

ANGUS COUNCIL

COMMUNITIES COMMITTEE – 15 JANUARY 2019

**ARBROATH (BROTHOCK WATER) FLOOD PROTECTION SCHEME
CONFIRMATION OF SCHEME**

REPORT BY HEAD OF INFRASTRUCTURE

ABSTRACT

This report updates the committee on the progress of the Arbroath (Brothock Water) Flood Protection Scheme (the “proposed scheme”) following committee approval to make a preliminary decision to confirm the proposed scheme without modification, and seeks a final decision to confirm the proposed scheme without modifications, procurement authority, permission for negotiations on land, access and compensation.

1. RECOMMENDATIONS

It is recommended that the Committee:

- (i) determines it will not hold a hearing to consider the proposed scheme,
- (ii) considers the two remaining valid objections and takes into account the environmental information in relation to the proposed scheme and, having done so, confirms the proposed scheme without modifications, as detailed in this report;
- (iii) approves the procurement authority for the Arbroath (Brothock Water) Flood Protection Scheme, in accordance with the process stated in section 16.8 of the Financial Regulations, and the procurement of the construction contract, as detailed in this report; and
- (iv) approves that Head of Infrastructure and in his absence the Service Leader – Roads & Transportation, to progress and complete land negotiations and accommodation works, and to take access to construct the works, as detailed in this report.

2. ALIGNMENT TO THE ANGUS LOCAL OUTCOMES IMPROVEMENT PLAN/CORPORATE PLAN

This report contributes to the following local outcome(s) contained within the Angus Local Outcomes Improvement Plan and Locality Plans:

ECONOMY

- An inclusive and sustainable economy

PLACE

- Safe, secure, vibrant and sustainable communities
- An enhanced, protected and enjoyed natural and built environment

3. BACKGROUND

- 3.1 Reference is made to Committee Report 344/18 regarding the preliminary decision to confirm the proposed scheme without modification.

4. CURRENT POSITION

- 4.1 As per the approval of the preliminary decision, and in accordance with the Flood Risk Management (Scotland) Act 2009, the objectors have now been notified of this decision.
- 4.2 At paragraph 5.7 of Committee Report 344/18, officers undertook to present a further report to committee in light of the preliminary decision to explain the next steps and seek relevant authorisations. This is that report.

- 4.3 Following the taking of the preliminary decision to confirm the proposed scheme without modification, it now falls on the council to make a final decision in relation to the proposed scheme by –
- (a) confirming the proposed scheme without modifications,
 - (b) confirming the proposed scheme with modifications, or
 - (c) rejecting the proposed scheme.
- 4.4 Before making a final decision, the council must –
- (a) determine whether it will hold a hearing to consider the proposed scheme,
 - (b) consider any valid objections (unless withdrawn),
 - (c) take into account the environmental information which comprises –
 - (i) the environmental statement prepared in connection with the proposed scheme,
 - (ii) any representations by any of certain specified persons,
 - (iii) any representations made by consultative bodies, and
 - (iv) any valid objection to the proposed scheme (unless withdrawn), and
 - (d) consider any representations made at a hearing (if one is held).
- 4.5 These requirements are discussed at paragraph 5.

5. PROPOSALS

- 5.1 The first determination to be made (paragraph 4.4(a)) is whether or not the council should hold a hearing to consider the proposed scheme. In certain circumstances specified in the legislation, the holding of a public local inquiry (by the Scottish Ministers) or hearing (by a local authority) is mandatory. None of those circumstances apply in relation to the proposed scheme. The council therefore may hold a hearing; it is not required to do so.
- 5.2 If it chooses to hold a hearing, although not a legal requirement to do so, in order to ensure independent consideration is given to the proposed scheme, officers recommend it be held under the auspices of the Scottish Government's Directorate of Planning and Environmental Appeals (DPEA) by whom an independent Reporter would be appointed to lead a structured discussion of the matters at issue. The two remaining objectors will be invited to attend and their objections heard. Notice of the hearing is also given by newspaper advertisement, and other persons who attend can also be heard.
- 5.3 If the council chooses to hold a hearing, the final decision in relation to the proposed scheme will not be taken until the Reporter has submitted his or her report. An indicative timescale would be for the hearing to be held 12 weeks after submission of a request to the DPEA (subject to the availability of a Reporter) plus the time required for the Reporter to prepare the Report. The costs of the hearing would be met by the council. The parties before it are expected to meet their own expenses in presenting their cases, although an award of expenses can be made, for example against the council if an objector is successful in his or her objection.
- 5.4 Officers consider the proposed scheme has not attracted a level of objection or adverse comment which justifies independent consideration of the proposed scheme in general and the two remaining objections in particular. Council has fully considered the proposed scheme during its development and publication (Committee Reports 16/18 and 344/18), all of which is in the public domain, and fully considered the two remaining objections (Committee Report 344/18). It is required to give further consideration to the two remaining objections before taking its final decision. Officers consider the steps taken by the council fulfil its requirements

in both the wording of the legislation and the spirit in which it is being implemented. Officers recommend the council does not hold a hearing.

