Issues Paper following the Committee for the Environment's Stakeholder event on River Pollution on 18th February 2016.

1. Introduction

On 26th November 2015, the Committee for the Environment agreed to:

- Commission a research paper to consider pollution causes; monitoring systems; and preventative measures by providing examples of methods in NI and across UK and ROI.
- Hold a stakeholder event to ascertain views of appropriate prevention measures to address / tackle these issues; and
- Produce an issues paper, with suggested areas for further consideration. These issues will be reflected in the Committee's legacy report.

The Committee considered the research paper *River Pollution in Northern Ireland: An overview of causes and monitoring systems, with examples of preventative measures* at its meeting on the 28th January 2016. This paper identified four topics for further discussion at the stakeholder event:

1. Impact of legislation;
2. Pollution causes;
3. Pollution monitoring; and
4. Enforcement.

The stakeholder event was held on Thursday 18th February. This report outlines the key discussions and issues that were raised during that event.

1. Overview from NIEA

At the start of the event, NIEA provided an overview of its work in relation to water pollution. It outlined the sources of water pollution; its incident handling operations; existing legislation (including the Water Framework Directive); penalties; the measures it is taking to prevent pollution; and the need to work together.

NIEA highlighted its:

- Planned multi million pound investment by NI Water in sewage infrastructure to increase capacity and effectiveness of waste water treatment in NI;
- Multi million pound agricultural Environmental Farming Scheme to improve water quality and the wider environment;
- Nitrates Action Programme with training and support from CAFRE for farmers to help reduce diffuse pollution from agricultural sources;
- Pollution Prevention Guidelines;
- Oil Storage Regulations; and
- Monitoring and enforcement actions are targeted at high risk sectors or industrial estates.

The event then broke into discussion groups on the four themes. The following four sections reflect some of the points and views expressed by stakeholders throughout the review process. Due to time constraints, a full analysis if these points has not been conducted, however it does highlight areas that could be explored in more detail moving into the new mandate.

2. Impact of Legislation

This discussion was to ascertain views on the impact of existing legislation - whether the approaches taken are effective to prevent pollution and improve water quality.

Key issues raised were as follows:

Implementation of legislation

- There was a suggestion that legislation here is reactive rather than proactive; but that the main issue with legislation is its implementation.
- There was discussion regarding the Water Framework Directive (WFD), and the River Basin Management plans. There was recognition that the WFD is good legislation, but there were comments that it only takes account of the baseline and it is a long time before change will filter through the system. (Ecological changes take time)

- There was a general perception that there is not enough funding to implement the WFD. There was a call for more robust measures with adequate financing.
- In order to effectively implement River Basin Management Plans (RBMPs), stakeholders said that partnership approaches are essential. They suggested that resources should be targeted and the responsibilities of individuals, groups, agencies and the Department should be emphasised and encouraged.
- There were calls for more clarity in respect of the WFD, as it can be confusing for people to understand what their obligations are.
- With the reorganisation of government departments, there was a suggestion that a more streamlined approach to addressing pollution needs to be taken and any unnecessary duplication addressed. There needs to be greater co-operation between Departments and agencies, with clear lines of responsibility.
- There was a suggestion that a long term water strategy was required. Also, there was a discussion regarding whether there is a need for a rural diffuse pollution plan; and whether lessons can be learnt from other jurisdictions. (DRD have published a Long Term Water Strategy)
- Specific issues were raised regarding litter along the shores of Lough Neagh: and whether legislation is needed to deal with this problem.
- Also, an example was given of the Nitrates Action Plan. There was discussion that diffuse pollution from agriculture is a major problem however derogation was given around stocking levels; and that derogation must be sought on an individual basis: Currently it is on an individual basis.[1]
- There was discussion regarding the disconnect from legislation and what is happening on the ground – particularly around hydrological activity and linkages.

[1] https://www.dardni.gov.uk/sites/default/files/publications/dard/Nitrates%20Directive%20Derogation%20Guidance%20Booklet%20-%20web%20version.PDF

Fines and Penalties

- There was general consensus that the level of fines imposed by courts was not high enough and did not act as a deterrent. The need to convey to the judiciary the seriousness of pollution incidents was stressed.
- There was a suggestion that there should be a three-strike rule for repeat offenders with an escalating system of fines.
- There was also suggestions that any money received from fines should be redirected back into the environment to rectify any damage that has been caused. In additional, there was a suggestion that the level of fines needed to be high enough to cover any costs.
- The social impact of pollution was discussed; and there was a suggestion that the level of fine might reflect the impact (for example the human cost preventing areas being used for leisure or recreational activities) or long term damage of the eco-system.
- The high costs associated with bringing a case to court was highlighted (e.g. time and financial implications). Criminal cases must be proven beyond reasonable doubt and evidence gathering and presentation must be robust. There was recognition that this can require significant resources. Civil cases have a lower evidential threshold (balance of probabilities) but are expensive.
- Many small groups don't have the resources to take legal action – therefore support is required from statutory agencies to pursue cases.
- There was a suggestion that courts in ROI are more effective in this area.

Public awareness

- There were suggestions for an increased focus on raising public awareness of the value of keeping our river free from pollution and the sources of pollution and pollution prevention. A change of mind-set is required to make pollution less acceptable. Public could be encouraged to report incidents (like neighbour watch schemes)

- There was discussion around how much information surrounding legislation is disseminated on the ground – there is a lack of education. Widening the use of communication channels was discussed, particularly around social media or TV campaigns.
- There is also a suggestion for the need to communicate the requirements of legislation.

Planning

- There was discussion regarding the role of planning. There were suggestions that consideration might be given at planning stage, for example when building a single dwelling discharge, consent should be part of planning. (Applications must show how waste water will be managed before planning consent is granted.)
- Stakeholders commented that there might be occasions when planning is being granted when there is insufficient infrastructure in place to support it.
- There was discussion that planning policy has an impact in terms of where water is directed and impacts on watercourses. Water infrastructure needs to be designed to respond.

3. Pollution Causes

The purpose of this discussion was to ascertain views on the main causes of pollution; and to discuss ways to reduce and / or eliminate these causes.

Key issues raised were as follows:

Causes of pollution

- The causes of pollution were discussed, and range from industrial, agricultural, government agencies, individual polluters. The need for quick identification of the pollution cause was highlighted.
- Every person, business, household is a potential source of pollution. The accumulative impact from households and industry must be acknowledged.
- There was recognition that some aspects are outside of our control (e.g. weather/ storm/ climate change).

- Some questioned whether there was a need for greater regulation of industry. Views were expressed that industrial waste has a tendency to be more toxic and do more damage than diffuse pollution. There was a suggestion that businesses should report to NIEA what chemicals they have. (Businesses are currently required to keep inventories of hazardous chemicals)
- Agriculture was recognised as one of the key sources of pollution. The cross compliance requirements attached to Single Farm Payments was highlighted as a means of preventing pollution from agricultural activities given that farmers can be subjected to significant reductions in SFPs for breaching rules/regulations relating to pollution control.
- There was discussion regarding the role of the DARD farm advisory service to secure buy-in from farmers and inform them on legislative compliance. (DARD actively promote compliance through FAS and CAFRE)
- Views were also expressed that government departments and agencies might be held accountable for pollution they have caused. However there was recognition that improvements have been made to address issues of under investment – however there was a view that significant work is still required, particularly in relation to the sewage system. (NI Water (DRD) is held accountable for any pollution incidents / breeches in discharge consents)
- There is not enough emphasis on pollution derived from ground water.
- There was general consensus that more work is required to better understand and reduce the impact of pollution from septic tanks, as it is a much larger problem than is currently thought.
- There was also calls for more work in specific causes, e.g. the impact of landfill in unlined gravel pits is unknown; shallow zone ground water[2] need further consideration.

[2] According the Geological Survey NI about 40% of water in rivers comes from underground, including shallow groundwater. Shallow zone groundwater is located just below the surface and is susceptible to pollution from agriculture and industry etc., especially in flat areas and hollows where pollutants may gather and store. This may pollute surface water at a slow, but ongoing rate as explained by the British Geological Survey: http://www.bgs.ac.uk/research/groundwater/quality/nitrate/home.html .

Education

- The lack of education among the general public was highlighted, and there was discussion regarding how this might be best overcome. The need for greater communication in terms of warning people that a pollution incident has occurred, is required. There is a lack of education and realisation of an individual's impact of his/her actions – i.e. public unaware of implications.
- There was discussion that there is a legacy issue in terms of educating people about the impact of pollution. Children now receive environmental awareness education in schools, but this was not part of the curriculum for older generations. The benefit of eco-schools was acknowledged and welcome. (All primary schools in NI are now eco-schools.)
- There was also a suggestion that agricultural stakeholders should also attend WFD meetings, not just angling or fishing clubs.

4. Pollution Monitoring

The purpose of this discussion was to ascertain views on the measures taken to monitor pollution.

Key issues raised were as follows:

Need for monitoring

- There was discussion on the need for monitoring, and a recognition that self-monitoring doesn't work. There is a need for more logs and quality monitoring. There is a need to better understand river systems and the ecological status.
- It was suggested that a greater, more rapid response time was required.
- The benefits of sharing information were discussed; and many recognised that the loss of expertise and reduction in staff within NIEA was a problem. The lack of resources within NIEA was acknowledged.

