



Agenda and Business Paper

Floodplain Risk Management Advisory Committee

To be held on
Wednesday 15 May 2024
at 8.30 am

Civic Centre cnr Baylis and Morrow Streets,
Wagga Wagga NSW 2650 (PO Box 20)

P 1300 292 442

[P council@wagga.nsw.gov.au](mailto:council@wagga.nsw.gov.au)

wagga.nsw.gov.au

FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE AGENDA AND BUSINESS PAPER

WEDNESDAY 15 MAY 2024

ORDER OF BUSINESS:

CLAUSE	PRECIS	PAGE
	<u>ACKNOWLEDGEMENT OF COUNTRY</u>	2
	<u>APOLOGIES</u>	2
	<u>CONFIRMATION OF MINUTES</u>	
CM-1	FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE MINUTES - 15 FEBRUARY 2024 & 27 FEBRUARY 2024	2
	<u>DECLARATIONS OF INTEREST</u>	2
	<u>REPORTS FROM STAFF</u>	
RP-1	2018-19-FM-0071 - NORTH WAGGA FLOOD MITIGATION OPTIONS	3
RP-2	2021-22-FM-0039 - LAKE ALBERT FLOOD MITIGATION OPTIONS - FEASIBILITY STUDY	11
RP-3	2021-22-FM-0032 - URANQUINTY LEVEE UPGRADE - INVESTIGATION AND DESIGN	12
RP-4	2022-FMP-0103 HUMULA AND MANGOPLAH FLOOD STUDIES	15
RP-5	DCCEEW 2024 FLOODPLAIN GRANTS	16
RP-6	FLOODGATE 15 A	17
RP-7	FLOOD PROJECT IMPLEMENTATION STATUS	19
	<u>QUESTIONS WITH NOTICE</u>	39

ACKNOWLEDGEMENT OF COUNTRY

APOLOGIES



CONFIRMATION OF MINUTES

CM-1 FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE MINUTES - 15 FEBRUARY 2024 & 27 FEBRUARY 2024

Recommendation

That the Minutes of the proceedings of the Floodplain Risk Management Advisory Committee Meeting held on 15 February 2024 & 27 February 2024 be confirmed as a true and accurate record, noting Council's adoption of these minutes at its meeting 11 March 2024.

Attachments

- 1.  FRMAC Minutes - 15 February 2024 40
- 2.  FRMAC Minutes - 27 February 2024

DECLARATIONS OF INTEREST

REPORTS FROM STAFF

RP-1 2018-19-FM-0071 - NORTH WAGGA FLOOD MITIGATION OPTIONS

Author: Andrew Mason

Director: Phil McMurray

Summary: | The project has reached finalisation and the consultant is presenting the final report and recommendations for adoption.

Recommendation

That the Floodplain Risk Management Advisory Committee receive and note the final report and recommends to the Council that it receive and adopt the report and the recommendations in full.

Report

As per the scope and brief of this study the consultant CIE, Woolcott, WMAwater and NGH have completed the four key areas of analysis:

- Economic
- Environmental
- Social
- Cultural

In discussion with this committee, the final report has been developed to reflect the findings of this analysis and has the following conclusion for Flood Mitigation for North Wagga:

Of the different options that could be adopted:

- *The combined L4A with a targeted VHR/VHP to high risk residents outside North Wagga delivers the best outcome for the community. However, there may be challenges for some households due to accessibility issues which could result in additional costs above the assumed \$120,000/property raising.*
- *L4B by itself or in combination with any other strategies is too expensive to be cost effective, regardless of the size of potential benefits.*
- *VHR and VHP delivers positive outcomes for the community where it is applied to high risk properties where the risk reduction is greater than the cost of the actions. This suggests a strategic approach to the application of these policies based on estimated risk reduction. Further, the VHP policy could be more efficient where the purchase applies only after flooding. A pre-emptive policy would immediately “destroy” the value of the property with certainty, compared to the comparatively low probability of this. An alternative would be to purchase a property pre-emptively but maintain it as part of the housing stock until it is damaged by a flood event which could be in, say, 10 years’ time.*

In implementing the proposed levee it is important to recognise that water is diverted to other parts of the floodplain, potentially negatively impacting on some properties. However, where negative impacts occur these are typically only result

in minor increases flood depths. The risk reduction benefits of the levee substantially outweighs the potential negative impacts on some properties.

Based on the draft report the FRMC had developed the following likely recommendation for Council:

- a. *Upgrading the existing North Wagga Levee system (Stage 1 of L4B - 5% AEP (1 in 20)) and offering Voluntary House Raising and Purchase subject to risk reduction and cost effectiveness*
- b. *Increasing the road heights and bridges along Hampden Ave to provide a safe evacuation route (Stage 2 of Option L4B) subject to funding.*

Public Exhibition

Public exhibition of the Flood Mitigations Options for North Wagga was required by the Local Government Act (1993, Section 38). This section stipulates that Council must exhibit the draft plan for public comment for a period of at least 28 days, and that submissions must be considered by the council before the plan is endorsed or amended.

The Draft Report was endorsed for public exhibition at the Council meeting on the 11 March 2024. The Public Exhibition period commenced on the 15 March 2024 and was closed on the 26 April 2024, after a period of 42 days.

Digital copies of the report were available on the Council website through the "Have Your Say" page and one on one sessions with Council Officers were available to be booked through this page.

The Reports, as attached, were presented for public exhibition, and included:

- Flood Mitigation Options for Wagga Wagga, Evaluation of options (CIE, Feb 2024)
- Flood Mitigation Options for Wagga Wagga, Evaluation of options (CIE, Oct 2023)
- North Wagga Flood Mitigation Community Engagement Report Phase 2 (Woolcott Research, 2024)
- North Wagga Flood Risk Mitigation Community and stakeholder Engagement Study (Woolcott Research, 2023)
- Assessment of Environmental Constraints North Wagga Flood Mitigation Options (NGH, 2023)
- Biodiversity Assessment Report North Wagga Flood Levee (NGH, 2023)
- Flood Impacts of Flood Mitigation Options for North Wagga (WMA Water, 2024)

There were six submissions received from the public and one from Biodiversity Conservation and Science during the PE period and an outline of these is included as an attachment to the final report.

The three submissions and the three one on one meetings did not highlight any significant problems or concerns with the proposed mitigation options.

The submission from Biodiversity Conservation and Science stated:

BCS has reviewed the Biodiversity Assessment Report North Wagga Flood Levee (NGH 2023). We agree the proposed works are likely to cause significant impact on threatened species. While that impact is likely to vary depending on the option(s) that are eventually built, we consider it important to determine the precise nature of that impact per option, and to use that information iteratively to avoid and minimise harm to biodiversity.

Given significant impact is likely, section 7.12(3) of the Biodiversity Conservation Act 2016 establishes Council is not to give consent without either the concurrence of the Environment Agency Head or a Biodiversity Assessment Development Report (BDAR). The review of environmental factors (REF) established by Part 8 of the Environmental Planning and Assessment Regulation 2021 is a good opportunity for Council to decide which of those two pathways best suit the activity. Given the proposed activity involves various options, we strongly recommend a BDAR is the best approach.

The BDAR relies on a method that will determine which option best avoids and minimises harm, mitigation measures that can be applied locally to maintain habitats and populations in situ, and price offsets per option to inform Council’s decision. The BDAR will also rely on the Biodiversity Offset Scheme to mitigate harm. That approach means Council does not have the ongoing burden of managing offset work.

