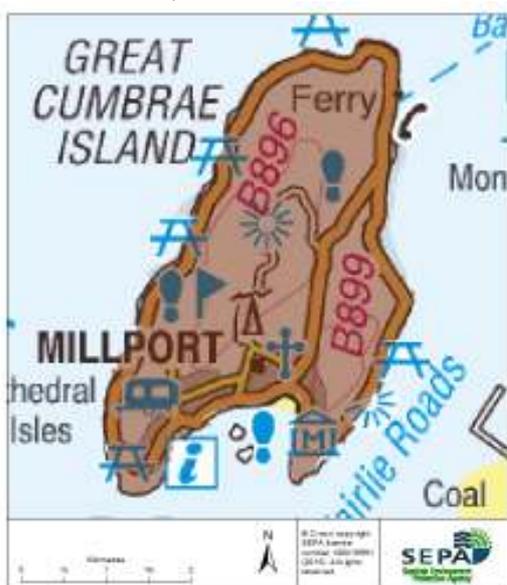


## Great Cumbrae Island (Potentially Vulnerable Area 12/02)

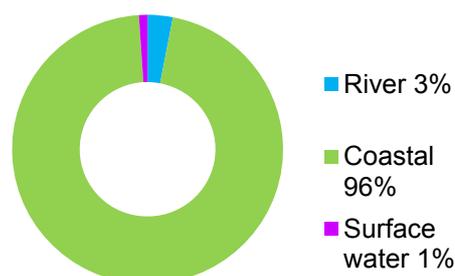
Local Plan District	Local authority	Main catchment
Ayrshire	North Ayrshire Council	Great Cumbrae coastal

### Background

This Potentially Vulnerable Area is approximately 10km<sup>2</sup>. It encompasses all of Great Cumbrae Island located in the Firth of Clyde, to the west of Largs (shown below).



Local studies have shown approximately 800 properties to be at risk. The Annual Average Damages are approximately £2.2 million.



**Figure 1:** Annual Average Damages by flood source

### Summary of flooding impacts

The national assessment shows that flooding within the area is primarily from coastal sources with a limited impact from surface water; however, there have also been reports of river flooding from the Mill Burn. The catchment size threshold used for the river study however, means that no watercourses on the island were modelled.

The vast majority of the damages arise from coastal flooding. It should be noted there may be an additional level of risk to residential and non-residential properties due to wave overtopping, which was not taken into account at the modelling stage of this assessment. Coastal flooding is likely to impact on sections of road infrastructure with the main road link at risk being the B896.

Due to the limitations of the national modelling approach the risk identified by the national assessment underestimated the risk in the area. North Ayrshire Council has undertaken further studies which identified a risk to over 700 properties from coastal flooding, including wave overtopping and erosion. A further 30 properties were identified at risk of river flooding from the Mill Burn.

Due to the discrepancy between the values from the national assessment and the local study no tables or figures from the national assessment have been provided. The information from areas studied by North Ayrshire Council will be reviewed for use when

updating the national mapping. Objectives and actions have been identified to reduce the identified flood risk.

There are only a small number of areas at risk of surface water flooding. These areas tend to coincide with the locations of small reservoirs and lochs. There is one location, to the north of Kames Bay, which indicates that surface water flooding may impact residential properties.

Further details of the risk of flooding to people and property, as well as to community facilities, utilities, the transport network, designated sites and agricultural land is available in the Flood Risk Management Strategy for Ayrshire, Great Cumbrae Potentially Vulnerable Area 12/02.

[http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA\\_12\\_02\\_Full.pdf](http://apps.sepa.org.uk/FRMStrategies/pdf/pva/PVA_12_02_Full.pdf)

## Objectives to reduce flooding in the Potentially Vulnerable Area 12/02

Objectives provide a common goal and shared ambition for managing floods. These objectives have been set by SEPA and agreed with flood risk management authorities following consultation. The objectives below have been set for Great Cumbrae Island Potentially Vulnerable Area:

- Avoid an overall increase in flood risk (ID 12039)
- Reduce overall flood risk (ID 12082)
- Organisations such as Scottish Water, energy companies and Historic Environment Scotland actively maintain and manage their own assets, including the risk of flooding. These actions are not detailed further in the Flood Risk Management Strategies.