Need for data

- The benefits of data were discussed. There was comment that hard data is required to be effective; and that there is a need for a telemetric system to feed into the system.
- Currently, NIEA can only rely on its own data in relation to court cases – there was a suggestion that this should be looked at, while others recognised it needed to fit protocol/standards.
- The opportunities for partnerships and for stakeholders to do more were recognised. Questions were asked whether NIEA could use university data or make greater use of environmental science graduates. There was also a suggestion that NIEA utilise drones or other technologies to conduct monitoring to build on use of robotic monitoring.
- There was also a suggestion of a need for 24/7 water sampling system – used in other jurisdictions (perhaps targeted approach in high risk areas).

Opportunities

- There was a suggestion to contract real time monitoring to outside firms. Also the Angling Management Initiative was mentioned.
- Stakeholders recognised that the amalgamation of DOE functions with DARD gives an opportunity to make more efficient use of staff with regards to monitoring and inspections.
- There was discussion on the heavy reliance on the public to report pollution – there should also be schemes to engage the public / neighbours in terms of monitoring sites; with visible warning signs in place for polluters.
- Suggested use of early warning pollution technology– automated phone alarm systems.

5. Enforcement

The purpose of this discussion was to ascertain views on effectiveness of enforcement measures

Key issues raised were as follows:

Effectiveness of enforcement

- There was general consensus that the current enforcement framework is not effective – a more joined up approach is essential.
- There is a perception that the seriousness of pollution incidents is not reflected in fines imposed; and there is inconsistency in the level of fines imposed.
- There was a view that pollution is too low on the government's agenda.

Measures to address lack of enforcement

- There was a suggestion for fixed penalties / on the spot fines, that are commensurate with the severity of the type, source and severity of pollution incident.
- There was a suggestion that the person(s) responsible for the pollution be compelled/offered the chance to put things right. The polluter should pay principle had popular support.
- There was discussion that companies / buyers can act as a deterrent - people should stop doing business with those who have poor environmental standards. More should also be done to incentivise good practice.
- Education and behavioural change in society and all business sectors was highlighted as a need to reduce the need for enforcement action
- Cross-border pollution and management was highlighted.
- It was recognised that prosecution is not the only option; other options include cost recovery, cross compliance, enforcement orders.
- Some felt that the need for enforcement represents a failure of the process and that it should be used as a last resort. Funding and investment critical to assisting and reducing need for enforcement action.

6. Issues for legacy report

Following the stakeholder event, the Committee agreed that further consideration should be given to the following issues:

Impact of legislation

Further analysis should be done on the implementation of the WFD as there are concerns among stakeholders that there are not adequate resources or funding.

A cross departmental approach is required – how can the new structure of government departments improve the water quality environment.

Pollution Causes

Further consideration should be given to preventative measures to reduce pollution causes by agriculture, industry and government agencies (including sewage systems). Also, there should be further consideration of the pollution caused by septic tanks.

Also, further consideration should be given to measures that will improve education and awareness of the impact of pollution.

Monitoring

Consideration should be given to further developing partnership working with stakeholders and with the public.

Consideration of other technologies might assist in developing better monitoring systems.

Enforcement

Further consideration should be given to how a consistent approach to enforcement could be applied.

The level of fines require further analysis to ensure that they are sufficient and act as a deterrent, and are commensurate with the severity of the offence. Further analysis should be undertaken to assess whether any of the money generated from fines are redirected back to improve the environment.

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River pollution in Northern Ireland: An overview of causes and monitoring systems, with examples of preventative measures

This paper examines the potential causes of river pollution, pollution monitoring systems in place in Northern Ireland, as well as some examples of preventative measures trialled both here and in other jurisdictions. It has been produced following a request by the Environment Committee to contribute to their preparations for a stakeholder event on River Pollution. **It provides information and examples to generate discussion among Committee Members and stakeholders and should not be taken as conclusive in its considerations.**

Executive Summary

This paper examines the potential causes of river pollution and monitoring systems in place in Northern Ireland (NI), as well as some examples of preventative measures trialled both here and in other jurisdictions. It has been produced following a request by the Environment Committee to contribute to their preparations for a stakeholder event on River Pollution. It provides information and examples to generate discussion among Committee Members and stakeholders and should not be taken as conclusive in its considerations.

Section 2 of the paper identifies a number of examples of approaches taken to preventing pollution. Pollution prevention forms part of the overall process of pollution management (pollution prevention, monitoring, response and enforcement) which is underpinned by effective approaches to water quality management and the implementation of the Water Framework Directive. This includes the implementation of River Basin Management Plans (RBMPs) and complying with environmental regulations for preventing water pollution e.g. consent to discharge permits. As requested by the Environment Committee, the paper explains the operation of a similar system in Scotland under the Controlled Activities Regulations which provides a hierarchy of licensing depending on the risk level of activities. This section also explores Sustainable Drainage Systems (SuDs) as an example of pollution prevention through mitigating the threats caused by overflows of untreated waste into nearby streams, rivers, or other water bodies during periods of intense rainfall. As requested by the Environment Committee, it also presents information on the replacement septic tank scheme in the Republic of Ireland and explains the situation in Northern Ireland. Enforcement may be seen as a form of prevention, and it may be of interest to find out whether current measures, explained under section 5, are considered sufficient.

Section 3 of the paper is concerned with highlighting a number of causes to river pollution using data from DOE. There is a need to investigate further approaches to addressing the ongoing problem of diffuse source pollution, particularly rural diffuse pollution as discussed in section 2.2. A number of other legislatures have introduced diffuse and rural diffuse actions plans such as Scotland and Wales, and England is consulting on one (see Information Box 1). The increased growth in 'other' sources and 'unknown' causes since 2009 suggests a growing problem with detection and further explanation as to whether this is the result of operational problems or other external factors may be needed. Other main causes of pollution include equipment failure and poor practice; does this suggest the need for improved education, awareness development and support across the business, industry and agriculture sectors?

Section 4 focuses on the monitoring of river pollution in NI. Similar to other jurisdictions (as detailed in Section 4.4) when dealing with incidents of pollution, NIEA's Operations Team rely on reports of incidents by the public and industry and on detection by field agents during their ongoing work and monitoring of river bodies. It may be of interest to find out whether current mechanisms for the reporting of pollution incidents are

utilised and efficient. For example, the Pollution Incident Hotline directs calls made outside of office hours to the EA in Reading, who contacts an on-call officer in NI. It may be interesting to find out how many calls are made out of hours and whether this approach affects the response time and efficiency in any way.

Another area considered is the duty/requirement for any business/industry to report a pollution incident. Requirements include the reporting of emissions to water environments under the Pollution Inventory (for NIEA regulated business). However these are required on an annual basis, and it may be of interest to find out whether there are any requirements for the immediate reporting of pollution incidents from all industry/business, similar to Scotland under the Controlled Activities Regulations (CAR).

The responsible operation of business, industry and agriculture in NI is largely controlled through the environmental permitting process. Changes to environmental permitting are to be introduced through the Environmental Better Regulation Bill which will bring a hierarchy of licensing, similar to that in Scotland under the Controlled Activities Regulations (see section 2.3.2). This allows regulators to focus efforts on high risk activities. However, further detail on the operation of this is to be provided under supplementary regulations in Schedule 1 of the Bill, which the Department may be able to provide in due course. It may be of interest to find out whether pollution reporting requirements will be included under the new permitting regime.

Key Points

- The management of water quality under the Water Framework Directive is instrumental in the prevention of river pollution.
- Prevention approaches include the effective implementation of River Basin Management Plans (RBMPs) and complying with environmental regulations for preventing water pollution e.g. consent to discharge permits under the Water Order 1999.
- It has been suggested that it is human activities, such as agriculture and industry, which are the main causes of water pollution in Europe.
- Scottish and Northern Ireland Governments both recognise diffuse pollution as the biggest pollution threat to their respective water environments. Scotland has a Rural Diffuse Pollution Plan with legislation in place to tackle diffuse pollution from rural sources.
- Similar to other jurisdictions, NIEA's Operations Team rely on reports of pollution incidents by the public and industry and on detection by field agents during their ongoing work and monitoring of river bodies.
- Further consideration is needed around the requirements for businesses and industries to report pollution incidents to NIEA and this has been discussed in section 4.2.2
- Problems related to river quality and pollution incidents are not solely an NIEA problem due to the dispersal of responsibilities across departments. Therefore, there may be a need for a more integrated and joined-up approach.
- While departmental re-organisation in May 2016 may bring an opportunity for more joined up working, it is important that work is underway to ensure the effective changeover and amalgamation of two departments (DARD and DOE) with different, and sometimes competing, priorities.
- The current Minister has suggested the creation of an independent Environmental Protection Agency (EPA). However, further details will be needed on the positioning of responsibilities within the new department and EPA to ensure all responsibilities are given equal weight.
- Changes to environmental permitting under the Better Regulation Bill may bring opportunities for improvements, however further detail on the new regime is required.