- 5.5 If the council decides to hold a hearing, consideration of the remaining requirements set out at paragraph 4.4(a) will be made at a future date following receipt of the report by the Reporter. If the council decides not to hold a hearing, it considers these remaining requirements at this stage.
- 5.6 The second requirement is to consider any valid objections which have not been withdrawn. There are two such objections, a breakdown of which, with associated commentary, is shown in Appendix 1 of Committee Report 344/18. These objections were considered by council before it took its preliminary decision to confirm the scheme without modification. Council is required to consider these objections again before making its final decision.
- 5.7 In relation to these objections, officers' position remains as set out at paragraph 5.4 of Committee Report 344/18.
- 5.8 The third requirement is to take into account the environmental information in relation to the proposed scheme, as set out at paragraph 4.4(c). A final decision to confirm the proposed scheme will expressly state the council has taken this information into account. The four elements which comprise the environmental information are as follows –
- (i) The environmental statement prepared in connection with the proposed scheme was made available to members as part of Committee Report 16/18. There have been no revisions made or updates to the environmental statement since then. Officers invite members to take account of the terms of the statement at this stage of considering their final decision.
 - (ii) The 2009 Act specifies persons whose representations form part of the environmental information to be considered. Of those persons listed, only one has made representations, the Scottish Environment Protection Agency (SEPA). A copy of those representations, with commentary by officers, is attached at **Appendix 1** to this report.
 - (iii) Regulations made under the 2009 Act identify the consultative bodies whose representations require to be considered. There is a degree of overlap between the persons specified in the 2009 Act itself (paragraph 4.4(c)(ii)) and the consultative bodies listed in the regulations. SEPA appear on both lists, and reference is made to the immediately preceding sub-paragraph (ii) for the representations made by that agency. No other consultative body made representations.
 - (iv) The final element comprising the environmental information is the two remaining objections to the proposed scheme. Again there is an element of duplication in the legislative requirements in this connection. Members are referred to paragraphs 5.6 and 5.7, and are invited to take into account these two remaining objections in the context of the effects of the proposed scheme on the environment.
- 5.9 The fourth and final requirement is to consider any representations made at a hearing, if one is held. Members are directed to paragraphs 5.1 to 5.5 on this matter. If no hearing is to be held, this requirement can be disregarded. If a hearing is to be held, then reference to this requirement will be made in a report to committee following that hearing.
- 5.10 Based on these considerations, it is recommended that members having taken into account the environmental information in relation to the proposed scheme a final decision be made to confirm the proposed scheme without modifications.
- 5.11 Notice of the final decision will be published in accordance with the terms of the 2009 Act. If the proposed scheme is confirmed, it becomes operative six weeks after the notice is published. In that 6-week period, the decision to confirm the proposed scheme can be challenged on limited grounds by any person affected by the confirmed scheme. The appeal is to the Sheriff. In the event of an appeal being made, a further report will be brought to committee explaining the process and its impact on the confirmed scheme.
- 5.12 Procurement authority and land implications, as detailed in sections 6 and 7 of this report on the basis of a final decision to confirm the scheme are also proposed.

6. PROCUREMENT AUTHORITY

- 6.1 The sourcing strategy for this project has identified that a civil engineering contractor is required. Due to the value of this project (in excess of £11million) and to ensure compliance with the European Union Procurement Directive the procurement plan has identified the proposal for a restricted - competitive tender process.
- 6.2 It is proposed that the Head of Infrastructure will evaluate the resulting application in order to prepare a select list of no more than six contractors who will be invited to submit tenders for the proposed works.
- 6.3 The total estimated value of the construction contract is £8million. This is above the Head of Infrastructure's delegated authority limit and therefore procurement authority is requested in line with Angus Council Financial Regulations section 16.8.
- 6.4 On the basis of a final decision to confirm the proposed scheme without modifications by the end of February 2019, it is envisaged that tender documents may be issued to the select list of contractors in March 2019, a contract award in mid-2019 with construction work scheduled to begin shortly after and be complete in 16 months, i.e. by the end of 2020. If a hearing is held or the final decision is to confirm that scheme with modifications, then this is considered to introduce delays in these delivery dates by three to six months.
- 6.5 The procurement procedure will be in line with the 2-stage (restricted) procedure:
- 6.5.1 Stage 1 – Public Advertisement and Assessment to prepare a select list of tenderers based on qualification criteria (March to May 2019). The evaluation of expressions of interest will be based on minimum qualification criteria, namely: experience, economic and financial standing; insurances, equal opportunities and health & safety. All eligible expressions of interest will then be evaluated against the following criteria with the weighting shown in brackets:
- (i) Relevant experience in delivering comparable services (25%);
 - (ii) References / past customer perception (25%);
 - (iii) Sufficiency of resources and organisational capacity to adequately support the proposed contract (20%);
 - (iv) Adequacy of quality control accreditation and assurance process (10%);
 - (v) Adequacy of environmental management accreditation and assurance process (10%); and
 - (vi) Adequacy of business continuity management including accreditation and assurance process (10%).
- 6.5.2 Stage 2 – The tendering procedure with select list with the most economically advantageous price / quality tender being the success criteria for contract award (March 2019 to May 2019). The price / quality split percentage to be applied will be 70/30. To ensure that applications of this weighting does not result in the acceptance of unacceptably low quality tenders, a minimum quality score threshold of 70% will be applied below which tenders will not be accepted. The basis of the evaluation will be set out in the invitation to tender documents which will specify the price / quality split percentage and evaluation criteria weightings that are as follows:
- (i) Detailed methodology for providing the project showing how you would manage and execute the project (35%);
 - (ii) Detailed CVs of contractor's staff and individuals who will be providing the service (10%);
 - (iii) Programme for delivering the project (20%);
 - (iv) Consideration of Environmental impacts of the construction work, and methods identified to mitigate environmental damage – site waste management plans (10%);
 - (v) Controlled Activity Regulations (CAR) – development of construction method statement and updating of Pollution of Prevention Plan (15%); and
 - (v) Community Benefits and Engagement with Local Communities (5%).
- 6.6 A Prior Information Notice (PIN) was published on 3 August 2017 via the Public Contracts Scotland portal, advertising the scheme, making contractors aware of the proposed project and outline programme of works. This gives potential contractors advanced notice of the proposed works and time to programme advanced workloads. Issuing the PIN has reduced the minimum periods to be applied to the Pre-Qualification and Tender stages.

