1. Why is this project needed?

The Flood Management (Scotland) Act 2009 requires local authorities, Scottish Water and SEPA to work together to reduce overall flood risk and to raise awareness of flood risk. North Ayrshire Council is responsible for managing flood risk in its area and building flood protection schemes where they are needed.

Millport is at risk from coastal flooding due to wave overtopping. Overtopping of the sea walls occurs from wave action during storms originating to the south or south west within the Firth of Clyde.

Locally obtained evidence confirms that minor to moderate flooding occurs most years. Many residents have taken individual action to reduce flood damages, such as installing flood boards to their doors and storing sandbags in case of need. Flooding also affects the use of the coastal road.

North Ayrshire Council commissioned a Flood Risk Assessment (FRA) in 2015. The FRA identified expected extents of flooding in Millport in the future for a range of different probabilities of flooding. A flood risk map was developed based on an assessment of overtopping of the sea walls in Millport and reviewing the calculated flood volumes against the topography of Millport. The table below summarises the locations that may be affected by flooding:
The seafront area slopes towards the sea, so flood water does not travel very far inland. However, if nothing is done to provide improved protection to the residential and commercial properties that are within the flood risk zone, flooding and erosion could cause damage in the future through the loss of use of the coastal roads and damage to adjacent residential and commercial properties.

The risk of flooding is expected to increase in the future, with research showing that sea levels are rising and that storms and large waves are occurring more often. SEPA is undertaking research to better understand these risks for Scotland.

### 2. What are the objectives for the scheme?

The objectives of the Millport Coastal Flood Protection Scheme (FPS) are:

- To provide effective flood protection for the community of Millport;
- To obtain all necessary permissions, consents and approvals, delivering a scheme that is acceptable to stakeholders and the community;
- To deliver value for money and affordability;
- To minimise the height of any required flood walls to preserve views and provide finishes to structures in keeping with the existing local environment;
- Awareness raising about flooding, severe weather warnings and resilience through working with local schools and the community.

<table>
<thead>
<tr>
<th>Return Period</th>
<th>Probability of occurrence each year</th>
<th>Locations affected by flooding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 1 year</td>
<td>100%</td>
<td>Area east of Millport Harbour (Millburn St, Crichton St, southern end of Crawford St, junction of Miller St &amp; Clyde St), 7 properties on Stuart St and Millport Pier Stores (Quayhead).</td>
</tr>
<tr>
<td>1 in 2 years</td>
<td>50%</td>
<td>As for 1:1 year, plus Crawford St (between Miller St and Millburn St), Miller St (Crawford St to Clyde St), Clyde St and an additional 22 properties on Stuart St.</td>
</tr>
<tr>
<td>1 in 5 years</td>
<td>20%</td>
<td>As for 1:2 year plus another 23 properties on Stuart St and most properties on the Quayhead.</td>
</tr>
<tr>
<td>1 in 10 years</td>
<td>10%</td>
<td>Flooding extends to most of Stuart Street, the junction of Glasgow St and College St and the eastern end of Glasgow Street (from Mountstuart St to Kelburn St).</td>
</tr>
<tr>
<td>1 in 100 years</td>
<td>1%</td>
<td>Flooding throughout Guildford Street and Glasgow Street and to the rear of properties on Howard Street. Garrison House and associated community facilities may not be directly affected but are likely to be inaccessible.</td>
</tr>
<tr>
<td>1 in 200 years</td>
<td>0.5%</td>
<td>Flood extents reach Garrison House and properties at the western end of Kames Bay.</td>
</tr>
</tbody>
</table>
3. What are the timescales for design and construction of the scheme?

Initial investigation and high-level appraisal has been completed for the FPS. This work identified two preferred options, which need to be developed further along with consultation with the community and statutory stakeholders to determine a preferred option.

Design development for the scheme involves four stages of work:

- **Stage A** – Outline design development, risk review and optimisation;
- **Stage B** – Consultation, consents and licences;
- **Stage C** – Detailed Design and Contract Documents; and
- **Stage D** – Construction.

Stages A and B will run in parallel, and began in May 2016. Stage C will commence following the formal consultation process for the flood protection scheme, and is currently expected to begin in early autumn 2017. The aim is to complete design work and appoint a construction contractor for works to commence in the spring of 2018. It is currently expected that construction would take between 1 and 2 years.

4. How will the scheme be funded?

The flood protection risks to Millport are recognised in Scotland’s national flood risk strategy. The delivery of a flood protection scheme for Millport is prioritised at 10 in a list of 40 proposed schemes for implementation over the next six years.