The initial information Council has is that a BDAR will take 15-18 months to complete and has a cost of approximately \$100,000.

Implementation timeline for adopted recommendation

Stage	Duration	Commencement
Topographic Survey	6 months	August 2024
Voluntary House Raising (VHR) and Voluntary House Purchase (VHP) project development and implementation	3-5 years	January 2025
Environmental Assessment	18 months	September 2024
Civil Design	12-15 months	July 2025
Levee contractor procurement	4 months	November 2026
Levee construction	24 months	March 2027

There are some significant issues that the committee need to be aware of regarding the recommendations from this report.

Evacuation Level for North Wagga

With the existing levee in place, the current evacuation trigger for North Wagga is a river height of 9.3m. The existing road network around North Wagga is inundated at a river height of approximately 9.4m. The “banks” along Hampden Ave between the Wiradjuri Bridge and Parken Pregan Bridge adjacent to Wilks Park are not keyed into the underlying ground and cannot be assumed to offer a safe evacuation route beyond the existing 9.3m. The Mill St causeway between East St and the Marah St is inundated at 9.4m and the East St section of North Wagga becomes isolated beyond this river height.

If a 10.1m levee plus freeboard is constructed around North Wagga and the existing road network or the “banks” are not modified then the evacuation trigger for North Wagga will probably remain at 9.3m.

The NSW State Emergency Service have been consulted regarding this issue and have provided the following response:

The NSW SES further recommend:

- Continuing to progress flood mitigation and management options in accordance with the NSW Flood Prone Land policy as set out in the Flood Risk Management Manual 2023 (the Manual) and supporting guidelines. This would include a detailed assessment during the next phase of the mitigation process to understand flood behaviour and constraints.
- Investigating ways to improve emergency access and egress during a flood.
- Carefully considering any locations of proposed increase in density of development and its associated increased risk to life and property. This flood mitigation option will address some residual risk to life and property.
- Considering Development Control Plan 2010 (DCP) which strengthen the land use planning process to identify areas where risk to life from flooding is intolerable.

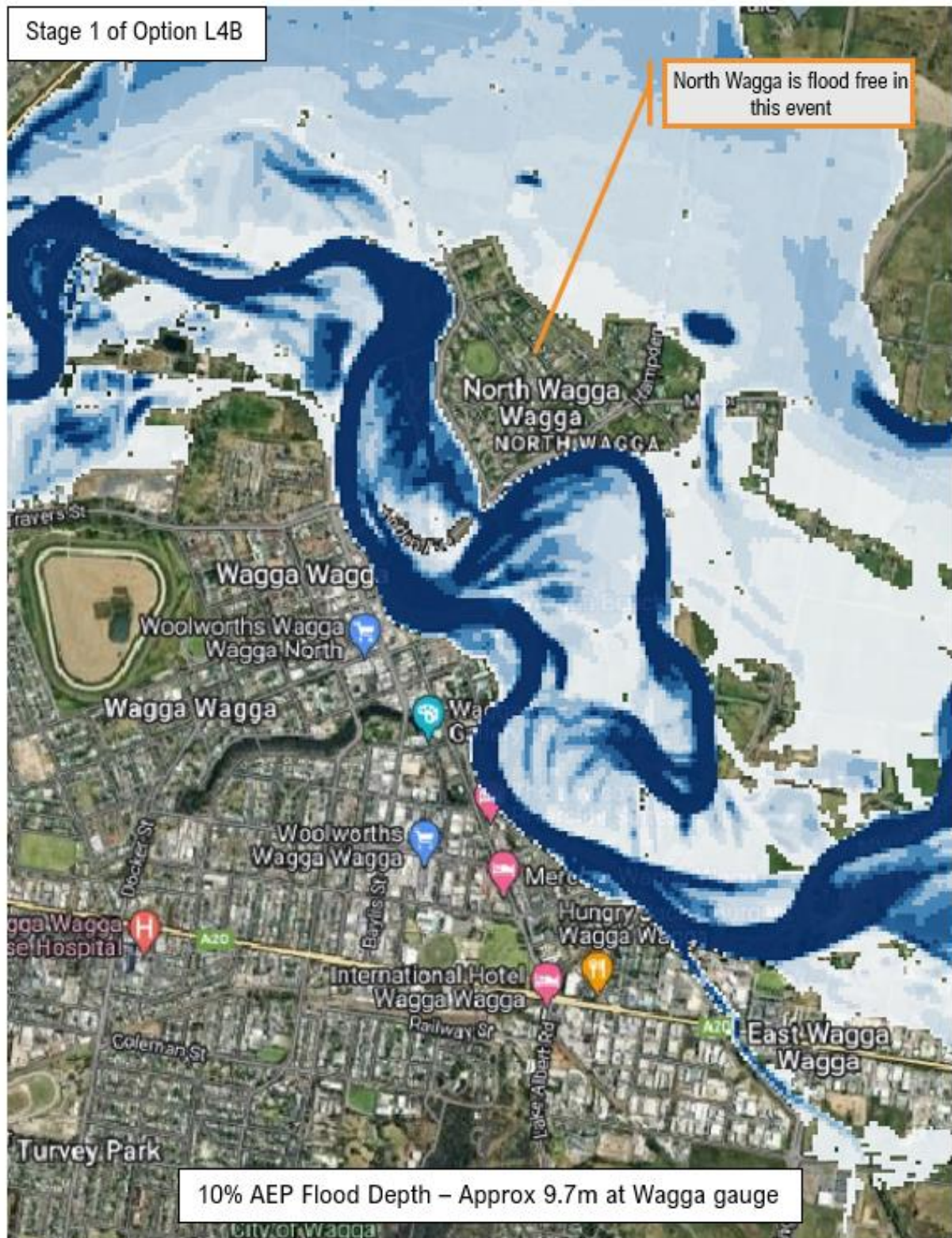
The second point in the above extract may allow Council to investigate the formalisation of the Wilks Park banks to enable the construction of similarly sized banks to a suitable standard to allow them to be licenced as levees and potentially for the SES and Council to raise the evacuation trigger for North Wagga to a level closer to the design height of the new levee.



The secondary issue with evacuation and egress is that the residents along East St will possibly still have to evacuate at 9.3m. Mill St between East St and the ring levee becomes inundated at around 9.3m - 9.4m.



There is no simple infrastructure solution to this and it may require the new levee design to incorporate a helicopter rescue pad into the East St levee for emergency evacuations.



If the banks along Wilks Park are formalised, the section of North Wagga protected by the ring levee will still be able to evacuate at 9.7m while the section of North Wagga along East St will need to evacuate at approximately around 9.3m.

Newly Inundated Houses

If a 5% AEP levee is constructed around North Wagga without the excavation to offset the displacement of water, there will be adverse effects to over 1100 other houses. In a larger flood event (1 in 200, 1 in 500) when the main city levee is overtopped there will be increased water in a significant number of houses. These houses already have over floor flooding but will have an increased amount of water of up to 200mm flowing through them.

There are a few properties that will now be flood affected that weren't previously inundated around East Wagga in a 5% AEP. Those 25 properties will be part of the targeted VHR/VHP program.

Funding

- Council has \$6.3M in funding raised through the levee Special Rate Variation (SRV)
- Council has \$1M available through the CDG0789 grant, this must be expended by December 2025
- Council has applied for the next round of BCS DCCEEW Floodplain grants for \$5M to allow for the environmental analysis, detailed design and construction of the North Wagga levee system
- Council has applied for the next round of BCS DCCEEW Floodplain grants for a VHP and VHR feasibility Scoping Study for the 25 houses that will be adversely affected by the construction of Stage 1 of the Flood mitigation options for North Wagga.