- 6.7 The committee is therefore asked to authorise the Head of Infrastructure to initiate the procurement process to procure a civil engineering contractor in accordance with the process stated above.
- 6.8 Accommodation and Utility Diversions Works
- 6.8.1 The estimated costs for the necessary accommodation works and diversions of utility apparatus to allow for the construction of the scheme is within the limits set by the Financial Regulations (maximum limit £500,000), thus granting for the Head of Infrastructure power to procure such contracts. The procurement process for the required contracts will therefore be initiated alongside the procurement of the main construction contract as detailed above, and in accordance with the requirements of the Financial Regulations.

7. LAND IMPLICATIONS

- 7.1 As previously reported to committee (Report No. 16/18), the Head of Infrastructure and Head of Finance and Legal are continuing to progress land negotiations with respect to compensation to affected land owners and to acquire the required land through agreement on such terms and conditions as deemed appropriate.
- 7.2 The Head of Infrastructure and Head of Finance and Legal will be required to serve notice on all affected properties where scheme operations are being carried out to gain access to carry out scheme operations. Where any person fails to comply with the notice served, in order to ensure the works can proceed timeously, it is recommended the Head of Finance and Legal be authorised to pursue entry onto the land concerned by legal means, including by obtaining court order, without further reference to committee. Compensation may be required to any landowner affected by the works.
- 7.3 The limit set by the Financial Regulations for properties (land and buildings) is £50,000. It is envisaged that no compensation claims will exceed this limit for any one property affected. It is therefore recommended that the Head of Infrastructure and Head of Finance and Legal be authorised to negotiate and complete land negotiations to this value for each separate property affected. As negotiations progress and payments made this will be reported to committee in due course.

8. FINANCIAL IMPLICATIONS

- 8.1 The cost of the Arbroath (Brothock Water) Flood Protection Scheme has been re-profiled to account for progress and has been subject of communication on grant funding allocations with Scottish Government since last reported (Report 16/18), as shown in Table 1 below. Capital funding allocations will need to be amended subsequently as part of the budget setting and development of the Financial Plans over the period 2019/24.

	Estimated Total Cost £000's	Actual to 31/03/18 £000's	Monitoring Budget 2018/19 £000's	Estimate 2019/20 £000's	Estimate 2020/21 £000's	Estimate 2021/22 £000's
Arbroath Flood Strategy (Brothock Burn / Seawall projects)	11,931	1,645	148	3,499	6,639	-
<i>Scottish Government Capital Grant (Ring Fenced)</i>	(6,699)	-	-	(1,388)	(5,311)	-
<i>Communities Coastal Fund (to initial joint Study)</i>	(75)	(75)	-	-	-	-
Net Cost	5,157	1,570	148	2,111	1,328	-

9. RISK

- 9.1 As reported previously (Report No. 87/16), the overall risk identified in this report is that of flooding to people, property and land in Arbroath. The Flood Risk Management (Scotland) Act 2009 presents the risk-based, plan-led approach to managing flood risk across Scotland and locally. Delivering the actions identified in the Local Flood Risk Management Plans will reduce flood risk, which includes the Arbroath (Brothock Water) Flood Protection that will reduce flood risk in Arbroath.
- 9.2 A risk register and project governance board has been in place since the outset of the project and updates are regularly reviewed key decisions and milestones in accordance with Financial Regulations Guidance on "Major Procurement".

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NOTE:

The background papers, as defined by Section 50D of the Local Government (Scotland) Act 1973 (other than any containing confidential or exempt information) which were relied on to any material extent in preparing the above report are:

Report No 344/18 – Arbroath (Brothock Water) Flood Protection Scheme – 13 November 2018
 Report No 229/18 - Information Report for the Period 30 May 2018 to 14 August 2018 - Schedule 2, Arbroath (Brothock Water) Flood Protection Scheme Update – 14 August 2018
 Report No. 16/18 – Arbroath (Brothock Water) Flood Protection Scheme – 16 January 2018
 Report No. 87/16 - Flood Risk Management (Scotland) Act 2009 Update – 1 March 2016

Appendix 1

SEPA



Our ref: PCS/159562
Your ref: 12/12/12BMLA

Eleanor Doyle
Angus Council
Angus House
Orchardbank Business Park
Forfar
DD8 1AN

If telephoning ask for:
Alasdair Milne

10 August 2018

By email only to: Arbroathflood@angus.gov.uk

Dear Madam

**Flood Risk Management (Flood Protection Schemes, Potentially Vulnerable Areas and Local Plan Districts) (Scotland) Regulations 2010
12/12/12BMLA
Brothock Water, Arbroath - Flood Protection Scheme 2018**

Thank you for your consultation email which SEPA received on 7 June 2018. I apologise for the delay in responding and would like to thank the council for their assistance in allowing us more time to provide our response.

