REF.	ACTIONS	PARTNERS (lead partners in bold)
6.1	**Ensure all existing collecting systems requiring improvements to achieve 2014 water quality objectives are promoted for inclusion in Scottish Water's 2010-2014 capital investment plan (Q&S IIIb).**	**SEPA** / SW
6.2	**Ensure new development is planned and undertaken sustainably such that sewerage network capacity is not exceeded or contaminated.**	**AC** / **ACC** / Developers / SEPA / SW
6.3	**Ensure Drainage Impact Assessment guidance is followed for all new developments.**	**AC** / **ACC** / Developers / SW / SEPA / ACP
6.4	**Ensure grey water systems are included in policy in future local plans. Promote use of grey water systems.**	**ACP** / **AC** / **ACC**

Acronyms are listed in the centre of this Action Card

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public sewerage & drainage

6 WATER QUALITY

OBJECTIVE 6. Ensure existing foul and surface water drainage infrastructures are satisfactory and those serving new developments are planned sustainably.

BACKGROUND

There are three forms of public drainage system: surface water, foul water and combined systems.

Surface water systems
The surface water drain carries rainwater from pavements, road surfaces and rooftops, discharging directly into local rivers and streams. Any discharge into this drain flows into the river untreated.

Foul water systems
The foul water drain carries waste water from toilets, sinks, showers, baths and household appliances to the local sewage treatment works, or to a private septic tank. This water is treated prior to being discharged, and should not impact negatively on the receiving watercourse. The majority of towns and villages in the catchment discharge treated domestic sewage to watercourses, either directly into the River Dee or into one of its tributaries. In general, these effluents are well treated to remove most of their organic load and the conditions of discharge ensure that their receiving waters can cope with and assimilate the remaining material.

Combined systems
The Victorian engineering that delivers much of Scotland's wastewater network was based on a combined surface water drainage and foul sewer system. In many parts of the catchment the foul sewer system is combined with the surface water drainage system. In combined systems runoff from road and roof ends up in the sewer network for treatment along with domestic sewage and trade effluent. As domestic sewage collects in the sewerage system it combines with rainwater run-off from urban and agricultural land, effluent from traders and infiltration from other surface waters. The resulting mix is a complex effluent with the potential to cause significant environmental damage if discharged without prior treatment.

A consequence of these 'combined sewerage systems' is that sewer networks and wastewater treatment works are subject to extremely variable flow rates, with the volume of wastewater in the network increasing by several orders of magnitude during heavy rainfall periods. This requires the wastewater network to have 'combined sewer overflows' (CSOs) that act as a safety valve to protect the network. During heavy rain, these will discharge effluent directly into the watercourse without passing through the Waste Water Treatment Plant (WWTP). In these circumstances, the effluent tends to be extremely dilute, with the vast bulk of it coming from rainwater washed into the network.

ISSUES

- Incorrect plumbing in the home can cause waste water from dishwashers, washing machines, sinks, baths and even toilets to be flushed directly into watercourses. Misconnected pipes are a common cause of pollution to rivers and streams, especially in urban areas, and as long as the properties that are misconnected carry on discharging waste water via the surface water sewer, the water quality will not improve.
- Untreated or poorly treated domestic sewage effluent can pollute watercourses with the following:
  - **Oxygen Depleting Substances and Inorganic Nutrients –** The discharge of organic matter to surface waters raises the Biological Oxygen Demand (BOD), causing oxygen levels to drop drastically – in more severe cases the river can no longer support invertebrates or fish. The discharge of nutrients (e.g. nitrates and phosphates) can cause enrichment

WHO IS INVOLVED?

Aberdeen City Council

Aberdeenshire Council

Aberdeen Countryside Project

Developers

Scottish Environment Protection Agency

Scottish Water

Further copies can be downloaded at www.theriverdee.org. For further information contact the Dee Catchment Officer
c/o The Macaulay Institute, Craigiebuckler, Aberdeen AB15 8QH Telephone: 01224 498200 email: info@theriverdee.org

deecatchment partnership

– also known as eutrophication – enabling the growth of bacteria and algae, again leading to the depletion of oxygen and the loss of larger aquatic plants which are an important food source and habitat for other aquatic life. 'Sewage fungus' – seen as slime on a river bed around outfalls – is a sign of untreated or poorly treated sewage effluent.

