CABINET 21ST FEBRUARY 2024

SUBJECT: **NANT CYLLA WATERCOURSE EROSION CONTROL WORKS**

REPORT BY: **CORPORATE DIRECTOR ECONOMY AND ENVIRONMENT**

1. PURPOSE OF REPORT

1.1 To provide Cabinet with an update in relation to erosion of the Nant Cylla watercourse, Ystrad Mynach and to request authorisation for a spend of £270k for detailed design of a stabilisation scheme and a £100k contingency fund for temporary stabilisation works should these be required whilst the full scheme is being developed and procured.

2. SUMMARY

2.1 The Nant Cylla is a heavily modified watercourse that flows rapidly through the centre of Ystrad Mynach to the River Rhymney.

2.2 The watercourse banks have previously been subject to scour and erosion, with gabion baskets installed in July / August 2018 as a temporary measure to reduce the impact of the scour. Partial failure of these was observed in December 2021, resulting in the installation of rock mattresses in March / April 2022 as a further temporary measure and selective stone fill at various times in various locations.

2.3 Progressive failure due to scour and erosion is still ongoing. Monthly monitoring checks are carried out to assess the rate of failure, with further temporary measures installed when required.

2.4 A fully designed, long-term solution is needed to reduce flow velocities and lessen the likelihood and impact of scour. An outline design using Green Infrastructure approaches has been developed by CCBC's Engineering Projects Group and an external consultancy, WSP.

2.5 CCBC has a legal responsibility for some of the affected areas of the watercourse. Whilst legal responsibility for other areas rests with the property owners / landowners, it is considered that a single scheme that addresses the entire stretch of the watercourse would result in better and more sustainable outcomes.

2.6 Some of the property owners have built outbuildings, bridges or other structures at the top of the banks and across the watercourse without planning permission or other

consents. These structures are further weakening the banks, are liable to collapse and will need to be removed to facilitate repair and restoration of the watercourse.

2.7 This report identifies the need for capital funding requirement of circa £270k to be made available in order for detailed design of the preferred engineering solution to be carried out and construction costs for the implementation of the scheme to be confirmed.

2.8 This report further identifies a need for a £100k contingency fund to be made available to for use in the provision of further temporary stabilisation works should these be required prior to the full scheme being implemented.

2.9 An indicative capital cost for the full scheme is currently estimated at £2.9M, including detailed design costs, which will be confirmed as part of the detailed design stage of the project.

2.10 The preferred engineering solution has an anticipated design life of 100-years and an anticipated whole life cost of £3.5M, which will be confirmed during the detailed design stage of the project.

3. RECOMMENDATIONS

3.1 Cabinet is asked to agree for capital funding of circa £270k to be made available to the Economy and Environment Directorate for detailed design of the scheme. This is to be funded from uncommitted capital earmarked reserves.

3.2 Cabinet is asked to agree for a contingency fund of £100k to be made available to the Economy and Environment Directorate for further temporary stabilisation works should these be required prior to implementation of the full scheme. Again, this is to be funded from uncommitted capital earmarked reserves.

3.3 Cabinet is asked to agree that no compensation will be offered to property owners / landowners in relation to the removal of structures built close to the top of the banks and / or spanning the watercourse, but that CCBC will commission detailed design and construction works at no cost to the property owners / landowners.

4. REASONS FOR THE RECOMMENDATIONS

4.1 The preferred option for the scheme uses a mix of Green Infrastructure and hard engineering approaches for different parts of the affected watercourse. The scheme will widen and re-naturalise parts of the watercourse to reduce flow velocities and thereby lower the likelihood and impact of scour and erosion.

4.2 The detailed design of the scheme is complex and requires a multi-disciplinary approach. It is recommended that this is procured using the South East Wales Technical and Professional Services (SEWTAPS) framework.

4.3 Failure to act could result in a reasonable worst case scenario involving collapse of the banks of the watercourse, leading to widespread flooding, damage to properties, adverse environmental impacts and risk of injury or loss of life.

4.4 A continued managed risk scenario with temporary works carried out as needed may reduce the likelihood of failure but only provides temporary risk reduction.

4.5 CCBC as landowner has a formal legal responsibility for maintenance of part of the affected watercourse and as Lead Local Flood Authority (LLFA) has a regulatory responsibility for the overall management of the watercourse and is therefore the best placed to take measures to repair, restore and re-naturalise the watercourse.

5. THE REPORT

5.1 The Nant Cylla is formally classified as a "heavily modified waterbody" meaning that its form has been substantially altered from a natural stream course, that flows north to south from Penpedairheol through Hengoed and Ystrad Mynach to the River Rhymney.

