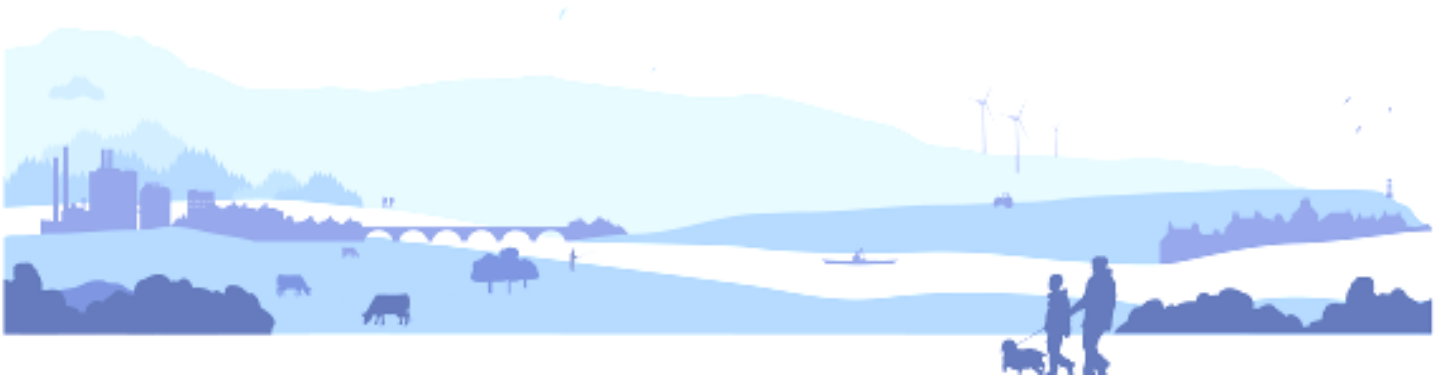
Current condition and challenges for the future: Solway Tweed river basin district



A public consultation

Foreword

This public consultation provides you with the opportunity to contribute to the development of new approaches for the water management challenges for the Solway Tweed river basin district. It is set in the context of an update on the condition of the water environment and our progress on delivering the first management plan published in 2009 which set targets for water management for 2015 and beyond.

The information and analyses presented in this document support the development of the second river basin plan to be published in 2015. Specifically, we are looking for your views and ideas for making the step change required to meet these key challenges.

Since publishing the first river basin plan our understanding of impacts on the water environment has greatly improved and partnership working has strengthened. However, there is still a lot of work to be done in order to meet the challenge of achieving good ecological status for the waters in the Solway Tweed river basin. Your input to this consultation and involvement in the second river basin plan is essential to meet our shared goal of sustainable water management.

James Curran
Chief Executive
SEPA

Steve Moore
Director North West
Environment Agency

Contents

1. Introduction

At the end of 2009, the first management plan for rivers, lochs, estuaries, coastal waters and groundwaters in the Solway Tweed river basin district was published (map 1). The plan identified where our waters are in a good or excellent condition and where they are under pressure. It also set improvement targets for right up to 2027 and put in place a programme of measures for achieving these targets.

Since then the main task for us – the Scottish Government, DEFRA, the Scottish Environment Protection Agency (SEPA), the Environment Agency, responsible authorities and other key water users and interest groups - has been to put this plan into action on the ground. To do this effectively we have been working with water users to make the improvements needed to achieve our targets for 2015. SEPA and the Environment Agency have also been carrying out monitoring to improve our understanding of the pressures and impacts on the water environment and the effectiveness of the actions we have been taking.

We now need to start work to prepare a second river basin management plan for publication at the end of 2015. The information contained within this document will provide the starting point for the second plan. There are three main parts to this report[1]:

- A description of the current condition of the water environment in the Solway Tweed river basin district;
- An assessment of progress on 2015 improvement targets;
- Discussion around the significant water management challenges we need to address in order to meet our objectives for the second and third cycles of river basin management planning and the potential options to manage these.

We are seeking your views on the significant management challenges and on potential new options for tackling them. We have asked specific questions in relation to the management challenges discussed in Section 5; however you are welcome to feedback on any aspect of this document. The ways you can respond are detailed at the end of this document and the list of consultation questions are found in the Annex. Your responses will help us develop draft proposals for the second river basin management plan which will be subject to consultation towards the end of 2014.

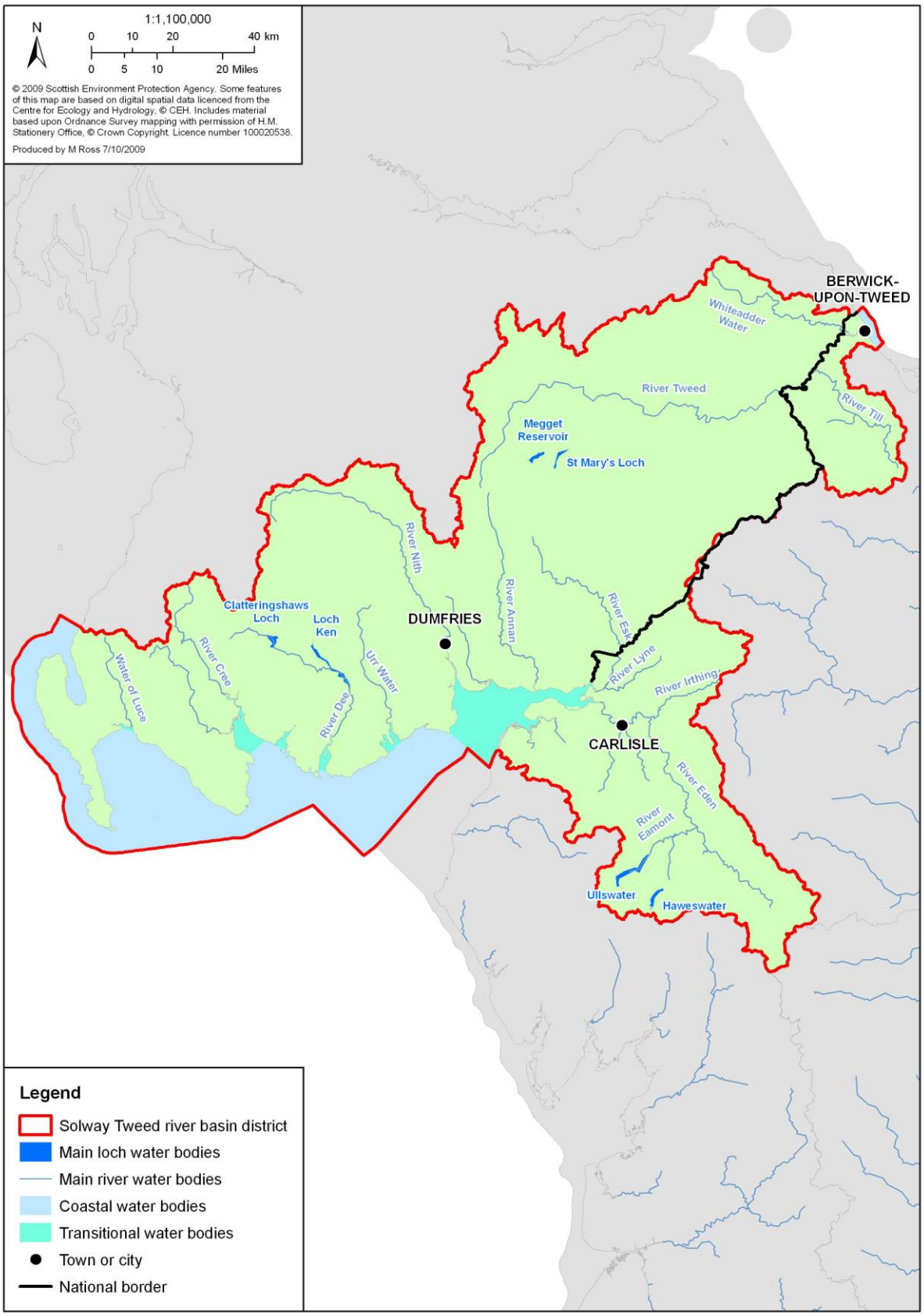
A significant amount of technical analysis underpins this document. You can access more detailed information at different spatial scales online via SEPA's supporting data application[2]. This will enable you to do custom searches on specific bodies of water or catchments of interest to you. You will also find information on our updated analysis on the benefits provided by the of the water environment. Links to the application are provided throughout this document.

