ENVIRONMENTAL PROTECTION AGENCY
NATIONAL WATER EVENT 2014
11th-12th June 2014
Galway Bay Hotel, Salthill, Galway
PROTECTING & IMPROVING WATER QUALITY
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Water Investment Priorities

David Flynn,
Programme Manager
Environmental Protection Agency

EPA Water Event 11-12 June 2014
Introduction

- EPA view on how to prioritise **short-term investment** in water services

- Integrating **environment (+ health)** priorities into **economic regulation** of water services

- **Prioritisation** necessary as demand outstrips both supply of funds & capacity to complete projects

- Compliance with relevant EU Directives is a key driver.

(+5-25 year priorities will be guided by drinking water safety plans and second cycle of river basin management plans)
Role of EPA

Decision
Water Charges Plan
Revenue & Tariff

Cooperation

Investment Plan

Regulatory Req.

UISCE
ÉIREANN : IRISH
WATER

CER
Commission for Energy Regulation
An Comisiún um Rialú Plúinte

EPA
Environmental Protection Agency
An Éiministíochta um Choimhneacháin
Role of EPA

- Environmental Regulator – no formal role in revenue and tariff control decisions (CER must ‘seek cooperation’)

- We are working with CER to support their decision making role

- Irish Water propose projects in its Capital Investment Plan

- EPA legislation is focused on individual water supplies and individual agglomerations – can make the move to a strategic role a challenge
70% of the original 237 remedial action list supplies are now complete

92% reduction in E. coli detection in public water supplies since 2005

Decline in the length of seriously polluted channel

94% of Ireland’s Urban Waste Water receives secondary treatment
  - Three times more than a decade ago.
Draft investment plan seeks €1.7bn for 386 projects

Indicative funding is €1.2bn and tariff criteria may limit this funding further.

Whatever happens; there is more work necessary than money available to fund this work.

Not all about money – existing commitments, project lead time etc.
**Wholesome** water: a safe and secure supply
Drinking Water Status

- Water Safety Plans started – early plans now well advanced
- 153 directions since 2007
- 30 Water Notices affecting 24,741 people
- 140 water supply zones on the remedial action list
Priority – Drinking Water

1. Supplies that are on boil water notice or use restrictions

2. Large Supplies at risk and listed in the Remedial Action List

3. Supplies with no Cryptosporidium barrier

4. Supplies with Trihalomethane failures

5. Supplies with an unverified Cryptosporidium barrier

6. All other RAL supplies
In Practice: Drinking Water Prioritisation

<table>
<thead>
<tr>
<th>Category</th>
<th>Reason</th>
<th>No of WSZs</th>
<th>No of WTPs</th>
<th>Population Served</th>
<th>No. of WSZs Listed in IP</th>
<th>No of WSZs not listed in IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Supplies on a Boil Water Notice or a Water Restriction.</td>
<td>12</td>
<td>6</td>
<td>29,408</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>1B</td>
<td>Largest supplies on the RAL all of which require significant treatment improvements linked to providing a “safe” and “secure” supply.</td>
<td>24</td>
<td>6</td>
<td>627,721</td>
<td>23</td>
<td>1</td>
</tr>
<tr>
<td>1C</td>
<td>Supplies with no Cryptosporidium barrier.</td>
<td>21</td>
<td>21</td>
<td>68,395</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Supplies with THM failures.</td>
<td>35</td>
<td>34</td>
<td>111,415</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>3A</td>
<td>Supplies where a Cryptosporidium barrier has been installed but the EPA requires verification of the effectiveness.</td>
<td>15</td>
<td>14</td>
<td>48,085</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>3B</td>
<td>All other RAL supplies.</td>
<td>33</td>
<td>31</td>
<td>54,923</td>
<td>8</td>
<td>25</td>
</tr>
</tbody>
</table>

140 112 939,947 68 72
Waste Water Outcomes

- **Pre-treatment:** resource efficiency
  - FOG projects,
  - Volume & concentration reduction

- **Collection:** network integrity
  - Leak repairs, ingress
  - Scope of agglomerations
  - Stormwater overflows

- **Treatment:** optimised processes
  - Technology

- **Compliance:** Protect public health & environment
  - Protect receiving water
  - UWWD Treatment requirements
Urban Waste Water Status

- 7 large plants without secondary treatment
- 42 urban areas with no waste water treatment
- 44 of the 170 large urban areas not meeting effluent standards
- Vulnerable bathing water sites
- Besides lack of treatment capacity, operation and management the other major cause of environmental incidents
# Bathing Water Risk