Contents

1 Introduction

The following paper is principally an information paper to supplement discussion at the Environment Committee's Stakeholder Event on River Pollution. Suggestions made and examples used are not conclusive and have been presented in a way to encourage further discussion, examples and insights from stakeholders.

As requested by the Environment Committee, the paper considers river pollution from the following aspects: pollution prevention approaches through the management of water quality under the Water Framework Directive (WFD) and associated legislation; the main causes of river pollution in Northern Ireland (NI); and the monitoring of pollution incidents in NI. Finally it offers some suggested areas for further consideration.

2 Improving Water Quality and Pollution Prevention

Approaches to managing water quality in the United Kingdom (UK) and the Republic of Ireland (Ireland) are set within the wider legislative framework imposed by the European Commission's Water Framework Directive (WFD). In implementing the WFD member states were required to adopt a process of River Basin Management Planning as a means of managing the often unique conditions and threats to their water resource. River Basin Management Plans (RBMPs) include an assessment of the multiple pressures on the water environment as well as a programme of measures to mitigate these pressures and improve water body status.[1]

The purpose of this paper is to identify examples of approaches taken to preventing pollution and improving water quality.

2.1 Managing Water Quality

At the European level there has been realisation of the need to manage the multiple stresses being placed on Europe's water resources with the European Economic Community (EEC) identifying water pollution as a priority matter at its First Action Programme on the Environment in 1973.[2] The initial response by the EEC included the 1976 Bathing Water Directive, aimed at improving beaches and the 1980 Drinking Water Directive[3], which sought to improve the quality of drinking water. During the 1990s European Legislation began to address key sources of pollution such as waste water, agriculture and major industries, with the Directives on urban waste water

[1] Hering, D (2015) Managing aquatic ecosystems and water resources under multiple stress — an introduction to the MARS project. *Science of the Total Environment,* vol. 503–504, pages 10–21[online] available from: http://nia1.me/2xv
[2] Environmental Law [online] Prevention and Control of Water Pollution: UK Legislation. Available from: http://nia1.me/2xn
[3] EC [online] The Drinking Water Directive. Available from: http://nia1.me/2xr

treatment[4], nitrates pollution from agriculture[5] and integrated pollution and prevention control (IPPC) which controls industrial emissions[6].

Building on the success and also key learning points of these policies, a review of EU water policy was initiated. This eventually led to the development of the EU's most far-reaching and holistic fresh water policy – the Water Framework Directive[7] which was introduced in 2000.

2.2 The Water Framework Directive

The WFD establishes a legal framework for protecting rivers, lakes, estuaries, inland coastal waters and groundwater bodies across Europe. During its first management cycle it required EU member states to aim to achieve "good status" in all water bodies by 2015. 'Good status' refers *"…to good ecological status (or Potential) and good chemical status for surface waters and good chemical and good quantitative status for groundwaters"*.[8] There are exemptions for when specific circumstances justified setting lower standards or extending the deadline. In these instances the achievement of 'good status' can be delayed until 2021 or 2027.These reasons could include:

- unreasonable cost implications;
- technical feasibility;
- unfavourable natural conditions; or
- designation of heavily modified water bodies (HMWBs)

In the case of HMWVs, such as canals and reservoirs, there is only the requirement to achieve good ecological potential, instead of good ecological status.[9]

2.2.1 Implementation of the WFD in Northern Ireland

Having been introduced in 2000, member states were set a timetable to achieve various milestones including transposing the WFD into local legislation and delivering the first river basin management plans (RBMP). This timetable is set out in Figure One.

[4] EC [online] Urban Waste Water Directive. Available from: http://nia1.me/2xt
[5] EC [online] The Nitrates Directive. Available from: http://nia1.me/2xq
[6] EC [online] Integrated Pollution and Prevention Control (IPPC) Directive. Available from: http://nia1.me/2xs
[7] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy [online] available from: http://nia1.me/vv
[8] European Commission (2009) Common implementation strategy for the Water Framework Directive [online] available from: http://nia1.me/2y4
[9] Annex V, Directive 2000/60/EC [online] available from: http://nia1.me/vv

Figure 1: WFD Timetable

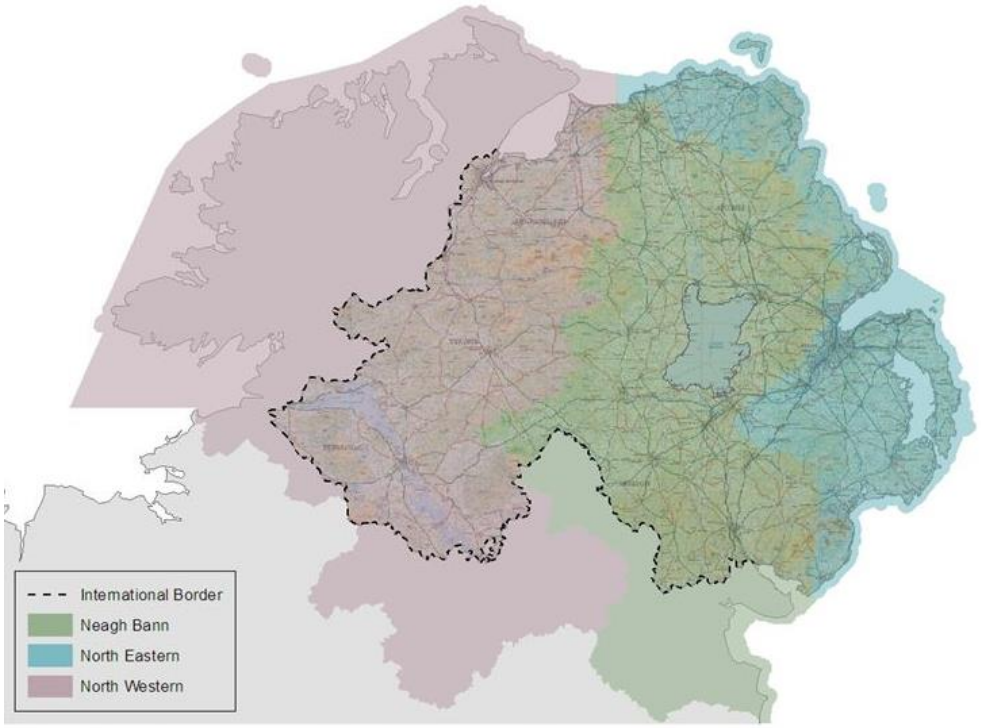
2.2.2 National legislation and identification of River Basin Districts and Authorities

The WFD was transposed into Northern Ireland law through The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003 (Statutory Rule 2003 No. 544). This identified the Department of the Environment (and the Northern Ireland Environment Agency) as the responsible authority for co-ordinating the river basin planning process.

2.2.3 River Basin Districts

There are four River Basin Districts in Northern Ireland, three of these cross the border and as such are known as International River Basin Districts (IRBD). [10] Every six years the Department of the Environment (DOE) produces a river basin management plan for three of Northern Ireland's River Basin Districts: the North Eastern, which is the only RBD to sit wholly within Northern Ireland; as well as the Neagh Bann and North Eastern IRBDs – these are shown in figure two below.[11] The fourth RBD is the Shannon IRBD; this is the largest in Ireland at more than 18,000 km^2 stretching from the source of the River Shannon in the Cuilcagh Mountains in Counties Cavan and Fermanagh to the tip of the Dingle peninsula in north Kerry.[12]

Figure 2: A map of the three River Basin Districts in Northern Ireland



Source: NIEA

[10] DoE [2008] *River Basin Management Planning* [online] available from: http://nia1.me/vw
[11] DoE [2008] *River Basin Management Planning* [online] available from: http://nia1.me/vw
[12] Shannon River Basin District [online] available from: http://nia1.me/2xp

2.2.4 River Basin Management Plans

The process of compiling the first RBMPS began with a gap analysis which required identifying the current status of the water bodies within the river basin (bad, poor, moderate, good or high) and assessing the 'gap' that must be filled in order to satisfy the requirements of the WFD i.e. that both the ecological and chemical status of all water bodies are 'good'.

Having identified the gaps, a 'programme of measures' was planned. These address what is required to achieve good ecological and chemical status in water bodies 'at risk' of failing to meet these targets. The first programme of measures to achieve good status (or potential) had to be in place by 2012 with the intention of achieving the objectives by 2015. Progress with WFD implementation is reviewed on a six-yearly basis and there are two further WFD planning cycles – up to 2021 and 2027.

2.3 Northern Ireland (Consent to Discharge)

In Northern Ireland, the Water (NI) Order 1999 requires individuals or businesses to acquire consent to discharge from the Northern Ireland Environment Agency (NIEA) before any discharges are made into the water environment. Individuals or businesses that make discharges into the water environment without consent, or that make discharges that do not meet the conditions of their consent, are committing an offence.

Where the source of pollution can be traced, it is the policy of the NIEA, where appropriate, to take action. Article 7 (1) of the Order deals with the main pollution offence, which is:

- '…a person commits an offence if, whether knowingly or otherwise, that person discharges or deposits any poisonous, noxious or polluting matter so that it enters a waterway or water contained in any underground strata';
- 'A person guilty of an offence under this Article is liable on conviction to imprisonment for a term not exceeding three months or to a fine not exceeding £20,000 or to both'.

