

Real-time Modelling of Sewer systems in London

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Introduction

- Background / History of work at Thames Water
- Drivers for real-time control
- System design
- Future developments at Thames Water
- System limitations
- Conclusions

Background / history of real-time control

- Met Office radar data – 2002 to present
- Ongoing programme of model upgrades and the installation of permanent monitoring commenced – 2007/8
- FloodWorks™ pilot study – 2009/10
- London Olympic Games – 2012
- Multitrode pumping station controls – 2012 to present
- FloodWorks™ to ICMLive™ – 2014

Drivers for real-time control

- We need much greater control of our assets and be pro-active rather than re-active
 - Are they running efficiently?
 - Do they need maintenance and when?
 - What is the consequence of failure?
 - Resilience / recovery plans in place?
- Changing regulatory requirements
- Greater understanding and control has to improve operating performance which will benefit customers and the environment
- Cost savings – TOTEX (CAPEX and OPEX)

System design

- ICMLive™ makes use of the latest Beckton model developed in InfoWorks®CS – 50,000 nodes

Rainfall

- Observed 1km spatial resolution radar data at 5 minute intervals
- Nowcast forecast data at 2km spatial resolution, 15 minute interval, six hour lead time

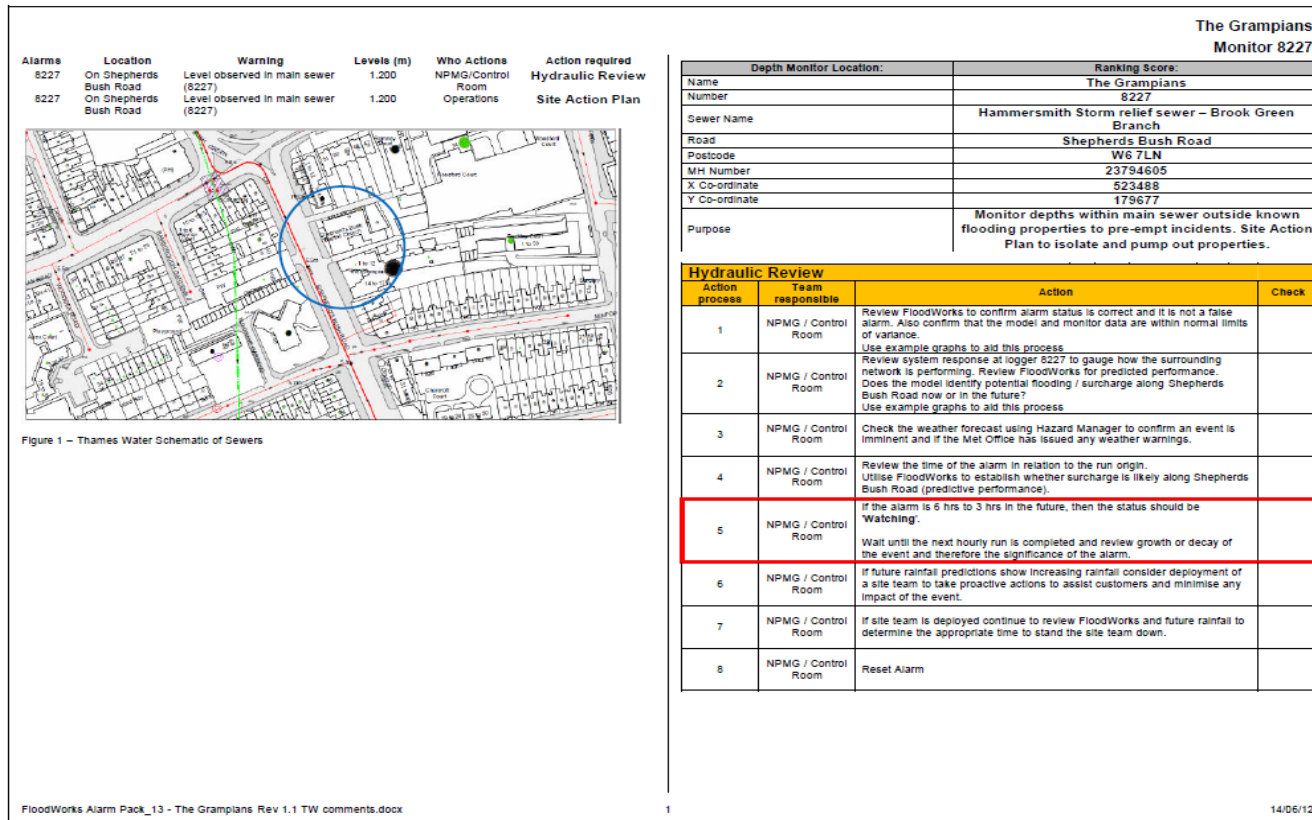
Observed sewer level data

- Level data from 30 Cello depth loggers
- 2 minute data recording interval
- Data transmitted every 2 hours, 12 minutes during events

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All sites are set up within ICMLive