**Source:** EPA Bathing Water Quality Report 2013

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>2010-2013 Status</th>
<th>Waters exhibiting periodic pollution events which could influence their overall status</th>
<th>2010-2013 Status</th>
<th>Waters with the potential to be of less than Sufficient status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clare County Council</td>
<td>Good</td>
<td>Ballyalla Lake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cork County Council</td>
<td>Excellent</td>
<td>Barley Cove</td>
<td>Sufficient</td>
<td>Youghal, Front Strand, Youghal, Claycastle, Fountainstown</td>
</tr>
<tr>
<td>Dublin City Council</td>
<td>Good</td>
<td>Merrion Strand</td>
<td>Sufficient</td>
<td>Sandymount Strand</td>
</tr>
<tr>
<td>Fingal County Council</td>
<td>Excellent</td>
<td>Donabate, Balcarrick Beach</td>
<td>Sufficient</td>
<td>Balbriggan, Front Strand, Loughshinny Beach, Rush, South Beach</td>
</tr>
<tr>
<td>Galway City Council</td>
<td>Poor</td>
<td>Traught, Kinvara</td>
<td>Sufficient</td>
<td>Ballycoughane Beach, Grattan Road Beach</td>
</tr>
<tr>
<td>Galway County Council</td>
<td>Excellent</td>
<td>Tran a hUine (Inny Strand, Waterville)</td>
<td></td>
<td>Clifden Beach, Tra na bhForbacha, Na Forbacha, Tra na mBan, An Spideal</td>
</tr>
<tr>
<td>Kerry Co. Co.</td>
<td>Good</td>
<td>Port, Lurganboy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Louth County Council</td>
<td>Excellent</td>
<td>Counsellors' Strand, Dunmore East, Dunmore Strand, Dunmore East</td>
<td>Sufficient</td>
<td>Ardmore Beach</td>
</tr>
<tr>
<td>Waterford County Council</td>
<td>Excellent</td>
<td>Morriscastle, Rossare Strand</td>
<td>Poor</td>
<td>Lilliput, Lough Ennell</td>
</tr>
<tr>
<td>Westmeath County Council</td>
<td>Excellent</td>
<td>Silver Strand</td>
<td>Poor</td>
<td>Duncannon</td>
</tr>
</tbody>
</table>
Priority – Urban Waste Water

1. Discharges causing **serious** pollution
2. Discharges contributing to **bathing water** failures
3. Discharges causing **moderate or slight** pollution
4. **Pearl mussel** catchment pressures
5. Discharges causing pressure on **shellfish** water
6. Overdue **secondary or tertiary** treatment
7. **No treatment** or preliminary treatment only
8. Risk to **drinking water** abstractions
9. Risk to **estuarine or coastal** waters
10. Other environmental pollution risk
Urban Waste Water Prioritisation in Practice

- 42 areas with no treatment
  - 27 agglomerations are included current CIP draft
  - 15 not proposed for funding

- Sites with Serious, Moderate or Slight Pollution
  - Serious pollution sites are all included
  - 21 sites not proposed for funding with slight/moderate pollution

- Bathing Water Sites
  - One site not proposed for funding
Allocation between Drinking Water & Urban Waste Water
Enforcement priorities

- Priority issues will attract most regulatory attention.
- EPA’s enforcement approach will be aimed at achieving these priorities.
- Public protection and confidence in regulatory system is key as users become consumers of water services.
Regulating Strategic Investment

- Demonstrate to consumers that money is spent where it is needed most
- Commitments made with details of key project timescales
- Commitments met with investment
- Report on key milestones for capital investment projects
- Get the most from existing assets
  - process optimisation and minor capital works programme
Summary

- EPA’s role is to focus on the environmental aspects
- Prioritisation gives best use of scarce funds
- Enforcement will be proportionate and targeted to support these priorities
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Balancing Economic and Environment
Regulation of Water Services

Cathy Mannion
Director Water

EPA National Water Event
June 2014
Presentation Overview

• Introduction to CER
• CER Role in Water
• Economic and Environmental Regulation
• Approaches Elsewhere
Introduction to CER
CER Overview

• 1999: CER appointed as economic electricity regulator
• 2002: Addition of gas
• 2004/05: Consumer protection functions
• 2006: On-shore gas and electrical safety regulator
• 2007: All-island SEM established
• 2010: Petroleum safety regulator
• 2013/14: Economic water regulator
CER Structure

- 90 Staff, 4 divisions
- 2 Commissioners, 4 Directors
CER Role in Water
CER Role in Water