2.4 Scotland (Controlled Activities Regulations)

The Committee has previously shown particular interest in a model from Scotland which provided for targeted enforcement depending on the level of risk of activities. This is provided in the Scottish equivalent to our Consent to Discharge, known as CAR (Controlled Activities Regulations) authorisation. Controlled Activities Regulations were introduced through the Water Environment and Water Services (Scotland) Act 2003 (or WEWS). The outworking of this is that since 2006 it is an offence to undertake the following activities without a CAR authorisation:

- discharges to all wetlands, surface waters and groundwaters (replacing the Control of Pollution Act 1974 (CoPA));

- disposal to land (replacing the Groundwater Regulations 1998);
- abstractions from all wetlands, surface waters and groundwaters;
- impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters;
- engineering works in inland waters and wetlands[13].[14]

It is intended to control impacts on the water environment including mitigating the effects on other water users. Different levels of authorisation apply depending on the activities to be carried out ranging from:

- **General binding rules** (GBRs) – activities that are considered of low risk to the environment are covered by a GBR. You will not have to contact the regulating authority or incur any charges, although you will have to follow a set of rules.
- **Registration** – activities that pose a low individual risk, but may collectively affect the environment, will need a registration, require you to apply to the regulating authority and incur a fee. You will not, however, incur an annual subsistence charge.
- **Licence** – activities that pose a moderate to high risk to the environment will either be a **simple licence** or – for activities that need a more complicated environmental assessment – a **complex licence.** A licence depends on the identification of a 'responsible person', who must ensure compliance with the conditions of the licence. In both cases, an application charge will apply and the activity may also be subject to an annual subsistence charge.

The Scottish Environment Protection Agency is the body responsible for enforcing the Regulations.

2.5 Reducing pollution

Run-off from impermeable surfaces such as roofs and roads has been identified as a significant source of diffuse pollution, particularly in urban areas. This problem is compounded here in Northern Ireland due to the fact that over 70% of the public sewer system is 'combined', [15] meaning it was designed and constructed to collect both foul sewage and storm water. During periods of intense rainfall the capacity of the combined system is often exceeded causing out-of-sewer flooding of untreated foul sewage. Combined Sewer Overflows (CSOs) – whereby untreated waste is discharged directly into nearby streams, rivers, or other water bodies, is therefore necessary,[16] despite posing a serious pollution threat.

[13] PAGE 6 - SEPA (2013) The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide [online] available from: http://nia1.me/2xw
[14] Ibid.
[15] Water and Sewerage Services Bill: DRD Briefing , Committee for Regional Development, meeting on Wednesday, 3 June 2015 [online] available from: http://nia1.me/2p1
[16] DRD (2014) Sustainable Water A Long Term Water Strategy for Northern Ireland Part 3: Flood Risk Management and Drainage [online] available from: http://nia1.me/2p5

2.5.1 SuDS

One way of mitigating this threat is with the use of Sustainable Drainage Systems (SuDS). There a strong rhetoric for support for SuDS in Northern Ireland with the publication of a SuDS strategy in 2012.[17] However it is only now in 2016, through legislation brought by the Department of Regional Development (DRD) that developers will be required to consider SuDS for all new developments – with the power to refuse surface water connections on that basis.[18]

SuDS is the collective term for a number of approaches to manage surface water that take account of water quantity (flooding), water quality (pollution) and amenity issues. SuDS work by effectively mimicking the natural drainage cycle, which is altered by development. There are a large number of SuDS solutions; however, these can be grouped into two main categories: soft and hard.

Soft SuDS are usually landscaped, vegetated features including swales and detention ponds. Hard SuDS include proprietary engineered precast concrete soakaways, permeable paving and attenuation tanks. Many schemes will feature a combination of hard and soft SuDS solutions and this method is recommended by the construction industry research and information association (CIRIA) as the most appropriate technique for maximising SuDS performance.

2.5.2 SuDS in Scotland

The Controlled Activities Regulations (discussed in section 3.2) require the use of all reasonable steps taken to ensure protection of the water environment – including the use of SuDS. Two exceptions exist to this requirement: Where the development is only a single dwelling; and where the discharge is directly to coastal waters (this does not include transitional waters).[19] A survey into the use of SuDS in Scotland has highlighted that the use of SUDS has become standard practice in Scotland, with over 700 sites being listed and nearly 4,000 systems having been implemented.[20]

In contrast, the current uptake of sustainable drainage solutions for new developments within Northern Ireland is estimated to be below 5%.[21] One reason for this slow uptake had been the automatic right to connect surface water run-off to a surface or combined public sewer, granted under Article 163 of the Water and Sewerage Services (Northern Ireland) Order 2006.[22] This has been addressed via the Water and Sewerage Services Bill which is expected to pass final stage on the 25th January 2016.

[17] NIEA (2012) A Strategy for Promoting the Use of Sustainable Drainage Systems [online] available from: http://nia1.me/2p0
[18] McKibbin, D. (2015) Sustainable Drainage System provisions within the Water and Sewerage Services Bill [online] available from: http://nia1.me/2xz
[19] SEPA [online] Diffuse pollution in the urban environment (SUDS). Available from: http://nia1.me/2xy
[20] SUDS in Scotland – the Scottish SUDS database - SR (02)09 cited by SEPA [online] Diffuse pollution in the urban environment (SUDS). Available from: http://nia1.me/2xy
[21] DoE (2014) Revised Planning Policy Statement 15 'Planning and Flood Risk' [online] available from: http://nia1.me/2pc
[22] NIEA (2012) A Strategy for Promoting the Use of Sustainable Drainage Systems [online] available from: http://nia1.me/2p0

Other barriers to SuDS uptake include the lack of knowledge and expertise in SuDS with uncertainty over whole life costs, the extent of land-take required in new developments, future maintenance responsibilities and adoption.[23] [24] To overcome these barriers the Northern Ireland SuDS Strategy recommends a number of actions:

- Specific training for the organisations involved (NIW, DRD, Planning NI, NIEA etc.) to provide an understanding of the applicability, limitations and benefits of SuDS;
- Responsibility for approving SuDS in new developments should rest with a SuDS approving body; and
- NIW should adopt and maintain approved 'hard engineered SuDS' within new developments in accordance with its sewer adoption policy and procedures.

Although the uptake of SuDS has been slow in Northern Ireland it is worth noting that SuDS have been included in 16 of Transport NI's major works schemes during the past 12 years.

SuDS schemes are also included in new developments with NI Water having adopted 59 schemes as part of the sewerage network since 2011. NI Water expects that it will adopt a further 31 schemes in new housing developments during 2015/16.

Source: DRD

The importance of SuDS should not be underestimated. Evidence given to the Regional Development Committee during its scrutiny of the Water and Sewerage Service Bill suggested that not only are SuDS recommended they will in fact become an essential factor in our ability to successfully manage storm water, mitigate flooding and of course reduce pollution incidents.

2.6 The Impact of the WFD and related Directives

Ten years after the adoption of the WFD, EU water policy was chosen as a pilot area for a policy 'fitness check' to ensure it continues to be fit for purpose. This forms part of the European Commission's Smart Regulation Policy, announced in its *Work Programme for 2010.* The purpose of the fitness checks *"…is to identify excessive burdens, overlaps, gaps, inconsistencies and/or obsolete measures which may have appeared over time".*[25] [26]The results of this 'fitness check' were published in 2012. They confirmed the validity of the EU's current water policy framework. However, in terms of the achievement of good status of many water bodies, there remains a long way to go.[27]

[23] Bastien, N.R.P., Arthur, S., Wallis, S.G. and Sholz, M. (2007) Towards the best management of SuDS treatment trains[online] available from: http://nia1.me/2p6

[24] DRD (2015) Draft Consultation Report Sustainable Water Draft Long-Term Water Strategy for Northern Ireland (2014 – 39). DRD: Belfast

[25] European Commission (2010) *Commission Work Programme 2010: Time To Act* [online] available from:

[26] Kampa, E., Von der Weppen. J. and Farmer, A. (2012) *2nd Stakeholder Workshop for the Fitness Check of EU Freshwater Policy.* European Commission [online] available from: http://nia1.me/vz

[27] EC (2015) The Water Framework Directive and the Floods Directive: Actions towards the 'good status' of EU water and to reduce flood risks [online] available from: http://nia1.me/2xx

3 Pollution Causes

Europe's water resources and ecosystems are extremely vulnerable to threats such as climate change and population growth. However, it has been suggested that it is human activities, such as agriculture and industry, which are the main causes of water pollution.[28] This pollution can come from a '*point source',* where there is a specific identifiable origin, such as a sewage pipe or factory wastewater pipe, or a non-point source (*'diffuse pollution')* which, because of its multiple origins, is more difficult to identify.