We have also been working in partnership to produce the first Flood Risk Management (FRM) Strategies for publication at the end of 2015. These will identify the most sustainable measures to manage flood risk, some of which may also help address some of the key management challenges identified in this report.

[1] This summary together with the information available through the links in the document review and update the analyses and reviews required by Article 5 of the Water Framework Directive and provide the overview of significant water management issues required by Article 14.

[2] The supporting application is found on SEPA's river basin planning website: http://www.sepa.org.uk/water/river_basin_planning/significant_issues/CCCF_Data_Application.aspx

Map 1. The Solway Tweed river basin district



2. Benefits provided by the water environment

We all enjoy the benefits of a clean and healthy water environment. Protecting these benefits and maximising their accessibility is at the heart of river basin planning. It is our role to ensure that we sustainably manage the many ways in which we use the water environment - from generating electricity to supplying communities with drinking water to enjoying walks near our many rivers, lochs and coastal areas.

Obtaining benefits from the water environment, such as hydroelectricity and drinking water, can sometimes come at the expense of ecological quality. A key aim of river basin management is to appropriately balance competing demands when making decisions about protection of the water environment and the targets to be achieved.

SEPA and the Environment Agency are developing approaches to improve the way benefits are considered within river basin planning.

Since 2009, SEPA has been gathering information on a range of benefits that the water environment provides for us. To find out more about how the water environment contributes to our social and economic well-being in Scotland, please go to the supporting data application.

The Environment Agency is currently identifying the measures required to improve all their water bodies to good status and assessing the costs and benefits associated with these actions. For more information on the English approach, please go to: www.environment-agency.gov.uk/research/planning/33106.aspx.

The improvements we make to the water environment in the Solway Tweed will provide a number of wider benefits, including increased potential for economic growth, enhanced recreation and leisure activities and a healthy environment we can pass on to future generations.

3. Current condition of the water environment in the Solway Tweed river basin district

3.1 Current condition of the water bodies in the Solway Tweed

SEPA and the Environment Agency update assessments of the status of the water bodies in the Solway Tweed river basin annually. Tables 1a and b on the following page summarise the latest classification results, based on monitoring information collected up until the end of 2012[3]. Our most recent assessments show that approximately 44% of all surface water bodies in the Solway Tweed are at good or high status.

[3] Note that 2012 results are not directly comparable with previous years due to additional evidence, improved methodologies and water body changes introduced since 2008.

Table 1 a) and b) Current condition of surface and groundwater water bodies in the Solway-Tweed river basin district in 2008 and 2012

a) Surface water status class	Number and % of water bodies in 2008	Number and % of water bodies in 2012
High	10 (2%)	12 (2%)
Good	249 (43%)	242 (42%)
Moderate	226 (39%)	231 (40%)
Poor	69 (12%)	71 (12%)
Bad	27 (5%)	24 (4%)
Total	581	580

b) Groundwater status class	Number and % of water bodies in 2008	Number and % of water bodies in 2012
Good	60 (82%)	49 (75%)
Poor	13 (18%)	16 (25%)
Total	73	65

More information on monitoring and classification can be found at www.sepa.org.uk/water/monitoring_and_classification.aspx and the supporting data application.

By the end of 2012, the number of water bodies in good or better condition had marginally fallen since assessments made in 2008. Additional baseline information - for example identifying new fish barriers, monitoring of animal and plant communities and increasing our knowledge of the impacts on habitats - has been collected and our classification reflects this better understanding. In addition, at this mid-point of the river basin planning cycle, the impact of our programme of measures on the condition of water bodies is expected to be small. This is because it takes time to turn plans into changes on the ground, and then for changes on the ground to come through in monitoring results. This is partly due to lag times in the recovery of plant and animal communities and groundwater response times, and partly because the assessments are based on combining and averaging monitoring results collected over a number of years.

3.2 Preventing deterioration

Many of our waters are already in a good or excellent condition; a situation enjoyed by only a few countries across Europe. Protecting our waters from deterioration is one of our principal aims. To help us to do this waters that are close to the bottom of a status class have been identified where careful management of pressures may be needed to prevent deterioration of status. We have also identified waters for which trends in the concentrations of pollutants are likely to cause deterioration unless appropriate action is taken, and waters whose ecological quality is at risk from the spread of invasive non-native species (Table 2 on the following page).