*Functions set out in Water Services Act (No. 2) 2013*

- **Advise** Minister on matters related to the delivery of water services
- Provide **economic regulation** of Irish Water
  - Approve Irish Water’s proposed Water Charges Plan
    - Revenue
    - Tariffs
    - Connection Policy
- Approve and direct Irish Water to comply with **codes of practice**
- Protect interest of Irish Water **customers**
- Seek cooperation with **Environmental Protection Agency**
Planned Regulatory Phases

- Phase 1: Prepare for water charging
- Phase 2: Interim revenue control, initiate regulation of IW
- Phase 3: First full regulatory period
## CER Current Work Plan

### Overview

<table>
<thead>
<tr>
<th>Month</th>
<th>Paper</th>
<th>Areas covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>Water Charges Plan Consultation</td>
<td>Allowed initial revenue, tariff structures and levels</td>
</tr>
<tr>
<td>July</td>
<td>Water Customer Handbook Decision</td>
<td>Terms and Conditions and Codes of Practice for IW customer service</td>
</tr>
<tr>
<td>August</td>
<td>Water Charges Plan Decision</td>
<td>Allowed IW revenue for initial revenue period; approved level of water charges</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(non-domestic and domestic)</td>
</tr>
<tr>
<td>Q4 2014</td>
<td>Connection Charges Consultation</td>
<td>Connection Charging policy and methodology</td>
</tr>
</tbody>
</table>
Economic and Environmental Regulation
What happens if revenues permitted IW insufficient to meet environmental requirements?

Prioritisation is key
Capital Expenditure

IW CIP 2014-16 proposed key focus areas:

- Asset Management
- Drinking Water Quality
- Water Conservation
- Drinking Water Capacity
- Waste Water Environmental Compliance
- Customer Serviceability Standards
- Targeted Investment

Challenges:

- Prioritisation of investment
- Ensure financially sustainable model
IW Major Capital Projects (Proposed)

- Wastewater Availability: 31%
- Drinking Water Quality: 16%
- Water Conservation: 12%
- Drinking Water Availability: 11%
- Wastewater Compliance: 30%
IW Proposed Capital Investment Plan 2014-2016

Proposed prioritisation into A, B, & C Categories
   A= Continue in Construction (Inherited)
   B= Review Scope & Commence Construction
   C= Continue Planning & Business Case Review

Further prioritisation needed – within above categories, water/waste water
Monitoring of performance essential
   Establish an output monitoring group
Approach in Northern Ireland
Gov’t Input

NIW submit BP

UR issues draft

UR consults

Gov’t provides budget to UR in line with Investment Strategy, provides Social & Environmental Guidance

NI Water submits business plan to UR. UR engages with stakeholders bilaterally and in groups (*next slide*)

Midway through deliberations, UR engages again. In advance of consultation, it also issues draft to stakeholders

During consultation holds bilaterals with stakeholders

Twenty five year plan forms the backdrop

*UR – Utility Regulator of Northern Ireland*
Northern Ireland – Price Control Process

- UR engages with stakeholders and groups
- Stakeholders:
  - Northern Ireland Water
  - Utility Regulator of Northern Ireland
  - Northern Ireland Environment Agency and/or Drinking Water Inspectorate (*not members of Group 3*)
  - Department for Regional Development (DRD)
  - Consumer Council for Northern Ireland
- Stakeholder Groups:
  - **Group 1:** Environmental Quality Group
  - **Group 2:** Drinking Water Quality Group
  - **Group 3:** Consumer Engagement Group
DRD Minister

Water Stakeholder Steering Group (WSSG)
DRD, UR, CCNI, NI Water NIEA (CEO's)

Water Investment Coordination Group (WICG)
DRD, UR, NIEA, DWI, CCNI, NI Water

Environmental Quality Sub-group
Wastewater quality & abstraction priorities
DRD, NIEA, NIM, and UR

Drinking Water Quality Sub-group
Drinking water quality priorities
DRD, DWI, NIW, and UR

Consumer Engagement Group
Consumer views and priorities
DRD, CCNI, NIW, and UR
Thank You

cmannion@cer.ie
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Water Service Operation Improvements and Process Optimisation

Ray O’Dwyer
Head of Operations and Maintenance
Irish Water

EPA Annual Conference
Galway
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Contents

• The Story so far
• Optimisation and its Importance
• Optimisation in Irish Water
• The Parting Message
Irish Water: A commercial self-funded modern Utility