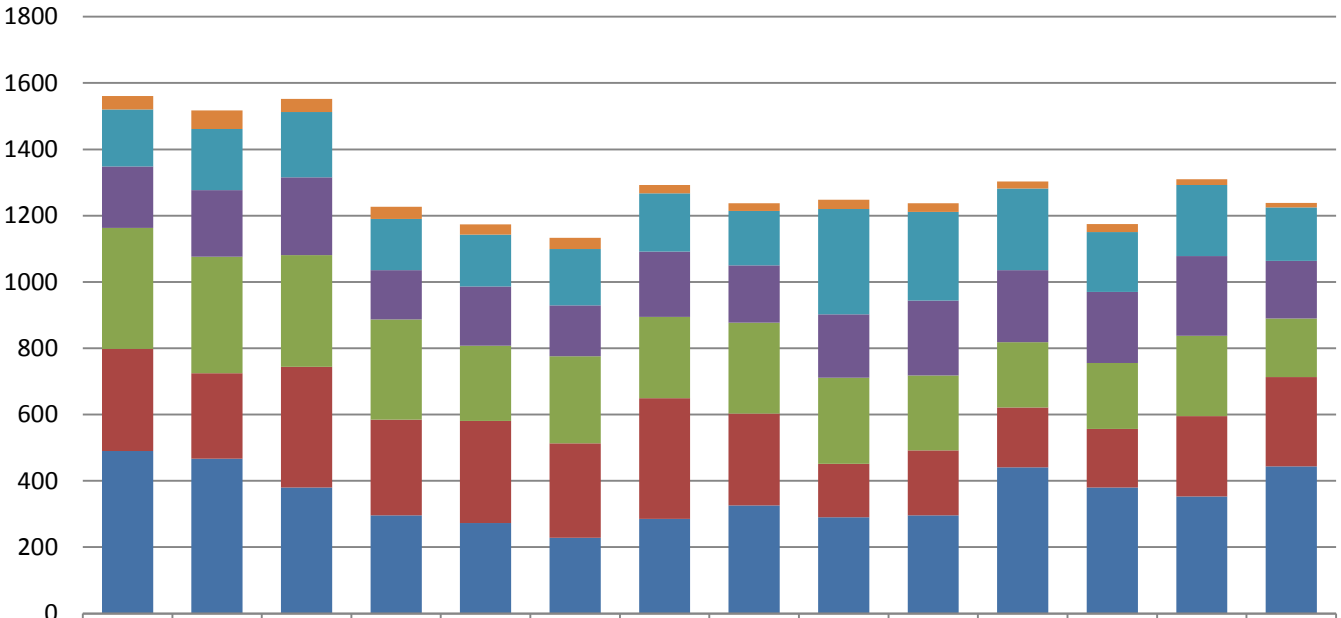
The prevailing land use of a region or river basin district, will determine the pressures faced by its water environment and this varies greatly across the EU. However, the Scottish and Northern Ireland Governments both recognise diffuse pollution as the biggest pollution threat to their respective water environments.[29] Joint guidance produced by the environmental regulators in both Jurisdictions – the Northern Ireland Environment Agency (NIEA) in Northern Ireland and the Scottish Environment Protection Agency (SEPA) in Scotland – identify the main sources of diffuse water pollution in rural areas as run-off from agricultural land and silt and dust from the mining, quarrying, and construction industries.[30] The guidance also states that in urban areas sources of diffuse water pollution include pollutants from car parks and transport; heavy metals and pollution washed from roofs and yards; animal faeces, for example from dogs and birds; and incorrect waste pipe connections.[31]

3.1 Northern Ireland Figures

The following section is concerned with causes and source of river pollution in NI as can be identified from DOE data. It illustrates the trends in pollution incident source (Figure 1) and cause (Figure 2) from 2001 to 2014 and highlights any main trends observed.

[28] Azmat, G. and Scrimgeour, F. (2014) Modelling governance and water pollution using the institutional ecological economic framework. *Economic Modelling*, Volume 42, October 2014, Pages 363–372
[29] SEPA and NIEA [online] Preventing water pollution. Available from: http://nia1.me/2x9
[30] Ibid.
[31] Ibid.

Figure 3: Trend in Incident Source 2001 to 2014

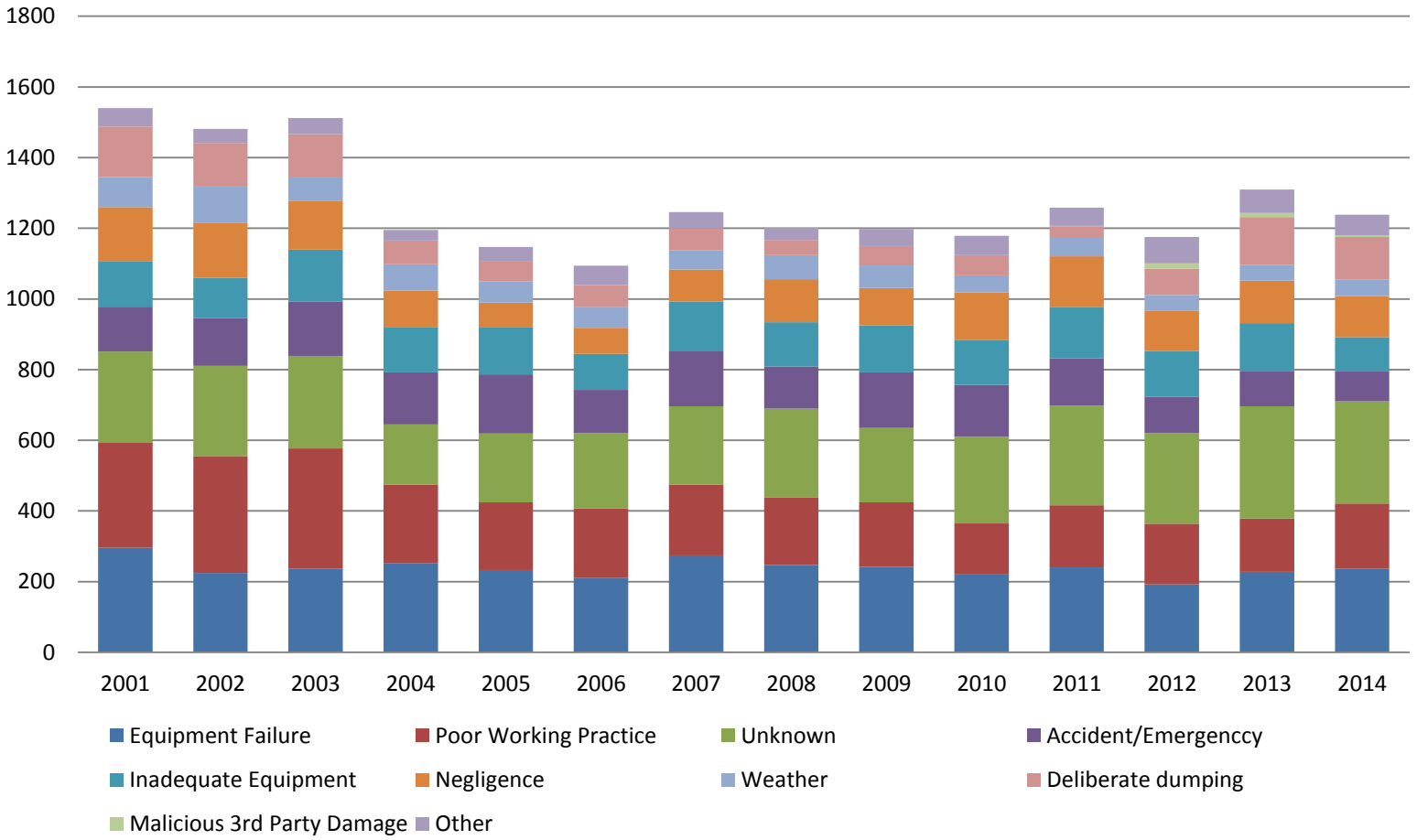


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Transport	41	56	39	37	31	34	25	23	28	26	21	24	18	13
Northern Ireland Water Ltd	172	184	197	154	157	170	175	164	318	267	246	181	214	161
Domestic	185	201	235	149	178	153	197	173	191	226	218	214	240	174
Industry	365	351	337	302	227	263	246	274	260	226	197	199	243	177
Other	308	258	364	289	308	285	364	277	161	196	180	177	242	269
Farm	490	467	380	296	273	228	285	326	290	296	441	380	353	444

Source: DOE (2013)[32]

[32] Data provided by DOE and DOE (2014) Water Pollution Incidents and Enforcement 2013

Figure 4: Trend in pollution incident cause 2001-2014



Source: DOE[33]

[33] Data provided by DOE and DOE (2014) Water Pollution Incidents and Enforcement 2013

3.1.1 Observations

Figure 3 shows farm source to have been consistently the highest pollution source from 2001 to 2014, showing a slight reduction to 2006, followed by a gradual rise to 2014. The other main contributors seem to fluctuate over the years between 'other', industry and at times NIW. However, NIW appears to have had a decrease from 318 in 2009 to 161 in 2014. In comparison, the number of 'other' sources has increased since 2012 from 177 to 242 in 2013 and 269 in 2014.

Figure 4 shows that poor working practice, equipment failure and 'unknown' have been the main causes of pollution incidents since 2001. In fact 'unknown' appears to have increased since 2009 from 211 to 317 in 2014. Also, deliberate dumping appears to have increased particularly since 2011 from 31 to 136 in 2014.