5.2 The lower reaches of the watercourse is channelised through the centre of Ystrad Mynach with banks largely formed of gabion baskets. Lateral movement of the watercourse is constrained by the existing urban development to both sides of the watercourse.

5.3 The Nant Cylla reacts quickly to rainfall events and has a steep gradient that results in high flow velocities within the stream. A resident video shows the stream under high flow conditions.

5.4 The combination of constrained watercourse and high flow conditions is leading to progressive erosion of the banks of the watercourse (see Figure X to Y below).

5.5 This results in the channel becoming ever more incised (cutting deeper into its channel) and undermining existing erosion protection measures.

5.6 The undermining of the erosion protection measures is causing a progressive failure of the banks, adjacent structures, and bridges / structures over the watercourse.

5.7 In some areas, residents have built unauthorised / unconsented outbuildings or other structures either close to the top of the banks and / or spanning the watercourse. These structures limit access to the watercourse for any maintenance works and are placing an additional load on the banks of the watercourse. The banks, including areas of gabion baskets, were not designed to take the structural loading from these outbuildings and other structures and this is also contributing to the failure of the watercourse.

5.8 The gabion baskets were installed in July / August 2018 as an erosion protection measure. Gabion baskets are rectangular wire mesh baskets filled with small rock of approximately 100-250mm in diameter. The baskets are often placed on top of one another to form a vertical or terraced retaining wall against a riverbank.

5.9 Progressive scour and erosion continued with significant movement of the gabion baskets occurring in December 2021.

5.10 Emergency stabilisation works have been carried out to provide temporary support and stabilisation of the banks of the watercourse. Most recently, this included works in March / April 2022 with rock mattresses installed underneath the gabion baskets and to the bed of the watercourse at a cost of £20k. Further stone fill is selectively applied to individual areas as required. .

5.11 The condition of the watercourse is being monitored by a specialist contractor, Edwards Diving Services (EDS) at a monthly rate of £450. EDS themselves do not enter into part of the watercourse during these monitoring visits due to the potential instability and risk of collapse in this area.

5.12 The gap across the watercourse at the top of the gabion baskets has reduced by 208mm between April 2022 and November 2023.

5.13 Gaps between the baskets in key monitored areas have increased by 20mm in the same period.

5.14 There are observed areas of voids of up to 2.5m below the banks and gabion baskets with little or no connectivity between the underside of the baskets and the stream bed.

5.15 Therefore, whilst the works carried out in March / April 2022 have reduced the rate of failure of the banks of the watercourse, the progressive movement shows that erosion is continuing and, if not addressed through a long-term scheme, could result in failure / collapse of the watercourse banks and associated structures on the banks or across the watercourse.

5.16 Under a **reasonable worst-case scenario** an individual high-flow event or a wet winter period can cause a rapid deterioration and sudden loss of support to the banks underneath or very close to one of the outbuildings, bridges, or decking areas, with the following outcomes:

- The bridge or structure is occupied by one or more residents at the time of collapse, resulting in a threat of severe injury or loss of life.
- As a result of the collapse, 38 properties are formally prohibited from any use of rear gardens due to a safety risk.
- The collapsed bank and structure cause a full or substantial blockage of the Nant Cylla, resulting in surcharge to the upstream culvert and causing flooding to High Street, Penallta Road, Bedwlwyn Road and Lewis Girls Comprehensive School.
- A pollution incident is recorded within the River Rhymney by Natural Resources Wales (NRW) due to sediment and other debris from the collapsed bank and structures being mobilised and washed downstream into the River Rhymney.
- Ystrad Mynach town centre and Lewis Girls Comprehensive School are closed whilst clearance works and emergency repairs are undertaken, with full closures lasting approximately 2-6 weeks.
- Parts of Lewis Girls Comprehensive School grounds remain out of use due to further risk of bank erosion and to facilitate access to the watercourse for a number of months.
- Repair works are carried out during high flow / winter period and under emergency conditions. This results in escalating costs due to the increased difficulty of working in adverse conditions, associated increased plant hire and increased health and safety risks.

5.17 Under a **managed risk scenario,** monthly inspections continue, with the frequency of inspections increased should sudden or excessive movement be observed. Insofar as possible, temporary works to stabilise any areas of excessive movement are carried

out during dry weather periods and outside of the fisheries window. The condition and stability of the watercourse is managed during the detailed design and procurement phases of the project, with a reasonable control on costs possible. Full scale improvement works are scheduled to minimise impact on residents, businesses and the school in full consultation / engagement with elected members and the public.

5.18 A feasibility study has been undertaken by CCBC's Engineering Projects Group (EPG) with support from an external consultant, WSP. This identified two alternative strategies for long-term stabilisation options:

- Strategy 1 uses Green Infrastructure approaches to widen and re-naturalise parts of the watercourse thereby reducing velocities and lowering the likelihood and impacts of scour. The total estimated cost (including detailed design cost) for construction is £2.9M. The scheme is anticipated to have a 100-yr design life, with a whole life cost of £3.5M.