The Scottish Government provide grant funding for 80% of the cost of flood protection schemes identified within the national flood risk strategy. The estimated cost of the scheme is £12.1 million. North Ayrshire Council would require to provide the remaining 20% of the funding.

5. Which options have been considered for the scheme and why?

A range of coastal flood risk management options have been assessed. A high-level options appraisal was completed in 2015 which considered eight alternative approaches to reducing the level of flood risk to Millport. This study included:

- Assessment of flood risk damages based on the number of properties within the flood risk area;
- Assessment of the risk of failure of the coastal defences and subsequent erosion of the seafront area;
- Numerical modelling of wave overtopping to review the level of protection that could be provided by the options under consideration;
- Cost estimates for the proposed options;
- An appraisal of benefits vs costs to determine the preferred option for improving the protection to Millport against flooding and erosion.
The high-level options appraisal initially reviewed the different types of coastal protection measures that could potentially be used to address the problems along the Millport frontage:

**Repairs to existing defences** would address the deterioration of the sea wall and extend the life of the structure. Without additional flood protection measures, repair works would not reduce wave overtopping, flood risk or the risk of a failure of the defences.

**Rock revetments** constructed by placing large rock armour against sections of the existing coast protection structures would protect the sea wall from direct wave attack and reduce the volume of water overtopping the walls during storms. Numerical modelling of wave overtopping showed that a rock revetment alone would not sufficiently reduce wave overtopping and flood risk impacts.

**Beach nourishment**, by importing substantial quantities of sand to raise beach levels in front of the sea walls, protecting the lower part of the sea wall and reducing the volume of water overtopping the walls. Beach nourishment would not fully address overtopping problems and could not be undertaken in isolation. Sand nourishment to the Millport beaches would also be very vulnerable to loss of material due to wave action, so lost sand would have to be regularly replaced. For these reasons sand nourishment is not technically viable for Millport and was therefore not considered further.

**Shore-connected rock breakwaters** are rock armour structures extending seawards from the sea wall. The breakwaters would reduce wave energy reaching the sea wall. Rock breakwaters are not expected to sufficiently reduce wave overtopping without other flood protection measures, and would not be appropriate for all parts of the Millport seafront. This method is a potential solution to reduce overtopping to the area to the west of Millport pier, in combination with flood walls.

**Offshore breakwaters** - the construction of a rock armour breakwater some distance offshore in Millport Bay. Offshore breakwaters reduce wave energy and resulting overtopping at the shoreline.

An extension to the **harbour breakwater**, assumed to be constructed of rock armour, to reduce wave energy reaching the Stuart Street sea wall and therefore the level of overtopping and associated flooding in this area.

**Flood walls**, constructed either inland of the existing coast protection structures (e.g. along the seaward side of the footpath to coastal road), or by increasing the height of the existing sea walls. The height of the flood walls would need to be minimised to limit the visual impact on the seafront area and on views of the open coast. For this reason additional flood protection methods would be needed to sufficiently reduce wave overtopping and flooding impacts to properties.

**Property level protection** involves the installation of various measures at each property at risk of flooding to minimise the impacts should flooding occur. This might include flood gates or barriers, changes to flooring and relocation of electric sockets. The success of this method depends on individual property owners responding to flood warnings. This option does not address the source of flooding, but is a viable option for the reduction of flood damages.
Property level protection is also a possible solution in combination with other methods to reduce residual flooding impacts.

The high-level options appraisal concluded that each of the proposed options would have a very different appearance. Assessment of visual impact is very subjective, with local residents and business owners likely to have varying opinions. It was therefore recommended that the next stage of the project should be local consultation on the preferred options, to identify key issues for residents and businesses, and to gather their views on the option that should be progressed to design development. This has been organised for 29 November and 1 December 2016.

6. What work needs to be completed to design the scheme?

Design development will involve:

- Undertaking the technical investigations needed to provide enough information to allow the scheme design to be completed and for the project risks to be assessed;
- Consultation with the community of Millport and engagement with statutory consultees to determine any issues associated with the possible solutions;
- Completing a baseline environmental assessment and obtaining a screening opinion to determine whether an Environmental Impact Assessment is required;
- Developing the scheme outline design;
- Preparing a report setting out the design development process, the identified constraints and risks and recommending the preferred solution based on a full assessment of these issues;
- Obtaining approval from North Ayrshire Council (the Council) to progress the flood protection scheme for approval by the Scottish Government.

Following formal consultation and approval of the flood protection scheme proposals, detailed design will be undertaken to prepare the information needed by a construction contractor in order to build the scheme. The exact requirements of the detailed design process will depend on the preferred scheme that is determined during the initial phase of design development.