- Effective Regulation
- Funding from International Lenders
- Support Economic Development
- Waste Water to Environmental Standards
- €11 billion Asset Base
- Providing Clean and Safe Water
- 1.6 million customers
- 100,000kms of pipes
- Skilled and Engaged Staff (IW, LAs)
- Integrated systems

Funding from International Lenders

Support Economic Development

Skilled and Engaged Staff (IW, LAs)

Waste Water to Environmental Standards

Providing Clean and Safe Water

1.6 million customers

100,000kms of pipes

Integrated systems

Effective Regulation

Funding from International Lenders

Support Economic Development

Skilled and Engaged Staff (IW, LAs)

Waste Water to Environmental Standards

Providing Clean and Safe Water

1.6 million customers

100,000kms of pipes

Integrated systems

Effective Regulation

Funding from International Lenders

Support Economic Development

Skilled and Engaged Staff (IW, LAs)

Waste Water to Environmental Standards

Providing Clean and Safe Water

1.6 million customers

100,000kms of pipes

Integrated systems
Irish Water:

- Took over responsibility for Water Services in January 2014 as the national water utility
- Partnership with 34 / 31 Local Authorities; 12 year SLA arrangements in place
- Target is to be a high performing utility as quickly as possible
- Customer contacts from April 2014
- Assumed all corporate and regulatory responsibilities from LAs at its creation
Irish Water Landscape

- Irish Water was created against a backdrop of some significant head-winds

Compliance Improvement Challenging

Customer Perception

Financial Constraints

Legal Legacy
Irish Water Landscape

- DECLG
- CER
- EPA
- HSE
- Irish Water
- HSA
- LAs
- Customers
The Importance of Optimisation

• Business has to concentrate on inefficiencies
  o customers expect value for money
  o financial pressure

• Optimisation is a lever in our armoury

• We need to recognise it will take time but equally appreciate that we need pace

• It can help us to achieve some much needed quick wins - however it is not a magic bullet
The Importance of Supporting Optimisation

• If optimisation is to succeed it requires collaboration across all stakeholders – it’s not just about Irish Water assets

• There are financial and time constraints which need to be recognised or overcome

• You can only optimise so much – it comes down to the right concepts, assumptions and designs
The Importance of Supporting Optimisation

Cost to Customers

Compliance Improvement

Which one wins?
Ireland’s Optimisation Challenge

• Optimisation is relevant at every part of the water and wastewater cycle

• Not just Irish Water assets – from Source to Tap and Sink to River
  o The way we conceive, design, operate and utilise our end-to-end systems all play a role in our ability to optimise

• Optimisation can rarely be achieved in isolation
The Water Optimisation Challenge

The Optimisation Water Cycle

- Use Less
- Distribution
  - Leakage Reduction
  - Network Rehabilitation
- Produce Less
  - Reduced Process Losses
  - Improved WQ Performance
- Impact Less
  - Sustainable Abstraction
  - Reduced Discharges
- Lose Less
  - Water Conservation Policy
- Abstraction
  - Wastewater
The Wastewater Optimisation Challenge

The Optimisation Wastewater Cycle

- Water Conservation Policy
- Generate Less
- Impact Less
- Treat Better
- Optimise Flows
- WQ Compliance Improved
- Reduced Storm Impact
- Sewer Integrity
- Control Licensed Impacts
- Protect More
- Treatment
- Return to Environment

Water Usage
Sewerage
Irish Water Challenges

• The Compliance Angle
  • 404 Notifications, ECJs, BWNs, RAL

• The Financial Angle
  • Significant financial constraint in recent years
  • There will be capital constraints for some time yet
  • Revenue streams have to be achieved
Optimisation in IW

*Process Optimisation* – “Activities that will support the drive in improved compliance and resilience, enable completion of O&M activities at lower cost (whilst maintaining or improving compliance) and/or improve our customers’ experience of our services”
Optimisation Core Principles – Our Drivers

Compliance
Set out an optimisation strategy to improve compliance, understand our compliance gaps, measure our improvements, improve and sustain compliance

Efficiency
Propose cost saving schemes, maintain a pipeline of opportunities, track implementation, review benefits

Avoid Unnecessary Spend
Target and promote operational improvements, where possible and appropriate ahead of capital solutions, promote capital requirements with IW stakeholders

Standardisation
Determine operational standards, be consistent in applying the standards, promote data and monitoring visibility, check for compliance against standards

Communications
Share site investigation outputs, create business cases for improvements, share best practice, advocate innovation, influence decision making