- Strategy 2 uses a more heavily engineered approach to manage / mitigate the scour. The total estimated cost (including detailed design cost) for construction is £1.8M. The scheme is anticipated to have a 50-yr design life, with a whole life cost (including for renewal at year 50) of £4.5M.

5.19 Whilst Strategy 1 has a higher initial cost, it is considered to have additional wider environmental benefits using Green Infrastructure approaches. It better aligns with Welsh Government policy and with the Well-Being of Future Generations objectives. Strategy 1 is, therefore, the preferred approach.

5.20 As outlined in Section 12 below, CCBC have a legal responsibility for works within some areas of the watercourse. Whilst the formal legal responsibility for works in other areas rests with the individual landowners, there is no certainty that the individual landowners would be in a position to be able to design and implement individual schemes.

5.21 It is understood that some of the land now in private ownership was obtained through adverse possession claims by the residents and that many of the outbuildings, bridges and other structures were erected without the necessary permissions and consents. However, due to the length of time elapsed since the structures were built, it is not now possible to take any formal enforcement action against the property owners for breach of planning permission or other consents. Some of the structures will have been built at considerable expense to the residents. These structures would have to be removed for bank stabilisation works to be carried out. It is not currently intended that the property owners would be offered any compensation for removal of the structures due to the unlawful nature of the original construction.

5.22 It is proposed that CCBC commission the detailed design and subsequent works for the full length of affected watercourse at no cost to the private landowners.

5.23 An outline engagement strategy has been developed and is described in Section 11 below.

5.24. **CONCLUSION**

5.24.1 If funding is not secured the Nant Cylla will continue to erode the stream bed, undermine bank support, and garden structures, potentially leading to a reasonable worst-case scenario of partial or complete collapse of the banks and bankside or bridge structures, flooding of the local area, considerable disruption to Ystrad Mynach, environmental damage and potentially serious injury or loss of life.

5.24.2 A continued managed risk scenario can reduce the likelihood of collapse of the banks but does not entirely remove the risk and requires continuous monitoring and interventions. A contingency fund is needed to ensure budget availability should intervention works be needed at short notice.

5.24.3 A scheme is needed to fully address the issue and to provide long-term stability to the watercourse. The detailed design is complex and requires an initial spend of £270k.

6. ASSUMPTIONS

6.1 That detailed design will result in an economically viable scheme.

6.2 That the continued managed risk scenario involving ongoing monitoring and temporary stabilisation works as required will prevent full or partial collapse of the watercourse banks whilst the scheme is designed and procured.

6.3 That no legal challenges are received in relation to the proposed removal of outbuildings, decking areas, bridges or other structures that are impacting on the stability of the watercourse.

7. SUMMARY OF INTEGRATED IMPACT ASSESSMENT

7.1 **Link to IIA**

8. FINANCIAL IMPLICATIONS

8.1 WSP, who provided support for the feasibility study assessment, have given an estimated cost for detailed design work of £270k.

8.2 Detailed design work will be commissioned through the South East Wales Technical and Professional Services (SEWTAPS) framework to ensure best value arrangements are achieved through competitive procurement.

8.3 A contingency fund of £100k is requested to be earmarked in case of further emergency / temporary repairs whilst the full detailed design is developed and construction procured.

8.4 The combined Corporate and Non-Corporate capital budgets for Drainage and Flood Alleviation works for 2023/24 is merely £246k and is fully committed to other flood priority schemes.

8.5 The Corporate Land Drainage budget of £123k is used to carry out repairs and maintenance work on land across various directorates where no specific budget allocation is included within individual service area budgets and is already fully committed.

8.6 The Non-Corporate Land Drainage budget of £123k is used for match funding on Welsh Government flood grant schemes and for priority capital works.

8.7 Given the limited budget availability and anticipated design costs and following consultation with the Section 151 Officer, it is proposed that the detailed design costs and contingency fund are funded from uncommitted capital earmarked reserves.

8.8 The current preferred option has an estimated construction cost of circa £2.9M, is anticipated to have a design life of 100-years and a whole life cost of £3.5M. These costs will be reviewed and confirmed during the detailed design phase of the scheme.