Table 2: Preventing deterioration of surface and ground waters in the Solway Tweed[1]

	Surface and ground waters in which a deteriorating trend is present	Surface and ground waters close to the bottom of a status class		Surface and ground water of concern - expert judgement	Surface waters at risk from the spread of invasive species[2]
	Water quality	Water quality	Water flows & levels		
Number of water bodies	5	55	2	9	70
Percentage of all water bodies	<1%	9%	<1%	1%	17%

[1] Numbers in this table do not include the Environment Agency's latest risk of deterioration assessments that will be completed at the end of 2013. For further information go to Environment Agency - identifying pressures and risks.
For further details, including waterbody scale information, go to the supporting data application
[2]Numbers only relate to surface waters in the Scottish part of the Solway Tweed

Many activities have the potential to cause deterioration. SEPA and the Environment Agency set conditions of authorisation for new activities, and undertake subsequent audit and monitoring. These regulatory controls are designed to ensure the activities are undertaken in such a way that the water environment is protected. Those carrying out the activities have an important role to play in helping to prevent deterioration by adhering to these conditions.

Table 2 has shown that 17% of water bodies in the Scottish part of the Solway Tweed river basin district are potentially at risk from the spread of invasive, non-native species. Table 3 on the following page identifies the key species where a risk of deterioration is likely unless appropriate controls and management are put in place. The main known species posing a risk of deterioration is the North American signal crayfish.

Table 3: Risk of deterioration from INNS in water bodies of the Solway Tweed (Scottish part only)

Source of impact	Species	Number of surface water bodies at risk of deterioration by 2027 (Scottish Solway-Tweed only)
Marine species	Common cord-grass (*Spartina anglica*)	7
Freshwater species	Australian swamp stonecrop (*Crassula helmsii*)	2
	Riparian vegetation[1]	4
	North American Signal Crayfish (*Pacifastacus leniusculus*)	57

[1] Includes, Rhododendron (*Rhododendron ponticum*) and Himalayan Balsam (*Impatiens glandulifera*).

3.3 Current Condition of Protected Areas

A significant number of the water bodies in the Solway Tweed river basin district are designated as protected areas because of their importance for wildlife conservation, drinking water supply, shellfish harvesting or bathing. These designated areas are vital to ensure that the diverse ecosystems and cultural and economic benefits contained within them are safeguarded. Protected areas are also important drivers of improvement objectives in the river basin plan.

Two of our three shellfish waters are not meeting the guideline standard in 2012 and updated assessments show that eight out of our nine bathing waters are also not at target condition. The main objective for drinking water protected areas is to prevent any deterioration in water quality that could compromise water supplies unless purification treatment is increased; 12 drinking water protected areas are at risk of deterioration.

Areas protected for wildlife conservation are largely already in good condition. In the first plan Scottish Natural Heritage and Natural England have determined that in 23 of the 33 water-dependent Special Areas of Conservation (SACs) and in 12 of the 13 water-dependent Special Protection Areas (SPAs) the water environment is sufficiently good to enable the achievement of the areas' conservation objectives[4].

In 2009 we set targets to improve the condition of a number of protected areas by 2015 – for further details go to the supporting data application.

The challenges associated with managing pressures on protected areas are similar too those found in the general water environment and these are discussed further in Section 5.

[4] The targets for Protected Areas are defined by their specific legislation e.g. number of bacteria in shellfish or the bathing waters. For SACs and SPAs the targets are defined in terms of the conservation objective of the site, in so far as their achievement depends on the status of the water environment.

4 Progress towards improvement targets

In the 2009 Solway Tweed river basin plan, surface and groundwater targets were set for reducing pollution, reinstating fish passage at man-made barriers to migration, restoring damaged habitats and mitigating over-abstraction of water. The targets were designed to improve the ecological quality of our rivers, lochs, estuaries and coastal waters. Targets were also put in place for improving protected areas. This section sets out SEPA's and the Environment Agency's assessment of whether we are on track to achieve our targets.

Set in the context of our estimates of current condition, the figures in Table 4 below show that although improvements are being made we will have to increase momentum if we are to meet the ambitious targets for the future.

Table 4: Current condition with targets set in the first plan for Solway Tweed water bodies[5]

	Number and % reaching good or better status			
	2012	2015	2021	2027
Surface waters	254 (44%)	302 (52%)	353 (61%)	536 (92%)
Groundwater	49 (75%)	60 (82%)	63 (86%)	68 (93%)

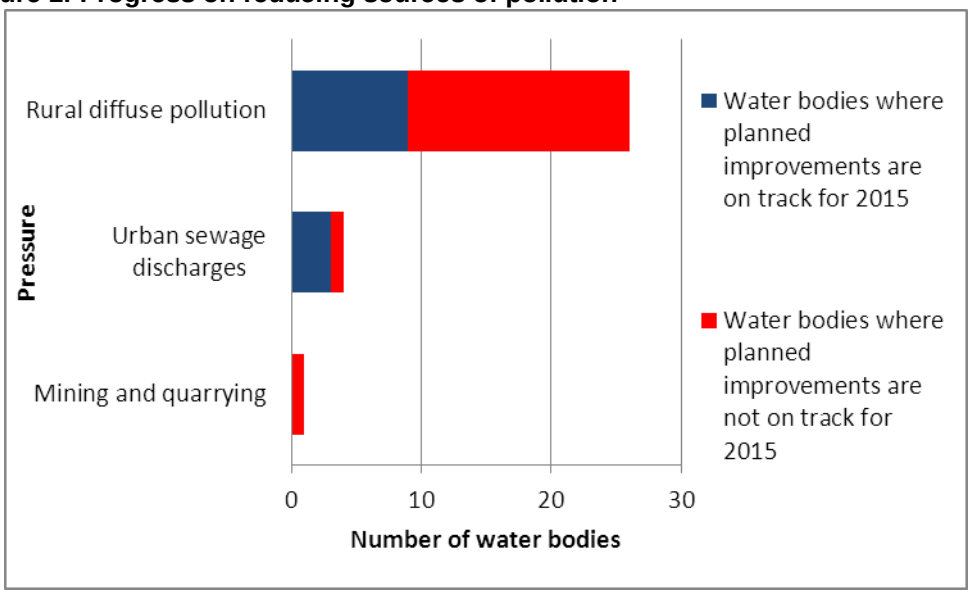
4.1 Improvement targets for water quality

In 2008[6], for nearly 70% of the water bodies in the Solway Tweed river basin district, water quality was already in a good or better condition.

Significant sources of pollution include excessive inputs of plant nutrients such as phosphorus and nitrogen, which affect the quality of more water bodies than inputs of any other pollutant. The main sectors causing these inputs include rural land uses, in particular agriculture, and sewage discharges. Analysis of the key water pollution sources (Figure 1 on the following page) indicates that for sewage discharges we are largely on track to meet our 2015 target objectives. For rural diffuse pollution, we are at risk of not meeting our objectives for the majority of planned improvements.

