

**CAMPBELTOWN FLOOD PROTECTION SCHEME**

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**1.0 EXECUTIVE SUMMARY**

- 1.1 The purpose of this report is to inform the Committee on the outcome of the appraisal of flood risk management options for properties at risk of flooding in Campbeltown as part of the Campbeltown Flood Protection Scheme project - in particular drawing attention to future financial investment by the Council for the project to proceed.
- 1.2 Campbeltown has experienced flooding over many years. This has affected residential properties, businesses, roads and community life in general.
- 1.3 The Local Flood Risk Management Plan was published in 2016 which included the Campbeltown scheme. The project was added to the Capital Plan in 2016-17 following receipt of the first grant from the Scottish Government of £40k. The total grant received to date is £603k, and £603k has been allocated to the project. The funding has allowed initial project development work to be undertaken/programmed and is expected to cost approximately £234k by the end of 2018-19. Further investigations and development work is required to better define the options and estimated costs prior to providing an Outline Business Case for approval.
- 1.4 A number of options have been developed and appraised so that four preferred solutions to reduce flood risk in Campbeltown remain. This report summarises work required to get to a final preferred solution (Outline Business Case). It notes there are ongoing flood modelling works associated with urban flood solutions.
- 1.5 Baseline damages for Campbeltown over the next 100 years at Present Value Damages are estimated at £38M, the bulk of which is related to cost to local businesses. The scheme options presented here have been tested economically to check the damages saved exceed the investment required in order to meet the SG requirements for flood schemes throughout Scotland.
- 1.6 A financial summary of the potential funding required to support the project through to construction based on current estimates is below. Expenditure to the end of October 2018 has amounted to £132k.

**Table 1: Potential project funding requirements based on current programme**

<b>Financial Year</b>	<b>17-18</b>	<b>18-19</b>	<b>19-20</b>	<b>20-21</b>	<b>21-22</b>	<b>22-23</b>	<b>Total</b>
	(£k)	(£k)	(£k)	(£k)	(£k)	(£k)	(£k)
Estimated project cost profile	84	150	400	2,850	5,696	150	9,330
<b>20% funding Council Contribution for CFPS</b>	<b>0</b>	<b>0</b>	<b>127*</b>	<b>570</b>	<b>1139</b>	<b>30</b>	<b>**1,866</b>

\*This figure represents a 20% Council contribution based on projected spend to end FY19/20.

\*\* Using the mid-range values of potential capital funding likely to be available between FY 19-20 and 22-23 a total of approximately £24m may be available for D&I projects. The £1.866m Council contribution would need to come from this or with a contribution from any Prudential borrowing.

1.7 Accordingly the Committee is recommended:-

- i. To note that modelling of flood protection options has been completed, with clear recommendations for solutions eligible for Scottish Government funding to be taken forward to the next stage of investigation, design and planning approvals.
- ii. To request that the Council, as part of the budget process, allocate the project £127k of capital and consider the potential need for additional funding in 20/21 through to 22/23.
- iii. To acknowledge the final scheme will be subject to approval of Outline Business and Full Business cases, which are expected to be submitted late 2019 prior to tender and late 2020 prior to tender award respectively and if approved additional funding may be needed as indicated in table 1.

## CAMPBELTOWN FLOOD PROTECTION SCHEME

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### 2.0 INTRODUCTION

- 2.1 Under the Flood Risk Management Act 2009, the Council is responsible for identifying flood risk areas and developing sustainable flood management options to form flood mitigation schemes. This is the basis of the Council's Flood Risk Management Policy. The Council has helped prepare the first Local Flood Risk Management Plan (LFRMP), published June 2016, which details the actions to be taken between 2016 – 2022. Currently central government is expected to contribute 80% to the overall funding of projects, which through a prioritisation process receive funding through to construction. The Act requires an LFRMP Interim Report published mid-cycle, which is currently being finalised, to report on progress toward reaching goals set by the Council (which is available at <https://www.highland.gov.uk/info/1226/emergencies/81/flooding/3>).
- 2.2 One such project Infrastructure Design are progressing is reported in the Interim Report is the Campbeltown Flood Protection Scheme, in accordance with the Highland and Argyll Local Flood Risk Management Plan 2016-2022. A previous study completed by Halcrow in 2008 demonstrated there was a business case for a flood protection scheme in Campbeltown; however funding was not available to bring this scheme to construction.
- 2.3 Consultants (AECOM) were appointed in 2017 by the Council to build upon work carried out by Halcrow and also look at surface water management in urbanised areas. The current study has proposed new flood mitigation measures for surface water and river flooding. The project has progressed to the point where the remaining options require detailed investigation and design. This includes confirmation of current and future 20% funding that the council would be required to contribute.
- 2.4 Appendix 1 to this report is a summary of the latest technical report by AECOM.
- 2.5 The Scottish Government (SG) has already confirmed to the Council £603k up to and including the 2018/2019 financial year for the Campbeltown Flood Protection Scheme. This has been provided based on previous