9. PERSONNEL IMPLICATIONS

9.1 There are no Personnel implications foreseen.

10. CONSULTATIONS AND ENGAGEMENT STRATEGY

10.1 The following statutory bodies and service areas have been consulted during the development of this proposal thus far:

- Natural Resources Wales.
- Caerphilly CBC Ecologists.
- CCBC Education department.
- CCBC Estates Department
- CCBC Legal Services Department
- CCBC Planning Department

10.2 It is understood that a previous letter was drafted and issued to ward members prior to the emergency works in March / April 2022 but it is not clear whether this letter was issued to property and landowners. At that time, it was proposed that CCBC would carry out the works **and** compensate residents for the loss of the unauthorised structures. Given further legal advice on the legal status of the structures, land ownership and riparian responsibilities, combined with the wider shift in the economy, it is still proposed that CCBC progress with detailed design at no cost to the residents. However, it is not proposed that any compensation will be offered to the residents for the removal of unauthorised structures.

10.3 An outline engagement strategy has been developed as follows:

- Detailed structural assessment of the full impacted length of the watercourse to provide an accurate appraisal of the current condition of the watercourse at an individual property level.

- Meeting between ward members and officers to update current status and advise of next steps.

- Write to individual property owners / occupiers to outline overall issues and detail specific risks in relation to their individual property. This is likely to include a

recommendation that outbuildings, bridges and other structures identified as being at risk are not used at any time. This is also likely to include a recommendation that residents do not use the lower ends of their gardens. The letters will include an invitation to meet with Officers.

- Officers to meet with property owners / occupiers on an individual basis to discuss their specific concerns in relation to the overall issues and at a specific property level.

- Quarterly updates issued to property owners / occupiers to advise of any changes observed through regular monitoring and updates on progress of detailed design process.

- Property owners / occupiers to be informed of any significant changes observed through monitoring reports resulting in a substantially increased risk to individual properties and / or the need for emergency works to be undertaken at the earliest practical opportunity.

11. STATUTORY POWERS AND LEGAL OBLIGATIONS

11.1 CCBC are the Lead Local Flood Authority (LLFA) under the Flood and Water Management Act (2010). The LLFA have a responsibility for strategic management of flood risk relating to streams and small watercourses such as the Nant Cylla.

11.2 The Landowner has riparian rights and responsibilities to maintain the watercourse and both banks, vegetation to the banks and the watercourse. Figure 2 below shows land ownership as confirmed by Land Registry searches.

Link to – a guide to your rights and responsibilities of riverside ownership in Wales (naturalresources.wales).

11.3 In Section 1, from Commercial Street / Bedwlwyn Road (no.6) to the rear of no. 60, CCBC is not the landowner of either bank of the watercourse and therefore, the legal responsibility to maintain the banks rests with the individual property owners. The ability of the landowners to be able to design and implement individual schemes in this area is questioned.

11.4 In Section 2, to the rear of no. 62, 64 and 66, CCBC is the landowner of the eastern bank with the property owners being the owners of the western bank. CCBC therefore has shared legal responsibility with the property owners for maintenance of the banks.

11.5 In Section 3, from the rear of no. 68 to the confluence with the River Rhymney, CCBC is the landowner of both banks where works are anticipated and therefore has legal responsibility for maintenance of the banks. A license for use of the western bank has been granted to White Rose Cottage. Part of the western bank in this section is unregistered, although it is to be anticipated that fair use of this land could also be demonstrated by White Rose Cottage and there are limited works proposed to the western bank at this point.

11.6 The Land Drainage Act 1991 Section 14A confers general powers upon the LLFA to carry out flood risk management works including:

a) to maintain existing works (including buildings and structures) to maintain the efficiency of the watercourse
b) to improve or alter an existing watercourse, including removal of dams, weirs or other obstructions
c) to construct new works
d) to alter or remove works

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Consultees: Cllr Nigel George, Cabinet Member for Corporate Services, Property and Highways
Dave Street, Deputy Chief Executive
Cllr. Andrew Whitcombe, Chair of Housing and Environment Scrutiny Committee
Cllr. Shane Williams, Vice-Chair of Housing and Environment Scrutiny Committee
Cllr. Alan Angel – Ward Member
Cllr Martyn James – Ward Member
Mark S Williams, Corporate Director for Economy and Environment
Richard Edmunds, Corporate Director of Education and corporate Services
Marcus Lloyd, Head of Infrastructure
Lynne Donovan, Head of People Services
Robert Tranter, Head of Legal Services and Monitoring Officer
Stephen Harris, Head of Financial Services and S151 Officer
Gareth Richards, Highway Services Group Manager
Anwen Cullinane, Senior Policy Officer – Equalities, Welsh Language
National Resources Wales

Appendices:

Appendix 1 Nant Cylla Scour Feasibility Study – Regarding Appendix A which is part of the Feasibility Study, entitled “Utilities” – This document contains plans which cannot be made accessible. Therefore, should anyone wish to discuss the content they may contact Mark Goodger, Author of the Report on goodgm@caerphilly.gov.uk

Appendix 2 Nant Cylla Monitoring Survey.