

# Rain and Grey Water Recycling Systems

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# Water Recycling and Water Re-use

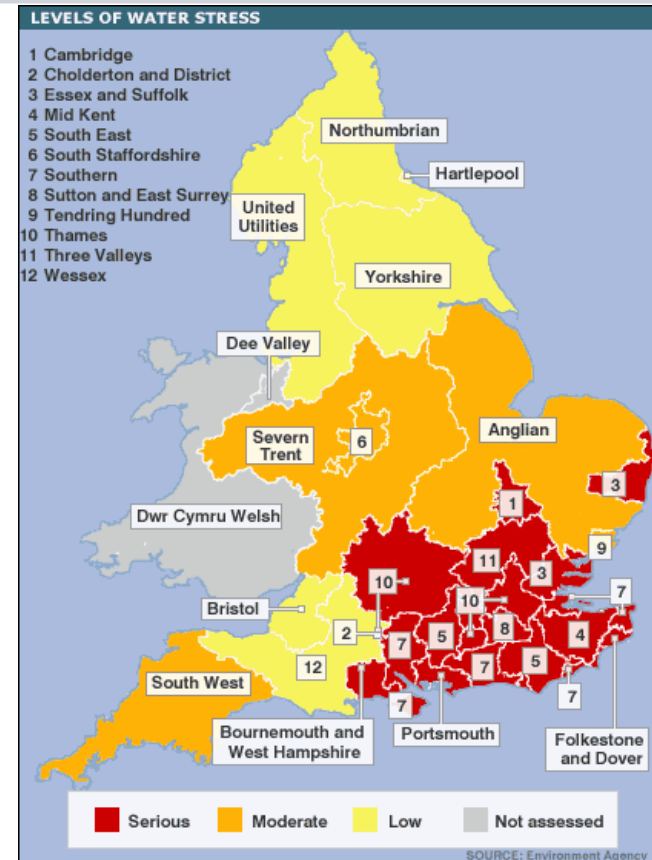
## AGENDA

- Introduction to Rain Water Harvesting and Grey Water Recycling Systems
- Rain Water Harvesting Systems
- Grey Water Recycling Systems
- Industrial Grey Water Recycling Systems

# NOW, The Equation Has Changed – Linking Water, Energy and Climate.

## Some Facts of Water Management Today

- Water is precious and its availability is one of the determining factors in new developments.
- Water treatment and transportation is a high consumer of energy, time and cost.
- Many waste water plants are significant contributors of CO2 and hazardous contaminants to the atmosphere.



## Water a source of risk for Industry?

Risk	Impact
Physical	<ul style="list-style-type: none"> <li>■ Disruption from non availability</li> <li>■ Temporary suspension of supply / disruption to operations</li> <li>■ Scarcity and metering is a driver for price increases rising annually</li> <li>■ Increased requirement for capital spending on supply &amp; treatment</li> <li>■ Competition for scarce resources limits growth</li> </ul>
Regulation	<ul style="list-style-type: none"> <li>■ Suspension of own supplier's license or discharge permit can disrupt water supply for manufacturing</li> <li>■ Enforced consent limits by Environment Agency bearing financial penalties</li> <li>■ Re-allocation to more urgent needs during drought disrupts operations</li> </ul>
Reputation	<ul style="list-style-type: none"> <li>■ Competition with domestic demand limits growth, or damages reputation</li> <li>■ Brand damage can be direct, or by association with suppliers' pollution or water use issues</li> </ul>

*(Source: synthesized from World Resources Institute, quoted in JP Morgan, "Watching Water", April 1st2008)*

# Introduction to Rain Water and Grey Water Recycling Systems



## Key Features

**Rain Water Harvesting** technologies take advantage of a natural water source by collecting and treating rainwater, generally from roofs and hard standings.

**Grey Water Recycling** technologies take advantage of secondary water already used and paid for within buildings or industrial processes.