cashflow estimates sent to Scottish Government for the project. The funds received so far are expected to be sufficient to develop the project through to tender, the scheme costs over the next 5 years could be up to £9.3M based on budget estimates provided to SG. The Council is expected to contribute 20% from its own resources, which based on current estimates may be up to £1.9M.

- 2.6 A breakdown of the current estimates for the Campbeltown Flood Protection Scheme is as follows:

**Table 2: Proposed option estimates and cost-benefit ratios**

Option	Description	Estimate	Cost Benefit Ratio
1	Storage at Millknowe	£3.1M	1.40:1
2	Upsize of Dalaruan culvert	£1.9M	2.00:1
3	Storage at Millknowe and upsize of shorter length of Dalaruan upsize	£4.5M	1.02:1
4	Sustainable urban drainage (SUDS) Retrofit in urban areas	c.£4.8M	TBC

A total project value of up to £9.3M depending upon which Option (1-3) is progressed along with Option 4. The Options are described further in Section 4. It should be noted that depending upon the final scheme options including SUDS retrofit and associated benefit/cost ratios, that the Council will have an opportunity to consider the options to progress the scheme in full or in part dependent upon the 20% funding component allocated/available. For example Option 2 may in due course present the better investment option over Option 3 at least cost.

- 2.7 An Initial Business Case (IBC) was presented to the Strategic Asset Management Board in October 2016 – a copy of the IBC refreshed with current budgets and programme dates is attached as Appendix 3 to this report. An Outline Business Case will be tabled prepared for approval prior to procurement once deemed planning has been obtained expected to be in late 2019, and a Full Business Case prior to tender award in late 2020. (see Appendix 2 for long term programme). The OBC and FBC will provide more detail on the financial commitment to Council in order to provide a 20% funding component for the works based on the scheme estimates as the project progresses.
- 2.8 The Scottish Government has provided clarification on the use of capital grants for flood schemes and how monies unused would be treated. They state: *'The grant for an eligible flood scheme is fixed at 80% of estimated costs after tender acceptance. Should the final cost be lower, any excess of grant paid which exceeds the 80% intervention rate will be taken back as part of the General Capital Grant calculation. If final costs are higher no additional grant is payable.'* Based on this, if the project was to stop at the end of the current financial year based on the estimated spend profile noted, the Council would require to return to the Scottish Government at least £416k of the £603k provided to date..

2.9 The need and basis for a Campbeltown Flood Protection Scheme has been raised through several committees in previous years e.g.:

- MAKI Area Committee – Nov 2008 – Noted a flood scheme was viable and cost beneficial, based on the Halcrow study.
- Council – January 2015 – Outlined proposed LFRMP actions including Campbeltown flood scheme and noted potential for 20% Council funding.
- EDI – April 2016 – Approval of the LFRMP and actions, confirmation of the 20% Council funding required for schemes, and £9.3M project estimate for Campbeltown in Cycle 1
- SAMB – Oct 2016 – IBC confirming LFRMP actions and required funding to support, including forecast for Campbeltown scheme.

### **3.0 RECOMMENDATIONS**

3.1 The Committee is recommended:-

- i. To note that modelling of flood protection options has been completed, with clear recommendations for solutions eligible for Scottish Government funding to be taken forward to the next stage of investigation, design and planning approvals.
- ii. To request that the Council, as part of the budget process, allocate the project £127k of capital and consider the potential need for additional funding in 20/21 through to 22/23.
- iii. To acknowledge the final scheme will be subject to approval of Outline Business and Full Business cases, which are expected to be submitted late 2019 prior to tender and late 2020 prior to tender award respectively and if approved additional funding may be needed as indicated in table 1.