Advice for the planning authority

Summary and key issues

We consider that the scheme as proposed will disrupt sediment transport and this will cause a river response. The most sustainable solution would be to allow as much water and sediment to pass through the impoundments as possible to minimise this impact, whilst not impacting on the flood protection aims of the scheme. We do, however, recognise that there may be valid reasons why this cannot be achieved but this is not made clear within the ES. Should higher flows not be possible, the impact of sediment disruption needs to be mitigated (i.e. a plan developed that will periodically move sediment from upstream of the impoundments to downstream). We would welcome confirmation from the council that this will be addressed at the next stage of the scheme development.

We would ask that in order to address our comments in sections 1.6-1.14 below, further information be provided on sediment management. It may be that further information may address our comments but if not, we would welcome discussions with the Council on the use of a suitably worded planning **condition** to require the provision of a plan to manage or deal with disruption to sediment transport.

We would be happy to meet with the council at the earliest opportunity to discuss the issues we have raised and to agree a suitable way forward.

As detailed in section 1.5 below, recent field studies by SEPA have highlighted the Brothock Water is at 'bad' morphological status under the Water Framework Directive. If the river restoration works recommended by us below were to be implemented, there is a good opportunity for the FPS to provide an opportunity to restore the realigned reaches in order to improve channel morphology and habitat. There is the potential that we could contribute

funds towards these restoration elements. We would very much welcome the opportunity to meet with the Council to discuss these opportunities.

Hydromorphology

1.1 In total there are 39 proposed operations, the bulk of which are on the Brothock Water (operations 1 – 2 and 4 – 39), but with some (operation 3) impacting the Hercules Den Burn, which is a non-baseline waterbody. The activities that will require authorisation from SEPA under the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) can be summarised as:

- Three flood storage areas (FSA) that will retain floodwater upstream of embankments during flood flows only. These will be formed of embankments across the floodplain and culverts (open or closed) that extend through the embankments.
- There is a total of 724m of floodwall (expressed in terms of channel length impacted). This includes 138m of new floodwall, 331m of replacement floodwalls where existing ones are in poor condition, and 255m of existing floodwall raising.
- New grey bank protection (160m) and bed reinforcement (80m).
- Trash screens upstream from the flood embankments and culverts. These are assumed to take the form of vertical piles within the channel.

Environmental Standards

1.2 Any proposals that are submitted for CAR authorisation will undergo an environmental standards test. This determines whether the proposals are likely to cause a downgrade at the local or, if necessary, waterbody scale taking into account the impact from existing morphological pressures.

1.3 The first stage of this test is to assess the impact at the local scale. Given the activity footprints, operations 1, 2 and 3 would be assessed separately, but operations 4 – 39 would be assessed together given their close proximity. As the environmental statement (ES) indicates that the FSAs will restrict flows at or above the 1 in 2 year flood event these will effectively behave similar to impoundments from a morphological perspective. The outcomes of this local scale assessment are presented in the table below.

	Current Local Status	Revised local status	Outcome
Operation 1 <i>Culvert, impoundment, bank & bed reinforcement, trash screen (piled structure)</i>	BAD (182%)	BAD (245%)	Pass
Operation 2 <i>Culvert, impoundment, bank & bed reinforcement, trash screen (piled structure)</i>	BAD (175%) ^{pf}	BAD (239%)	Pass
Operation 3 <i>Trash screen (piled structure)</i>	BAD (134%)	BAD (135%)	Pass
Operations 4 – 39 <i>New floodwalls</i>	BAD (190%)	BAD (194%)	Pass

1.4 Although causing a significant local impact, because these reaches are already at 'bad' morphological status due to existing pressures it is not possible for any further downgrade. Consequently, the first stage of the environmental standards test is passed.

1.5 Officially the waterbody is at 'moderate' morphological status but this classification is based on remotely sensed data that has under represented morphological pressures. Recent field surveys to gather more accurate morphological data across Scotland have included the Brothock Water. A manual assessment of the morphological status using these data reveals that the Brothock Water is at bad morphological status. Consequently,

although it is not necessary to carry out a waterbody assessment, the proposals cannot threaten the existing waterbody status and are not likely to threaten achievement of good ecological potential (the Brothock water is a heavily modified waterbody). Furthermore, if additional river restoration works are also considered (see below) this may actually present a good opportunity to improve the existing condition.