This final report is being presented to the committee for acceptance and the committee is required to recommend to Council that it receive the report and accept the recommendations in full. A detailed report will then be presented for consideration at the Council meeting on 27 May 2024.

Financial Implications

N/A

Policy and Legislation

Local Government Act
Development Control Plan 2010
Flood Risk Management Manual

Link to Strategic Plan

Safe and Healthy Community

Objective: Our community feel safe

Be responsive to emergencies


Risk Management Issues for Council

N/A

Internal / External Consultation

The Committee are advised that the consultants will attending this meeting remotely and presenting via zoom.

Attachments

1.  CIE Report_Wagga Wagga CC_Flood Mitigation Options - Provided under separate cover

RP-2 2021-22-FM-0039 - LAKE ALBERT FLOOD MITIGATION OPTIONS - FEASIBILITY STUDY

Author: Andrew Mason
Director: Phil McMurray

Summary: | Work on this project has commenced and Stantec are working on the project in line with the program, two reports are provided for the committee.

Recommendation

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Lake Albert Flood Mitigation Project.

Report

Stantec have completed two stages of their program and provided the reports that have been accepted by Council. Stantec are planning the consultation phase of the project and will start with targeted meetings to specific user groups.

Council staff have sought advice from an industry consultant regarding mitigation options specifically for the boat club and will provide these to the consultant for the meetings with the stakeholders.

Financial Implications

N/A

Policy and Legislation

N/A

Link to Strategic Plan

Safe and Healthy Community

Objective: Our community feel safe

Be responsive to emergencies

Risk Management Issues for Council

N/A

Internal / External Consultation

N/A

RP-3 2021-22-FM-0032 - URANQUINTY LEVEE UPGRADE - INVESTIGATION AND DESIGN

Author: Andrew Mason
Director: Phil McMurray

Summary: | The project is progressing as per the required program. The preliminary design has been completed.

Recommendation

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Uranquinty Levee project.

Report

RHDHV have completed the preliminary design and conducted their first round of community consultation in Uranquinty. They are working on the issues raised by the community and continuing to finalise their design. Their update on the project status and a sample of their design drawings is attached to this report.

Financial Implications

N/A

Policy and Legislation

N/A

Link to Strategic Plan

Safe and Healthy Community

Objective: Our community feel safe
Be responsive to emergencies

Risk Management Issues for Council

N/A

Internal / External Consultation

N/A

Attachments

1   Uranquinty Levee Upgrade - Progress Report



Note / Memo

**Haskoning Australia PTY Ltd.
Water & Maritime**

To: Mr Andrew Mason
From: Andrew Morris
Date: 07 May 2024
Copy: [Click to enter "CopyTo"](#)
Our reference: PA3159-RHD-WR-XX-ME-CI-0001
Classification: Project related
Checked by: [Click or tap here to enter text.](#)

Subject: Uranquinty Levee Upgrade - Progress Report 3

Dear Andrew,

Please find below a progress report related to Uranquinty Levee Upgrade.

1. Updated Community Consultation Materials

We attended a community consultation in Uranquinty on the evening of the 28th February 2024. During the community consultation, the design development to date was outlined, including the proposed raising of each of the four sections of levees and associated immunity. Following the presentation, representatives of the community also highlighted that there are a number of problem drainage areas with the township that also contribute to inundation. These include:

- The low point, which includes a gate valve at the intersection of Maran Street and bridge Street. A community member referred to flooding which had resulted in inundation of property.
- Devices which are meant to prevent the ingress of water from the main creek system leaking and closing inadequately.
- Potential for overland flows to enter the township at the highway and railway line.

The members of the community advised that these matters had been raised as part of the previous phases of the floodplain management study.

As a result, it was agreed in principle to prepare updated consultation materials, with suitable notification time for the community, to allow a secondary consultation session to run through these matters with potential solutions in more detail. This material is being prepared and will be available for Council review shortly. Once the material has been reviewed and agreed upon, it is anticipated a second community consultation will be scheduled.

2. Preliminary Design Progress

Separate to the community consultation design, engineering plans are being prepared to document the preliminary design of the levee raising and to inform the cost benefit analysis of the project.

This has involved preparing engineering plans, based on the survey and services investigation and modelling the levee upgrades as defined by the levee freeboard assessment. The modelling will inform a preliminary assessment of quantities and facilitate costing of the proposed works.



Once this is complete, the cost benefit analysis of the upgrade will be reviewed and the findings documented in a report that captures the investigations to date. This will include:

- Background investigations including survey, geotechnical, services and site investigations.
- Levee freeboard investigation and evaluation.
- Options assessment and evaluation of preferred option for preliminary design.
- Cost Benefit Analysis.
- Any impacts on third parties and private landowners.

I trust this provides an adequate summary of progress since the previous meeting. Please don't hesitate to contact me should you have any questions.

RP-4 2022-FMP-0103 HUMULA AND MANGOPLAH FLOOD STUDIES

Author: Andrew Mason

Director: Phil McMurray

Summary: | WMAwater have commenced the study for Humula and Mangoplah and will be conducting some community consultation in the villages next few weeks

Recommendation

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Humula and Mangoplah Flood Studies Project.

Report

Council engaged WMAwater in late September 2023, to undertake the Humula and Mangoplah Flood Study.

The relevant LiDar data has been provided to WMAWater for development of the flood models and they are planning to conduct community consultation within the next few weeks in the two villages to calibrate the models against historical records and memories.

Financial Implications

N/A

Policy and Legislation

N/A

Link to Strategic Plan

Safe and Healthy Community

Objective: Our community feel safe

Be responsive to emergencies

Risk Management Issues for Council

N/A

Internal / External Consultation

N/A

RP-5 DCCEEW 2024 FLOODPLAIN GRANTS

Author: Andrew Mason

Director: Phil McMurray

Summary: | This Report provides an outline of the DCCEEW Floodplain Grant Applications for 2024

Recommendation

That the Floodplain Risk Management Advisory Committee receive and note the report with regard to the 2024-25 Floodplain Management Program.

Report

As a direct outcome of the North Wagga Flood Mitigation Options Study, Council has applied for two grants under the DCCEEW 2024-25 Floodplain Management Program.

The grants are targeted at two projects:

- North Wagga levee construction
- Wagga Wagga Voluntary House Raising and Purchase Scheme - Investigation and Design

The outcome of the grant applications will be announced towards the end of 2024.

Financial Implications

N/A

Policy and Legislation

N/A

Link to Strategic Plan

Safe and Healthy Community

Objective: Our community feel safe

Monitor and enforce public safety

Risk Management Issues for Council

N/A

Internal / External Consultation

N/A

RP-6 FLOODGATE 15 A

Author: Andrew Mason

Director: Phil McMurray

Summary: The repair of Floodgate 15A is being undertaken and reinstatement of the levee, placement of the pipe collar and replacement of the footpath is nearing completion.

