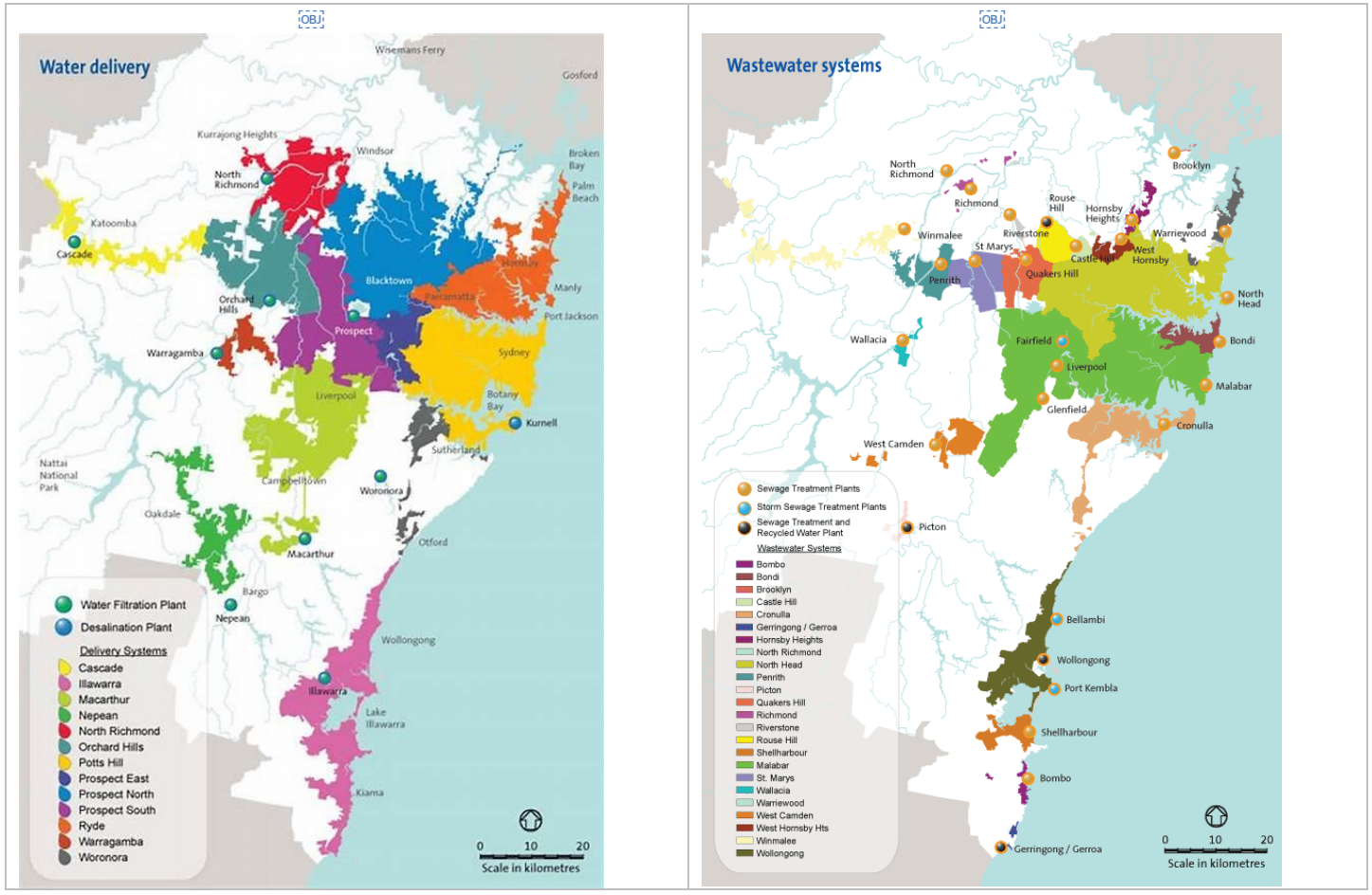
# Sydney Water System capacity reports - Explanatory notes

System capacity is dependent on both network and treatment plant capability to provide a level of service required with current and anticipated system loads.



System capacity information is provided here as a guide. The information should be read in conjunction with the Sydney Water Growth Servicing Plan (GSP) which provides our timescales for servicing growth and additional advice on our planning strategy, processes and funding. Given their complexity and unique behaviour, capacity assessments and reports are divided into network and treatment components for systems – both should be referred to in the case of each drinking water and wastewater system.

## Drinking water system capacity

### Treatment

Production capacity of Sydney Water's water filtration plants is based on the treatment plant's ability to produce potable water as per the product specifications – notably the Australian Drinking Water Guidelines.