Comments on the ES, design and good practice

1.6 As the waterbody is at less than good status the proposals will need to undergo a good practice test whereby a demonstrated need is weighed against the environmental impact and proposed mitigation. Given the need for the FPS in this location a consentable solution under CAR is likely. However, the impoundment of flows around and greater than the 1 in 2 year event would not represent good practice from a morphological perspective given the associated disruption to sediment transport (see comments below). Consequently, we would **strongly recommend** that the plans are altered to better maintain the morphological function of the watercourse and/or that further mitigation is included. We have a number of comments from a morphological perspective that should be addressed in order to provide added environmental benefit to the scheme and reduce maintenance issues:

1.7 For operations 1 and 2 (at least) flows above the 1 in 2 year event would be impounded, but the reasoning behind this needs further clarification. The 1 in 2 year flow is typically around the most morphologically effective discharge that governs long term channel form. Impounding flows around this threshold would result in significant coarse sediment deposition within the FSAs, starving the downstream watercourse of sediment and creating instability (i.e. increased erosion). It would be better to allow at least modest flows the ability to flow freely through the structure in order to maintain sediment continuity. It is not clear why the 1 in 2 year flow is the necessary cut-off as it would seem unlikely that these more modest flows would pose a significant flood risk through the town. Indeed the ES states that baseline floods below the 1 and 10 year event would not result in significant flooding of property or infrastructure (section 5, volume 1). Although this suggests that flows greater than the 1 in 10 year event would result in flooding this does not take account of the improved flood defences through Arbroath. Consequently, we would recommend that these more modest flows are not restricted. Furthermore, as detailed below the restoration of the river within the FSA may also further reduce flow conveyance downstream. As it stands there is the potential for significant morphological risk associated with the proposals.

1.8 SEPA's 2013 consultation response raised the potential impact of the FSAs on sediment transport and recommended that this should be covered in the ES. However, the existing baseline geomorphic assessment (from 2011), whilst giving a detailed description of existing natural processes, does not clearly assess the likely impact of the proposed scheme. Consequently, the current ES assessment of impact only identifies a benefit of retaining some of the high fine sediment load within the FSAs. There is no consideration given to retention of coarse material here and the associated sediment starvation downstream. Given the potential impact of the FSAs on sediment transport a more detailed geomorphic assessment of the likely disruption to sediment transport, its impacts on the impounded (e.g. increased deposition) and downstream reaches (e.g. sediment starvation, reduced flows), as well as proposed mitigation (e.g. sediment management) should be provided.

1.9 A significant proportion of the waterbody classification is taken up by high impact channel realignments (HIR) and embankments. The river within the footprint of the FSAs are straight and remain impacted by some of these HIR pressures and embankments. This FPS presents a good opportunity to restore these realigned reaches in order to improve channel morphology and habitat. Furthermore, the increased channel sinuosity would reduce channel gradient and increase floodplain connection providing natural flood management (NFM) benefits. The Brothock Water is currently a priority waterbody for restoration projects and so there is the potential that SEPA could contribute funds towards the restoration elements of a project, especially where it brings a range of benefits to the

community in Arbroath. We would be keen to meet with the Council to discuss this opportunity.

1.10 The use of grey bank and bed reinforcement between the culverts (and at the confluence of the realigned drainage ditches) would be discouraged. These will deflect energy and increase erosion downstream. Clear justification for the reinforcement requirements will be needed and we would encourage softer hydraulically rough techniques where possible. SEPA have guidance on such techniques are available at www.sepa.org.uk/media/219450/bank_protection_guidance.pdf

1.11 Culverts through the flood storage “embankments” do not follow good practice. We would expect to see continuation of natural river bed sediment on top of the invert and energy dissipation as required. For operation 1 it is stated in the description (online) that baffles will be included to retain bed material, but neither are shown on the drawing. Operation 2 does not appear to include either river bed sediment or structures to aid its retention. All culverts should include bed material and bed retention structures as appropriate. Furthermore, the increased flow confinement and reduced friction through the culvert will create an excess energy that is deflected downstream where it is likely to erode a scour pool if the bed and banks are unprotected. Reinforcing the bed and banks will simply deflect this problem downstream so that the scour pool is formed where the protection ends. Instead, an appropriately scaled stilling basin / scour pool should be included in the design.

1.12 It is not clear why bed reinforcement is deemed necessary at the culvert entrance. At least at flows that normally spill onto the floodplain, the constriction caused by the culvert (and embankment) will likely cause a backing up of flow that is more likely to reduce, rather than increase energy here.

1.13 The realigned drainage ditches are entering the main watercourse at 90° to the main channel flow. This is not good practice and the angle should be lowered.

1.14 The realigned ditches include grey bank protection on the outside of the bends. This will deflect energy downstream and increase erosion elsewhere. We would strongly encourage hydraulically rough techniques to be employed where possible to dissipate energy as detailed above.

1.15 For a number of operations sheet pile cut-off walls are being installed. Are these to prevent groundwater flow from the channel beneath the existing walls as the river level rises? If so then do the sheet piles extend to a deeper impermeable layer?

Summary of comments in relation to hydromorphology

As the current waterbody and local reach status are bad the proposals would not result in any downgrade and so are likely to pass the environmental standards test. Given the need to protect Arbroath from flooding a consentable solution is likely. However, we have some concerns with the current proposals given the impact of the FSAs on the most morphologically effective discharges. Impounding water around the 1 in 2 year flow will likely starve the downstream reaches of sediment and this will result in increased erosion and channel instability. Instead we would strongly recommend that these modest flows (up to flows that would not threaten property or infrastructure) are able to pass unimpeded to reduce the impact on sediment dynamics. Furthermore, consideration should be given to restoring the channels at least within the FSAs because this will bring significant morphological improvements to the watercourse. Given this and the potential NFM benefits this would bring, SEPA may be able to contribute funds to any restoration works. We would be keen to discuss this with the Council.