- **Toxic Substances –** In addition to oxygen depleting substances, sewage effluent contains toxic substances. Ammonia is a main component of sewage, which is directly toxic to aquatic life. Other toxic substances present on roads and yards, such as hydrocarbons, heavy metals, pesticides and herbicides are transported to the sewerage system by rainfall events. These are present in much smaller quantities but are just as harmful and can be more difficult to treat and remove.
- **Pathogens –** High levels of bacteria, viruses and parasites from human and animal sources pose a threat to the recreational use of water bodies.
- **Sanitary waste** flushed down toilets blocks drains and damages screening equipment at treatment plants, resulting in the littering of river banks and beaches around Scotland's coast. Sanitary waste should always be binned rather than flushed away.

EXISTING / RECENT INITIATIVES

- Treated wastewater must comply with quality standards set by the Scottish Environment Protection Agency (SEPA) prior to being discharged to a watercourse. SEPA is responsible for controlling discharges to waterbodies and does this by issuing and enforcing permits. These have quality standards set at a level that will protect the receiving water for the benefit of communities and wildlife.
- Existing WWTPs must be maintained in good condition to meet their effluent quality standards.
- Development pressures can arise that may lead to a requirement to upgrade WWTPs so that they are able to cope with a greater flow. In 2005-2006 seven villages in the Deeside Wastewater Treatment Improvement Scheme benefited from new wastewater treatment works.
- The Urban Wastewater Treatment (UWWT) Directive sets the objectives for providing appropriate treatment for communities.
- It also sets requirements for CSO standards, including screening of effluent (to prevent gross solids being discharged) and spill frequency.
- Discharge consents, set by SEPA, implement standards for water quality set out in the UWWT, Freshwater Fish and Birds and Habitats Directives.
- These consents will be converted to water use licences under the Water Framework Directive Controlled Activitites Regulations from April 2006.



New Water Water Treatment Plant at Banchory (3 -Dee Vision)

- Scottish Water (SW) has recently embarked on the third Quality and Standards process (Q&S III), and all investment within the Deeside catchment has already been considered.
- Scottish Water has recently completed upgrades at several WWTPs in accordance with the UWWT Directive.
- Further actions to improve CSOs are also underway, for example at Ballater.
- Drainage Area Studies.
- Memorandum of Understanding on development constraints.
- Q&S III development funding (nationally prioritised).
- Aberdeen City, Cairngorms National Park Authority and Aberdeenshire Local Plans.
- Sewers for Scotland 2.
- SW strategic strategy on network capacities.

ACTIONS REQUIRED

- Ensure all existing collecting systems requiring improvements to achieve 2014 water quality objectives are included in Scottish Water's capital investment plan.
- Ensure new development is planned sustainably such that the sewerage network capacity is not exceeded.
- Ensure Drainage Impact Assessment guidance and the SuDS Design Manual are followed for all new developments.
- Promote use of grey water systems.
- Ensure Dee Catchment Management Plan reflects the deliverables that are identified in the Q&S III programme.
- Promote bagging and binning of sanitary waste.

LEGISLATION

See Action Pack Annex for information sources

- UWWT Regulations
- Control of Pollution Act (COPA)
- Water Environment and Water Services Act 2003
- Sewerage (Scotland) Act 1968
- Town and Country Planning (Scotland) Act 1997
- Urban Wastewater Treatment Directive
- Urban Wastewater Treatment (Scotland) Regulations 1994
- Freshwater Fisheries Directive 2006/44/EC
- Birds and Habitats Directives

GUIDANCE AND INFORMATION

See Action Pack Annex for information sources

- Drainage Impact Assessment Guidance.

BENEFITS TO PROTECTED SPECIES

The following specially protected species will benefit from the Actions:

- Grass wrack pond weed *Potamogeton compressus*
- Pillwort *Pilularia globulifera*
- Freshwater pearl mussel *Margaritifera margaritifera*
- Common frog *Rana temporaria*
- Palmate newt *Triturus helveticus*
- Northern blue damselfly *Coenagrion hastulatum*
- Stiletto-fly *Cliorisimia rustic*
- Stone fly *Brachyptera putata*
- Atlantic salmon *Salmo salar*
- Brook lamprey *Lampetra planeri*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*
- Daubenton's bat *Myotis daubentonii*
- Otter *Lutra lutra*
- Water vole *Arvicola terrestris*
- Goldeneye *Bucephala clangula*
- Osprey *Pandion haliaetus*

RELATED ACTION CARDS

4. Road and access track drainage

5. Surface water drainage

11. Watercourses in Aberdeen city

37. Elrick burn catchment