Integrated Water Re-Use with SUDS

Cost-effective Water Management for New Developments

18th October 2016

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Integrated Water Re-Use with SUDS

Agenda

1) SUDS principals

2) Conventional rainwater harvesting system

3) Conventional attenuation

4) Combined „Passive" System

5) Combined „Active" System

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<u>SUDS Principals</u>

1) AVOID run-off

   (e.g. do not seal the ground)

2) REDUCE run-off

   (e.g. infiltration, evaporation, rainwater harvesting)

3) DELAY run-off

   (e.g. attenuation)

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London Plan

A Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

1 store rainwater for later use
2 use infiltration techniques, such as porous surfaces in non-clay areas
3 attenuate rainwater in ponds or open water features for gradual release
4 attenuate rainwater by storing in tanks or sealed water features for gradual release
5 discharge rainwater direct to a watercourse
6 discharge rainwater to a surface water sewer/drain
7 discharge rainwater to the combined sewer.

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Conventional rainwater harvesting

- Tank sized on annual rainfall not potential peak event
- Supply of constant relatively small flows
- Best scenario: tank always full

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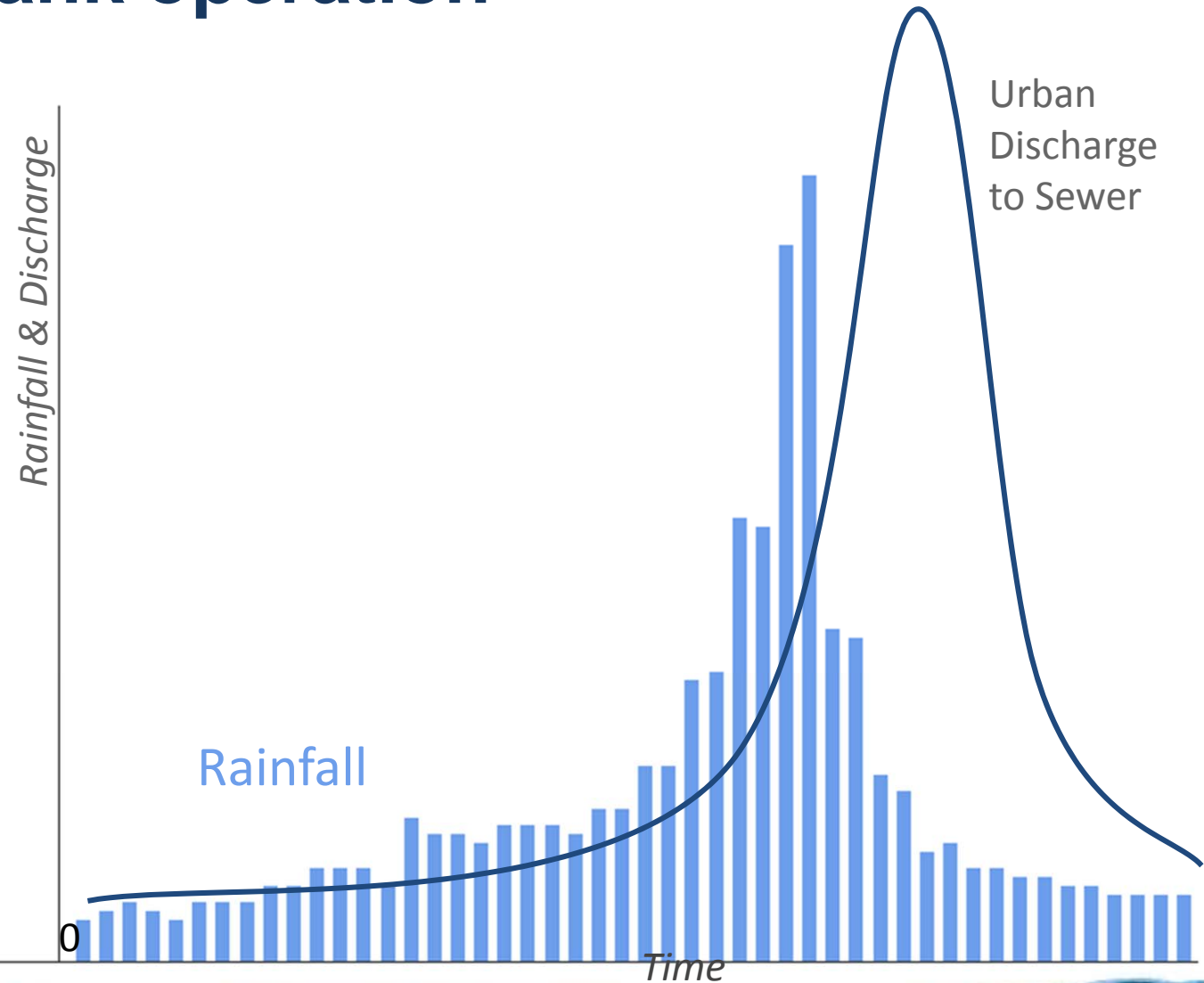## Conventional attenuation