Flood risk hydrology

Angus Council has made the Arbroath (Brothock Water) Flood Protection Scheme 2018 meaning that it is seeking approval to construct the flood protection measures. The scheme will comprise a comprehensive set of measures including upstream flood storage areas, direct defences and debris catching posts. The scheme is designed to protect homes and

businesses up to a 0.5% AP (1:200) flood event.

Flood storage areas are planned at Brothock Meadows and St Vigeans on the Brothock Water and at Hercules Den on the Hercules Burn. These are designed to attenuate the peak flows reaching Arbroath to limit the required height of the direct defences in the town. The outflows from the storage areas will be controlled by limiting the size of the culvert outlet at each of the impoundment structures. These will be sized to start impounding floodwater at a flow equivalent to Qmed.

SEPA supplied rainfall and river flow data to the Council's consultants during the supporting studies for the scheme. SEPA's flood risk hydrologists were also consulted during the hydrological and hydraulic modelling stages of the supporting investigations.

The Brothock Water will discharge to the harbour area and then the North Sea at the downstream end of the flood protection scheme. Therefore it will not be forwarding any increase in flows downstream of the scheme that could increase the risk of flooding to receptors.

Some of the defence structures in town will simply require raising of existing defences while others may require new construction. Access to undertake the construction work may be a challenge in some areas. One such area is between Brothock Bridge and Ladybridge Street. As there are properties on both sides of the watercourse in this stretch access during the construction period is only possible from in the channel. We have been advised that the existing defences will need to be breached during the construction phase which will place nearby properties at an increased risk of flooding. During the construction phase sections of the channel may need to be shuttered off to provide areas for dry working. Should this be the case then there will likely be an increased risk of flooding from overtopping due to a temporary reduction in the conveyance capacity of the channel. To reduce the risk associated with these necessary works we strongly recommend that the construction of the upstream storage areas precedes the construction of the defences in Arbroath.

SEPA operates and maintains two flow measurement stations within the Brothock Water catchment; one on the Colliston Burn at Colliston and one on the Brothock Water off Dens Road in Arbroath. Flow records from these stations are reported to the National River Flows Archive and the real-time water level and flow data from these two locations also form part of the flood warning scheme for Arbroath. The Arbroath flow measurement station is located within the reach of the Brothock Water impacted by the flood protection scheme. There are two doors at the flow measurement station; one providing access to the river from the station and the other to the side of the building, through the adjacent wall. Operation 6 of the scheme requires flood doors to be fitted at this location to prevent floodwater breaching the new defences at this location and an extra concrete ring is to be fitted above the stilling well. SEPA is still awaiting details of these proposals and wish to enter discussion with Angus Council and its consultant about measures required to ensure continuous water level and flow monitoring from this location in order that flow records and flood warning are maintained throughout the construction period.

In order to provide effective flood warning during the construction period SEPA will also need to know what the reduced capacities of the Brothock Water channel will likely be when the existing defences are breached and when in-channel works are being undertaken. The consultant may be able to assist with some limited model runs for the critical areas of the scheme.

Caveats & Additional Information for Applicant

Please note that we are reliant on the accuracy and completeness of any information supplied by the applicant in undertaking our review, and can take no responsibility for incorrect data or interpretation made by the authors.

Ecology

3.1 The EIA has addressed the previous comments we have made on ecological aspects

and we consider the mitigation suggested to be sufficient. We note that the Construction Environmental Management Plan (CEMP) is still to be submitted. All the mitigation measures highlighted in the ES should be included in this document. It would be advantageous when carrying out vegetation reinstatement / replanting works to work with the Tayside Local Biodiversity Action Plan (LBAP) to address the biodiversity benefits highlighted in the proposal.

3.2 No mention is made in the ES of non-native invasive species. Non-native plants themselves and any soil containing seeds of these species is classified as non-hazardous controlled waste and procedures should be put in place to deal with this during and after the proposed construction works. It is an offence under the Wildlife and Countryside Act 1981 to allow the spread of non-native invasive species. Mitigation measures to prevent the spread of invasive species should be included in the forthcoming CEMP.

3.3 In section 6 (Consultation Drawings section), in the Safety Health and Environmental Information Box for each operation, it is mentioned routinely, 'Vegetation within Arbroath to be maintained to prevent blockages'. Clarification is sought on what this means / entails. In-channel management of vegetation may require a SEPA licence.

Regulatory Advice

Our regulatory services staff have met with Angus Council on the Controlled Activities Regulations (CAR) aspects of the project. Advice has been given on topics such as vehicles operating within the water (if required) and silt management. We will be requesting a Pollution Prevention Plan over and above the appropriate Construction Method Statement (CMS) for each operation of the FPS. The Pollution Prevention Plan will identify potential pollution points that Angus Council have identified and this will make sure they have appropriate mitigation in place for each operation of the FPS.

4.2 We anticipate being able to determine this CAR application with a potentially positive granting of a licence providing all conditions are met.