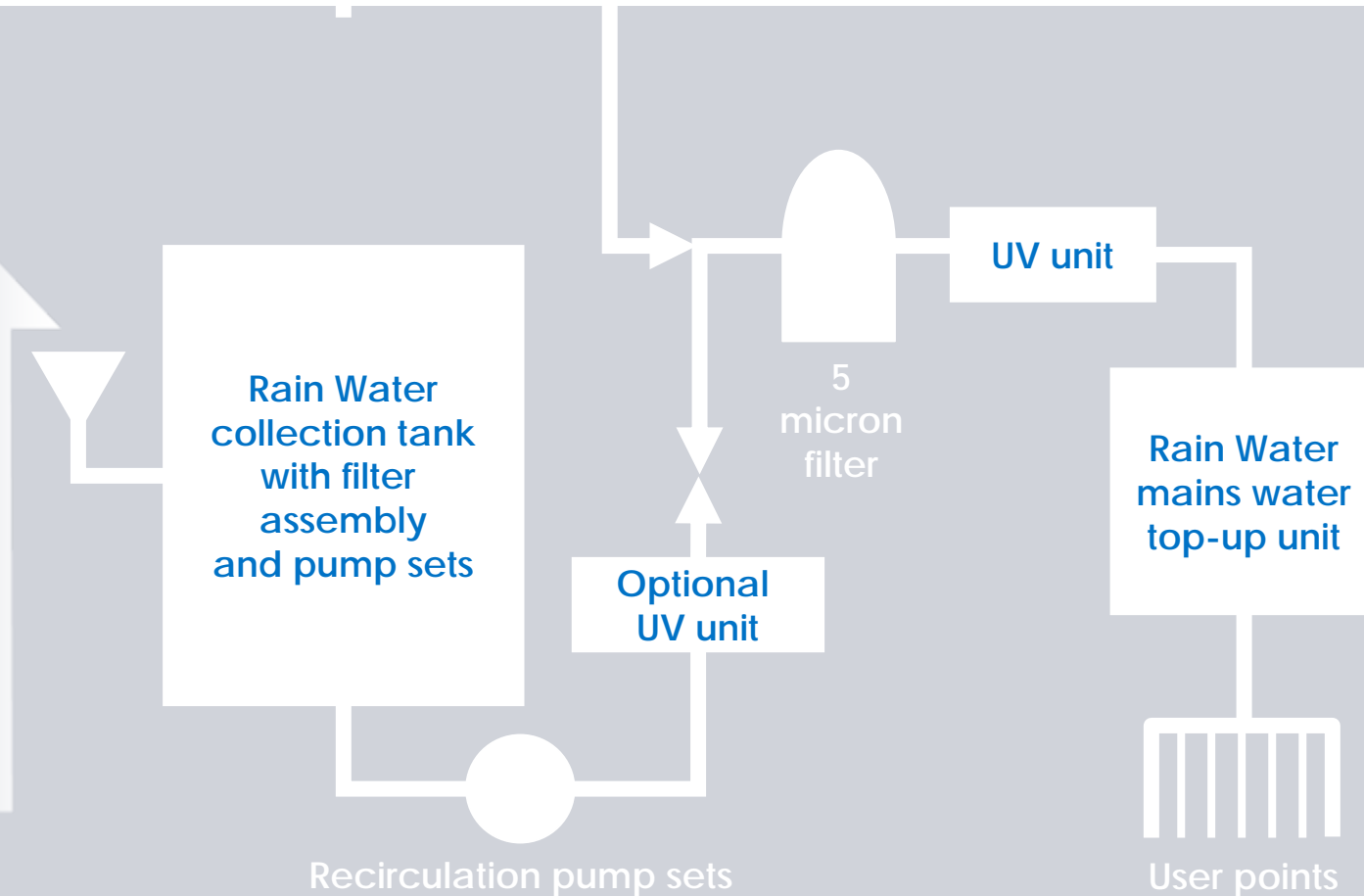
## Environmental Value

- Rain water is an important natural source which is often overlooked in terms of recycling.
- It is discharged to the surface water drainage system, which can cause surface water run off problems.
- A facility can re-use rain water and or grey water for non potable water supply within the building by collection, filtration and treatment.

## Customer Value

- Rain water harvesting and grey water recycling can considerably reduce operating costs.
- Both reduce either surface water run off or process water streams from a facility, saving on environmental costs.
- Rain water harvesting and grey water recycling are compulsory in buildings in order to achieve BRE 'Codes for Sustainability Excellence' status.