### **4.0 DETAIL**

4.1 Options have been narrowed down using a robust short listing process. An initial long list of options was developed which was screened based on the technical, financial and legal feasibility of options as well as input from statutory stakeholders (A&BC, SEPA, Scottish Water and SNH) and initial high level hydraulic modelling. Consultation with landowners one-to-one and two public consultation sessions were held through the process which contributed to refinement of the options assessment. An ecological assessment was conducted of potential sites.

4.2 Based on topographical survey, hydraulic modelling, environmental assessment, concept engineering design, scheme costings, three public consultation events, statutory stakeholder consultation workshops, initial landowner consultations and a holistic economic, environmental and social appraisal, the short list of nine options has been narrowed down to four (including the surface water management SUDS retrofit).

- 4.3 The sifting process already undertaken has ruled out a number of the potential solutions based on the estimated costs outweighing the expected benefits.
- 4.4 Option 1 is an upstream flood storage area designed to store flow in storm events and reduce the impact of high flows on the Millknowe Burn and Dalaruan Street culvert. The upstream flood storage would be used only periodically and the flood water would be discharged into the Dalaruan culvert at a controlled rate using a flow control culvert without retaining a permanent body of water at this location. The best location for this storage is in farm fields adjacent to Snipefield industrial estate. This location is known to flood frequently so we would be enhancing this natural mechanism. The area also offers a potential storage volume up to the 1 in 200 year event (i.e. one with a statistical 0.5% chance of occurring in any given year) with a fairly minimal height (2.6m) of dam required. Flood defences would also be required along the east bank to protect the industrial estate. The main embankment and defences may raise aesthetic issues. This needs to be balanced with sympathetic landscape design to ensure the character of the area is retained.
- 4.5 Option 2 is an upsize of the Dalaruan Street culvert. This option would increase the capacity of the culvert to manage flood flows. The upsize would cover a length of approximately 500m and require excavation along the carriageway. Upsizing the entire length of culvert has been considered but it has been determined a reduced length of upsize would offer similar benefits whilst reducing disruption. The main constraint with this option is the potential for clashes with underground services along the route which can increase costs. This option has potential to be disruptive with a 6 month programme of road restriction/closure anticipated. This impact would be mitigated by traffic management planning.
- 4.6 Option 3 is a combination / optimisation of Option 1 and Option 2. This has the potential to protect an additional number of properties and also reduce the need to upsize pipes upstream of the Dalaruan intake, reducing cost of the culvert upsize required.
- 4.7 Option 4 is surface water management options including Sustainable Urban Drainage System (SUDS) Retrofit and sewer upgrades. SUDS Retrofit would involve disconnection of large impermeable areas from combined drainage and diverting to a suitable SUDS feature to store, slow and treat runoff. Recommendations of potential sewer upgrades at identified network pinch points to Scottish Water would also be made. Work is ongoing to refine in-town SUDS retrofit solutions appropriate to surface water flooding extents and opportunities. Scottish Water is being engaged through this process from a technical perspective, with the possibility of financial contribution depending upon the component of sewer flows that may contribute to surface water flooding.
- 4.8 Do Nothing Scenario - A baseline damages economic assessment has been completed as part of the options assessment which indicates the impacts of a 'do-nothing' scenario. The Present Value Damage (PVD) to Campbeltown over an appraisal period of 100 years is estimated at £38M

the bulk of which is associated with non-residential property i.e. local businesses. The current funding model presents an opportunity to support business investment in Campbeltown by reducing flood risk, direct damages, and insurance costs associated with future damages. It would build on the public investment to Campbeltown already made for CHORD, CARS and Kintyre Renewables HUB. .

- 4.9 Further work is required on the available options to assess their merits in more detail. Two key activities require to be undertaken prior to the selection of the final preferred flood prevention scheme to clarify and refine the cost benefit ratios:-
- Utility diversion assessment – to further identify any utility apparatus that may be affected by the proposals
  - Geotechnical desk study – to further identify the types of ground conditions to be expected. A site investigation may follow based on the results of this assessment.
- 4.10 Following selection of the final preferred scheme options, EIA screening is being carried out to determine if a full EIA is required.
- 4.11 Public Consultation - The third in a series of public events at relevant stages was held on 4 October 2018 to discuss the recommended options with members of the public and affected landowners subject to available funding. Previous public meetings have been held in 2017/2018 after baseline modelling and upon completion of a short list of options. Public events were advertised on the Council website, social media, within the local paper and advertising posters. Press articles were included before and after the third public event in October 2018. Initial consultations with affected landowners for preferred scheme solutions have also commenced. Canvassing at the Kintyre Agricultural Show was also carried out in August 2018 to further gauge the views of the local community. Early stakeholder consultation with SEPA and Scottish Water has also been undertaken.
- 4.12 Proposed Programme – This is subject to approval of business cases and the necessary funding being available. The current programmed milestones for the project are (refer also programme in Appendix 2):
- Ground investigation works – commence early 2019
  - Formal scheme notification to the Scottish Government – completed by April 2019
  - Deemed planning approval – obtained by October 2019 assuming any objections to scheme notification have been resolved
  - Detailed design – completed by August 2020
  - Outline Business Case submitted for the proposed scheme expected between late 2019 and mid 2020 which would then allow tenders to be invited