3.1.2 Consideration Points

The Department has highlighted the importance of tackling and identifying diffuse source pollution suggesting that this may be the cause in some (68%) of river body failures.[34] . Also, statistics indicate that low severity incidents and farm sources appear to be the largest contributors to river pollution. An increase in 'other' sources and 'unknown' causes since 2009 suggests a growing problem with detection; further explanation as to whether this is the result of operational problems or other external factors may be needed.

As an example, Scotland has a Rural Diffuse Pollution Plan with legislation in place to tackle diffuse pollution from rural sources. Wales also has a Diffuse Water Pollution Action Plan (see Information Box 1).

Information Box 1: Rural Diffuse Pollution Plan

The Rural Diffuse Pollution Plan, produced under the Controlled Activities Regulations, ensures the buy-in and co-ordinated work of key stakeholders. It contains an action plan explaining the actions that Diffuse Pollution Management Advisory Group (DPMAG) and its members are required to perform to ensure a co-ordinated response to tackling diffuse pollution from rural sources. It also has a communications plan requiring members to develop and promote the national awareness campaign.

As a result the National Farmers Union (NFU) of Scotland was keen to be involved in awareness raising for their members, to bring them up to the required standard of compliance. The stakeholders have been involved in joint on-farm workshops and contributed to farmer friendly guidance, including the Farming and Water Scotland website. This is hosted by Scotland's Rural Universities and Colleges which provides ideas, information and contacts to help reduce diffuse pollution from farms.

Wales also has a Diffuse Water Pollution Action Plan available here. England conducted a consultation, September to November 2015, on introducing new basic rules for farmers to tackle diffuse pollution from agriculture (mainly phosphorus).

[34] RaISe (Nov 2015) NIAR 626-15 *River Pollution: Background and Summary of Potential Issues.* P. 9 http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2015/environment/12715.pdf

As discussed in the previous Research Paper for the Environment Committee *River Pollution: Background and Summary of Potential Issues,* around 33% of river body failures in Northern Ireland are due to point source discharges from Waste Water Treatment Works (WWTWs), industry, sewerage networks, urban runoff and other non-sewered discharges. In England, the Environment Agency (England) has established partnerships with regional River Trusts to engage communities in monitoring urban pollution of their local rivers in an attempt to address urban runoff and pollution. See Information Box 2

Information Box 2: EA River monitoring Partnerships (England)

The South East Rivers Trust work with the Environment Agency (EA) engaging local communities in monitoring urban pollution in their local rivers. This provides feedback to the EA where they are not able to attend lower impact pollution incidents. There is now a trained volunteer task force that can provide a first line of response to assess the situation and report back to the EA. The information is used to update the EA's incident management system and enhance understanding of these rivers, including details of river pollution trends, and gaining knowledge of where habitat improvements are needed.
More information is available here.

It is generally accepted that an On Site Waste Water Treatment Systems (OSWWTS), such as septic tanks, that are well constructed, sited and maintained to approved standards, pose a 'relatively small' pollution risk[35]. However, a high density of OSWWTS, particularly those that are poorly maintained has been shown to increase the risk of pollution.[36] [37] For example, a study conducted in three rural tributaries of the Blackwater River in counties Tyrone, Armagh and Monaghan found that nutrient levels exceeded acceptable levels more frequently in catchments with higher densities of OSWWTS than those with lower densities.

A survey that recorded the state of OSWWTS infrastructure in the Blackwater area found that of the 113 OSWWTSs surveyed, 35% were at a high risk of having a negative impact on water quality due to the condition of the system, while 73% were assessed as a medium risk. See information Box 3

[35] SNIFFER (2009) Review of the Legislative Requirements and Responsibilities Relating to On-site Wastewater Treatment Systems and Their Impact on Water Quality [online] available from: http://nia1.me/2rd PAGE 26
[36] Arnscheidt, J., Jordan, P., Li, S., McCormick, S., McFaul, R., McGrogan, H.J., Neal, M. and Sims, J.T. (2007) Defining the sources of low-flow phosphorus transfers in complex catchments. Science of the Total Environment vol. 382 pp. 1-13 [online] available from: http://nia1.me/2rc (subscription required)
[37] NIEA [online] River Basin Management Plans: Programme of measures. Available from: http://nia1.me/2ri

Information Box 3: Septic Tanks

According to the Northern Ireland Environment Agency (NIEA) there are 113,254 consented On Site Waste Water Treatment Systems in Northern Ireland, whilst there are approximately 16,000 unconsented systems. There are two potential areas of concern in this matter:

1. There is uncertainty with regards the exact figure of unconsented system and more importantly what condition these systems are in; and
2. Where systems are consented, little if anything is known about the condition of these systems and whether or not they are being suitably maintained.

RaISe publication 585-15 discusses the use of onsite wastewater treatment systems in Northern Ireland in some detail looking particularly at the threat posed to water quality. This paper includes a discussion on the inspection and replacement scheme introduced in the Republic of Ireland in 2012 as a means of improving water quality and looks at some of the early outcomes of this policy.

4 Pollution monitoring

4.1 Background

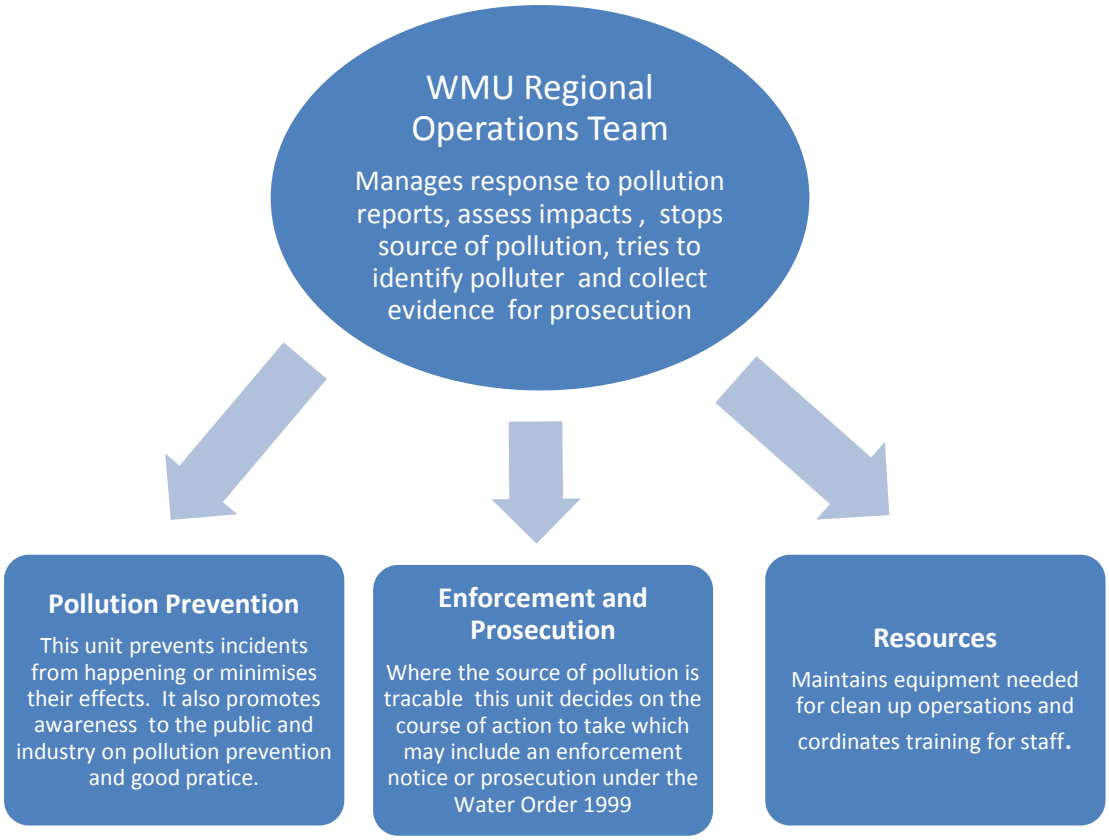
Protection of the water environment is the responsibility of the Northern Ireland Environment Agency (NIEA) under its Environmental Protection Directorate. Within this Directorate is the Water Management Unit (WMU) which aims to conserve, protect and improve both freshwater and marine aquatic environment of NI. The WMU consists of both centrally located scientific staff and field agents located across NI who:

- Take action to combat or minimise the effects of pollution;
- Monitor water quality;
- Prepare water quality management plans;
- Control effluent discharges; and
- Support environmental research

The WMU has a Regional Operations Team formed under terms of the Water (Northern Ireland) Order 1999 and the Control of Pollution (Oil Storage) Regulations (Northern Ireland) 2010.

This team is responsible for preventing pollution of waterways, responding and managing the risk of pollution and taking enforcement action against polluters. It particularly deals with major scale emergency incidents that exceed (or are likely to exceed) the capability of NIEA Response Plans or the Local Government Division. To perform these roles, the team is split into further units, some of which include the following, as shown in Figure 5.