Recommendation

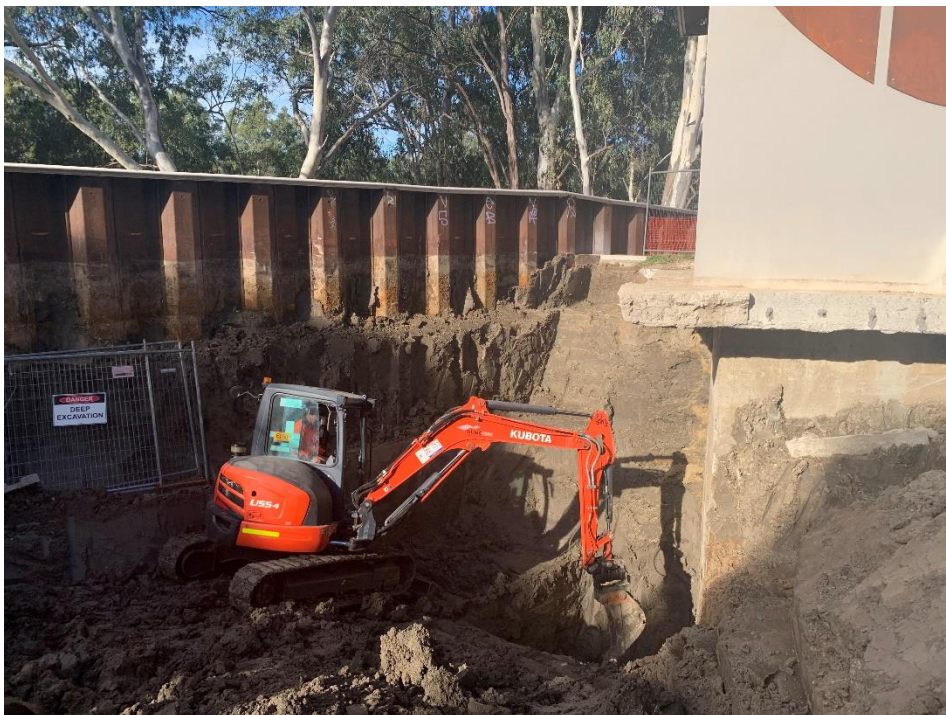
That the Floodplain Risk Management Advisory Committee receive and note the report in relation to repairs to Floodgate 15A.

Report

Floodgate 15A is a major component in the stormwater and flood infrastructure in the City of Wagga Wagga. It was initially constructed in 2008, damaged in the 2010 and 2012 floods, repaired in 2013 and became fully functional in 2016.

The pipe outlet at the base of the well shaft has been compromised and an immediate repair and rehabilitation project has begun to restore the floodgate to full functionality.

Stantec were initially contracted to undertake engineering assessment of the issue and to develop an immediate repair and long-term solution. Huon and Tye Jackson Welding were engaged to implement the solution developed by Stantec and Council. The project is being undertaken to the required specifications with the levee repaired, the failed grout replaced with a more suitable product and the stainless-steel sleeve installed to protect the pipe/wall connection from water turbulence in the future.





Financial Implications

The DRFA funding of \$1M from the Office of Local Government NSW has been identified to complete this repair project, the project is on track to be completed within the allocated budget.

Policy and Legislation

N/A

Link to Strategic Plan

Safe and Healthy Community

Objective: Our community feel safe

Be responsive to emergencies

Risk Management Issues for Council

N/A

Internal / External Consultation

N/A

RP-7 FLOOD PROJECT IMPLEMENTATION STATUS

Author: Andrew Mason

Director: Phil McMurray

Summary: | This Report outlines the status of the flood projects across the various studies that Council currently has underway.

Recommendation

That the Floodplain Risk Management Advisory Committee receive and note the report in relation to Flood Project Implementation Status

Report

Council has over 60 recommendations from the three recently completed studies and is working its way through the studies. The spreadsheet tracking these projects is an attachment to this report.

Financial Implications

N/A

Policy and Legislation

N/A

Link to Strategic Plan

Safe and Healthy Community

Objective: Our community feel safe

Be responsive to emergencies









Risk Management Issues for Council

As outlined in the Report.

Internal / External Consultation

N/A

Attachments

1.   Flood Studies Project Status - FRSMP 2018
2.   Flood Studies Project Status - EWS
3.   Flood Studies Project Status - MOFFS 2021
4.   Flood Studies Project Status - VOFFS 2021

Option	Description	Benefits	Concerns	Priority		Responsibility	Status
Feasibility study to investigate a Voluntary House Raising & Voluntary Purchase Scheme in Wagga Wagga Study Area. The feasibility study is to be investigated in conjunction with Option L4B (see below)*.	Residential properties located outside leveed areas may be eligible for voluntary house raising which aims to reduce property damages to residential dwellings, or voluntary purchase, which aims to remove residents from high hazard areas and prevent future development of the purchased lot. Feasibility study is to include economic appraisal of both options, eligibility criteria for participation, identification of construction constraints and extensive community consultation to determine likely participation rates.	The frequency of overfloor inundation (and hence property damage) is significantly reduced by raising the dwelling above the Flood Planning Level. This option can provide benefits to many dwellings across the floodplain without impacting others. Voluntary purchase reduces the number of residents in high hazard areas and can improve conveyance by removing dwellings and rezoning lots to prevent future development.	Suitability for house raising depends on building footings (slab on ground not appropriate), which may limit participation. Some residents may not want stairs due to health and mobility issues. Economic viability of this scheme would be directly linked with participation rates. Raised houses could encourage residents to 'shelter in place' during floods, however isolation and long durations of floods put them at high risk. Significant ongoing education efforts will be required to ensure any evacuation orders are heeded.	High*		Strategy and Projects	The report is completed and will be discussed by Council on the 27/05/2024
Feasibility Study to investigate North Wagga Levee Upgrade to 5% AEP level of protection including upgrade to Hampden Avenue to equivalent level (as embankment and conveyance improvements through Wilks Park. Feasibility study is to be conducted in conjunction with Option PR1 (see above)*.	Undertake a study to further investigate and determine the feasibility of raising the North Wagga Levee to a 5% AEP level of protection, and raising Hampden Avenue to an equivalent level with some excavation of Wilks Park to improve conveyance and offset upstream flood impacts. The feasibility study is to include EIS for the park excavation, geotechnical assessment of existing levee, site-by-site assessment of third party impacts and extensive community consultation.	Moderate reduction in frequency of inundation and property damages in North Wagga and minor benefits upstream due to increased flow conveyance beneath the newly excavated Wilks Bridge.	Significant concerns regarding risk to life of residents inside levee: ongoing education required to ensure residents fully understand the level of protection the levee would offer. Raising the levee has external adverse flood impacts on a number of properties which require further investigation. The upgrade involves additional excavation beneath Wilks Park Bridge which is likely to have associated environmental impacts. Other concerns include the high capital cost and the need for ongoing maintenance.	High*		Strategy and Projects	The report is completed and will be discussed by Council on the 27/05/2024
Update the recently completed Vegetation Management Plan to consider new state biodiversity legislation instruments, then draft Standard Operation Procedures for selected recommended activities.	The recently completed VMP was written in accordance with new biodiversity legislation, however implementation guides and instruments were not available at the time of writing. Following completion, Council is to select recommended activities to progress, and draft Standard Operating Procedures for these items.	Controlled vegetation management ensures that in the long term, vegetation does not roughen the riparian zone excessively, and to protect areas of ecological value (especially habitat for native fauna).	There is a perception that broadscale clearing may occur, however vegetation management activities will be targeted and controlled. Vegetation management will not explicitly reduce flood affectation, however will ensure that over time flood behaviour is not worsened by increased riparian roughness due to increased vegetation density.	High		Environment and Regulatory Services	Implementation of actions from the Vegetation Management Plan are being progressed including management of exotic plant species and weeds. Grant funding was received and willows in the floodplain were removed.