4.3 Advertising will be required on this FPS and external consultation undertaken with fisheries and potentially Historic Environment Scotland as there are designated sites within the boundary of the FPS.

4.4 Details of regulatory requirements and good practice advice for the applicant can be found on the [Regulations section](#) of our website. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the regulatory services team in your local SEPA office at:

SEPA, 62 High Street, Arbroath, DD11 1AW, tel 01241 874370

If you have any queries relating to this letter, please contact me by telephone on 01786 452537 or e-mail at planning.se@sepa.org.uk

Yours faithfully

Alasdair Milne
Senior Planning Officer
Planning Service

Disclaimer

This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at this time. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning or similar application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application or similar application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not

referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. For planning applications, if you did not specifically request advice on flood risk, then advice will not have been provided on this issue. Further information on our consultation arrangements generally can be found on our [website planning pages](#).

Angus Council Response to SEPA

WS/ED/

20 September 2018

By Email Only

Scottish Environment Protection Agency
Alasdair Milne
alasdair.milne@sepa.org.uk

PLACE

Strategic Director:
Alan McKeown

SL/Works20a

Dear Alasdair.

Arbroath (Brothock Water) Flood Protection Scheme

Further to our email dated 28 August 2018, I am writing in reply to your email (Your ref:12/12/12BMLA) dated 10 August 2018 regarding the above project. In your email you gave us feedback to the scheme which has been discussed among the project team and I have enclosed the replies for your information. I have used the number system used in your email to reference the points you made.

- **1.6 Morphology**

We will be pleased to discuss the morphological comments – a meeting is recommended.

- **1.7 Sediment**

At Operation 1 and 2 we are forced to retain lower return periods in order to be able to store sufficient water in the higher return periods. With Operations 1 and 2 being relatively high up the catchment, we are required to retain the majority of the water. The 1:2 year return period is not being retained for direct flood protection purposes but rather it is a function of the reduction in flow required during the higher return period events.

With regard to significant course sediment deposition at Operations 1 and 2, the Brothock currently has an issue with transporting fine sediment meaning that there is currently little or no transportation of course sediment. The existing modifications (bank protection, straightening) to the channel also result in less gravel being released through natural erosion. The gradient is low here, with a narrowing of the valley at Demondale causing a constriction, and therefore it is likely that gravel is being retained upstream of the town for the most part, and any that reaches Arbroath is transported quickly. However, extensive accumulations of gravel are not evident, suggesting that the rate of movement/accumulation is low. Once the storage area is constructed, the rate of accumulation would be monitored to ensure that mitigation (manual transport of gravels to downstream reach) is undertaken as required and would be appropriate for the river.

- **1.8 Baseline Study on Sediment**

As noted in our response to 1.7, we believe that the baseline situation already results in a lack of gravel transport through the middle catchment (Brothock Meadows area) therefore the risk of erosion as a result of starvation downstream is thought to be low. However, should starvation of the coarse sediment lead to erosion in the downstream reach of the Brothock Meadows storage area, this could release fresh gravel to the channel which is currently prevented by the channel and bank modifications. The potential for retention of fine sediment at the storage area and release of gravel from the channel banks downstream could mitigate impacts to the Brothock Water as a result of the storage area.

- **1.9 River Classification**

Any restoration works that can be undertaken as part of the scheme operation will be considered where possible. Currently the scheme notice has been published and Angus Council are hoping that the scheme will go ahead without any formal modifications to the scheme. Any restoration works that add operations to the scheme would have a significant effect the progress of the scheme. Angus Council will work with SEPA where possible.

- **1.10 Bank and Bed Reinforcement**

Noted and these elements will be changed to remove the grey bank reinforcement and as part of that we will also increase the channel sinuosity of the diverted ditches.

- **Culverts**

The drawings for Operation 1 will be updated to include baffles that will retain bed material. Operation 2 will be updated to include energy dissipation to help retain material.

The downstream channel and floodplain capacity control flood levels within the storage area. The outlet control nature of the system therefore ensures that exist velocities from the culvert are limited and hence low erosion potential. It should be noted however that the structure is a Category A reservoir and hence the robust nature of the control structure.

- **Bed Reinforcement**

The storage area is a Raised Reservoir under the Act and is categorised as a category A reservoir. A robust arrangement has been provided around the control structure to minimise risk of surface and internal erosion.

- **Drainage Ditches**

Noted and these will be altered along with the changes in note 5. above.

- **1.15 Sheet Piles**

The purpose of the sheet piles are to prevent seepage and they have been assessed to be of sufficient length to prevent this.

- **2.5 Sequence of Construction**

We agree that the flood storage areas will be built before the downstream works in Arbroath.

- **2.6 SEPA Gauging Station**

We will be pleased to discuss the proposed works at the gauging station with SEPA. For the stilling well, we see this as a simple increase to the height of the well within the gauging station but we would be pleased to discuss.

- **2.7 Flood Warnings**

If we can arrange a meeting we would be pleased to agree what additional information you would need for this.

We note that notices may be required for the works. We are currently working on the CAR application. A Pollution Prevention Plan will be developed on the basis of the CAR and a Construction Environmental Management Plan will be a requirement placed on the Contractor and will be available after their appointment.