## Rainwater Harvesting System



# First Rain/Grey Water Recycling installation in the City of London

**SIEMENS**



## Key Features

### General Components: Rain Water from Roof Areas & WHB Water Recycling

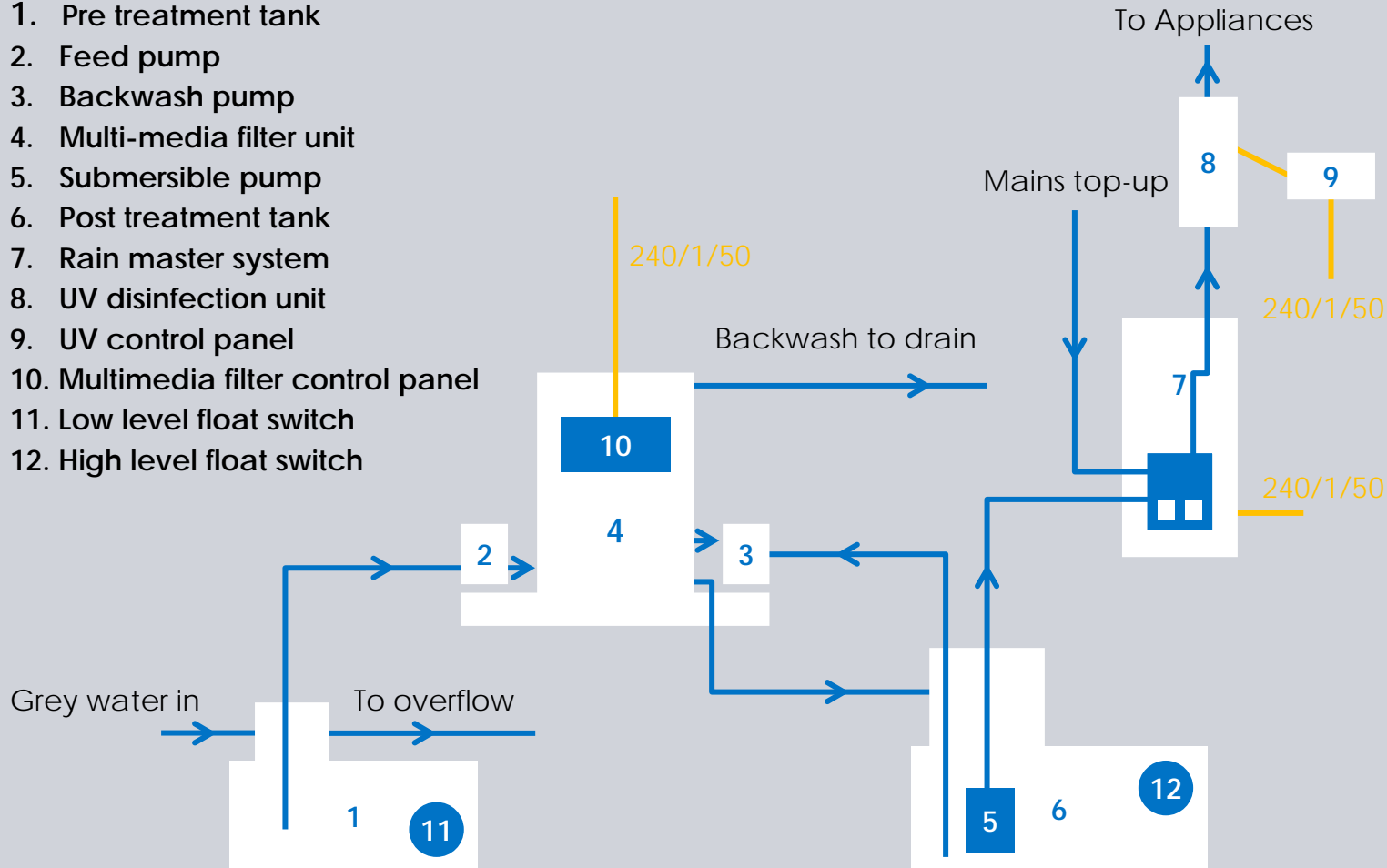
- Pre filtration – Removal of large particles
- Rain/Grey water collection tanks – Rain water storage
- Pump sets – Duty-standby to feed post treatment tanks
- Post filtration – Reduction of small particles
- Rain/Grey water disinfection – Use of ultra violet disinfection
- Post treatment tanks – Storage of treated rain water
- Mains water top up – Insufficient rain water periods
- Booster pump sets – Distribution of recycled water to appliances

## Customer Value

- It is envisaged that the customer will use 18,000 litres of water per day for the use of toilet flushing within the building. At a rate of £1.50 per cubic metre per day x 18 cubic metres per day x 313 working days
- = £8,451.00 saving per annum at current water charges. As well as being eligible for the Enhanced Capital Allowance Scheme.

## Rain/Grey Water Recycling Schematic

1. Pre treatment tank
2. Feed pump
3. Backwash pump
4. Multi-media filter unit
5. Submersible pump
6. Post treatment tank
7. Rain master system
8. UV disinfection unit
9. UV control panel
10. Multimedia filter control panel
11. Low level float switch
12. High level float switch



# First Grey Water Recycling installation in Canary Wharf

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## Key Features

### General Components: AC Blow Down & WHB Water Recycling

- Pre filtration – Removal of large particles
- Grey water collection tanks – Rain water storage
- Pump sets – Duty-standby to feed post treatment tanks
- Post filtration – Reduction of small particles
- Grey water disinfection – Use of ultra violet
- Post treatment tanks – Storage of treated rain water
- Mains water top up – Insufficient rain water periods
- Booster pump sets – Distribution of recycled water to appliances



## Customer Value

- It is envisaged that the customer will use 37,000 litres of water per day for the use of toilet flushing within the building. At a rate of £1.50 per cubic metre per day x 37 cubic metres per day x 313 working days
- = £17,371.00 saving per annum at current water charges. As well as being eligible for the Enhanced Capital Allowance Scheme.

# Industrial Grey Water Recycling with Electro Coagulation

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## Key Features

**General Components: Industrial Grey water from .....**

- Pre Screening – Removal of large particles
- Buffer/Collection Tanks – Industrial water storage
- Ph control – Optimum Ph between 7-9
- Pump Sets – Duty-standby to Electro Coagulation System
- Electro Coagulation Unit – Flocculation of particles
- Reactor Vessel – Reaction & Resonance
- Post Treatment Tanks – Storage of treated grey water
- Mains Water Top up – Insufficient grey water periods if recycling required
- Filterpress- Separation of filtercake from treated grey water
- Booster pump sets – Distribution of recycled water to appliances/drainage system

## Customer Value

Effluent water fulfils the highest environmental standards. The effluent water is highly recommended for re-use. The effluent water can be drained into the sewer without a problem.

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