Improve Flood Warning System	Various measures to continue and improve on Wagga Wagga's existing flood warning systems, both to enhance flood forecasting and dissemination of information to the public, including investigation of "DipStik" to be installed at Oura to provide water level alerts.	Improved warning systems will better increase the accuracy and timeliness of flood predictions and improve the communication methods to deliver accurate and persuasive messages during flooding.	BOM is responsible for issuing Flood Watch and Flood Warnings.	High		Strategy and Projects	Council have received a grant from DCCCEW to continue the next stage of this project
Flood Emergency Management Planning	Review and update current Council and SES emergency flood response documents, drawing from latest modelling and recent floods.	Improved flood planning reduces flood risk to life and property, assisting residents of flood prone areas better prepare themselves and their property for flooding.	There are a number of documents to be updated and coordinated.	High		Strategy and Projects. SES	SES have finalised work on updating their floodplans. Council staff have completed updating the Levee Owners Manual and Flood Emergency Response Operations Plan
Community Flood Education	Ongoing community engagement is key to maintaining flood awareness, which can wane as time between flood events increases.	A flood aware community is generally better prepared for flooding, more responsive to evacuation orders and more resilient in recovery.	Levee upgrades can cause increased complacency in residents, which needs to be gently targeted with ongoing flood education campaigns.	High		SES	The NSW government have released a set of information that will assist Council with the ongoing education of the community with regard to flooding. Council have an ongoing program to improve the information on Council's website to provide a current source of reliable information for the community
Future consideration of increasing conveyance beneath Wiradjuri Bridge by extending span and/or excavating beneath the bridge.	Future Option: use planned upgrades to Wiradjuri Bridge (maintenance/ traffic capacity upgrade etc.) as an opportunity to improve flood conveyance between North and South Wagga.	Increasing flow conveyance reduces flood levels across the floodplain upstream of Wiradjuri Bridge and reduces flood damages in the CBD, Wagga Floodplain and parts of North Wagga.	There may be adverse impacts downstream of the bridge, high capital costs and ongoing maintenance costs. Would have to be undertaken in conjunction with other bridge works.	Low		Strategy and Projects	Will be incorporated into the outcome of the North Wagga Flood Mitigation feasibility Study

Improved Access to Oura	Long term, staged upgrades to raise Oura Road (or other route) above the 1% AEP flood level.	Flood free access east-west across Wagga Wagga to Oura is beneficial not only to residents of Oura but to communities across the Riverina.	This road intersects several major flow paths and would require significant culverts/ bridge sections. Costs would be significant.	Low		Strategy and Projects	Initial investigations have highlighted significant issues with this proposal. This does not look to be a feasible option in the short-term
Improved Access to Gumly Gumly	Long term, staged upgrades to raise or divert the Sturt Highway (or other route) above the 1% AEP flood level between East Wagga and Gumly Gumly.	Flood free access east-west across Wagga Wagga to Oura is beneficial not only to residents of Gumly Gumly but to communities across the Riverina.	This road intersects several major flow paths and would require significant culverts/ bridge sections. Costs would be significant. Sturt Highway is owned by RMS.	Low		Strategy and Projects TFNSW	This was raised with TFNSW and they will investigate options for flood proofing the Sturt Highway as the road is rehabilitated as part of the future roadworks programs
Move Flood Planning Area mapping into the Wagga Wagga DCP, whilst retaining the definition of the Flood Planning Area and Flood Planning Level in the LEP.	A general definition of both FPL and FPA is to remain in LEP, with details and FPA mapping provided in the DCP for ease of updating following the completion of future studies.	By keeping the FPA mapping in the DCP, Council would not be required to prepare a Planning Proposal each time the FPA map is updated (e.g. with completion of future flood studies).	This amendment to the LEP would require Council to submit a planning proposal.	High			Awaiting finalisation of the update to the LEP to allow reference to the FPA map in DCP.
Reformat DCP to Matrix style document	The Development Control Plan (DCP) is currently a long, wordy and cumbersome document. Reverting to a matrix style format will make it easier for Council and the public to apply and understand.	Matrix style with controls dependent on hydraulic categorisation and hydraulic hazard will be clearer and simpler to interpret. Controls specific to each precinct are not necessary.	There may be resistance to moving away from precinct-centric controls, however the proposed format would be more equitable and clearer about which controls apply to a proposed development.	High	General Changes	Regional Activation	Engaged consultants in August 2018 to update flooding controls in DCP - process identified issues with completion prior to completion of VOFFs and MOFFs. These issues are yet to be resolved.

Add clause to LEP to control critical facilities and vulnerable land uses between the FPA and PMF extent.	This clause empowers Council to apply appropriate flood related controls to critical facilities within the PMF extent that fall outside the FPA (which are not subject to the DCP).	Critical facilities including schools, aged care facilities, childcare facilities outside of the FPA are not currently subject to development controls, however are vulnerable to flood risk in events greater than the 1% AEP. This clause will require development of critical facilities to consider and prepare for flooding during the development application stage	This amendment to the LEP would require Council to submit a planning proposal, which could be lodged in conjunction with Option PL1.	High	Controls to reduce risk to life	Regional Activation	NSW Planning are currently in the process of reviewing standard flood clause. Council has been involved in this process. It is anticipated this will be updated automatically in the LEP without the need for Council to prepare an amendment. Expected completion 2021.
Requirement of Site Specific Flood Emergency Plans	Certain types of developments will be required to provide site specific emergency flood plans to demonstrate how occupants and stock will be kept safe during and after flood events.	Preparation of a plan increases the flood awareness of the business owner and reduces risk to life of staff or occupants by improving evacuation efficiency and preparedness. Increased awareness can also reduce property damages by preparing the site for flooding.	There may be resistance from developers, as preparation of a site-specific flood plan may be considered onerous to prospective developers.	High		Planning	Similar controls currently exist in the DCP. Any review and update of these controls will retain this provision.
Flood Risk Info on s149 Planning Certificates	Increase depth of flood information to be provided on s149(2) and (5) certificates to identify the property's flood hazard, hydraulic category and whether or not flood related development controls apply.	The more informed a home owner is, the greater the understanding of their flood risk. During a flood event this information can help prepare residents to evacuate and reduces the number of residents that elect to take shelter in high hazard areas.	None -s149 certificates already contain basic information, Council to provide further detail from current FRMS results.	High		Planning	Flood related development controls are provided on certificates. Further investigation is required to determine whether flood hazard and hydraulic category can be provided under liability requirements.
Controls to set Minimum Floor Levels	The Flood Planning Level (FPL) for a variety of types of development is set at a design flood event level plus a freeboard.	Incidences of overfloor inundation can be reduced for new developments by ensuring their floor levels are set at the FPL (as a minimum).	FPL and FPA to be updated based on results from this FRMS and applied appropriately to various types of development.	High		Planning	Completed. Controls currently exist in DCP. New data from FRMP&S is currently being used when assessing development applications.