We agree that a meeting would be advantageous. I would appreciate if you could contact Eleanor Doyle on 01307 473385 or doylee@angus.gov.uk to arrange a mutually suitable time.

Yours faithfully

Walter Scott
Service Leader (Roads & Transportation)

Main Points of follow up meeting with SEPA

EMAIL SENT 06/11/18

Good Afternoon Alasdair

Thank you for hosting the meeting last week. I am writing to clarify points from the meeting for our mutual record. The main points discussed in the meeting are as follows;

Attendees;

Angus Council: Mark Davidson (MD), Eleanor Doyle (ED).

AECOM: James Tunnicliffe (JT), Dylan Huws (DH).

SEPA: Alasdair Milne (AM), Una Thom (UT), Malcolm MaCconnachie (MM), Mathew Burke (MB) & Tony Allan (TA)

- **Scheme Update**

MD gave an update on the current position with the scheme. The project team have prepared a report to go to Council committee on 13th November 2018 to recommend a "preliminary decision to proceed with the scheme with no modification". If the committee approves the report then a second report will go to the mid-January committee to make a final decision to confirm the scheme with no modifications. If the project is given the go ahead at the January committee the project team would advance the procurement of the project and other statutory consents with an aim to start on site in summer 2019.

- **Sediment**

MB voiced his concerns of the impact to the sediment transport in the Brothock as a result of the project. He would like to see more flow through the culverts to aid sediment transport but acknowledges that this may not be possible. DH highlighted that increased flows would impact the in town defences, this is why there is such a high attenuation at the Brothock. As a result SEPA would like to see proposals in place to monitor where sediment is being trapped and how much and it effects downstream. The plan should detail the level of monitoring and methods. This would be advisable to be in place prior to the commencement of the works.

DH does not anticipate that the works will have much effect on the sediment movement. A Flood Storage Area (FSA) is regarded as a "reservoir area" and therefore monitoring will be in place regardless. MM queried if instrumentation is planned for the FSA when built. MD said none was planned at present, but is being considered.

MD highlighted that there has been issues raised previously with land owners such as local farmers and the golf course at Letham Grange, "engineering" the land to improve drainage etc. which all affects the sediment transport of the Brothock. AC will initiate further discussions with the landowners regarding this matter.

AC will submit details to SEPA on proposals for monitoring.

- **Scour at FSA Culverts**

MB is concerned that scour will become an issue at the end of the culverts in the FSA. DH noted that the flows are being controlled and velocities are not significant enough to cause scour. MB would like to see the model showing output velocities. He feels that the scour will create a pool and it may be better to create scour pools as part of the construction to head off any future problems.

AECOM to forward modelled flow velocities.

- **SEPA Gauging Station**

UT stated that SEPA will require the gauging station to be operational during the works. DH/JT confirmed the works to heighten the stilling well in the station could be done prior to the works or on completion so the station is fully operational throughout the construction. This is favourable to SEPA, but more detail would be required. It is preferable to do the works in the drier months of the year, therefore this will be confirmed when the construction start is more defined. A temporary station will be required during the works to the stilling well to maintain data, bearing in mind that vandalism is a problem in Arbroath. The works should only take 1-2 days.

MD asked if there was anything that could be improved about the gauging station as part of the works. UT highlighted that there is a problem with bank erosion around the gauging station with undercut on both banks. This will be investigated further.

- **Flood Warning**

Existing threshold levels were discussed for flood warning. MM noted that one of the works operations breaches the existing flood wall. MD noted that the works will be phased so the FSA are completed ahead of this to give some protection to the in town defence works. SEPA will require the level and flow for that location for monitoring purposes. AECOM will provide this information.

In the meeting SEPA noted the following warning levels;

Above gauge station -levels to be confirmed by SEPA

- 1.1m - operational level
- 1.4m- flood warning
- 1.6m - operational public warning

Colliston station is also used to verify water levels.

- 1in2 - 1.2 above the gauge
- 1in5 - 1.33 above the gauge

DH noted that the small site area on the land side of the wall breach will provide protection to the town so in a flood event on the specific area of the site will be at risk.

- **CAR Licence**

TA made the following comments in reference to the CAR;

1. Where hard bank protection is proposed and in particular gabions – this must be fully justified in the application. TA suggested re-profiling the bank or willow whips. MD queried if a stone wall would be preferable to gabions. This would also have to be justified.
2. Baffles were not shown on drawings. JT confirmed that this has been revised. Bottomless culverts are not viable. Baffles will be filled initially with natural bed material. They will fill up naturally over time.
3. Ditches have been realigned. Can one be aligned to join the Brothock at a slightly higher angle? Yes - JT will action.
4. CAR will need a method statement from the Contractor for each op and Polution Prevention Plan overall.
5. SEPA costs for a complex licence plus for each operation thereafter.

If there is anything you feel that I have missed from the meeting then please let me know.

As discussed at the meeting, there is a further meeting scheduled for Friday 9 November 2018 with Susan Nisbett of SEPA to discuss potential improvements to the Brothock Water.

Regards

Eleanor Doyle, Engineer – Infrastructure Commissioning, Place – Technical & Property Services, Angus House, Orchardbank Business Park, Forfar DD8 1AN. Tel: 01307 473385