7. Which approvals are needed for the scheme to progress?

The Flood Risk Management (Scotland) Act provides local authorities in Scotland with permissive powers to manage flood risk in their areas and to carry out flood protection works. As defined by the Flood Act, a flood protection scheme is a scheme by a local authority for the management of flood risk within the authority’s area. A flood protection scheme is promoted by the local authority, and confirmed under the Act by the local authority or, in certain circumstances, by Scottish Ministers.
A proposed flood protection scheme must include the following information as a minimum:

- a statement of how the scheme will contribute to the implementation of measures described in the Local Flood Risk Management Plan;
- a description of the extent and scale of the proposed scheme, referring to maps, plans and specifications and including sufficient information to allow a layperson to understand the scale and nature of the proposed works and the impacts they would have on their interests;
- a description of the land which may be affected and any land which needs to be entered for construction of the scheme; and
- a statement of the estimated cost of the scheme.

It is currently expected that the following additional licences will be required:

- A marine licence for Marine Construction Works from Marine Scotland Licensing Operations, on behalf of the Scottish Ministers, under the Marine (Scotland) Act 2010.
- A Harbour Revision Order from the Scottish Ministers under the Harbours Act 1964.

Environmental reports will be prepared to satisfy the requirements for these consents.

8. What about drainage through the flood walls?

We understand that there are concerns about the capacity of the surface water drainage in Millport for dealing with surface water run-off as well as wave overtopping. The flood protection scheme will be developed to significantly reduce the volumes of wave overtopping, reducing the demands on this drainage network. The design will include for drainage of surface water run-off through the planned flood walls.

9. How will information about the scheme be provided?

Newsletters giving updates on progress with development of the scheme will be provided every 2 to 3 months. Newsletters will be posted to all properties in Millport and additional copies will be made available in local shops and the library. Information on the scheme development and all the newsletters are uploaded to the North Ayrshire Council Flooding website: http://www.north-ayrshire.gov.uk/resident/community-safety/flooding.aspx

North Ayrshire Council is developing a dedicated page on the Council’s website for the scheme. Information about the scheme, including the newsletters and relevant background information, will be provided on this website.

We plan to hold community design workshops on the 29 November and 1st December 2016 to share information about the scheme and to work with local residents to understand their needs and concerns in relation to the potential scheme options and the construction process. By this time we will have more information about the technical requirements of the scheme, including the results of computer modelling of waves and tides and investigation of the ground conditions in the scheme area. Workshop sessions will be held over two days, to enable as many people to be involved as possible.
Feedback will be provided to let people know how their comments have been addressed in the development of the preferred option.

A public meeting will be held in spring 2017 to present the proposed scheme design before the flood protection scheme is formally advertised for consultation ahead of its review for approval by the Scottish Government.

The community design workshop and public meetings will be advertised widely around Millport, in the local newspaper and on the Council’s website.

10. How will the impacts of construction on residents and businesses be minimised?
The scheme will be planned with the aim of minimising the impacts of the construction process on residents and businesses as far as possible.

11. How can you increase your resilience to flood risks?
- Sign up to Floodline to receive free advance notice of when and where flooding might happen. Floodline number: 0345 988 1188; or online [http://floodline.sepa.org.uk/floodupdates/](http://floodline.sepa.org.uk/floodupdates/)
- Prepare a flood plan and put a family flood kit together so everyone knows what to do if flooding happens
- Familiarise yourself with how to shut off gas, electricity and water supplies
- Keep a list of useful contact numbers including your Floodline quick dial code
- Consider flood protection products that could help to reduce the impact of flooding on your property and ensure your insurance provides adequate cover for flood damage

12. How can I get affordable insurance?
Flood Re is a flood re-insurance scheme. Flood Re has been set up to help those households who live in a flood risk area find affordable home insurance.

Flood Re makes no difference to how you purchase your home insurance, whether that’s through a price comparison site, directly from an insurer or through a broker. Once you have purchased your policy, you will always deal with your own insurer even if you need to make a claim. You do not need to contact Flood Re directly.

See the following website for more details. [http://www.floodre.co.uk/homeowner/](http://www.floodre.co.uk/homeowner/)
13. How will the impact on the environment be minimised?

An Environmental Scoping Report has been undertaken by environmental scientists, which considers the scheme, details the relevant legislation with which the scheme must comply and identifies the all the ways the scheme may potentially impact on:

♦ Physical Environment i.e. coastal processes, water quality, soils and geology;
♦ Ecological Environment i.e. birds, fish, seals, whales, dolphins, otters, habitats and designated sites; and
♦ Human environment i.e. noise, air quality, traffic, landscape, archaeology, navigation, recreation and tourism.