Figure 5: Structure of NIEA Operations Team



***Field staff**: NIEA relies on external services for field staff provided from Group Environmental Health Committees. Field staff perform a range of duties including pollution investigation, sampling and collecting evidence, clean-up work, pollution prevention, recommendations on discharge consents.*

Source: DOE[39]

[39] The NIEA and Water Pollution https://www.doeni.gov.uk/articles/niea-and-water-pollution (Accessed 14/01/2016) and information supplied by DOE (21/-1/2016)

4.2 Monitoring in NI

This section focuses on the monitoring of river pollution. When dealing with incidents of pollution, NIEA's Operations Team rely on reports of incidents by the public and industry and on detection by field agents during their ongoing work and monitoring of river bodies.[40]

Figure 6 illustrates two main avenues of detection described above and illustrates how these may feed into the overall management process for river pollution

Figure 6: Outline of pollution detection and response

Source: Created using information from DOE[41]

[40] ibid

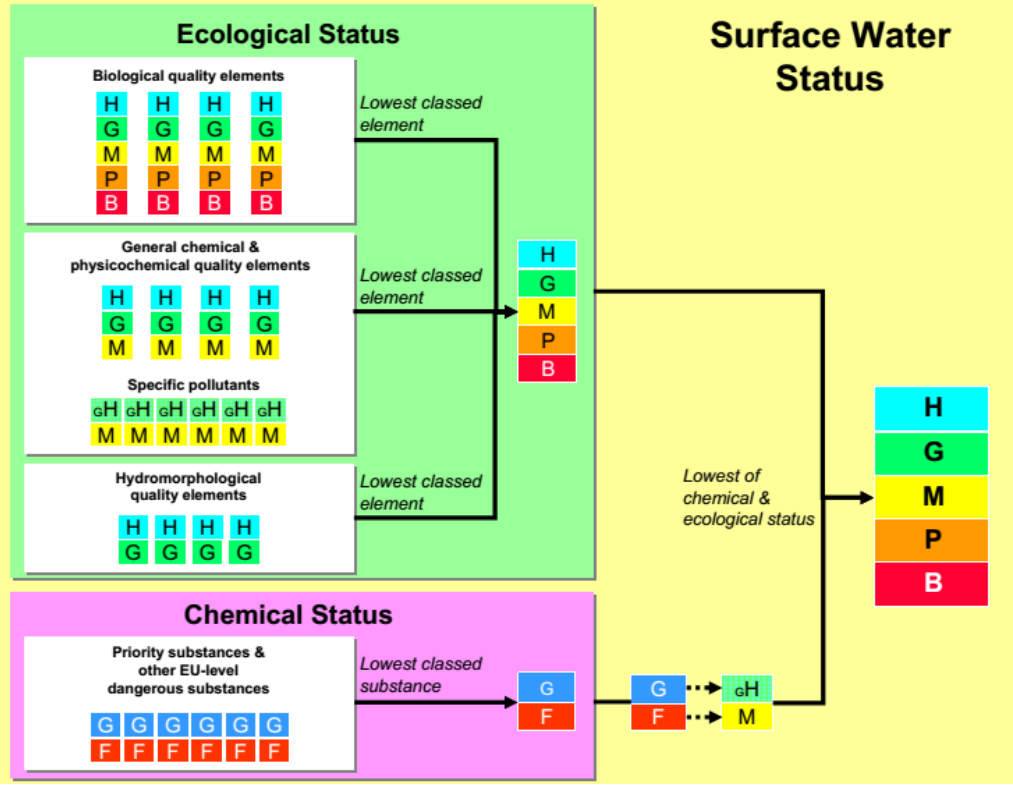
[41] The NIEA and Water Pollution https://www.doeni.gov.uk/articles/niea-and-water-pollution (Accessed 14/01/2016) and information supplied by DOE (21/01/2016)

4.2.1 Ongoing work/monitoring

Under the Water Framework Directive, member states are required to monitor and report on the status and classification of water quality, which is determined by assessing a combination of biological, chemical, ecological and hydromorphilogical quality elements (macroinvertibrates, Ph and ammonia) to assign status from 'high' to 'bad' quality. [42]

Figure 7 shows how results for different quality elements are combined to assign status of surface water.

Figure 7: Quality elements assessed to assign Surface Water Status



Source: UK TAG[43]

Classification requirements from the WFD are transposed in Northern Ireland (NI) through the the Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015.

The Northern Ireland figures for status of our water bodies show that 37% meet good status as required under WFD. This is better than England (17%), comparable to

[42] DOE (2015) Northern Ireland Water Framework Directive Statistics Report October 2015

[43] UK Technical Advisory Group on the Water Framework Directive (2007) Recommendations on Surface Water Classification Schemes for the Purposes of the Water Framework Directive (p.5)

Wales (39%) and behind Scotland (65%). Ireland is at 52% (rivers only). Northern Ireland has shown the highest level of improvement, from 28% in 2009, to 37%, a 32% increase. [44]

According to information from DOE, around 600 river sites are monitored through the six year river basin management cycle of the WFD. Therefore due to the amount of data, DOE reports on the overall status and not individual measurements.[45]

This may bring about the opportunity for the detection and reporting of pollution to the NIEA Operations Team as explained in Figure 6.

4.2.2 Reports of pollution

Another avenue for the detection of pollution is through reports made to NIEA on pollution or incidents; these may be made by members of the public, industry, farmers etc.

NIEA operates a free phone Water Pollution Hotline available to the public at all times. During office hours calls made are directed to the operations room in Lisburn, where the incident is assessed and passed to field staff for investigation. Outside office hours, calls are directed to the Environment Agency (EA) Communications Centre (Reading), who contact an O-Call Duty E Pollution Officer in NI to respond.[46]

There are examples of approaches which encourage monitoring and investigation of pollution by local communities; one is described in Information Box 4.

Information Box 4: Riverfly Partnerships

This is a community-led initiative to monitor river stretches to identify pollution. Those involved are trained in simple river monitoring techniques, using aquatic animals, which can be checked on a regular basis. Any significant changes can be quickly identified and investigated. Groups are active on the Enler, Lagan, Six Mile Water, Faughan, Derg and Roe rivers. [47]

This method relies on the actual reporting of pollution by those who detect it. However, in a Code of Practice for farmers under Cross Compliance requirements for the use of plant pesticides (SMR 10) (see Information Box 4), reports are required to be made to NIEA Pollution Unit with any instances affecting fish.[48]

[44] Information provided by DOE (13/11/2015)
[45] Information provided by DOE 30/11/15
[46] Information supplied by DOE (21/01/16)
[47] Information provided by DOE 13/11/2015)
[48] https://www.dardni.gov.uk/publications/code-practice-using-plant-protection-products p.60

Any breach of Cross Compliance requirements may jeopardise support received by a farmer under the Common Agricultural Policy as detailed in Information Box 5.

Information Box 5: Cross Compliance for farmers

Cross compliance is a key feature of the Common Agricultural Policy. Farmers receiving support under CAP are required to meet a series of requirements towards the protection of the environment and also animal health and welfare and public health. There are two types of cross compliance requirements that farmers are required to meet:

Statutory Management Rules (SMRs) – these are fixed across the EU; and

Good Agricultural and Environmental Condition (GAEC) –these can be tailored to individual Member States.

Those SMR and GAECs that would impact upon river quality and pollution include:

SMR1 – Protection of water against nitrate pollution

SMR 10- Restrictions on the use of plant protection products

GAEC 1- Establishment of buffer strips along watercourses

GAEC 3- Protection of Groundwater against pollution

GAEC 4- Minimum soil cover (could have silting impacts)

For more information see RaISe Paper (NIAR 599-15) on Cross Compliance Standards and Inspection processes utilised by DARD and NIEA.

Duty to report

There appears to be requirements for farmers to report pollution in order to keep in line with Cross Compliance under SMR 10.

Under the main enforcing legislation (the Water Order 1999) used by NIEA under its water pollution management role[49], there does not appear to be any general requirement to report a pollution incident as there is no offence for *not* reporting one. However, reporting requirements appear to be included under licensing conditions.

The Pollution Inventory (PI) records information about releases of substances from industrial activities regulated by NIEA under the Pollution Prevention and Control (PPC) Regulations, and other operators such as large water treatment works.[50] Regulated industries with a PPC permit are required to record the annual release of specified substances (this includes substances from a number of EU requirements, including the WFD[51]). If emission releases are above the stated annual thresholds for specified substances, industries must report this to NIEA to be included in the Pollution Inventory database. These include 'notifiable releases' that are unplanned and unauthorised

[49] See Enforcement in DOE [online] The NIEA and Water Pollution https://www.doeni.gov.uk/articles/niea-and-water-pollution (Accessed 14/01/2016)

[50] NIEA (2013) Pollution Inventory Reporting Form Consultation Document https://www.doeni.gov.uk/sites/default/files/consultations/doe/pollution-consultation-inventory-reporting-form-revision-2013.pdf

[51] Ibid p. 4

releases of a particular substance(s) to the environment. These may result from an emergency, mis-operation, accident or plant failure.[52]

4.3 Consideration Points

- As it appears, NIEA also rely on external reports of pollution, it may be of interest to find out how well utilised the Pollution Incident Hotline is and how often pollution is detected through the Pollution Inventory process, so as to give an indication as to whether further measures could be considered to encourage/require external reporting.
- The Pollution Incident Hotline directs calls made outside of office hours to the EA in Reading, who contacts an on-call officer here. It may be interesting to find out how many calls are made out of hours and whether this approach affects the response time and efficiency in any way.
- It may be of interest to find out whether there are any NIEA manuals or procedures to be followed when responding to pollution incidents and whether these are shared across departments.
- Reporting requirements under the PI are on an annual basis, it may be of interest to find out whether there are any requirements for the immediate reporting of pollution incidents from all industry/business, similar to those for farmers under Cross Compliance requirements.
- The Environmental Better Regulation Bill is currently with the Assembly and aims to streamline all environmental permitting.[53] It may be of interest to find out whether pollution reporting requirements will be included under the new permitting regime.