- Procurement – completed by October 2020
- A Full Business Case will be tabled for approval prior to tender award expected in late 2020
- Construction – from late 2020

4.13 Funding – A financial summary of the potential Council funding required to support the project through to construction based on current estimates provided to Scottish Government is in the table below (which also notes spend to date).

It should be noted the £603k provided to the Council as an 80% contribution to the project to date, though not ring-fenced, if not utilised for the project is effectively repayable to the SG.

For the project to proceed on the basis of the table below, the Council would require to make provision in the financial year 19/20 of £127k as the 20% of estimated project costs to the end of FY19-20 and make allowance for funding in future years, noting the project value may be less than noted once investigations and design are progressed further. The budget allocation for FY19/20 is expected to provide adequate funding for the project to complete all detailed design and procurement.

**Table 3: Potential project funding requirements based on current programme**

<b>Financial Year</b>	<b>17-18</b>	<b>18-19</b>	<b>19-20</b>	<b>20-21</b>	<b>21-22</b>	<b>22-23</b>	<b>Total</b>
Funding source	(£k)	(£k)	(£k)	(£k)	(£k)	(£k)	(£k)
Capital - Campbeltown Flood Protection Scheme	84	150	400	2,850	5,696	150	9,330
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\*This figure represents a 20% Council contribution based on projected spend to end FY19/20.

\*\* Using the mid-range values of potential capital funding likely to be available between FY 19-20 and 22-23 D&I would have an allocation of approximately £24m to source the necessary Council contribution from plus any Prudential borrowing. This figure has been provided by Finance to the Strategic Asset Management Board.

## 5.0 CONCLUSION

5.1 Significant work has taken place to understand the flooding mechanisms in Campbeltown and the initial long list of potential solutions has been narrowed to four. The Council in partnership with the Scottish Government now has an opportunity to address flood risks in Campbeltown. As part of the local Flood Risk Management Plan (LFRMP), the Scottish Government has and is expected to provide 80% of the funding required. If the scheme is not progressed the Council will likely require to return



funding provided by SG for the purpose of progressing this scheme, as identified in the LFRMP and endorsed by the Council.

A 20% component of Council funding of the project based on current estimates for the project is around £1.9M through to FY22/23, though this figure could decrease as the project extents are more defined following investigation and design.

- 5.2 Either Option 1, 2 or 3 to be taken forward as the preferred flood prevention scheme. In part this will depend on which option has best cost benefit ratio following utility assessment and geotechnical assessment, and provides best value in the context of wider urban surface water solutions which may be recommended also.
- 5.3 Option 4, surface water management measures are to be included as part of the scheme if found to be viable.
- 5.4 It is proposed that scheme notification is commenced in the first quarter of 2019.
- 5.5 Full details of the scheme will then be published and stakeholders and affected parties will be notified. There will be a 28-day consultation period within which objections may be made.
- 5.6 Following the conclusion of the consultation period, if there are no objections to the proposed flood protection scheme and landowner discussions are satisfactorily resolved, the final scheme proposals can be confirmed. The design details can then be finalised and a viable scheme submitted to the Scottish Government.

## **6.0 IMPLICATIONS**

### **6.1 Policy:**

Works are in accordance with the Local Flood Risk Management Plan 2016-2022 as endorsed by Council.

Local Authorities have powers under Flood Risk Management (Scotland) Act 2009 “to manage flood risk and to take forward a flood protection scheme.”

The Campbeltown Flood Protection Scheme would enable Argyll and Bute Council to enact this power under the Flood Risk Management Policy.

### **6.2 Financial:**

The current capital budget allocation to support ongoing project activities will fund the scheme to be taken to tender readiness. The project will require outline and full business cases to be approved prior to awarding any works contract. Apart from the 80% Scottish Government grant, any funding the Council allocates is expected to be at the expense of other D&I projects.

