Water Services Training Group

19th Annual Conference

Optimising Services Delivery in the Water Industry

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Optimising Services Delivery in the Water Industry

Wastewater Network Asset & Model Data Review and New Irish Water Standards

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Irish Water

Contents

Wastewater Networks

1. Why we need reliable Asset Information and Models

2. What data coverage and quality do we presently have

   * Review of GIS & Models

3. Strategy to improve wastewater network data

   * Drainage Area Plan Stages

   * Irish Water Standards

1. Why We Need Reliable Asset Information and Models

Many reasons including:

* Need to understand performance **RISKS**

* Need to understand **CAPACITY** availability

* Need to identify appropriate **INTERVENTION STRATEGY**

* Benefits for **OPERATIONS** & service to the **CUSTOMER!**

1. Why We Need Reliable Asset Information and Models

RISKS

* Hydraulic – flooding
  * Verified historic?
  * Model predicted?
  * Root cause?
* Environmental
  * interaction with water bodies
* Operational, Service
  * blockages, m&e failure
* Structural
  * collapses

Reliable Asset and Model Data essential for event frequency & consequence estimation

1. Why We Need Reliable Asset Information and Models

CAPACITY

* Availability
  * Short term, long term planning
  * Impact of Growth, Climate Change, Urban Creep, Inflow & Infiltration

INTERVENTION STRATEGY

* Need to better understand wastewater flow
  * Domestic, Commercial
  * Infiltration – groundwater, rainfall induced, tidal
  * Inflow

Reliable Asset & Model Data essential for existing & future capacity estimations and determining intervention strategy.
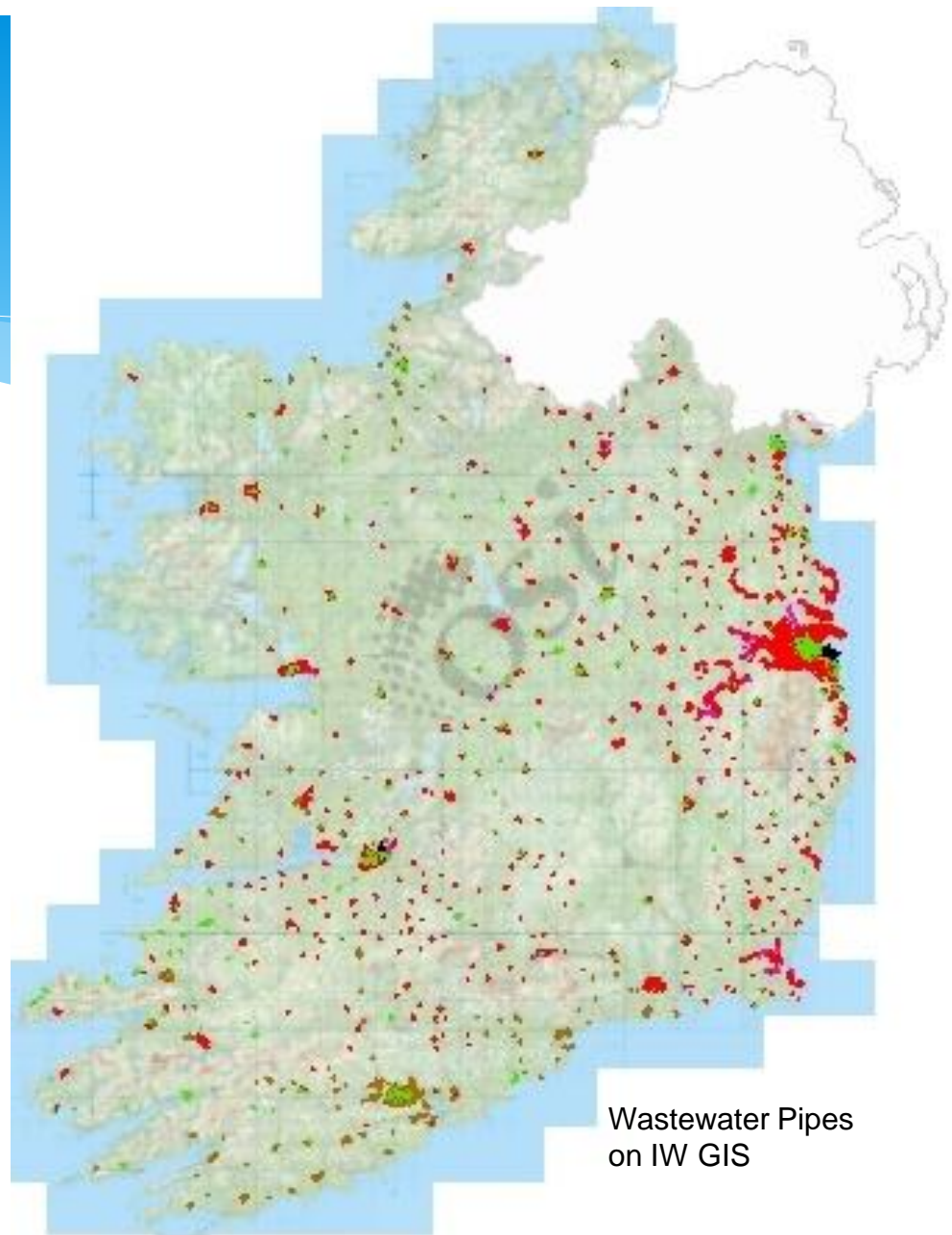
2. What data coverage and quality do we presently have