Coach, inspire, prioritise, promote, listen, share
The Optimisation Challenge in Irish Water

- Not everything can or should be fixed by Capex.
- Optimisation in Irish Water is about seeking operational improvement at the same time as spending Capex diligently.
- It is right that optimisation in Irish Water should currently be focused on driving out Opex inefficiency and doing things better for less.
Irish Water Approach to Optimisation

- Quality and quantity driven
- Reduced losses (at all opportunities)
- Water conservation promotion
- Water and wastewater treatment efficacy
- Minor Programme and CIP
- Licensing enforcement??
Current Optimisation Focus

- Dedicated team of process optimisation specialists within the O&M function

- Head of O&M
  Ray O’Dwyer

  - Regional Operations Managers x 3
  - Operations Support Manager
    Michael O’Leary
  - Operational and Control Manager

  - Process Optimisation Manager
    Haydn Knowles-Love

  - Process Optimisation Analysts x 22
Current Optimisation Focus

• Focussed on seeking and delivering quick-wins
• Initially compliance is the critical driver
• Deliver efficiency and customer benefits wherever possible
• Multi-faceted Irish Water approach to operation and optimisation
Early Years Approach
Phase 1 and Phase 2

Information Gathering
Phase 1 Site Investigation Process
Phase 1 Prioritisation Process

Enduring Process
Phase 2 Site Investigation Process
Phase 2 Prioritisation Process
Solution Delivery
Review
Re-prioritisation
Agreement and Sign-off by Stakeholders
Optimisation – Phase 1

• Our current optimisation approach is prioritised on compliance improvement

  • ECJ cases
  • BWN and Water Restrictions
  • Persistent / significant breaches of ELVs or DW Stds
Optimisation – Phase 2

Critical
- Legal / ECJ Cases
- Persistent & Significant Regulatory Shortfalls
- Sensitive Customer & Significant Stakeholder Impacts

Must Do
- Regulatory Shortfalls
- Efficiency – “Sweat the Assets”
- Efficiency – Spend to Save Initiatives
- Other Customer & Stakeholder Impacts
- Minor / Asset Programme Delivery Support

Very Desirable
- Changes to Internal Standards
- Innovation Activity
- DBO Optimisation Opportunities

Increasing Influence Within the Optimisation Strategy
Phase 2 Prioritisation

- Will encompass compliance, efficiency and customer issues in balance and competition.
- More sophisticated risk-based approach with risk scoring matrix and mechanism.
- Focussed on resilient optimisation solutions, in terms of both quality and quantity.
Examples of Optimisation in Practice

Wastewater Treatment Works – Example 1

- Non-compliant for: BOD, SS, Ammonia & Ortho-P

- Identified main cause:
  - Final stage treatment (Humus Tank) under-sized
Examples of Optimisation in Practice
Wastewater Treatment Works

• Operational solutions: (1) Increase recirculation of effluent back through process; (2) increase frequency of de-sludging; (3) increase maintenance of air siphons and effluent channel

• Likely Opex implication: circa €30K p.a.
Examples of Optimisation in Practice
Wastewater Treatment Works –

• Capital solutions: (1) Provide tertiary treatment in form of wetlands; (2) provide package plant consisting of aeration tank and clarification chamber; (3) provide RGF capable of dealing with hydraulic load

• Likely Capex implication: circa €75K (av per solution)
Examples of Optimisation in Practice
Water Treatment Works – Example 2

• Non-compliant for: THMs, Taste and Odour

• Identified main cause: poor process control and challenging raw water fluctuations

• Operational solutions:
  • (1) RGF backwash control improvements;
  • (2) alternative coagulation product use;
  • (3) better use of plant control alarms

• Likely Opex implication: circa €20K p.a.
Examples of Optimisation in Practice

Water Treatment Works – North Roscommon

- Capital solutions:
  1. Alternative intake location;
  2. pH adjustment by means of acid dosing;
  3. Installation of GAC/PAC

- Likely Capex implication: circa €100K (av per solution)

Totex
What’s Different?

• National Focus / Dedicated Resources / Shared Knowledge / Funding
  • A new focus for us is on seeking and implementing operational solutions, where possible ahead of capital investment needs
  • Capital investment will still however play a role in achieving optimisation
  • We are working in a Totex environment
The Parting Message

• We’re starting from a challenging position

• Irish Water needs to deliver against a number of objectives, some of them competing

• We all have a role to play in optimisation – from concept to compliance to customer

• Continuous Improvement

• It’s not a magic bullet - it will produce results but we need to be realistic in how quick and how much