- 6.3 Legal:  
If the preferred option is the flood storage option (Option 1 or Option 3), land acquisition or other compensation arrangements with land owners will have to be considered
- 6.4 HR:  
None
- 6.5 Equalities / Fairer Scotland Duty:  
Equality Implications Assessment will be carried out during the public consultation period.
- 6.6 Risk:  
If the studies are not progressed as per the LFRMP, Council will forfeit potential for 80% funding from SG and may require to reimburse SG those funds already provided expressly for this purpose.
- As with any project of this nature there is potential for public objection to the scheme. Management of this risk has been initiated through public engagement through a series of workshops, public events and one to one meetings with landowners.
- 6.7 Customer Service:  
A lot of complaints can be expected if the Council does not progress the project. The project will provide economic, cultural and physical benefits to the community.

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**Policy Lead Cllr Roddy McCuish**  
November 2018

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## **APPENDICES**

*Appendix 1 – Summary of Campbeltown Flood Protection Scheme and Surface Water Management Plan Phase 4 Options Appraisal Report – AECOM October 2018*

*Appendix 2 – CFPS Long Term Programme dated 11 October 2018*

*Appendix 3 – Initial Business Case to SAMB – Local Flood Risk Management Plan - refreshed to 30 October 2018 (originally submitted 6 October 2016)*

## APPENDICES

### Appendix 1 – Summary of *Campbeltown Flood Protection Scheme and Surface Water Management Plan Phase 4 Options Appraisal Report – AECOM October 2018*

AECOM Ltd were commissioned by Argyll and Bute Council to undertake a Flood Protection Study (FPS) and Surface Water Management Plan (SWMP) for Campbeltown.

At this point of the study, sufficient work has been carried out to understand the flood mechanisms affecting Campbeltown and to identify constraints and opportunities with regard to potential flood mitigation options. River flooding from the Millknowe Burn and to a lesser extent the Balegreggan Burn is known to affect Campbeltown, particularly the central area around John Street and Saddell Street. Surface water flooding from ponding rainfall and an overwhelmed combined drainage network also pose a flood risk to Campbeltown particularly in the Longrow area. A map showing flood risk areas is included at the end of this appendix.

Once flood risk in the area was understood, AECOM developed a long list of measures to address flood risk these ranged from Natural Flood Management, Property Flood Protection, Deculverting, SuDS retrofit, flood diversion channels, upstream storage etc. Workshops were used to derive a Short List of options based on assessment of measures taking account of Technical, Legal and Economic perspective. The resultant shortlist is shown in **Table 0-1** below.

<b>Table 0-1 Short List Options No.</b>	<b>Option</b>	<b>Description</b>
<b>1</b>	Upstream Storage on Millknowe Burn	Earth embankment and control to impound water in storm events upstream of Millknowe intake
<b>2</b>	Flood diversion culvert at Balegreggan Burn	480m long culvert to divert flood flow from the Balegreggan Burn
<b>3</b>	Upsize of Dalaruan Street culvert overall partial length	496m culvert upsize at Dalaruan Street up to a maximum diameter of 1.2m
<b>4</b>	Witch Burn Flood Storage and Meadows Surface Water Management	Earth embankment and control to impound water in storm events upstream of Whinhill Road and swale and detention basin to control ponding surface water at the Meadows

<b>5</b>	Tomaig Holdings Wetland and Meadows Surface Water Management	Wetland creation at Tomaig Holdings to store water permanently and swale and detention basin to control ponding surface water at the Meadows
<b>6</b>	Property Level Flood Protection	Passive flood resilience measures on individual properties including flood doors, airbrick covers and repointing of brick
<b>7</b>	Millknowe Storage and Balegreggan Diversion	Combination of Option 1 and 3
<b>8</b>	Millknowe Storage and Upsize of Dalaruan Street culvert	Combination of Option 1 and lesser upgrade of Dalaruan culvert from Millknowe intake
<b>9</b>	Balegreggan Diversion and Upsize of Dalaruan Street culvert	Combination of Option 2 and Option 3
<b>10</b>	SUDS Retrofit	Disconnection of large impermeable areas from combined drainage and diverting to suitable SUDS feature to store, slow and treat runoff.
<b>11</b>	Sewer upgrades	Upsize sewer at key constraints to add localised storage capacity.