## Summary of flooding actions

Actions describe where and how flood risk will be managed. These actions have been set by SEPA and agreed with flood risk management authorities following consultation.

Selection of actions to deliver the agreed objectives was based on a detailed assessment and comparison of economic, social and environmental criteria. The actions shaded and then described below have been selected as the most appropriate for Great Cumbrae Island Potentially Vulnerable Area.

### Selected actions

Flood protection scheme/work	Natural Flood Management works	New flood warning	Community flood action groups	Property level protection scheme	Site protection plans
Flood protection study	Natural Flood Management study	Maintain flood warning	Awareness raising	Surface water management	Emergency plans/response
Maintain flood protection scheme	Strategic mapping and modelling	Flood forecasting	Self help	Maintenance	Planning policies

The delivery of selected actions by year over the six-year plan cycle is summarised below.

<b>Delivery of selected actions</b>					
<b>Year 1 (2016/17)</b>	<b>Year 2 (2017/18)</b>	<b>Year 3 (2018/19)</b>	<b>Year 4 (2019/20)</b>	<b>Year 5 (2020/21)</b>	<b>Year 6 (2021/22)</b>
Millport Coastal Flood Protection Scheme					
			Mill Burn Flood Mitigation Works		
Shoreline Management Plan					

The Maintain flood warning, Maintain flood protection scheme, Strategic mapping and modelling, Awareness Raising, Emergency Plans/response, Flood Forecasting, Self help, Maintenance and Planning policies will be delivered continuously throughout the 6 year cycle between 2016 and 2021.

### Actions to manage flooding in Potentially Vulnerable Area 12/02

<b>Action (ID):</b>	<b>FLOOD PROTECTION SCHEME/WORKS (120020006)</b>
<b>Objective (ID):</b>	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)
<b>Delivery lead:</b>	North Ayrshire Council
<b>Action Description:</b>	In 2015 North Ayrshire Council completed a Coastal Flood Risk Assessment Study for Millport Town. This was followed by the Option Appraisal Study, which outlined the feasibility of developing flood mitigation strategies and measures along with a high level cost benefit assessment. The studies identified a number of financially feasible options to reduce the risk of flooding. Future investigations will look to identify the most sustainable flood mitigation option to manage flooding. The need for the Coastal Flood Scheme development in Millport town is recognised by SEPA Flood Risk Management Strategy. The scheme has a national priority rating of 10 out of the 42 schemes and the estimated cost of the scheme is £12.1 million.
<b>Timing and status:</b>	The outline design with option optimisation will take place in 2016-17, the detailed design will take place in 2017-18 and construction will take place in 2019-20.
<b>Funding:</b>	The project will be funded through North Ayrshire Council's capital budgets provided by Scottish Government. Schemes confirmed by the Scottish Government qualify for grant funding of 80% of eligible costs. The Council has made provision within its capital plan to contribute the remaining 20%.
<b>Coordination:</b>	North Ayrshire Council will coordinate with Marine Scotland, Clyde Marine Planning Partnership Forum, SEPA, Scottish Water, local residents, landowners and other stakeholders identified through the development of the scheme.
<b>Potential Environmental Impacts:</b>	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. Further impacts will be assessed by the local authority.

<b>Action (ID):</b>	<b>FLOOD PROTECTION SCHEME/WORKS (120030006)</b>
<b>Objective (ID):</b>	Reduce the risk of river flooding to residential properties in Millport along the Mill Burn (12003)
<b>Delivery lead:</b>	North Ayrshire Council
<b>Action Description:</b>	In 2015 North Ayrshire Council completed a Flood Risk Assessment Study for Mill Burn and followed by the Option Appraisal Study which outlined the feasibility of developing flood mitigation strategies and measures along with a high level cost benefit assessment. The studies identified initial remedial work that could be carried out, this has helped to reduce the level of risk in the area. Future investigations will establish the remaining level of risk and the most sustainable combination of actions to manage this risk. The need for the Flood Scheme development for the Mill Burn is recognised by