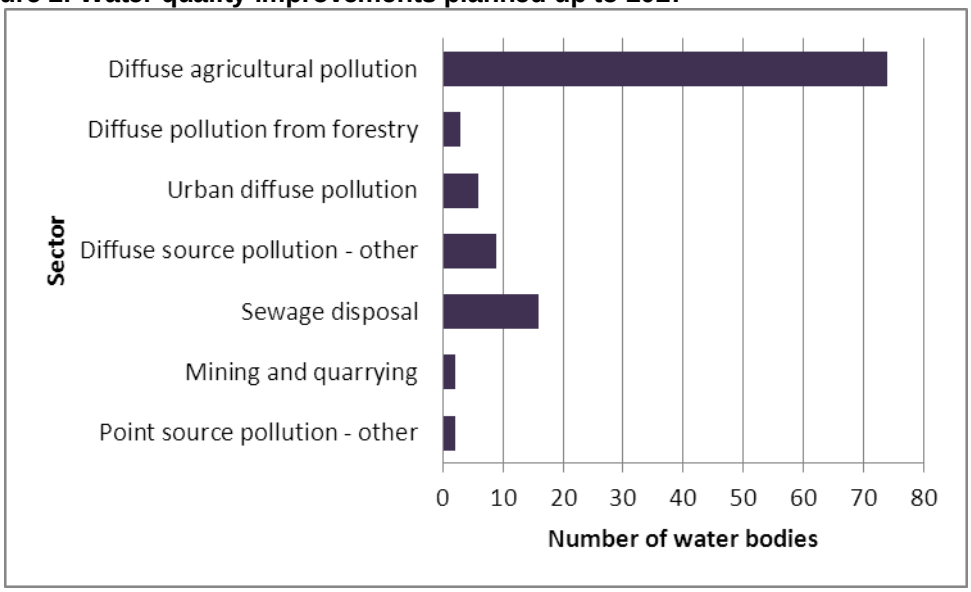
[5] Note that 2012 results are not directly comparable with previous years due to additional evidence, improved methodologies and water body changes introduced since 2008.
[6] Classification data up to the end of 2008 was used to set targets in the 2009 river basin plan

Figure 1: Progress on reducing sources of pollution



In the first plans we also set out longer-term improvement targets for water quality for 2021 and 2027. As Figure 2 shows, achieving these targets will depend to a large extent on our ability to reduce pollution from agriculture and from discharges of sewage. Targets for sewage disposal through the water utility investment programmes are mostly on track; however, given the number of improvements for sewage disposal required beyond 2015, it is important that we ensure opportunities to reduce costs are explored wherever possible. The challenges associated with meeting our targets for rural diffuse pollution are discussed in Section 5.2. There were also some improvement targets set for water bodies impacted by acidification caused by non renewable energy generation; but because of the scale of the measures required and natural recovery time an extended deadline beyond 2027 was set in the first plan.

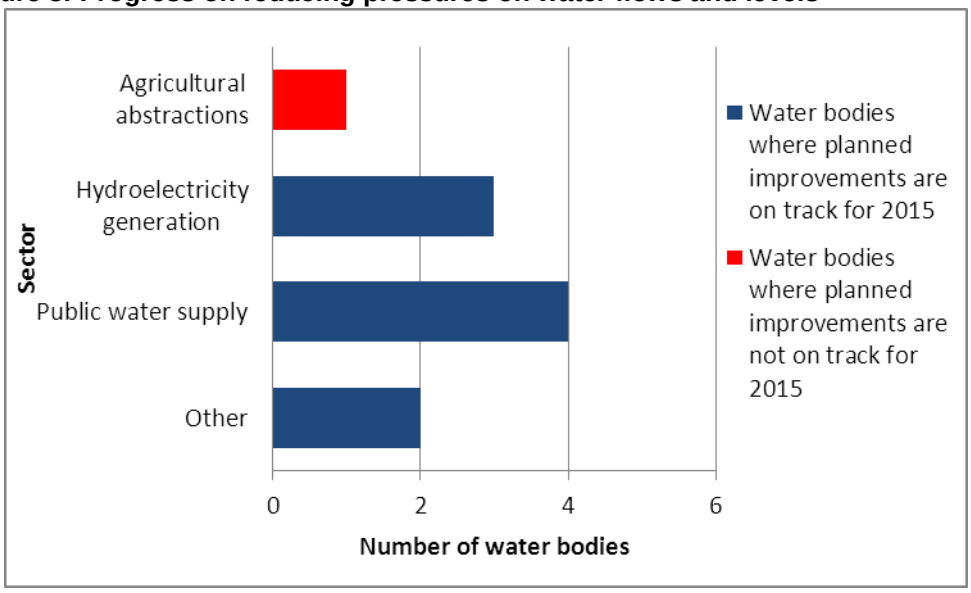
Figure 2: Water quality improvements planned up to 2027



4.2 Improvement targets for water flows and levels

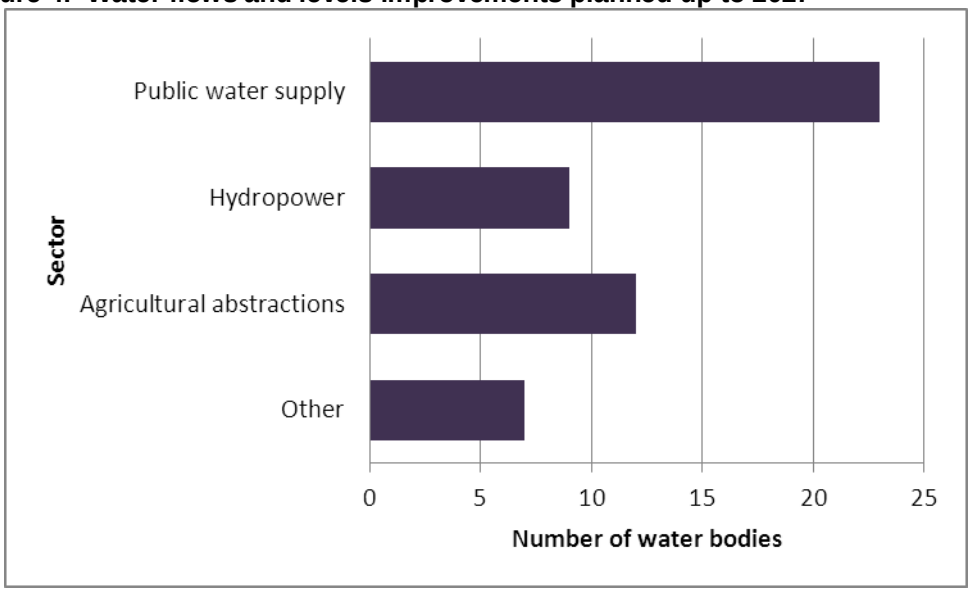
In 2008, just over 85% of waterbodies had water flows and levels which were classified as good or better. Ten failing waterbodies had targets for improvement which had to be met by 2015, and nine of these are on track to meet their targets. Only one waterbody is at risk of not meeting its target and more information is required before a measure can be set. The source of pressure for this water body is agricultural irrigation (Figure 3).