- Tank sized to peak event
- No supply envisaged
- Best scenario: tank empty

Attenuation tank
(example: 100m3 - 100y/event + climate change)

Inlet
from roofs

Reduced outlet

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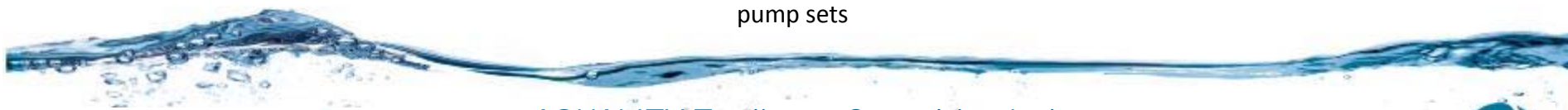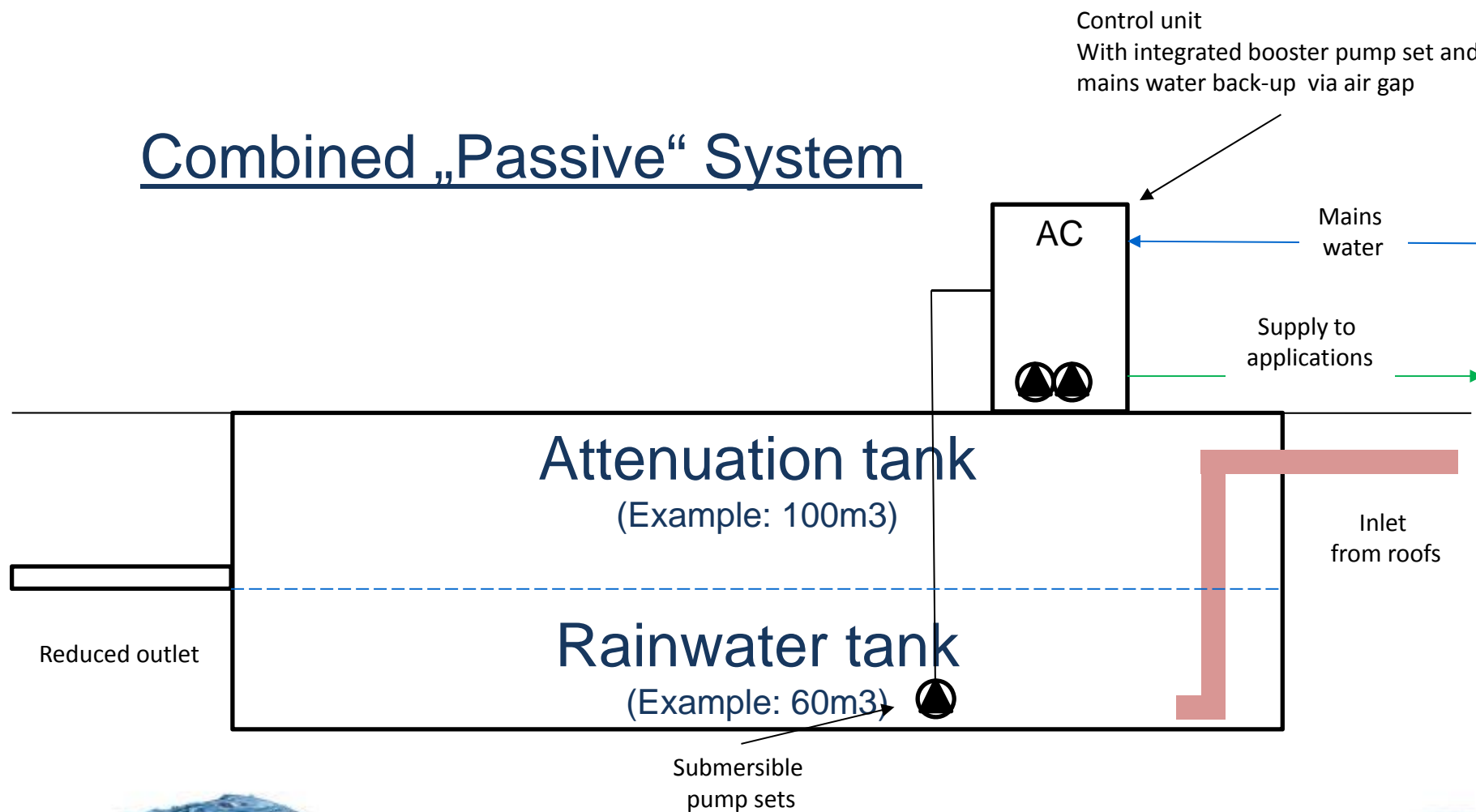intelligent water management