	SEPA Flood Risk Management Strategy. The scheme has a national priority rating of 30 out of the 42 schemes and the estimated cost of the scheme is £1.1 million.
<b>Timing and status:</b>	2019-2021
<b>Funding:</b>	The project will be funded through North Ayrshire Council's capital budgets provided by Scottish Government. Schemes confirmed by the Scottish Government qualify for grant funding of 80% of eligible costs. The Council has made provision within its capital plan to contribute the remaining 20%.
<b>Coordination:</b>	North Ayrshire Council will coordinate with Marine Scotland, local businesses, SEPA, Scottish Natural Heritage, residents and other key stakeholders identified through the development of the scheme.
<b>Potential Environmental Impacts:</b>	Flood protection schemes can have both positive and negative impacts on the ecological quality of the environment depending on how they are designed. Further impacts will be assessed by the local authority.

<b>Action (ID):</b>	<b>FLOOD PROTECTION STUDY (121030005)</b>
<b>Objective (ID):</b>	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)
<b>Delivery lead:</b>	North Ayrshire Council and South Ayrshire Council
<b>Action Description:</b>	<p>The requirement for a Shoreline Management Plan (SMP) covering the Ayrshire coastline was identified by SEPA through the development of the Ayrshire Regional Flood Risk Management Strategy. The SMP is required to provide guidance to operating authorities and regulatory bodies as to future sustainable flood and coastal erosion risk management, essentially providing an agreed high level approach, intent and framework for management. In addition, the SMP should provide guidance to planners, individuals and organisations with interests in the coast, setting out an understanding of coastal behaviour, the pressures, constraints and opportunities for sustainable use of the coastal zone to facilitate and guide others in developing their own planning.</p> <p>The Ayrshire SMP is being developed in partnership between the operating authorities and those other organisations with key roles in shoreline management. To this end the project is led by a SMP Project Steering Group (PSG), with detailed management being undertaken by the SMP Technical Group (TG). These groups would include members of the following organisations: North Ayrshire Council (involving their engineering and planning departments); South Ayrshire Council (involving their engineering and planning departments); Scottish Environment Protection Agency (SEPA); Scottish Natural Heritage (SNH) and Historic Environment Scotland.</p> <p>The Shoreline Management data gathering analysing stage is completed and through this process, information gaps were identified for Arran coast and the South Ayrshire coastline. The study will include coastal process modelling, sediment sampling and lab analysis to develop a robust understanding of the coastal processes along the Arran coast. It will also allow the existing information for</p>

	the North Ayrshire mainland coast to be updated based on more recent information on sea level rise.
<b>Timing and status:</b>	The Ayrshire Shoreline Management Plan started in 2015 and is expected to be developed by mid 2018.
<b>Funding:</b>	This study will be funded through North Ayrshire Council's revenue budget provided by Scottish Government.
<b>Coordination:</b>	The list of statutory bodies and key stakeholders are identified through the scoping stage of the process approved by the Steering Group, led by North Ayrshire Council.
<b>Potential Environmental Impacts:</b>	Flood protection studies will consider the positive and negative impacts of proposed actions on the ecological quality of the environment. This study is proposed for the coastline. Future works could improve the condition of the estuary or degrade it. Opportunities to improve the condition of the estuary will be considered by coordinating with river basin management planning.

<b>Action (ID):</b>	<b>STRATEGIC MAPPING AND MODELLING (120820016)</b>
<b>Objective (ID):</b>	Reduce overall flood risk (12082)
<b>Delivery lead:</b>	SEPA
<b>Action Description:</b>	SEPA will seek to incorporate additional surface water data into the flood maps to improve understanding of flood risk. Approximately 1,300km <sup>2</sup> of improved surface water data is currently available within this Local Plan District.
<b>Timing and status:</b>	The surface water strategic mapping and modelling will begin in 2016 and will be completed by the end of the year.
<b>Funding:</b>	SEPA's strategic mapping and modelling activities are funded by Scottish Government through SEPA's grant in aid settlement.
<b>Coordination:</b>	SEPA's strategic mapping activities will be co-ordinated with the activities of other responsible authorities as required.