Figure 3: Progress on reducing pressures on water flows and levels



The majority of improvements planned for flows and levels beyond 2015 are for public water supply (Figure 4); a smaller number have been planned for hydropower and irrigation. We are confident that, working with the relevant sectors, with the appropriate regulatory framework in place, this programme of measures can be achieved.

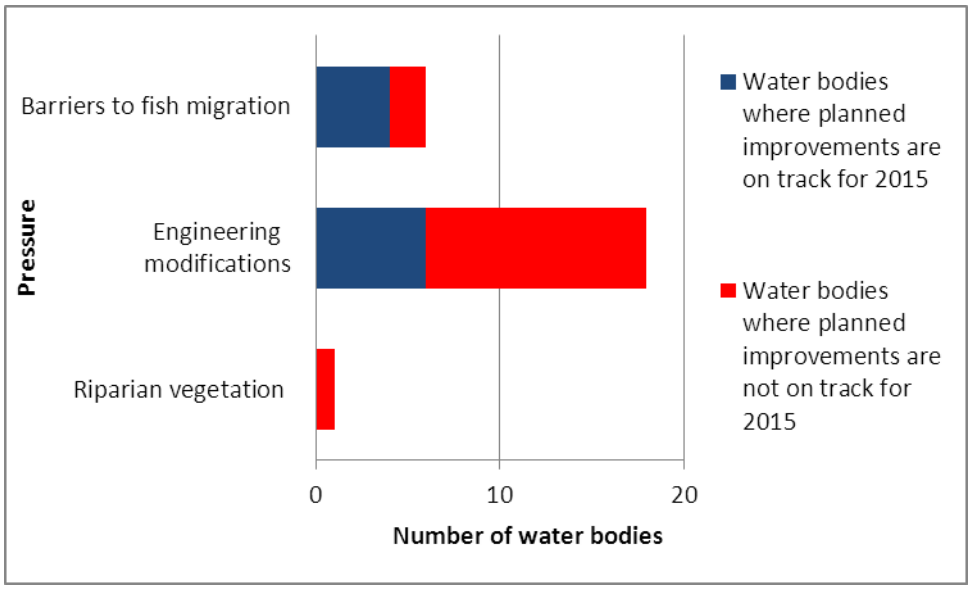
Figure 4: Water flows and levels improvements planned up to 2027



4.3 Improvement targets for the physical condition of the water environment

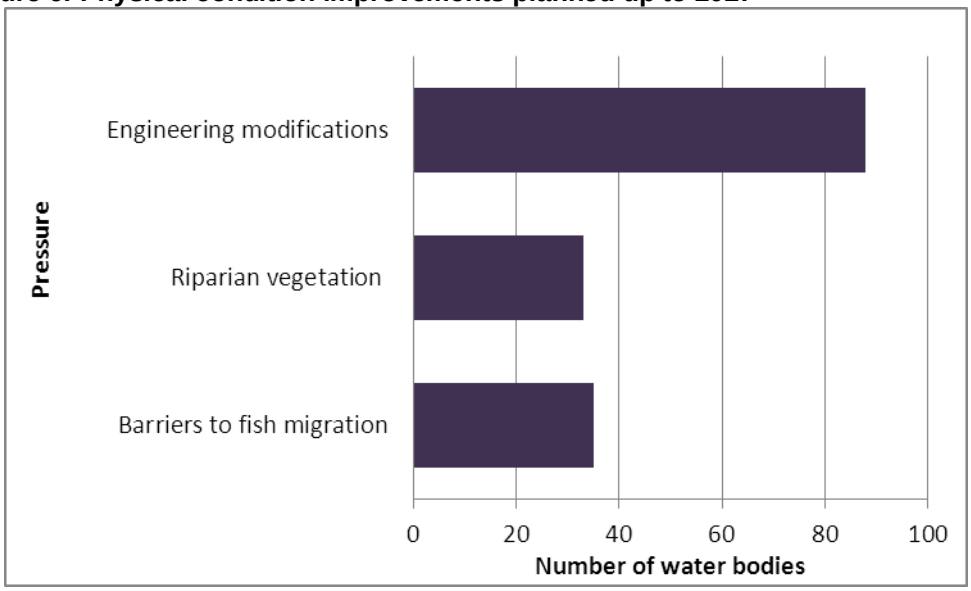
In 2008, we estimated that the physical condition of beds, banks and shores was good or better in around 80% of surface water bodies. We set targets for 25 improvements by 2015 and at this stage we are set to meet our targets for ten of these improvements (Figure 5).

Figure 5: Progress towards improvements to physical condition of the water environment



In the first plan we also set out longer-term improvement targets for physical condition for up to 2027. Figure 6 illustrates that the majority of improvements planned are for engineering modifications (both historical and current) including barriers to fish migration. The challenges of meeting these improvements will be discussed in Section 5.3.

Figure 6: Physical condition improvements planned up to 2027



4.4 Improvement targets for managing invasive non-native species (INNS)

As no technically feasible control methods are available for some high impact species, notably North American signal crayfish and Australian Swamp Stonecrop, no improvement targets were set. For INNS impacting upon riparian vegetation in the Scottish part of the basin, improvement targets have been assessed as pressures on the physical condition of the water environment (Section 4.3).

4.5 Summary of progress on improvement targets

In the first river basin plan we set the objective that 52% of surface water bodies would be in a good or better condition by 2015. Our most recent classification results indicate that 44% of surface water bodies were in a good or better condition at the end of 2012. We are continuing to make progress for the remainder of the cycle; however our assessments indicate that it is unlikely we will reach our goal for 2015.

We are making significant progress in areas where regulatory controls exist to reduce pressures to the water environment e.g. abstraction of water, sewage disposal, and hydroelectricity generation. For other pressures, particularly those driven by land use, we all need to increase our efforts and adapt our existing approaches to sufficiently address key issues such as rural diffuse pollution and restore habitats damaged by building, maintenance and engineering works.