Overview of:

A. GIS Coverage and Confidence levels

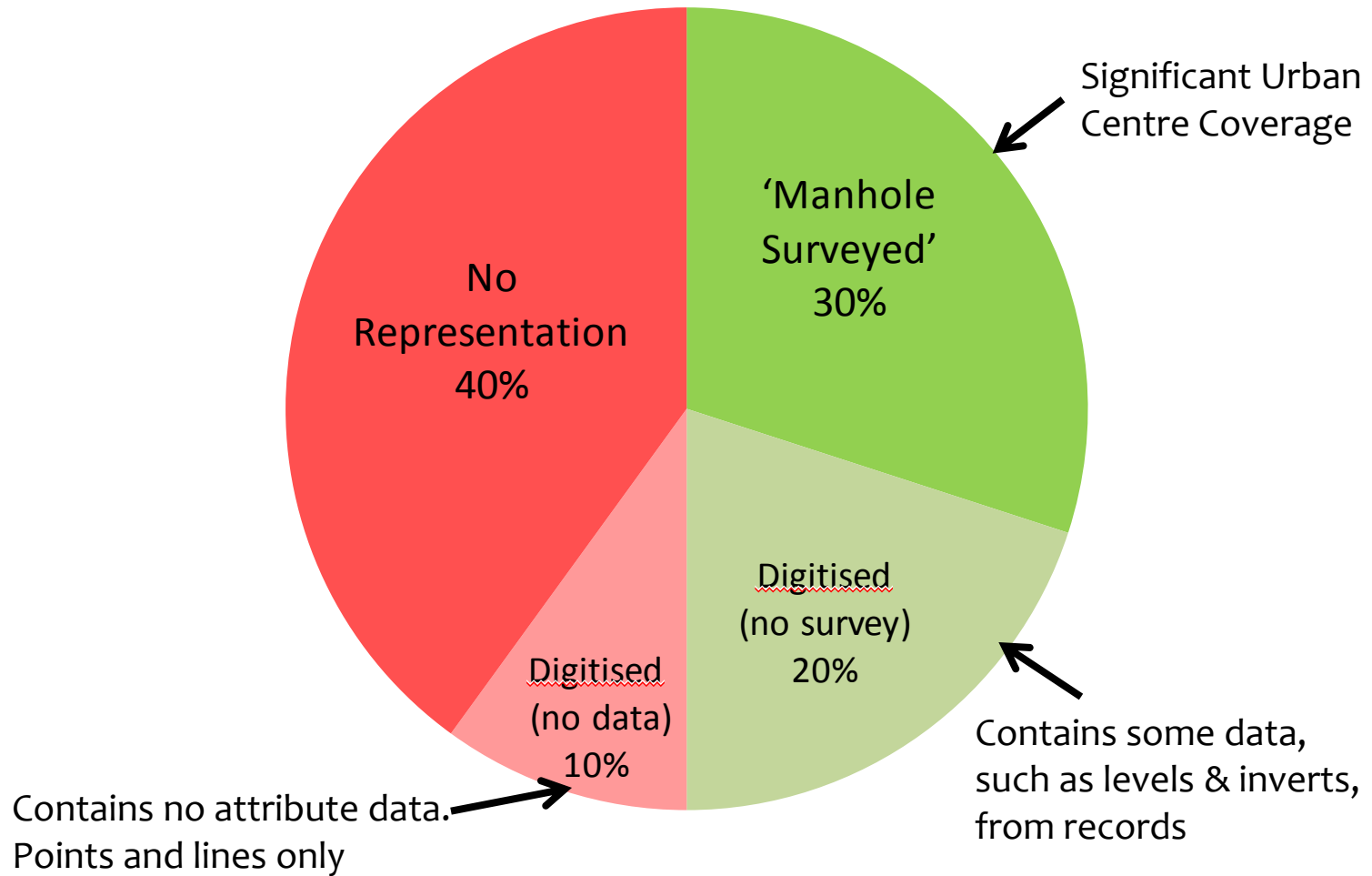B. Hydraulic Models – Coverage and Confidence levels