<b>Action (ID):</b>	<b>MAINTAIN FLOOD PROTECTION SCHEME (120020017)</b>
<b>Objective (ID):</b>	Reduce the risk of coastal flooding to residential properties and non-residential properties in Millport (12002)
<b>Delivery lead:</b>	North Ayrshire Council
<b>Action Description:</b>	The proposed Millport Coastal Flood Protection Scheme will look at altering the current defences including seawalls, revetments and breakwaters along Millport Bay. It is proposed that a new break water will be constructed and the seawall will be extended in order to enhance the protection of Millport Town. Until this time North Ayrshire Council will continue to inspect and maintain the Millport Coastal Flood defences, which will continue to manage flooding according to the design standard at the time of construction. The Millport Flood defences have an annual inspection regime along with a principal inspection every 6 years, to ensure integrity and peak efficiency. The sea defences will be maintained as part of the

	Council's coastal asset management programme. If the defences remain the same, levels of flood risk are likely to increase over time as a consequence of climate change.
<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	The maintenance of flood protection scheme will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
<b>Coordination:</b>	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process.

<b>Action (ID):</b>	<b>MAINTAIN FLOOD WARNING (120820030)</b>
<b>Objective (ID):</b>	Reduce overall flood risk (12082)
<b>Delivery lead:</b>	SEPA
<b>Action Description:</b>	SEPA will continue to maintain the the Millport Seafront flood warning area, which is part of the Firth of Clyde coastal flood warning scheme. When flood events occur in an area with a flood warning service, SEPA will seek to verify and validate the warning service. SEPA will use feedback and post-event data to ensure that our flood warning service is timely and accurate.
<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	The maintenance of SEPA's flood warning service is funded by Scottish Government through SEPA's grant in aid settlement.
<b>Coordination:</b>	A flood protection scheme for Millport and a shoreline management plan are proposed in this PVA. SEPA will work with the local authority to ensure that changes to hydrology and flood risk as a result of the proposed flood protection scheme and any new information about flood risk resulting from the proposed flood protection study are fully considered in the existing flood warning system.

<b>Action (ID):</b>	<b>FLOOD FORECASTING (120820009)</b>
<b>Objective (ID):</b>	Reduce overall flood risk (12082)
<b>Delivery lead:</b>	SEPA
<b>Action Description:</b>	The Scottish Flood Forecasting Service is a joint initiative between SEPA and the Met Office that produces daily, national flood guidance statements which are issued to Category 1 and 2 Responders. The service also provides information which allows SEPA to issue flood warnings, giving people a better chance of reducing the impact of flooding on their home or business. For more information please visit SEPA's website.

<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	SEPA's flood forecasting service is funded through Scottish Government's grant in aid allocation. The Met Office receives funding from the UK Government.
<b>Coordination:</b>	SEPA / Met Office joint initiative. Hydrological information is provided by SEPA and meteorological information is provided by the Met Office. SEPA uses the information to predict the likelihood and timing of river, coastal and surface water flooding.

<b>Action (ID):</b>	<b>SELF HELP (120820011)</b>
<b>Objective (ID):</b>	Reduce overall flood risk (12082)
<b>Delivery lead:</b>	—
<b>Action Description:</b>	Everyone is responsible for protecting themselves and their property from flooding. Property and business owners can take simple steps to reduce damage and disruption to their homes and businesses should flooding happen. This includes preparing a flood plan and flood kit, installing property level protection, signing up to Floodline and Resilient Communities initiatives, and ensuring that properties and businesses are insured against flood damage. The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared. Further detail can be found in the Councils and Scottish Flood Forum websites.
<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	Individual property owners have a responsibility to prevent flooding to their properties, therefore there is no fund allocated to this task in the Council's budget.
<b>Coordination:</b>	The Councils, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

<b>Action (ID):</b>	<b>AWARENESS RAISING (120820013)</b>
<b>Objective (ID):</b>	Reduce overall flood risk (12082)
<b>Delivery lead:</b>	Responsible authorities
<b>Action Description:</b>	North Ayrshire Council, SEPA and Scottish Water collectively work to raise awareness of flood risk and how those affected can be better prepared. Most recently in April/May 2015, as part of the Draft Flood Risk Management Strategy Public Consultation, the Council and SEPA gave residents in 7 towns, including Millport, the opportunity to meet and discuss the Strategy and raise awareness of the SEPA Coastal Flood Warning Scheme. North Ayrshire Council