Our understanding of the environment has significantly improved during this first cycle of river basin planning. We have uncovered more pressures on the water environment but gaps remain in our understanding. For example, identifying relative sources of pollution is essential to enable us to target investment to more effectively tackle point source and diffuse pressures. Improving our understanding of the physical condition of the water environment is also priority. This is a substantial task and an appropriately targeted and phased approach will be required. Overall, working together as partners and identifying where we can achieve improvements will form the basis of our forward planning.

5 Significant water management challenges

5.1 Current and future challenges

The implementation of the first river basin management plan has provided valuable experience of working in partnership to tackle a wide range of pressures. The task for the second and third cycles will involve making a large number of improvements to water bodies in the Solway Tweed. This includes a number of improvements on sewage disposal, public water supply and hydropower, for which there are steps in place through licensing controls. We must also limit the risk of deterioration by pressures such as INNS as outlined in the Invasive Non-Native Species Framework Strategy and Action Plan for Great Britain (May 2008), further catchment scale biosecurity plans[7] and the Scotland supplementary plan[8].

[7] The Tweed, Cumbria and Dumfries and Galloway areas have biosecurity plans and ongoing actions.
[8] The INNS supplementary plan for Scotland will be published at the end of 2013 and will be available to view on http://www.sepa.org.uk/water/river_basin_planning/implementing_rbmp.aspx. The plan sets out the key responsible authorities and actions for controlling INNS in Scotlands water environment.

This assessment has informed the identification of a range of issues that are limiting our ability to improve the water environment. We consider these issues to be the most significant management challenges to achieving our objectives for 2015 and beyond. They are significant because to address them requires a step change in how we target our efforts and the funding available for improvements, or a new approach to how we reduce the pressures. The latter may require enhancements to the policy framework that underpins river basin management, including through making additional provisions in legislation.

These significant water management challenges identified for the Solway Tweed are:

- impacts from rural diffuse pollution;
- impacts on the physical condition of the water environment;
- toxic substances and urban diffuse pollution.

We must also look beyond our 2027 targets to identify future challenges that may impact on our ability to sustainably manage the water environment in the long term. For example, climate change is likely to have an impact on the amount and frequency of rainfall. If we take no action to mitigate the effects, SEPA estimates that by 2050 around 12% of water bodies in the Scottish part of the Solway Tweed river basin are unlikely to be able to support current rates of water abstraction without their ecological status deteriorating. It is also expected to lead to significant shifts in agricultural land uses. Adoption of land management practices resilient to climate change could help mitigate risks. Cheviot Futures is already exploring these options in the Tweed and Northumbria[9]. For more information on the impact of climate change on freshwaters please see the Living with Environmental Change website[10].

We now discuss each of the significant water management challenges identified in the Solway Tweed river basin and propose potential new options for future management. We are seeking your feedback on these new options.

5.2 Rural diffuse pollution

Diffuse pollution caused by the run off of nutrients and chemicals from land into water is a common issue throughout the basin. It can arise from land management activities including agriculture, forestry, mining, recreation (for example from golf courses), and also from septic tank discharges. Each of these sources have an impact in the basin and different sectors will need to work together to address these impacts and maximise the benefits for the catchment.

The greatest contribution to rural diffuse pollution in the Solway Tweed basin is as a result of agricultural activities. Due to the number of businesses involved and the wide geographical coverage of rural pollution issues, it is clear that efforts to reduce the effects on the water environment need to be prioritised. Whilst other sources of pollution must not be ignored the priority should be to target those catchments where agriculture is affecting protected areas,

[9] www.cheviotfutures.co.uk

[10] The Environment Agency and SEPA have recently worked with the Living With Environmental Change (LWEC) Partnership to produce a report card which contains contributions from over 30 academics and other stakeholders. It looks at the effect of climate change on freshwater – including rainfall, floods and droughts and is intended to help people understand the scale of possible change and inform decisions about the way that water is managed. For further information see www.lwec.org.uk/resources/report-cards/water.

such as recreational waters, drinking water supplies, shellfish waters and important wildlife habitats.

Up to 2015 in the Scottish Solway Tweed, the planned approach includes focused efforts to tackle diffuse pollution in the Galloway Coastal and Stewartry Coastal Areas, which are linked to key bathing waters. To date, SEPA has surveyed 915km of rivers within in these catchments, and concentrated visits to the Galloway coastal catchment, visiting 270 farms. In addition, visits and implemented monitoring in the rivers draining into Sandyhills Bathing water in the Stewartry Coastal area[11] have been completed. There continues to be risks of failure to meet targets in these areas.

Catchment Sensitive Farming[12] has delivered advice and grants to many farmers across the South Solway and Till. Eden Rivers Trust have also delivered a number of projects aimed at tackling diffuse pollution from agriculture within the Eden catchment, and are part of the Demonstrations Test Catchments research project[13].

The approach thus far is showing positive signs of improving land management, however measures to mitigate diffuse pollution from agriculture by 2015 are judged to be significantly at risk of failing to meet their targets (Figure 1).

It has become clear from our efforts to date that farming practices contributing to pollution are more numerous and widespread than we originally estimated and there are many different potential sources of pollution on every farm. It is taking longer than we anticipated to gain improved understanding of pollution risks and to work with land managers to reduce these risks. Adopting basic good environmental practice is the first necessary step; however, further, targeted measures may be required in some cases to achieve our targets.

These challenges may significantly affect our ability to achieve our water quality improvement targets. There are many more measures required to tackle rural diffuse pollution, the majority linked to agricultural measures, which must be successfully implemented by 2027 (Figure 2). To achieve these objectives within reasonable timescales it is considered that we will need a step change in our approach.

Some possible options for meeting the challenge include:

- Increased engagement with land managers to help them identify what they can do, and where, to reduce pollution risks. Experience to date indicates that practical advice is the most important factor in determining whether the right actions are taken in the right places.

- Re-prioritising how funding support is targeted to allow land managers to take appropriate actions over and above basic good environmental practice. For example, to control pollution from nutrients in some water bodies, options such as creating woodland buffers or wetlands to help intercept pollutants may be needed.

- Building on and extending our partnership approach with land managers to ensure provision of coordinated and integrated advice and support e.g. via catchment schemes established by Scottish Water and the English utility companies[14].

[11] www.sepa.org.uk/water/river_basin_planning/dp_priority_catchments.aspx
[12] www.environment-agency.gov.uk/business/sectors/32767.aspx
[13] www.edenriverstrust.org.uk
[14] Scottish Water: www.scottishwater.co.uk/about-us/corporate-responsibility/sustainable-land-management
United Utilities SCAMP programme: http://corporate.unitedutilities.com/scamp-index.aspx
Northumbrian Water: www.nwl.co.uk/your-home/environment/catchment-management.aspx

- Exploring options to reduce phosphorus additives in livestock feed.