2. GIS Review

* Multiple data sources

* National assessment now possible

* 270,000 nodes

* 11,000km pipe

Wastewater Pipes on IW GIS

Irish Water Wastewater Network GIS **Estimated** Coverage and Survey Status

No Representation
40%

'Manhole Surveyed'
30%

Significant Urban Centre Coverage

Digitised (no survey)
20%

Contains some data, such as levels & inverts, from records

Digitised (no data)
10%

Contains no attribute data. Points and lines only

2. Model Collection & Review

Summary

* 130 agglomeration/sub-catchment hydraulic models in library

  * Some large urban agglomerations have no model

  * 80% over 10 years old

  * Model maintenance generally not undertaken

  * Inconsistent modelling approaches

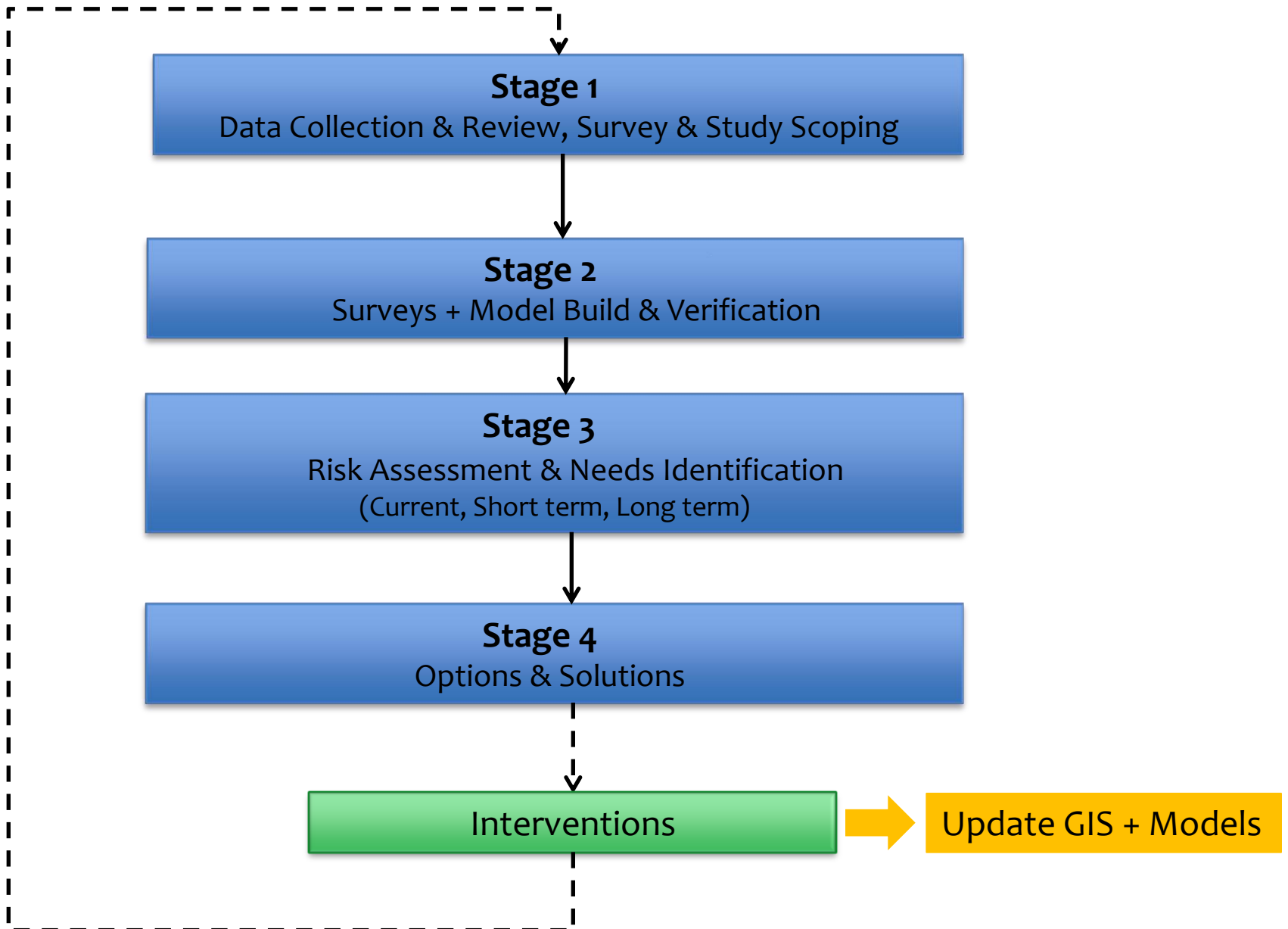 * Auditing – a rare occurrence

2. GIS and Model Review Conclusion