	<p>support local Flood Action Groups at Millport. Through the continued development of flood schemes and studies at higher risk locations, officers from the Council's Flood Risk Management Team attend community council events to discuss elements of flood risk management.</p> <p>Across Scotland, SEPA will create and share communication and education resources with other responsible authorities. These resources will include awareness campaigns, media and marketing activity and promotion of SEPA's flood forecasting and warning services (Floodline). For the new Millport flood protection schemes, SEPA will support the local authority's communications and engagement activities with media activity, local public awareness events and education engagement with schools. SEPA will also deliver joint communications with local authorities for Floodline customers in any newly protected flood warning area.</p> <p>Scottish Water will provide targeted flooding communications for Scottish Water specific activities and raise awareness by producing and supplying targeted information to the public on large capital projects and detailed local studies.</p> <p>Further Information is provided on North Ayrshire Council, SEPA and Scottish Water websites.</p>
<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	<p>North Ayrshire Council's awareness raising activities will continue to be funded from the revenue budget provided by Scottish Government.</p> <p>SEPA's awareness raising activities are funded by Scottish Government through SEPA's grant in aid settlement. Scottish Water is funded by customer charges as set by our economic regulator. All business activities required under this action by Scottish Water are accounted for in their capital or operational expenditure.</p>
<b>Coordination:</b>	A new coastal along with a river flood protection scheme are proposed for Millport. North Ayrshire Council, SEPA and Scottish Water will continue to engage with responsible authorities and all other stakeholders, including community groups and the public to raise awareness of flood risk and how those affected can be better prepared.

<b>Action (ID):</b>	<b>MAINTENANCE (120820007)</b>
<b>Objective (ID):</b>	Reduce overall flood risk (12082)
<b>Delivery lead:</b>	North Ayrshire Council, asset / land managers
<b>Action Description:</b>	North Ayrshire Council in accordance with Section 18 of the Flood Risk Management (Scotland) Act 2009 undertake assessment of water bodies to determine whether works of clearance and repair would substantially reduce the risk of flooding. This information is used to produce a schedule of works which is available for the public

	<p>to inspect.</p> <p>High risk locations such as those with screens and some smaller culverts are inspected on a scheduled basis. The majority of inspections tend to be undertaken in the winter months when flows are higher, and leaves and other waterborne debris can be an issue. Works of clearance are carried out during these inspections which are not specifically "scheduled". The main water bodies, and other water bodies, within urban areas are subject to an annual visual inspection and any works identified are scheduled in accordance with Section 59 of the Act.</p> <p>North Ayrshire Council reviews the locations at which visual inspections are undertaken based on changing circumstances. For example a new flooding issue or concern raised by a member of the public at a location will lead to officers undertaking further inspection works at that location. North Ayrshire Council also works with riparian landowners to ensure that, within the constraints of the legal obligations, they manage their responsibilities in a manner which reduces flood risk.</p> <p>Scottish Water undertake risk based inspection, maintenance and repair on the public sewer network.</p>
<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	The maintenance work will be funded through North Ayrshire Council's Revenue Budget provided by Scottish Government.
<b>Coordination:</b>	North Ayrshire Council will work in coordination with all appropriate stakeholders identified through the inspection and maintenance process. Scottish Water will keep responsible authorities informed of large scale capital maintenance work to identify opportunities for co-ordination.

<b>Action (ID):</b>	<b>EMERGENCY PLANS/RESPONSE (120820014)</b>
<b>Objective (ID):</b>	Reduce overall flood risk (12082)
<b>Delivery lead:</b>	Category 1 and 2 Responders
<b>Action Description:</b>	<p>The Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency. North, South and East Ayrshire teams are a shared service team known as the Ayrshire Civil Contingencies Team. If disaster strikes, or if emergencies develop in Ayrshire, communities will look to the Council for support and advice. The Ayrshire Civil Contingencies Team ensures that the Council will be able to respond speedily and effectively in a major emergency in accordance with the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005. Our responsibilities include preparing comprehensive and robust contingency plans and procedures irrespective of the nature of the emergency. The main aim is to preserve life and property. Every emergency plan also sets out to:</p> <p>Mitigate the harmful effects of the emergency on the environment; bring about a swift return to normal life in the communities and</p>

	environment affected; and encourage all agencies and organisations to prepare for their role.
<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	Funding is allocated to category 1 and 2 responders by the Scottish Government for dealing with emergency response and in extreme cases may reimburse responders after an extreme event.
<b>Coordination:</b>	<p>Category 1 and 2 responders will coordinate in the development of the Emergency Response Plan and actions during a flood event.</p> <p>When civil contingencies come into force Police Scotland co-ordinate category 1 and 2 responders in severe flood events.</p>