Controls to set Minimum Flood Proofing Levels	Flood proofing to the FPL is to be required for certain types of development to reduce flood damages.	Implementation of a minimum flood proofing level can lead to reduced flood damages. Wet or dry flood proofing could be allowed at the developer's discretion.	FPL and FPA to be updated based on results from this FRMS and applied appropriately to various types of development.	High	Controls to reduce proposed development	Planning	Completed. Controls currently exist in the DCP. Updates to the DCP controls resulting from adoption of final FRMP&S, VOFF & MOFF will retain provisions for flood proofing levels.
Controls to ensure appropriate building design and materials	Certain developments are to be certified by an engineer to ensure they can withstand flooding forces, buoyancy and debris.	Developments in higher hazard areas or the floodway may be subject to fast flowing or deep floodwaters, and buoyant debris. This control will ensure such buildings are constructed suitably to withstand such forces and reduce damages and hazard.	There may be resistance from developers, as engineering certification may be considered onerous to prospective developers.	High		Planning	Completed. Controls currently exist in the DCP. Updates to the DCP controls resulting from adoption of final FRMP&S, VOFF & MOFF will retain provisions for building design and materials.
Controls to Manage Offsite Impacts: Flood Impact Assessment	A flood impact assessment can be used to demonstrate that a proposed development will not have any adverse flood impacts elsewhere in the floodplain (e.g. on a neighbouring property).	Developments in higher hazard areas or the floodway may cause adverse flood impacts to other properties and contribute to impacts of cumulative development. This control requires developments of a certain size to submit an impact assessment to demonstrate no offsite flood impacts occur	There may be resistance from developers, as a flood impact assessment may be considered onerous to prospective developers.	High	Controls to reduce risk to the wider floodplain		Completed. Controls currently exist in the DCP. Updates to the DCP controls resulting from adoption of final FRMP&S, VOFF & MOFF will retain provisions for flood impact assessment.
Appropriate Dwelling Design	Redevelopment of existing dwellings should be undertaken so as to improve flood risk where possible, and development controls can be used to achieve improvement over time.	The proposed controls seek to reduce the flood impacts of a replaced dwelling by, for example, locating it on the part of the lot with the lowest hazard, orienting the dwelling to cause least obstruction of flow, requiring minimum floor levels above the FPL, and using open piers to allow flow beneath the property.	There may be limited scope to change the siting of the dwelling or resistance to having open space beneath houses.	High			Completed. Controls currently exist in the DCP. Updates to the DCP controls resulting from adoption of final FRMP&S, VOFF & MOFF will retain provisions for appropriate dwelling design.

Reference	Option and report Reference	Priority	DPE Funding available	Responsibility	Status
Improving Understanding and Knowledge of the Influence of tributaries on Flooding	Option 3 Monitoring and prediction	High	Probably	WWCC	Ongoing development of internal flood forecasting capability
Review the existing rating Curve	Option 6 Monitoring and prediction	High	Yes	WaterNSW	recently completed by WaterNSW
Review Flood Forecasting and warning services	Option 8 Interpretation	High	No	WWCC and BOM	
Revise Flood Intelligence Card and Local Flood Plan for Oura	Option 9 Interpretation	High	No	WWCC and SES	
Review the need for new targetted prediction and Warning Services for graziers and water licence holders	Option 10 Message Construction	High	No	WWCC and BOM	
Incorporate GIS mapping within warning services and products	Option 11 Message Construction	High	Yes	WWCC BOM SES	Council have received a grant from DCCEEW to continue the next stage of this project
Community Education materials	Option 13 Communication	High	No	SES WWCC	The NSW government have released a set of information that will assist Council with the ongoing education of the community with regard to flooding. Council have an ongoing program to improve the information on Council's website to provide a current source of reliable informaiton for the community
Expand the use of CATS	Option 14 Protective behaviour	High	No	SES WWCC	
Targetted Review and change to the Minor Flood Level for the Wagga Wagga gauge	Option 7 Interpretation	Low	No	WWCC and BOM	

Automatic gauge at Oura	Option 1 Monitoring and prediction	Medium	Yes	WWCC WaterNSW BOM	The gauge at Eringoarrah is programmed for review by BOM under a federally funded program
Level Sensors and Flow Gauges at Key Culverts	Option 2 Monitoring and prediction	Medium	Possibly	WWCC	
Extend the model boundary	Option 4 Monitoring and prediction	Medium	Yes	WWCC	Council has a plan to extend the model boundary in 2028
Automate the floodgates	Option 5 Monitoring and prediction	Medium	No	WWCC	This option is very expensive and currently deemed not feasible
Communication of road closures	Option 12 Communication	Medium	No	WWCC TfNSW	TfNSW have fast-tracked a statewide program

Option ID	Option	Description	Benefits	Concerns	Priority	Responsibility	Status
RM01	Amend Flood Plans to include Overland Flow Flood Information	Amend local flood plans and operational plans to include information on flood risk due to overland flow, drawing on modelling and information provided in this FRMS&P	Detailed information will allow for better management of overland flow flood risk and will increase understanding of the different levels and types of risk present in Wagga Wagga.	Modelled results should be used as a guide only, as real flood behaviour may vary from modelled design results.	High	WWCC and SES	Currently underway with information added into the Flood Emergency Operational Response Plan
RM04	Community Flood Awareness	Establish and implement ongoing and collaborative education to improve flood awareness.	Flood awareness significantly improves preparedness for and recovery from flood events, building a more flood resilient community.	Ongoing efforts to ensure information is not forgotten. Potential for residents to become bored or complacent with messaging.	High	WWCC and SES	The NSW government have released a set of information that will assist Council with the ongoing education of the community with regard to flooding. Council have an ongoing program to improve the information on Council's website to provide a current source of reliable information for the community
RM05	Improvements to Driver Safety	Undertake an investigation using the outputs from the FRMS&P to identify locations for the installation of road flood signage.	The installation of appropriate road signage pointing to routes likely to be cut and alternate routes, reduces the risk to drivers during floods, reducing the number of incidences of motorists driving through floodwater. Could potentially reduce demand on SES with a reduced number of incidents.	Community attitudes, awareness of, and behaviour during overland flood events will need to be considered. Signage needs to be as automated as possible to reduce additional demand on Council resources.	High	WWCC and SES	Council currently has 72 Water Over Road signs installed across the LGA
P01	Adoption of Overland Flow Flood Planning Area	Adopt the Overland Flow Flood Planning Area developed in the FRMS&P.	FPLs are effective tools to limit property damage to new development and redevelopment. FPLs may pertain to minimum floor levels or flood proofing levels depending on the type of development.	A planning proposal is required to amend the LEP and implement the new FPL. May be considered more onerous for developers.	High	WWCC Regional Activation	The existing DCP controls cover Riverine Flooding only. An update to these controls commenced and was deferred until the completion of the 2021 MOFFS & VOFFS studies being completed. Changes to the existing flooding controls will recommence and include MOFFS and VOFFS and relevant FPLs. Recent updates to Council's LEP by NSW Department of Planning includes a definition of FPA by directly referencing it to have the same meaning as the Floodplain Development Manual.