## **Flood Prevention Scheme Option Development**

The short listed options were then developed and appraised through the following:

- Hydraulic Modelling –to understand impact of a measure on flood risk
- Public consultation –with main affected landowners and local community to get feedback on options
- Concept Design –to develop a better understanding of costs and how options would be constructed and identify opportunities and constraints.
- Costing –to determine if an option is value for money. This has been considered over the whole 100 year design life of the proposed scheme to include annual and intermittent maintenance costs.
- Damage Assessment –to quantify economic benefits from the option in terms of damages avoided over the 100 year life of the scheme.

Multi-criteria Appraisal –to appraise option holistically in terms of social, economic and environmental

The appraisal has allowed the options to be appraised against each other so a preferred scheme can be identified and taken forward to outline design stage.

### Preferred Flood Prevention Options

The top 3 options all have a cost-benefit ratio above 1 and are therefore viable options to progress as the preferred scheme and are set out in **Table 0-2**:

Rank	Option Number	Description	Whole Life Cost	Cost Benefit Ratio	No of properties protected to 1 in 200yr
1	4	Millknowe Storage – constructing online flood storage dam at Millknowe intake 118m long, 2.6m high with flood walls/embankments along east bank.	£3,144,207	1.39	22
2	5	Dalaruan Upsize - Upsizing 495m length of Dalraun Street culvert	£1,891,581	2.00	16
3	8	Millknowe Storage and partial upgrade of Dalaruan culvert – Combination of two options with 278m of culvert to be upsized.	£4,483,938	1.02	24

At present there are two key uncertainties in costing which will aid selection of an option:

Unknown ground conditions at Millknowe which would determine the approach to foundations for structures. This has potential to be large proportion of the cost if sheet piling is required.

□ The number, depth and location of utilities running along the route of the Dalaruan culvert. This may result in the need to divert services which can add significant cost.

Both of these items have potential to be expensive and contingency has been built into costs to account for this. However, clarifying this uncertainty would aid refinement of the Cost Benefit ratio. A Geotechnical Desk Study is planned to understand ground conditions and a Utility Search will be carried out along the culvert route to choose the final preferred scheme.

### **Surface Water Management Option Development**

Flooding in Campbeltown is not only a result of river flooding but also due to surface water which cannot drain away in storm events. This surface water flooding is localised to hotspots where drainage systems become overwhelmed or water tends to pond a low points in storms. Surface Water Management Measures are therefore needed to address residual flood risk in addition to flood prevention measures. These measures fall under two categories:

□ SUDS Retrofit –The runoff from the sites is proposed to be removed from the existing combined drainage systems, many of which are at capacity. Instead Sustainable Urban Drainage Systems will be incorporated to provide surface water treatment and runoff attenuation. As part of the long list of options for Campbeltown FPS, a high level assessment of potential for SUDS retrofit has been carried out. High level modelling indicated benefit was possible around Saddell Street and Longrow. This option is currently being developed further by refining areas based on volume of storage required and available space.

□ Sewer upgrades -Where manholes are flooding potential to upgrade the sewer network in the direct area to stop surcharging/flooding of manholes will be investigated.

Development of SWM measures was put on hold in order to utilise an opportunity to gain up to date information regarding the drainage network from Scottish Water. However, since gaining full visibility of the upgrades completed by SW it has been decided to progress the SWM options with AECOM's existing model.

The development of SUDS and sewer upgrades options will be run parallel to the next phase of work. The surface water options will be assessed in combination with the preferred flood protection scheme. This should ensure any suitable surface water measures are included as part of the overall scheme.

### **Next Steps**

The next steps will involve consultations and confirmation of the preferred scheme. The following steps will be taken to progress the study to the next phase:

□ Progress SWM elements to be either included or excluded

- Carry out utility search/survey on Dalaruan Street and Millknowe Road
- Carry out an initial geotechnical desk study then targeted GI for Millknowe embankment areas
- Re-assess cost-benefit ratios for top 3 options based on outcomes of utility and ground investigation work
- Start screening process for Environmental Impact Assessment



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**Figure 2.1 –Baseline 200 year plus Climate Change Flood Extents**

## **APPENDICES**

Appendix 2 – *CFPS Long Term Programme dated 11 October 2018*



## **APPENDICES**

Appendix 3 –  
*Initial Business Case to Strategic Asset Management Board Local Flood Risk  
Management Plan - refreshed to 30 October 2018 (originally submitted 6 October  
2016)*