DEFICIT IN UNDERSTANDING OF WASTEWATER NETWORK ASSETS, RISKS AND PERFORMANCE

* Further Asset Surveys Required

* New Models Required

3. Strategy to improve wastewater network data

* Use of the staged Drainage Area Plan process

* New Irish Water Standards
  * Drainage Area Plan
  * Asset Surveys
  * Hydraulic Modelling

Drainage Area Plan (DAP) - Stages

Stage 1
Data Collection & Review, Survey & Study Scoping

Stage 2
Surveys + Model Build & Verification

Stage 3
Risk Assessment & Needs Identification
(Current, Short term, Long term)

Stage 4
Options & Solutions

Interventions → Update GIS + Models

DAP Stage 1
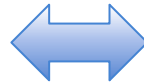
* Data Collection
* Data Review
* Scoping
  * Study Requirements
  * Survey Requirements
* New Stage 1 Report Template developed
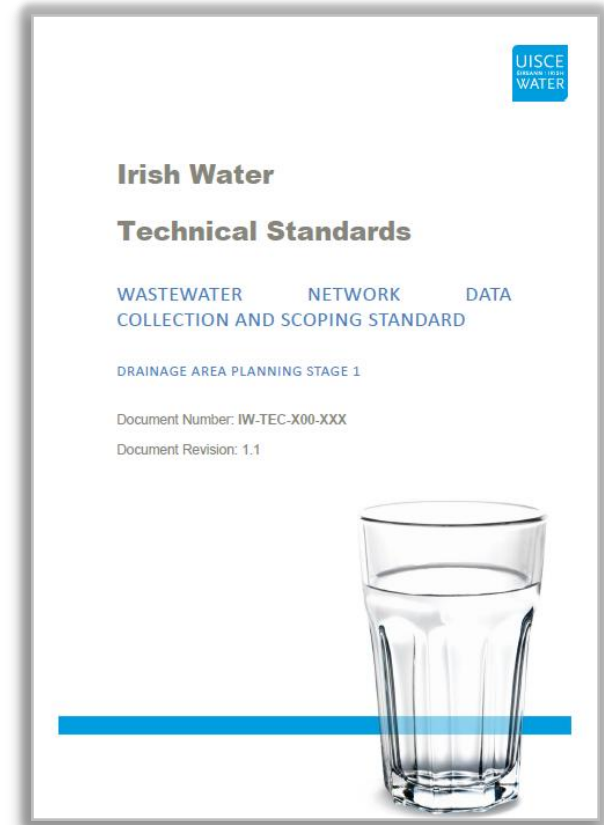
DAP Stage 2