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Attenuation tank operation

Tank discharges during the event
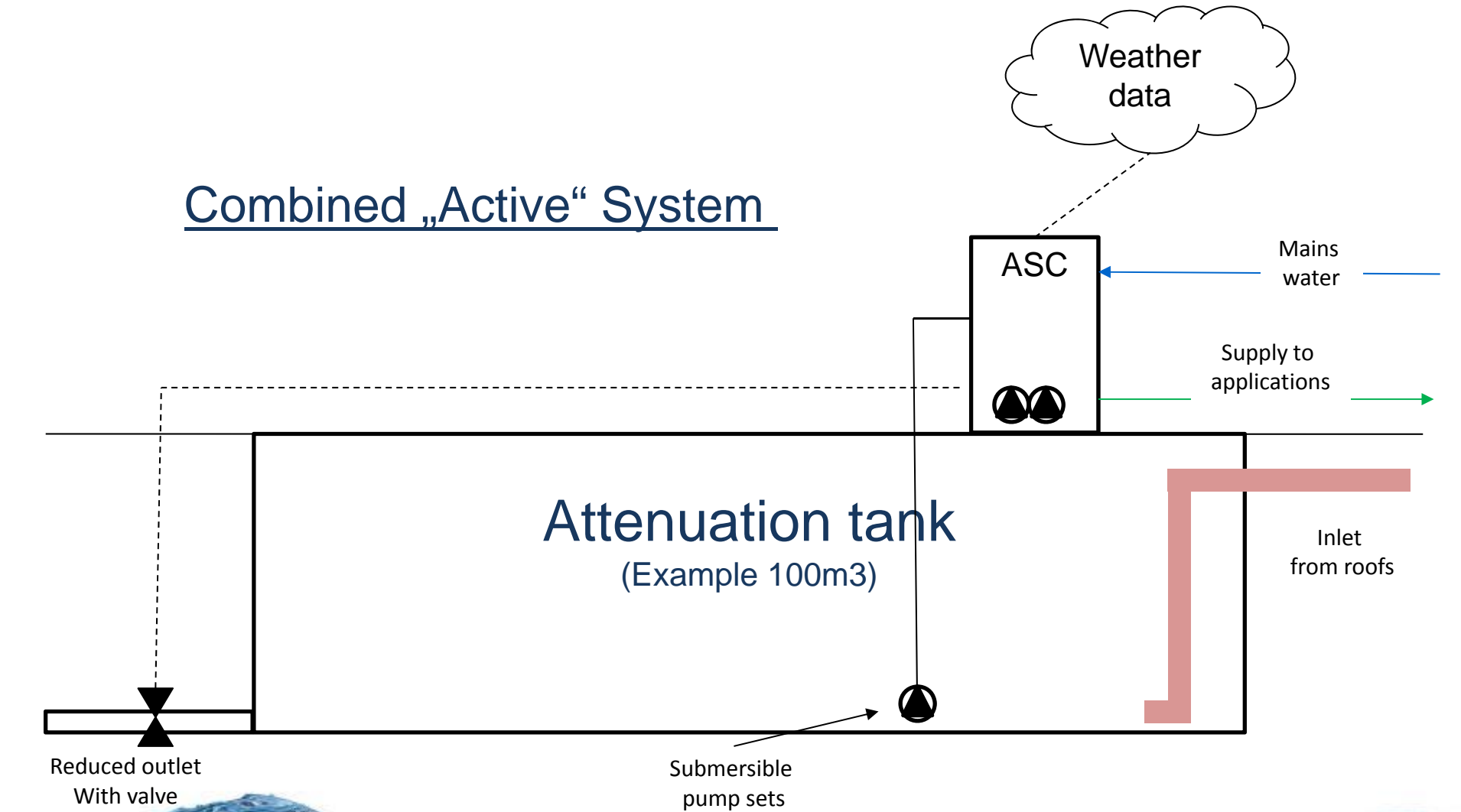During small event all water leaves the tank immediately as flow reduction limit is not reached.