<b>Action (ID):</b>	<b>PLANNING POLICIES (120390001)</b>
<b>Objective (ID):</b>	<p>Reduce overall flood risk (12082)</p> <p>Avoid an overall increase in flood risk (12039)</p>
<b>Delivery lead:</b>	Planning authority
<b>Action Description:</b>	<p>North Ayrshire Council adopted its first and current Local Development Plan (LDP) on 20 May 2014. The plan plays an important part in reducing the vulnerability of existing and future development to flooding. Through Policy P18: Drainage, SUDS and Flooding and in accordance with the Scottish Government's Scottish Planning Policy, we apply the Flood Risk Framework, or a sequential approach, to guide certain types of development to appropriate locations in terms of flood risk. We have a presumption against new development in areas of significant flood risk unless the stringent criteria in Policy P18 can be satisfied. Planning applications received by us are individually reviewed and, if flooding is a potential and significant concern, further information is sought by consultation with the applicant, SEPA and/or the Council's Flooding &amp; Structure Design Team and, where appropriate, by submission of a flood risk assessment. Through both Policy P18 and appropriate planning conditions, we also seek to minimise the impact of new developments on flood flow through the use of sustainable urban drainage systems. We are now reviewing the current LDP and moving toward preparation of a replacement plan or LDP2. The key stage in preparing the new plan is the Main Issues Report, anticipated for publication in January 2017. To help us prepare the MIR, we are undertaking a 'Call for Sites' exercise to identify sites within North Ayrshire that may have potential for development. We will apply the Flood Risk Framework to site selection so that development is, as far as reasonably possible, located where the risk of flooding is acceptable, taking account of climate change and the vulnerability of future uses to flood risk. We also will use the strategic flood risk assessment process to inform choices about the location of development and planning policies for flood risk management. SEPA's flood risk plans and approved Flood Risk Management Strategies and Plans will also influence choices. LDP2 will cover a 10 year period, starting from 2019 when the new plan is likely to be adopted.</p>

	<p>Scottish Water is a statutory consultee within the planning legislation and is required to comment on all outline or full planning applications which are referred by a local authority.</p> <p>Scottish Planning Policy and accompanying Planning Advice Notes set out Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. In terms of flood risk management, the policy supports a catchment-scale approach to sustainable flood risk management and aims to build the resilience of our cities and towns, encourage sustainable land management in our rural areas, and to address the long-term vulnerability of parts of our coasts and islands. Under this approach, new development in areas with medium to high likelihood of flooding should be avoided. For further information on the application of national planning policies see SEPA's Strategy.</p> <p>SEPA has a statutory role in relation to the provision of flood risk advice to planning authorities. This role is expressed in Section 72 of the FRM Act, 2009. SEPA also has a duty to co-operate with planning authorities in the preparation of development plans. When consulted in relation to planning applications for development or site allocations in development plans, and where the planning authority considers there may be a risk of flooding, SEPA will provide advice. The advice provided by SEPA will be with respect to the risk of flooding and on the basis of the relevant information it holds which is suitable for planning purposes. It will also be in line with the principles and duties set out in the FRM Act. Further information about how SEPA engage in the planning system, including guidance on flood risk and planning is available on SEPA's website <a href="http://www.sepa.org.uk/environment/land/planning/">http://www.sepa.org.uk/environment/land/planning/</a>.</p>
<b>Timing and status:</b>	Ongoing
<b>Funding:</b>	The development and review of the Council's Planning Policies and Guidance notes will be funded through North Ayrshire Council's revenue budget provided by Scottish Government. SEPA's land use planning activities are funded by Scottish Government through SEPA's grant in aid settlement.
<b>Coordination:</b>	North Ayrshire Council's and SEPA's land use planning activities will be co-ordinated with the activities of other responsible authorities as required.