- Asset Surveys
  - CCTV
  - Manhole
  - Ancillaries – CSOs
  - Pumping Station

- Model Build
- Flow & Rainfall Survey
- Model Verification

New Standards

- Sewer Pipe CCTV Standard (Draft)
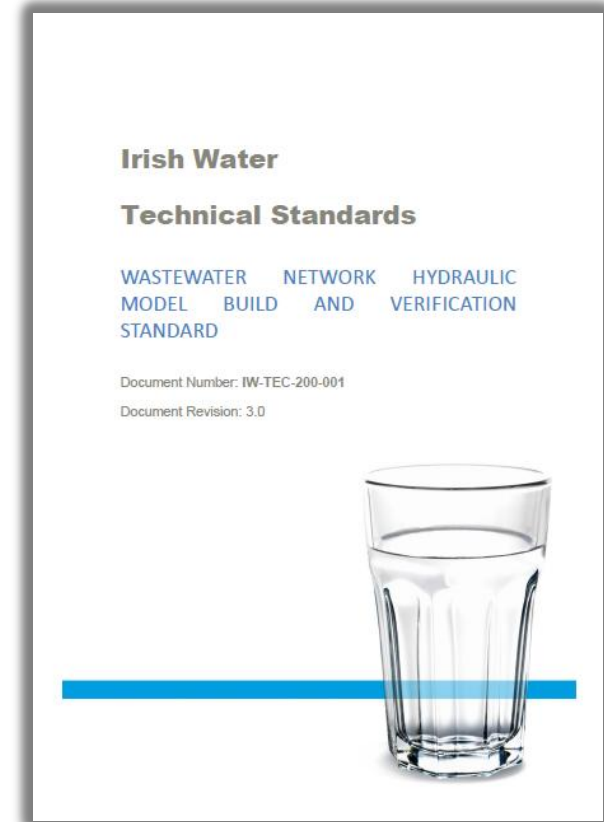- Below Ground Asset Survey Standard (Draft)

- Hydraulic Model Build and Verification Standard

Stage 2 - Model Build & Verification Standard

Key Requirements

- Build & Verification to facilitate an **AUDIT**

- Build and Verification must be based on **EVIDENCE**

    - Historical Verification
    - Survey Verification – short term surveys, long term monitoring, impermeable area analysis

- Reporting must detail **CONFIDENCE** levels for all areas of the network

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Technical Standards

WASTEWATER NETWORK HYDRAULIC MODEL BUILD AND VERIFICATION STANDARD

Document Number: IW-TEC-200-001
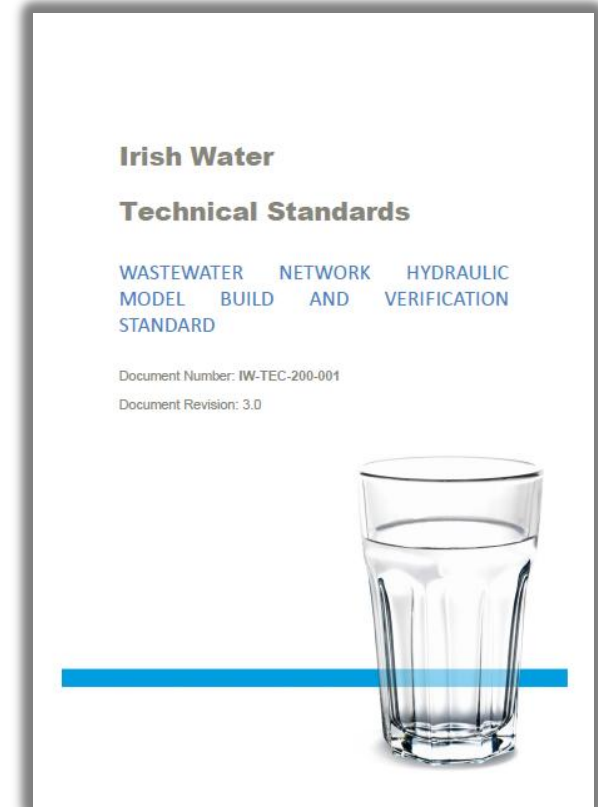
Document Revision: 3.0