Rainfall & Discharge

Urban Discharge to Sewer

Rainfall

0

Time

Integrated Water Re-Use with SUDS

Combined „Passive" System

Control unit
With integrated booster pump set and
mains water back-up via air gap

AC

Mains water

Supply to applications

Attenuation tank
(Example: 100m3)

Inlet
from roofs

Reduced outlet

Rainwater tank
(Example: 60m3)

Submersible
pump sets

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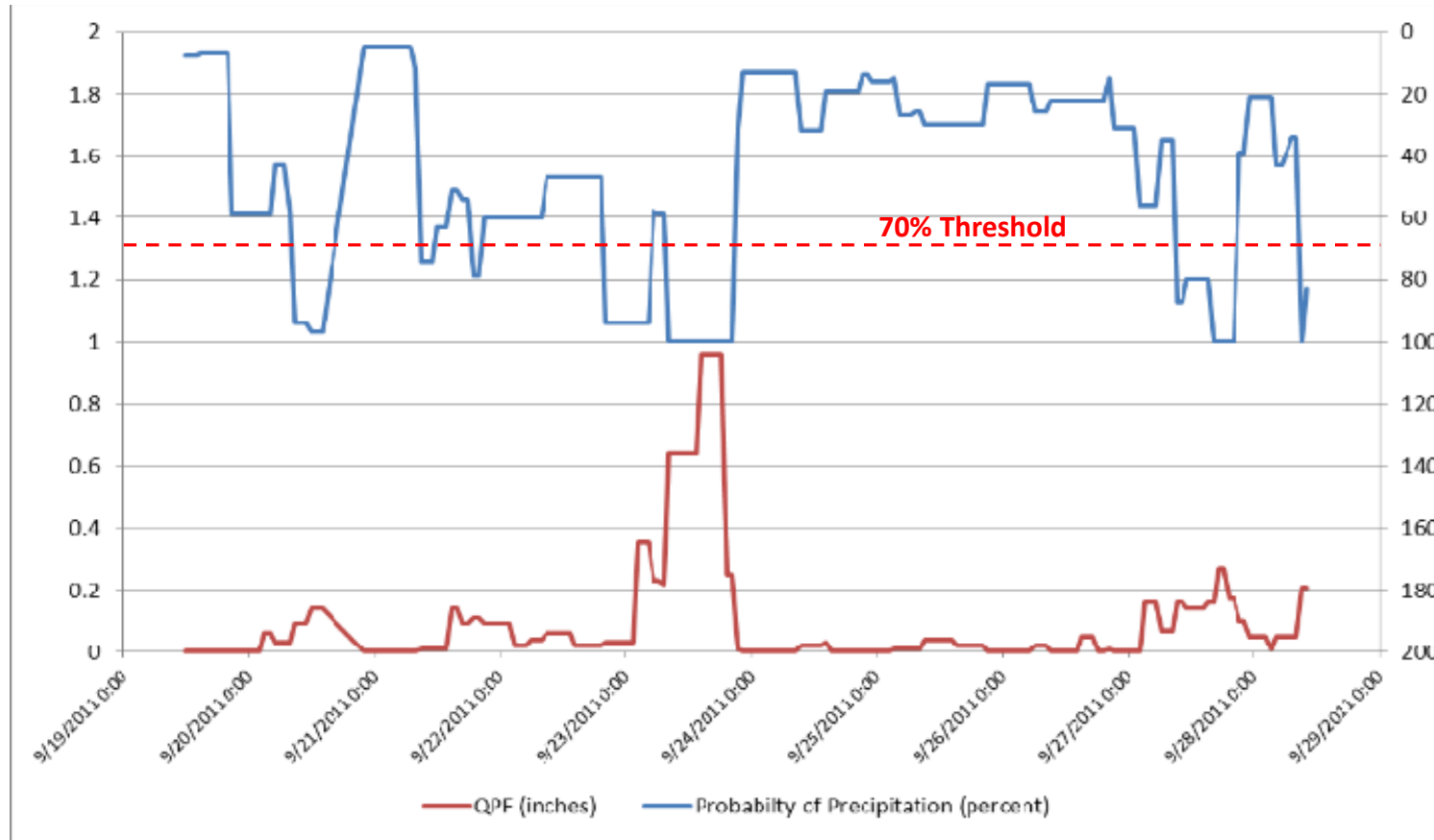
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Aqua-Storm-Control powered by Opti