The production capacity is the daily rate of production under typical raw water quality characteristics and is assessed against the ability to produce the forecast maximum daily demand.

System configurations (such as storages) and intersystem augmentations may be used to offset demand requirements and optimise proposed infrastructure scope and timing.

The assessed capacities consider poor raw water quality conditions which may significantly reduce the production capacity of a water filtration plant. Further details on production reliability constraints, durations, and any proposed infrastructure response can be provided on a case by case basis as required.

### Network

Key drinking water system performance criteria in networks include: system pressures, continuity of supply and water quality. These are achieved through timely planning assessments that ensure assets are designed and built to meet continuing increases in system demand (based on best available development intelligence from the Department of Planning, Local Councils and developers).

At a high level (e.g. treatment plant or reservoir), it may be possible to say where Sydney Water has spare capacity using a mass balance (i.e. simplified inflow minus outflow) style approach informed by high level checks. However, at a reticulation system level it becomes very difficult to quantify the volume of spare capacity. This is due to a number of key issues as summarised below:

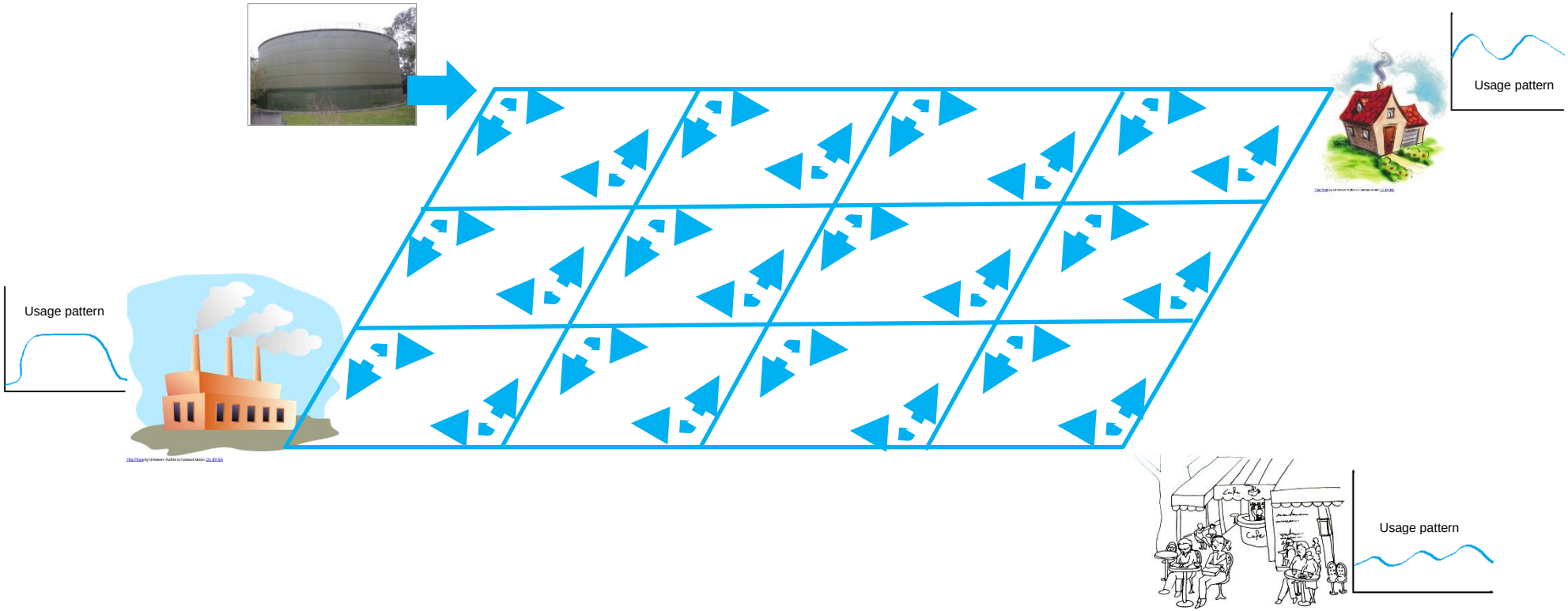
1. The inter-connected, grid-like, nature of drinking water systems make it difficult to quantify absolute spare capacity
    - The distribution of flows through the various "arms" can adjust to varied loading conditions and multiple "loops" can contribute to serving a single demand with shifting balance points and flow directions depending on other system loads and time of day
2. Geographical variation: it may be possible to serve more development in one part of the system (based on connectivity and/or elevation)
3. Some land-use types may be successfully accommodated where others may not depending on their usage patterns during the day

4. Fluctuations in demand with continuing development and asset ageing (where performance may vary over time) also make keeping system capacity information up-to-date (at this level) quite difficult.