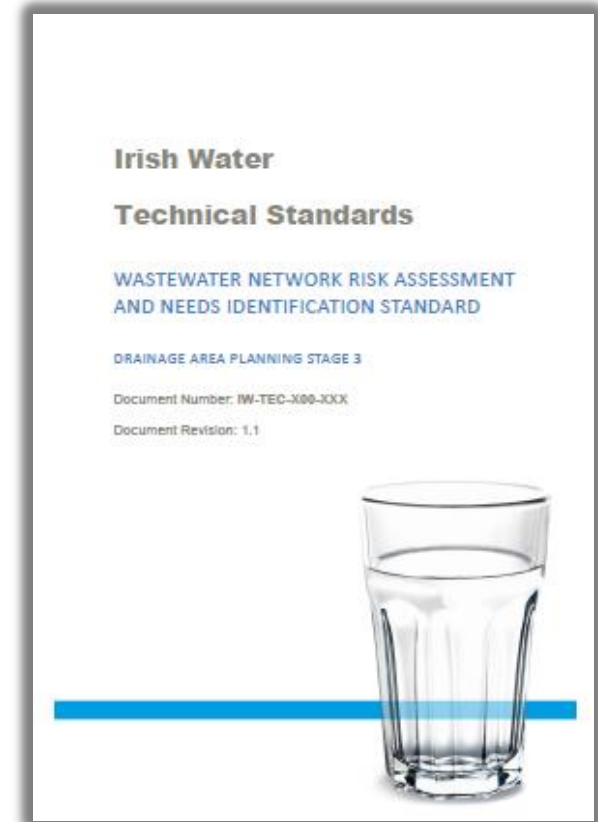# Stage 2 - Model Build & Verification Standard

Contents Include:

- QA Information Notes for model build

- Model build process guidance – e.g. boundary conditions, roughness, flow components etc.

- Application of runoff equations

- Planning & management of flow surveys

- Acceptable calibration and verification

- Deliverables to Irish Water

  - Flow monitor verification sheets

  - Outputs for corporate GIS

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Technical Standards

WASTEWATER NETWORK HYDRAULIC
MODEL BUILD AND VERIFICATION
STANDARD

Document Number: IW-TEC-200-001

Document Revision: 3.0

Stage 3 Risk Assessment & Needs Identification

* New Standard (draft)

* Risk assessment

* Needs Identification
  * Current, Short term & long term development scenarios

* Policies under development include:
  * Climate Change
  * Urban Creep
  * Basements
  * Environmental
  * Hydraulic, Design Rainfall

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Technical Standards

WASTEWATER NETWORK RISK ASSESSMENT AND NEEDS IDENTIFICATION STANDARD

DRAINAGE AREA PLANNING STAGE 3

Document Number: IW-TEC-X00-XXX

Document Revision: 1.1

Summary

1. We need reliable Asset Information and Models

    To understand Risk, Capacity and Intervention Strategies are three reasons

2. GIS: 40% of our wastewater network is not represented. A further 30% is low to medium confidence data.

   Hydraulic Models: Variable coverage and many are outdated

3. Strategy to improve wastewater network data includes
   * Drainage Area Plans
   * New Irish Water Standards
   * Model and GIS Maintenance