[52] NIEA Pollution Inventory Reporting – General Guidance Notes https://www.doeni.gov.uk/sites/default/files/publications/doe/pollution-guidance-niea-inventory-reporting-guidance-2013.pdf

[53] Environmental Better Regulation Bill as introduced http://www.niassembly.gov.uk/assembly-business/legislation/2011-2016-mandate/primary-legislation-current-bills/environmental-better-regulations-bill/

4.4 Monitoring in other jurisdictions

The following table presents a summary of the monitoring processes for pollution incidents in other jurisdictions. The table is based on information supplied by each of the respective environment agencies, for which there was a difference in the level of detail provided. Therefore the information provided is not conclusive but provides an indication of the general process.

England and Wales	Scotland	Republic of Ireland
The Environment Agency may become aware of a potential pollution incident by several different means, which includes: receiving third party reports (e.g. members of the public, emergency services, local authorities, asset and site owners/operators); through monitoring activities; and the Environment Agency's own observations. The Environment Agency operates an Incident Communication Service (ICS) that is available to receive incident reports 24 hours/day. The Environment Agency assess information to determine whether an incident has occurred and how or if the Environment Agency should respond (in a prioritised and risk based approach); ***Reporting Duty*** Water companies are responsible for the self-reporting of pollution incidents to the EA. The company must use EA guidance to assess whether tomake a report. A site operator may be issued with an Anti-Pollution Works Notice to clean up and prevent future pollution incidents.	River pollution complaints and reports are sent to local teams via SEPA's call centre. These may be a mix of public complaints (emails and calls), notified incidents (from Scottish Water, local authorities, public etc) and from SEPA staff that are out on inspections, complaint investigations, routine monitoring, etc. They are passed through to the local teams where they are assessed for priority then investigated accordingly.[54] There is also a National Monitoring Team who's prime task is to undertake routine monitoring i.e. sampling, of rivers, lochs and discharges from public sewage treatment works run by Scottish Water. These samples are analysed and the results collated into water quality data and scores against compliance with the regulations for the licenced sites.[55] ***Reporting Duty*** Most licenced sites are required to report incidents; this is a common condition in the CAR (Controlled Activities Regulations) licence, therefore incident notifications can be received this way. As above, local teams triage the issue and investigate accordingly.[56]	In general, long term water pollution is detected via the Water Framework Directive Operational and Surveillance monitoring programme. This covers around 1800 river stations for chemical analysis annually and around 2500 for biological analysis (over a 3 years period).[57] While this approach will throw up long term problems it is more common that localised (sporadic pollution) incidents are reported to EPA or to the Local Authorities by members of the public, farmers, fishermen, or through inspections by local authority or Fisheries Board staff etc. In such cases these are investigated by EPA or by whichever relevant body receives the incident notification.[58] ***Reporting Duty*** Localised pollution arising from incident discharges at EPA licensed industrial facilities or from e.g. wastewater treatment plants is required to be reported by the facility (on pain of enforcement proceedings for non-compliance with their licence) or by Irish Water (in the case of water / wastewater facilities).[59]

[54] Correspondence with SEPA Local Environment Protection Officer (15/01/2016)
[55] ibid
[56] ibid
[57] Correspondence with Environmental Queries Officer, Environmental Protection Agency (ROI) (18/01/2016)
[58] ibid
[59] ibid

4.4.1 Observations

In a similar way to Northern Ireland, jurisdictions such as Scotland, Wales and England have two main avenues for the detection and reporting of pollution incidents:

1. through the routine water quality monitoring and sampling of rivers by environment agency staff.
2. through external reports made due to reporting requirements for industries and farmers, or voluntary reports by established partnership groups, programmes or general public, industry, farmers, river users etc.

Whichever avenue is used all reports are assessed by a central team to determine the level of response to be made by the respective environment agency and the need for any enforcement action.

5 Enforcement

As referred to under section 2.3.1 above, under the Water (Northern Ireland) order 1999 it is an offence to deliberately or accidentally cause pollution of a waterway, as stated under Article 7:

> *…a person commits an offence if, whether knowingly or otherwise, that person discharges or deposits any poisonous, noxious or polluting matter so that it enters a waterway or water contained in an underground strata*[60]

Where it is possible to trace the source of pollution, it is the responsibility of the NIEA (Enforcement and Prosecution team (see Figure 5)) to decide on the line of action to take.[61] This may include an enforcement notice or prosecution where a person guilty of an offence under Article 7 is:

> *… liable on conviction to imprisonment for a term not exceeding three months or to a fine not exceeding £20,000 or to both*[62]

In addition to this, a guilty party may:

- have to pay for analysis and court costs;
- be liable for the cost of clean-up operations, which can easily run into tens of thousands of pounds;
- have to pay compensation to angling clubs if a fish kill occurs; and
- suffer reputational damage to their business.

[60] Water Order (Northern Ireland) 1999 http://www.legislation.gov.uk/nisi/1999/662/contents/made
[61] DOE [online] The NIEA and Water Pollution https://www.doeni.gov.uk/articles/niea-and-water-pollution (Accessed 20/01/2016)
[62] Water Order (Northern Ireland) 1999 http://www.legislation.gov.uk/nisi/1999/662/contents/made

If it is decided that prosecution is appropriate, NIEA staff collect evidence which is submitted to the Office of the Director of Public Prosecutions.[63]

6 Further considerations

- As indicated in the RaISe research paper *River Pollution: Background and summary of potential issues*, problems related to river quality and pollution incidents are not solely an NIEA problem due to the dispersal of responsibilities across departments. Therefore, there may be a need for a more integrated and joined-up approach.
- While departmental re-organisation in May 2016 may bring an opportunity for more joined up working, it is important that work is underway to ensure the effective changeover and amalgamation of two departments (DARD and DOE) with different, and sometimes competing, priorities.
- The current Minister has opened up discussion surrounding the creation of an independent Environmental Protection Agency (EPA).[64] However, further details will be needed on the positioning of responsibilities within the new department and EPA to ensure all responsibilities are given equal weight.
- Effective pollution management (pollution prevention, monitoring and response and enforcement) is underpinned by the effective implementation of the WFD as indicated in this paper.
- To address overarching issues surrounding river pollution, appreciation should be given to the link to the WFD which has an impact on:
  - Pollution prevention
  - Water quality and pollution monitoring
  - Reporting and responding to pollution
  - Partnership working[65]
- Pollution management (including pollution response, monitoring, prevention and enforcement) would appear to be resource intensive and a highly specialised area. It may be of interest to find out whether there has been (or is expected) any impact due to budget cuts and any loss of expertise due to the Voluntary Exit Scheme.
- There is a need to investigate further approaches to addressing the ongoing problem of diffuse source pollution, particularly rural diffuse pollution as discussed in

[63] DOE [online] The NIEA and Water Pollution https://www.doeni.gov.uk/articles/niea-and-water-pollution (Accessed 20/01/2016)

[64] DOE (Nov 2015) Durkan seeks views on independent environmental protection agency https://www.doeni.gov.uk/news/durkan-seeks-views-independent-environmental-protection-agency (Accessed 25/01/2016)

[65] England uses the Catchment Based Approach (CaBa) and the Department has suggested the use of the Water Catchment Partnership approach to encourage partnership working. However, the Rural Diffuse Action Plan produced under the CAR regulations in Scotland is an example of using legislation to ensure partnership working (see Information Box 1). However, the question is whether there would be a legislative basis for a similar approach in NI. For further information on the CaBa see RaISe (2015) River Pollution: Background and summary of potential issues. Section 6 http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2015/environment/12715.pdf

section 2.2. A number of other legislatures have introduced diffuse and rural diffuse actions plans such as Scotland and Wales, and England is consulting on one (see Information Box 1).

- Other main causes of pollution include equipment failure and poor practice, does this suggest the need for improved education, awareness development and support across the business, industry and agriculture sectors?
- The responsible operation of business, industry and agriculture is largely controlled through the environmental permitting process. Changes to environmental permitting are to be introduced through the Environmental Better Regulation Bill which will bring a hierarchy of licensing, similar to that in Scotland under the Controlled Activities Regulations (see section 2.3.2). This allows regulators to focus efforts on high risk activities. However, further detail on the operation of this is to be provided under supplementary regulations in Schedule 1 of the Bill, which the Department may be able to provide in due course.
- Enforcement may be seen as a form of prevention, and it may be of interest to find out whether current measures (see section 5) are considered sufficient.