System capacity maps have been developed to indicate where there are major existing or potential / emerging capacity constraints that mean that serving further significant development requires major or complex systems upgrades that Sydney Water would have to deliver. When looking at a development in an area with constrained capacity, it is always best to talk to us at Sydney Water about the potential way forward.

Mapping also includes potential investments over the next ten years – please note that these may change with changes in growth forecasts etc. There may also be additional upgrades within the reticulations systems in addition, however, these can be addressed on a case by case basis.

While every effort is made to ensure the validity of the data published on this site, there are a number of factors that can affect the delivery of services. For the latest information please contact Sydney Water.




Note:

Different land use types (i.e. different peak usage and usage patterns) and different connectivity (e.g. pipe sizes and distance from water source reservoir) lead to constant variation in demand and flow direction during the day with varying demand distribution over time.

Capacity to serve additional growth depends on the location, land use type, and scale of development.

## Wastewater system capacity

### Wastewater network capacity

Sydney Water aims to provide reliable wastewater servicing throughout our area of operations. Timely planning assessments are required to ensure that assets are designed and built to continue to maintain reliable services.

Wastewater network capacity is defined in terms of dry weather system performance (e.g. 60% pipe full capacity), no dry weather overflows from wastewater network assets (e.g.: Sewer Pumping stations to have sufficient detention time in the event of failure) and wet weather performance (with overflow frequency and volumes. This is in keeping with Environment Protection Authority (EPA) licence requirements – see EPA website for more details).

Sydney is serviced through a system of approximately 26,200kms of wastewater mains, each with a contributing catchment including baseloads and inflow / infiltration (e.g. groundwater, rainwater or seawater ingress).

Sydney Water endeavours to capture system performance through an ongoing program related to EPA Licence reporting (including annual updates based on trunk system hydraulic modelling) but this does not extend to including the full reticulation system as models already take an extended period to run.

The reticulation spare capacity depends on a number of factors (as shown below) but we endeavour to identify and resolve system capacity constraints through timely investment.

1. The extent and volume of stormwater inflow into our system and the system deterioration over time

2. Catchment baseloads also increase over time with continuing development.

Note that there are a number of wastewater schemes that have been delivered through the Priority Sewerage Program (PSP). Initiated by the NSW Government in the 1990s, the Priority Sewerage Program (PSP) has provided improved wastewater services to selected existing, but previously unsewered, towns and villages in environmentally sensitive areas. The villages included in the PSP were identified through an assessment by the Environmental Protection Agency (EPA) to reduce environmental and health risks in these areas.

Scheme boundaries and design allowances were determined based on land zoning and community consultation. The remoteness of PSP villages generally meant that, even with the NSW Government lot subsidy, there was substantial cost involved in providing these services and further upgrades connecting into the centralised wastewater systems would also be costly. Over the time since the schemes were delivered, capacity has typically been taken up through infill development within serviced areas. See Priority Sewerage Program and Pressure Sewerage Systems (ads.swc) for further information.

### Wastewater Treatment Capacity

Wastewater treatment capacity is defined in terms of both hydraulic capacity (dry and wet weather) and load capacity. Load capacity is defined as the average pollutant influent loading

rate a treatment plant can receive whilst maintaining output streams (liquid, solids and gaseous) end user, operating and Environmental Protection Licence (EPL) requirements.

Load demand is nominated in Equivalent Population as defined based on a standardised mass contribution basis, typically nominated in EPCOD in which an EP is defined as contributing 110 gCOD /d.

Plant hydraulic capacity is nominated in terms of average dry weather flow (ADWF) capacity. Further capacity information such as maximum instantaneous flow capacity can be made available on request.

Liquid stream treatment capacity is assessed based on:

- Ability to meet discharge effluent requirements (as per EPL)
- Ability to meet end use application requirements for recycled water
- Using modelling outcomes and/or design operating criteria

Solids stream (biosolids) treatment capacity is assessed based on the ability to stabilise, dewater and transport as required for the nominated disposal pathway – typically beneficial reuse by land application. Consideration is given to optimal operating setpoints, preferred product outcomes, and loading patterns and unit availability scenarios, when determining treatment capacity.

Assessed capacities of treatment processes may be impacted by:

- Changes to catchment characteristics and/or system configuration
- Changes to product specifications (i.e. EPL requirements)
- Major maintenance activities