P02	Adoption of Overland Flow Flood Planning Level	Adopt the Overland Flow (Residential) Flood Planning Level developed in the FRMS&P defined as the 1% AEP level plus 0.3 m freeboard. Modify the Wagga Wagga LEP to contain the definition consistent with Reference 7.	The FPA will provide clear guidance on the properties subject to flood related development controls.	A planning proposal is required to amend the LEP and implement the new FPA definition. Consultation would be required.	High	WWCC Regional Activation	The existing DCP controls cover Riverine Flooding only. An update to these controls commenced and was deferred until the completion of the 2021 MOFFS & VOFFS studies being completed. Changes to the existing flooding controls will recommence and include MOFFS and VOFFS and relevant FPLs. Recent updates to Council's LEP by NSW Department of Planning includes a definition of FPA by directly referencing it to have the same meaning as the Floodplain Development Manual.
P05	Appropriate Land Use Zoning in Future Development Areas	For areas not covered by existing flood mapping, undertake a flood investigation to develop flood mapping and allow for an appropriate assessment of flood risk. Ensure Planning Proposals for the rezoning of future growth areas are undertaken with due consideration of flood risk using information available to Council through its various Floodplain Risk Management Studies and Plans. If no flood information is available, consideration should be given to undertaking further analysis prior to determining land use zoning for future development areas. Ensure Development Planning Controls are implemented to manage development in areas of new growth in relation to flooding. This may include, for example, guidelines relating to the permissible proportion of impervious surfaces in areas of new development.	Considering flood risk in future development areas will allow early decisions to be made to reduce flood risk and minimise the impacts of flooding.	There may be resistance from developers who consider new controls to be onerous or likely to reduce the development yield.	High	WWCC Regional Activation	This is currently being undertaken with all Planning Proposals and will continue to be done.

P07	Appropriate Management of areas subject to both riverine and overland flow flood risk.	Proposed development is to be assessed (and designed) with due consideration of the full range of flood risk present at the site, i.e., riverine, overland flow, or both mechanisms. For residential development both Riverine and Overland Flow FPAs are to be considered, while critical utilities or vulnerable facilities may warrant consideration of the PMF for either or both flood mechanisms, particularly when considering Flood Planning Levels, evacuation constraints and other methods to manage the full range of flood risk.	Considering flood risk from all mechanisms will ensure development is appropriate given the prevailing risk, minimising flood risk and the impacts of flooding.	There may be resistance from developers who consider new controls to be onerous.	High	WWCC Regional Activation	The existing DCP controls cover Riverine Flooding only. An update to these controls commenced and was deferred until the completion of the 2021 MOFFS & VOFFS studies being completed. Changes to the existing flooding controls will recommence and include MOFFS and VOFFS and ensure all flood risks are considered.
P08	Confirm suitability of riverine flood related development controls within the overland flow PMF extent.	Controls to reduce riverine flood risk (e.g. by filling above a particular level) may inadvertently exacerbate the flood risk due to overland flow. It is recommended that Council's flood related development controls are assessed for their suitability in relation to overland flow flood information provided in this Study.	Considering flood risk from all mechanisms will ensure development is appropriate given the prevailing risk, and ensuring impacts are not worsened by controls to protect against one mechanism.	Individual consideration may be required.	High	WWCC Regional Activation	The existing DCP controls cover Riverine Flooding only. An update to these controls commenced and was deferred until the completion of the 2021 MOFFS & VOFFS studies being completed. Changes to the existing flooding controls will review suitability of controls.
P09	Inclusion of Overland Flow flood information on Section 10.7 Planning Certificates	In Section 10.7 Planning Certificates, notations regarding flooding should provide information on all mechanisms of flood risk at the site, including riverine, overland flow, or if appropriate, both. A greater level of detail can be provided via Section 10.7(5) certificates using high-resolution outputs from this Study and Council's other Floodplain Risk Management Studies.	The more informed a home owner is, the greater the understanding of their flood risk. During a flood event this information can help prepare residents to evacuate and reduces the number of residents that elect to take shelter in high hazard areas.	Limited -s10.7(2) certificates already contain basic information, Council to provide further detail from current FRMS&P results. May increase demand on Council staff, however GIS systems can be established to provide this information efficiently.	High	WWCC Regional Activation	Planning certificates identify whether the land is below the 1% Average Recurrence Interval and therefore flood related development controls may apply. No further details is provided on whether this is Riverina or overland flow.

GD01 (Glenfield Drain)	Red Hill Road and Glenfield Road Basin (further investigation)	Aim: To reduce peak flows entering Glenfield Drain by temporarily storing runoff and releasing it at a lower flow rate; • Involves augmentation of the existing retarding basin south of Red Hill Road by excavating approximately 5,000 m ³ , and building up the existing Red Hill Road/ Glenfield Road intersection to raise the basin embankment, resulting in a total capacity of approximately 5.1 ML; Low spots in the existing embankment north east of the roundabout were filled	Reduced flood levels on and adjacent to Glenfield Road up to the railway in the 1% AEP event, including properties no longer flooded on the eastern side of Glenfield Road.	Increased flood depths upstream of the embankments, both in the designated basin southwest of the intersection, as well as the downstream parts of Jubilee Park. Public safety considerations due to prolonged ponding in roadside basin.	High	WWCC Projects	Contract awarded to Lyalls
GD02 (Glenfield Drain)	Adjin Street & Maher Street Intersection Civil Works (further investigation)	Suite of civil works intended to reduce inundation of properties and roads between Maher Street and Glenfield Road.	Removes external flood affectation for 47 properties and over-floor flooding for 4 dwellings in the 1% AEP event. Significant reductions in flood levels east of Glenfield Road.	Minor increase in flood levels in the industrial properties and vacant land upstream of the railway.	High	WWCC Projects	Contract awarded to Lyalls
GD03 (Glenfield Drain)	Anderson Oval Basin and Swale Augmentation (further investigation)	Aim: Increase flood storage capacity at Anderson Oval to reduce flooding on Finch Place and to reduce (and delay) peak inflows from entering Glenfield Drain; • Increase existing embankment height around Anderson Oval from 1 m to 2.25 m; • A spillway is provided in the north western section of the basin, set 0.25 m lower than the remainder of the embankment; A swale was excavated to allow runoff from Finch Place to flow towards Fernleigh Road rather than back up behind the basin embankment.	The extent of reductions in flood levels is significant and can be observed up to the northern extent of the City model. Effective in reducing peak flood levels across a range of events.	Public safety concerns as a significant depth (> 1 m) would be ponded within the playing field in a 5% AEP event. Reduction in amenity and usability of the oval following rain events.	High	WWCC Projects	Contract awarded to Lyalls

GD05 (Glenfield Drain)	Flowerdale Lagoon Drainage Improvements	Aim: Improve drainage of the Flowerdale Storage Area by installing an additional major levee pipe between Floodgates 01 and 02 (Flowerdale Lagoon and Wiradjuri Reserve); The installation of three 1.8 m diameter levee pipes has been tested near the Wiradjuri Walking Track, between Flood Gates 1 and 2.	Significant flood level reductions along Spring Street and the Olympic Highway up to Evans Street and Shaw Street (up to 0.42 m). Similar reductions can be seen along Pearson Street (up to 0.38 m). Major flood level reductions observed on the vacant land between the lagoon and the Olympic Highway (up to 0.66 m); Minimal works required.	Construction at this location would interfere with the Main City Levee Spillway. Potential for constraints relating to cultural and heritage values of Flowerdale Lagoon.	High	WWCC Projects	Contract awarded to Lyalls
SW01	Incarnie Crescent Stormwater Line	Aim: Reduce flood levels along Incarnie Crescent; Connect existing drainage line along Incarnie Crescent via a new 525 mm pipe to the trunk drainage line east towards the river.	Peak flood level reductions can be observed from Incarnie Crescent all the way west to the Wiradjuri Walking Track. No increases in flood level can be seen. Scope of work is not extensive.	Incarnie Crescent will require closure while works are underway.	High	WWCC Projects	Grant received, design completed
LA01 (Lake Albert)	Raising Lake Albert Road	Raise Lake Albert Road at the north east corner of Lake Albert by approximately 1 m-1.5 m over a length of 450 m, and Lakeside Drive by approximately 1 m for 200 m from its intersection with Lake Albert Road. Increase airspace in Lake Albert to provide storage capacity during flood events; Involves reducing the Lake Albert outlet capacity by approximately 50% to limit peak outflows.	Reduces peak flood levels downstream of Lake Albert in the 1% AEP by up to 0.47 m immediately downstream of the road, and to a lesser degree across the East Wagga commercial area. Minor increase in surface area of Lake Albert due to relatively gently sloping banks;	Increases flood levels by up to 0.45 m in the 1% AEP event in Lake Albert. Potential adverse impacts to properties at southern end of the Lake. Lake Albert Road will require closure while works are underway.	High	WWCC Projects	Contract awarded to Stantec