- Coordination of activities to ensure management of pressures from other sources of rural diffuse pollution, for example, forestry and septic tanks.

- Embedding understanding of how to mitigate diffuse pollution risks in training and education courses for land managers. This will foster good practice for the next generation of land managers and those undertaking further training and education.

Question 1A:

What are your views on the options suggested for meeting the challenge posed by rural diffuse pollution?

Question 1B:

Do you have any further suggestions for how this challenge can be addressed?

5.3 The physical condition of the water environment

Since 2009, some significant improvements have been delivered in catchments within the Solway Tweed basin district through efforts from voluntary initiatives. These include working with land managers, the removal of key fish barriers and scoping out improvements to determine how best to make on-the-ground improvements to physical modifications. Several innovative projects have been scoped or are now being delivered, including the Eddleston Water Project – co-ordinated by the Tweed Forum[15], the Nith Pilot project[16] co-ordinated by SEPA, and the Eden River Restoration Strategy work on the River Leith, co-ordinated by Eden Rivers Trust in partnership with Natural England and the Environment Agency[17].

Through this work we have all learned that:

- Ensuring a sound catchment-scale evidence base is a key step in planning and delivering cost-effective improvements through a partnership approach;

- Restoration of physical condition requires considerable initial negotiation, often with multiple land managers. The work itself must be preceded by careful scoping, and actual delivery of measures can be costly;

- There are issues where more information is required. An example would be marine trawling, where a better understand the impacts on animal communities living on the sea bed impacted by this type of fishing is required;

- Effective planning is key; a restoration plan containing guidance has been prepared for Scotland[18] and specific detailed plans drawn up in England for the Eden[19] and the Till[20].

[15] www.tweedforum.org/projects/current-projects/eddleston
[16] http://www.sepa.org.uk/water/river_basin_planning/implementing_rbmp/pilot_catchment_project.aspx
[17] www.environment-agency.gov.uk/research/library/publications/123821.aspx
[18] http://www.sepa.org.uk/water/river_basin_planning/implementing_rbmp.aspx
[19] www.savetheeden.org/the-next-three-years/
[20] www.tweedforum.org/projects/current-projects/till_restoration_strategy

Due to the complexity and feasibility of getting measures in place some improvements to engineering modifications and barriers to fish migration are at risk of not reaching the 2015 target. These types of pressure also represent the largest number of planned improvements to physical condition beyond 2015. Therefore our challenge for the next river basin planning cycle will be to deliver more improvements, including meeting those targets which weren't met in the first cycle. Some possible options for meeting the challenge include:

- Taking forward a more integrated, partnership approach between responsible authorities and other public bodies that links our goals for the water environment with wider goals for biodiversity, woodland creation, fisheries, flood risk management, urban regeneration and green-space and green network provision in and around our towns and cities.

- Expanding the amount of engagement work aimed at identifying opportunities for, and securing partnership initiatives to deliver, improvements to the physical condition of water bodies.

- Working with those responsible for the management of built structures in the water environment, such as road and rail crossings etc, to embed environmental improvements into the maintenance programmes for those structures.

- Increasing the amount of support and funding available for making improvements.

Question 2A:

What are your views on the options suggested for meeting the challenge posed by changes to the physical condition of the water environment?

Question 2B:

Do you have any further suggestions for how this challenge can be addressed?

5.4 Toxic substances and urban diffuse pollution

In the Scottish part of the basin, SEPA's latest assessment of the state of the water environment identified around 2% of water bodies as being at worse than good status because of unacceptably high concentrations of toxic pollutants. For the majority of these, the pollutant concerned was ammonium. Only a small number were assessed as worse than good because of other, more persistent and hazardous pollutants. However, recent detailed risk assessments by the Environment Agency indicate that the national monitoring programme results may be significantly underestimating the number of waters at risk from certain toxic pollutants, most significantly for a group of pollutants known as poly aromatic hydrocarbons (PAHs) but also for a number of other pollutants as set out in the tables below. We have also agreed an ambitious objective of phasing out emissions, discharges and losses of a number of the most hazardous pollutants.

Achieving our goals for such pollutants, which are produced from a wide range of sources and ubiquitous in the environment, presents an ambitious challenge across the UK. Nevertheless by combining action to reduce losses at source and improvements to urban drainage systems, we think significant reductions in pollution can be achieved.

Run-off from roads and other urban surfaces is an important route into the water environment for most of the pollutants of concern. In contrast to traditional drainage systems, sustainable urban drainage systems (SUDS) can be effective at trapping or even

treating the pollutant. To make use of this and make progress towards achieving our objectives, we will need to retrofit SUDS onto existing drainage system with the most polluting outfalls.

Tables 5a-e on the following pages identify the key chemicals of national concern in the UK due to their toxicity to both humans and wildlife, and outlines possible options for future management.

Table 5: Toxic substances of national concern

5a: Brominated diphenylethers (BDPE)			
Where do they come from?	**How are they released into the water environment?**	**What are the challenges to achieving our targets?**	**What options are there for a step change in our approach to meeting the challenge?**
Used to prevent the spread of fires in many household goods - from cushions to computers	Treated items will shed particles, which mix into household dust - and most of this ends up in sewers via our washing machines, or by being mixed in with rainfall Particles can be released if the item is recycled	Numerous small sources make source control difficult The most bioaccumulative forms have been banned and other forms restricted in the EU but are still being produced and used elsewhere and can come in to the country in imported goods Removal from wastewater with current technology is extremely expensive	Controls on imports could be explored Focus could be directed to controlling emissions from electronic waste dismantling plants which are likely to be large sources Improved control over disposal of waste sofas and textiles could be explored Sustainable Urban Drainage Systems (SUDS) which remove particulates could help reduce proportion from urban run-off (although this does not address the problem of household/industrial wastewater)

Question 3a
What are your views on the options proposed for BDPE?

5b: Mercury and Cadmium			
Where do they come from?	**How are they released into the water environment?**	**What are the challenges to achieving our targets?**	**What options are there for a step change in our approach to meeting the challenge?**
Mercury is used in dentistry, batteries, paints and fluorescent lights. A legacy remains from historical use in thermometers Cadmium is used in batteries, pigments, stabilizers and agricultural fertilisers	Mercury enters the wastewater network and through industrial point sources Cadmium enters the water environment diffusely through land run-off	Due to current use and legacy of these chemicals in existing products, the goal of ceasing emissions, losses and discharges to the water environment will be very challenging Removal from wastewater with current technology is extremely expensive	Discussions are ongoing in the EU regarding banning mercury in dental amalgam, cadmium in agricultural fertilisers and button cell batteries containing both chemicals SUDS could help to remove the sediments to which these metals bind

Question 3b
What are your views on the options proposed for Mercury and Cadmium?