ASC is a system based on a cloud technology platform that uses sensor data, forecast information, & modeling

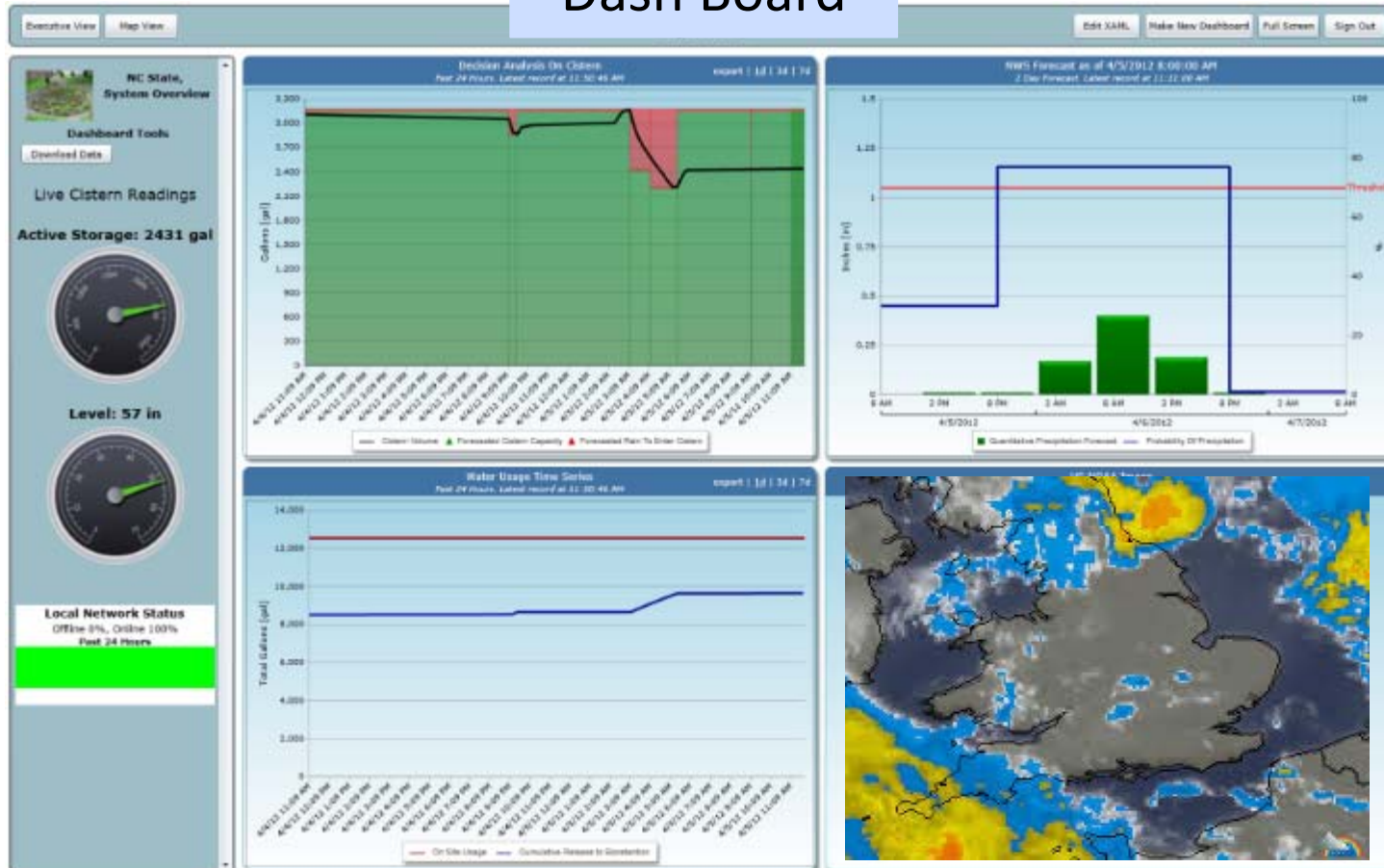to actively control, maintain, and monitor, water infrastructure.