- All sites have Cello depth loggers sending data to ICMLive™
- Two alarm thresholds have been set up, 'Surcharge' and 'Spill'



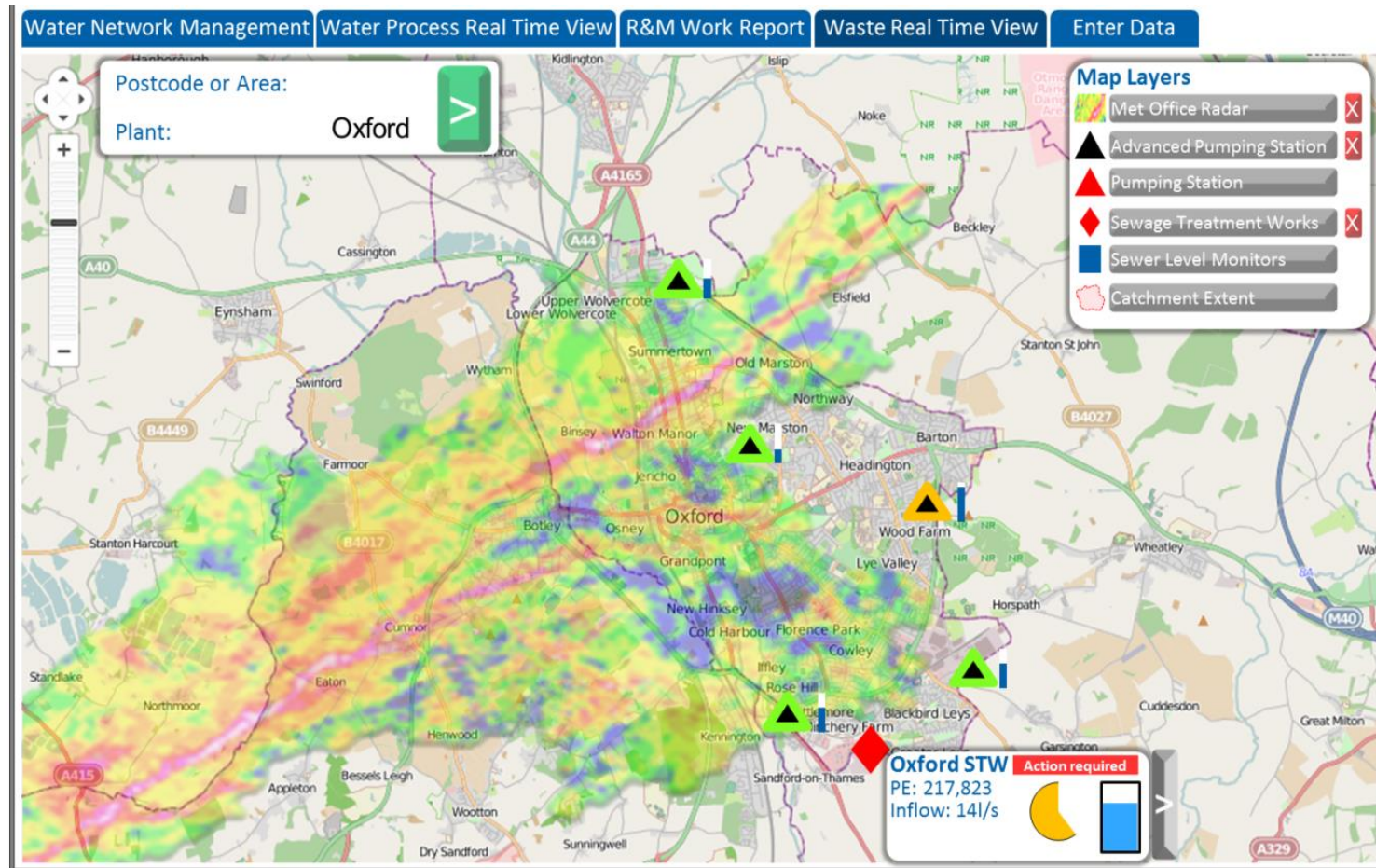
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ICMLive™



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Frontline Information Technology (FIT)



System limitations

- Greater understanding of ICMLive™ alarm thresholds (It takes time to bed-in)
- Updating the model to reflect temporary/interim operational changes (diversions, pump outages, cleaning)
- Rainfall inputs are currently only radar. RG/Radar merging has not yet been applied to our models
- Alarms triggered 3 to 6 hours in the future should be used as warnings
- Alarms triggered 0 to 3 hours in the future are much more reliable
- Site selection is crucial

Conclusions

- Understanding the performance of key assets is fundamental to applying successful real time management
- A key challenge is transferring this understanding to operators and control room decision makers and is crucial if models are to be used as live operational tools
- This in turn requires a greater understanding of the
 - Assets
 - Catchment and data feeds such as radar data
 - Risks / resilience / recovery
- Real-time modelling will benefit Customers, stakeholders and the environment
- Commitment and resources from the business (FIT/ ICMLive™)

Questions?