5c: Polyaromatic Hydrocarbons (PAHs)			
Where do they come from?	**How do they get into the water environment?**	**What are the challenges to achieving our targets?**	**What options are there for a step change in our approach to meeting the challenge?**
Found naturally in oil and coal Produced from burning substances containing carbon, such as petrol, diesel, natural gas, coal, wood, stubble, heather and plastics Formed in the manufacture of coke	Particles enter the water environment mainly through urban run-off though a small percentage enters through wastewater discharges and directly from the atmosphere Significant levels have built up from historic use	Because so many sources exist, the substance is found nearly everywhere, making source control difficult The goal of ceasing all emissions, losses and discharges of this substance will be very challenging	Re-design and retrofit of SUDS to trap and breakdown PAHs in urban run-off Integration with policies for reducing air pollution through better traffic management to reduce particulates from vehicles Work with manufacturers to reduce pollutants at source, for example from vehicle emissions and tyres Work with roads authorities to look at targeted maintenance sweeping of roads and emptying of gully pots on roads with high usage

Question 3C
What are your views on the options proposed for PAHs?

5d: Nonylphenol			
Where does it come from?	**How is it released into the water environment?**	**What are the challenges to achieving our targets?**	**What options are there for a step change in our approach to meeting the challenge?**
Used in production of resins, plastics, stabilizers and industrial surfactants, including clothing	The substance enters the water environment mainly through urban run-off though a proportion enters through commercial wastewater discharges	There are many sources for this substance and it is used in a large number of products, making source control difficult The goal of ceasing all emissions, losses and discharges of this substance will be very challenging Wastewater treatment costs for the substance are high	Control of imported products containing the substance could be explored International negotiations for ceasing use in products where restrictions are not in place should be explored Treatment at end of pipe is possible by SUDS for surface water run-off and wastewater treatment for contaminated trade effluents (though costly)

Question 3D
What are your views on the options proposed for Nonylphenol?

5e: Di(2-ethylhexyl)phthalate (DEHP)			
Where does it come from?	**How is it released into the water environment?**	**What are the challenges to achieving our targets?**	**What options are there for a step change in our approach to meeting the challenge?**
Used as a plasticiser (to make plastics more flexible) Applications include vehicle parts, soles of shoes, window and door sealants, roofing materials and traffic signs/cones	By far the greatest source is diffuse, from road surface run-off and urban areas A smaller portion enters from point sources, including domestic and commercial wastewaters	There are many sources for this substance and it is used in a large number of products, making source control difficult The goal of ceasing all emissions, losses and discharges of this substance will be very challenging Most treatment works cannot effectively remove this substance	Work with other countries on targeted EU controls Work with manufacturers to encourage the use of alternative plasticisers in products presenting most risk to the environment Treatment via SUDS for roads, especially those deemed high risk due to high volume of traffic

Question 3E:
What are your views on the range of options proposed for DEHP?

SEPA and the Environment Agency are working together to form a baseline inventory of toxic substances of concern in the environment to assist in monitoring our compliance with the legislative requirements[21]. Further data gathering and changes to monitoring approaches, for example by measuring an increased range of substances in ecosystems, will improve our understanding of the environmental risks and challenges ahead.

Question 3F:

Do you have additional suggestions for management options for these substances?

Question 4:

Do you have suggestions for how we can address the wider challenges of urban diffuse pollution?

6. Summary and next steps

This document has set out to describe the current condition of the water environment and assess progress towards achieving the improvement targets we set for 2015. Monitoring and analysis of the water environment of the Solway Tweed river basin district has shown that 44% of our surface waters are in a good or better condition.

Progress assessments indicate that the legislative framework is facilitating improvements on the ground for many sectors. In addition a strong partnership approach is proving to be the key factor in achieving our environmental outcomes, particularly for improvements on diffuse and physical condition pressures. Building on the catchment approach will continue to be an important way to focus and identify synergies so that the programme of measures delivers improvements to multiple pressures. We are fortunate that much of the basin is taking this

[21] SEPA - Significant issues

approach e.g. the Dumfries and Galloway catchment initiative[22], Eden Rivers Trust[23] and Tweed Forum[24].

Through the assessments presented in this report and the online tool, the key management challenges for the second cycle of river basin planning have been identified as rural diffuse pollution, impacts on the physical condition of the water environment, and toxic substances and urban diffuse pollution. For these pressures a step-change will be required in order to meet the outstanding 2015 targets and those set for 2021 and 2027.

Our aim for this consultation is to get your input on the development of the programme of measures for these significant water management challenges going forward. Working together to identify the most appropriate actions will create a robust second plan that ensures maximum benefits to the water environment and its many users.

Question 5:
Do you agree with our assessment of water management challenges described in this report?

Question 6:
Are there any other areas you can contribute to for second plan development that you would like to discuss further?

There are a number of ways to respond to this consultation:

- Using the consultation tool[25] on SEPA's website;
- By requesting a paper version of the response form (email rbmp@sepa.org.uk);
- By writing to SEPA at SEPA RBMP Unit, SEPA Corporate Office, Castle Business Park, Stirling, FK9 4TR.

This consultation runs from 22 December 2013 to 22 June 2014 and SEPA and the Environment Agency will issue a response document by September 2014.

[22] www.sepa.org.uk/land/conservation.aspx
[23] www.savetheeden.org
[24] www.tweedforum.org
[25] https://consultation.sepa.org.uk/rbmp/cccf-solwaytweed

ANNEX: List of consultation questions

1A. What are your views on the options suggested for meeting the challenge posed by rural diffuse pollution?

1B. Do you have other suggestions for how to address rural diffuse pollution?

2A. What are your views on the options suggested for meeting the challenge posed by changes to the physical condition of the water environment?

2B. Do you have other suggestions for how to address changes to physical condition?

3A. What are your views on the options proposed for Brominated diphenylethers?

3B. What are your views on the options proposed for Mercury and Cadmium?

3C. What are your views on the options proposed for Polyaromatic hydrocarbons?

3D. What are your views on the options proposed for Nonylphenol?

3E. What are your views on the options proposed for Diethyl Hexyl Phthalate?

3F. Do you have other suggestions for options for these substances?

4. Do you have suggestions on how to address the wider challenges of urban diffuse pollution?

5. Do you agree with our assessment of the management challenges described in this report?

6. Are there any other areas you can contribute to for second plan development that you would like to discuss further?