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Combined „Active" System

Weather data

ASC

Mains water

Supply to applications

Attenuation tank
(Example 100m3)

Inlet from roofs

Reduced outlet
With valve

Submersible
pump sets

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Forecast interpretation

70% Threshold

QPF (inches) — Probabilty of Precipitation (percent)

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Dash board for performance monitoring and alarm functions

Dash Board

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Operating safety

a) Flood prevention first
System will always revert back to attenuation function is case of failure.
Therefore never compromise the intended flood prevention.

b) Redundancy
All operational elements are being designed with redundancies e.g. Level gauge, valves etc.

c) Online real time monitoring and alarms
Severe weather or component failures are immediately communicated to local or remote facility management. This also acts before failure can have an impact.
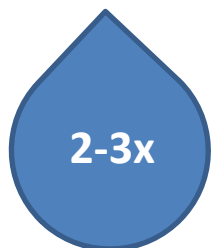
d) Offline
System is still operating like a conventional attenuation system, if system is offline or service deactivated.
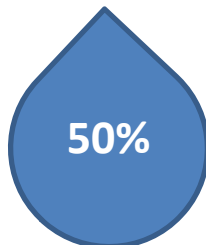
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Further applications for ASC:

ASC's main benefits for water infrastructure:

2-3x
Increase in average retention time

50%
Decrease in required storage volume

90-99%
Decrease in total wet weather discharge

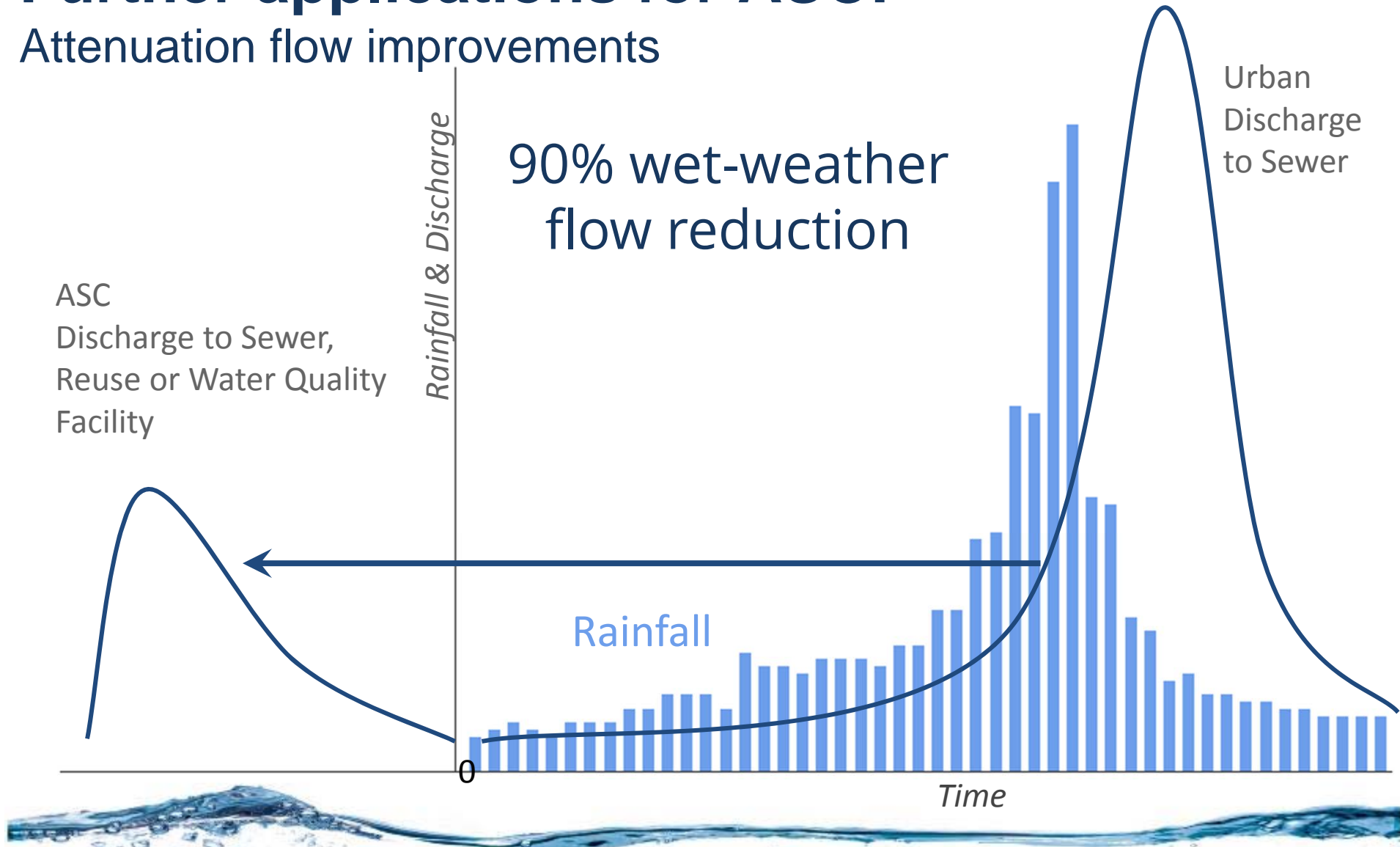### .... ASC is retrofitable and provides performance monitoring!!!

Some other applications:
+Wet-weather discharge reduction

+Combined sewer overflow reduction

+Dry/wet pond water quality improvement

+Hydromodification

+Optimised weather dependant irrigation

+Green roof irrigation, run-off control and evaporation improvement

+Predictive maintenance and analytics of monitoring data

….etc.

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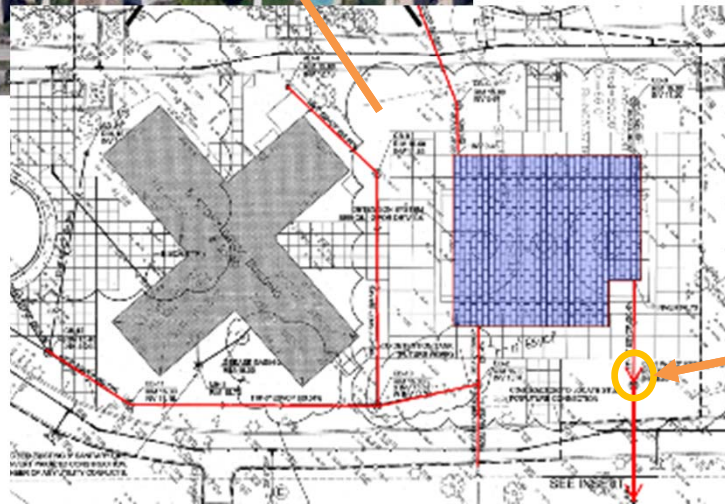**AQUALITY Trading & Consulting Ltd.**
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Further applications for ASC:

Attenuation flow improvements

Retrofit of a flow control valve
on 80m3 attenuation tank

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Further applications for ASC:
Pond overflow control with attenuation effect

Thank you for your attention

We are looking for pilot projects for ASC.
Please contact:
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