water from the reservoir into the sea. If the sea level is higher, up to seven drainage pumps that are capable of pumping an Olympic-size swimming pool per minute, can be activated to discharge excess stormwater into the sea.

Click [here](#) to find out more about the Marina Barrage.

## **14. Will there be more floods due to the increased urbanization in Singapore?**

Prior to any new land development or before construction begins in any area, PUB works together with agencies such as URA, HDB, LTA and JTC to set aside the necessary drainage reserves for the implementation of drainage works. With the new requirement for “Source” measures in place since 2014, developers will also have to ensure that they manage the peak runoff discharged from their sites to the public drainage system.

## **15. How can I, a member of the public, be kept informed of floods?**

During heavy rain events, the public can be updated on rising water levels in drains or canals and flash floods via:

- PUB’s Facebook
- PUB’s Twitter
- PUB’s free mobile app MyWaters

The public can also subscribe to a free SMS alert service to keep tabs on the water level in a canal or drain at a designated location via PUB’s website.

For the latest weather reports and news on floods, the public can also tune in to radio traffic watch broadcasts.

In addition, the public can access selected CCTV images of road conditions in low-lying areas and hotspots via PUB's website or MyWaters mobile app.

Click [here](#) for more information on Water Level Sensors and CCTV images.

Click [here](#) for more information on subscribing to the free water level SMS alert service.

Click [here](#) to go to PUB's Facebook page.

Click [here](#) to go to PUB's Twitter page.

## **16. How does the water level sensor system work?**

Water level sensors provide data on water levels in the drains and canals. This data sent to PUB staff enhances PUB's monitoring of real-time site conditions during heavy storms and response time.

The public can also subscribe to SMS alerts of data from a location of their choice.

Click [here](#) for more information on water level sensors.

Click [here](#) for more information on subscribing to SMS alerts.

## **17. How can I report a dirty or choked drain?**

Choked or dirty drains, canals and rivers may limit drainage capacity and prevent fast and effective drainage during heavy rain. Therefore everyone should do their part in keeping our waterways clean and litter-free. If you see any choked drains or pollution in the waterways, you can call the DPC hotline at 6225 5632 or send a feedback via on the Online Feedback Form [here](#).

## **18. How can I get weather information?**

You can obtain the latest weather information via NEA weather forecast hotline at 65427788, [www.weather.gov.sg](http://www.weather.gov.sg), radio broadcasts and NEA's myENV free mobile app. The public can also subscribe to heavy rain warning SMS alert service provided by the Meteorological Service Singapore (MSS). To subscribe, please click [here](#).