LA02 (Lake Albert)	Augmentation of Crooked Creek Diversion into Lake Albert	Increase capacity of the existing Crooked Creek diversion south of Craft Street, to reduce flood risk further north by diverting flows into Lake Albert; Construct a 1 m high diversion embankment along Craft Street to assist in function of the Crooked Creek diversion channel and provide protection to residences north of Craft Street. To be undertaken in conjunction with LA01 and LA03	The extent of reductions in flood levels is significant and can be observed from Craft Street through to East Wagga along the Crooked Creek system.	Environmental factors including retention of 'low flow' through the original creek channel. Erosion, scouring and sedimentation concerns will need to be considered in the design of widened channels. Potential loss of habitat. Acquisition of privately owned land adjacent to the creek may be necessary depending on preferred channel width.	High	WWCC Projects	Contract awarded to Stantec
--------------------	--	---	---	--	------	---------------	-----------------------------

LA03 (Lake Albert)	Augmentation of Stringybark Creek Diversion into Lake Albert	Increase capacity of the Stringybark Creek diversion south of Nelson Drive and reduce flood risk along Plumpton Road and further downstream by diverting flows into Lake Albert; Construct a diversion embankment 1 m high, parallel to Nelson Drive;	Reductions in peak flood levels observed from Nelson Drive through to East Wagga. Reductions in over-road inundation, particularly Plumpton Road;	Environmental factors including retention of 'low flow' through the original creek channel. Erosion, scouring and sedimentation concerns will need to be considered in design of widened channels. Acquisition of privately owned land adjacent to the creek may be necessary depending on preferred channel width.	High	WWCC Projects	Contract awarded to Stantec
--------------------	--	--	---	---	------	---------------	-----------------------------

Medium Priority

Option ID	Option	Description	Benefits	Concerns	Priority
-----------	--------	-------------	----------	----------	----------

RM02	Flood Emergency Response Coordination	The ongoing improvement of the coordination within and between the response agencies to ensure: •Roles and responsibilities are well defined and understood by each agency (and the broader community); •Hazards can be responded to quickly, efficiently and safely; and Calls from the public can be directed to the appropriate agency and responded to effectively.	Ongoing improvements to the coordination between and within emergency service agencies. Improvements to volunteer coordination. Identify vulnerable occupants.	Challenges include change of personnel, difficulty in organising meetings and exercises between flood events.	Medium	WWCC and SES	
RM03	Flood Warning System	Utilise Severe Weather Warnings from the BOM to prepare for potential flash flooding events, couple with community awareness campaigns and utilise information from the FRMS&P to understand the consequences of the warning.	Improve current system using outputs from the FRMS&P. Potentially increase warning time available to the community.	May not be possible to increase warning time in overland catchments due to short catchment response time. Communication needs to be at the correct level to avoid false alarms and complacency.	Medium	WWCC and SES	Council have received a grant from DCCEEW to continue the next stage of this project
P03	Adoption of Flood Related Development Controls for development within the Overland Flow FPA	Incorporation of flood related development controls in the Wagga Wagga DCP to manage development in areas of Wagga Wagga prone to flood risk from overland flow. The intent and objectives of the development controls is to be consistent with those applied to the riverine FPA, however adjustment of the phrasing or implementation criteria may be necessary to better suit the context of overland flow flood risk.	Improve clarity of DCP (Flood for the benefit of both developers and Council assessors/approvers. Enable proponents to design, build and manage development using the best available flood information.	There may be resistance from developers who consider new controls to be onerous.	Medium	WWCC Regional Activation	The existing DCP controls cover Riverine Flooding only. An update to these controls commenced and was deferred until the completion of the 2021 MOFFS & VOFFS studies being completed. Changes to the existing flooding controls will recommence and include MOFFS and VOFFS and ensure all flood risks are considered.
P04	Development Controls on Low Flood Risk Areas	Modify the Wagga Wagga LEP to enable Council to apply flood related development controls to critical facilities and vulnerable land uses between the FPA and PMF extent, as defined in this study and the Revised Murrumbidgee River at Wagga Wagga FRMS&P for overland flow and riverine flood risk, respectively.	Ensure critical utilities and vulnerable facilities are designed, constructed and managed in such a way as to minimise flood risk to the structure and (if relevant) its occupants.	This amendment to the LEP would require Council to submit a planning proposal, which could be lodged in conjunction with Option PM01.	Medium	WWCC Regional Activation	Recent changes to the LEP were undertaken by NSW Department of Planning & Environment. These changes resulted in two new clauses in the LEP dealing with flooding. These clauses provide controls on how Council must assess development applications that occur on land within the Flood Planning Area and provides flood risk considerations for certain types of developments that have a higher risk of life.

SW02	Bolton Park Drainage Gate Automation	Aim: To allow control of the outlet flow from the existing Bolton Park storage to alleviate pressure on the downstream system and reduce flooding in Morgan and Berry Streets; Install automated penstock operation	Minor flood reductions along Morgan Street and Berry Street for frequent events, potential reduction in duration of inundation.	Ineffective in rarer events. Public safety risks, and changes to amenity and usability of the field during and following storm events.	Medium	WWCC Projects
FM01	Willans Hill Overland Flow Options Assessment	Aim: To ultimately develop mitigation strategies for properties impacted by rainfall runoff in the Willans Hill area. Establish an appropriate tool that can identify issues and assess mitigation options for the runoff and overland flow impacting the Willans Hill area. The assessment should also consider the impacts of development. Undertake a drainage investigation study of the area.	A more appropriate scaled hydraulic model will allow strategies to be developed that can minimize the impacts of runoff and overland flow in this area.	Very targeted area, there may be other areas which require a similar assessment. Suggested works will likely need to be funded by private landowners or in some cases Council (unlikely to be funded by the State).	Medium	WWCC Projects
FM02	McNickle Roach Road and Intersection	Aim: To improve flood immunity at the Roach and McNickle Road intersection to improve access for residents in Riverview Drive. Install culvert with conveyance area of 5m2 and reinstate channel downstream of intersection.	Relatively minor upgrades to the culvert at the intersection and reinstatement of a channel downstream can significantly improve the flood immunity of the intersection. Overall a general reduction of flood levels in the area.	Very targeted area, there may be other areas which require a similar assessment. Intersection will require closure while works are undertaken and alternative access will be required. Suggested works would not be eligible for State funding.	Medium	WWCC Projects

Low Priority

Option ID	Option	Description	Benefits	Concerns	Priority	
GD04 (Glenfield Drain)	Rabaul Place Trunk Drainage Line (further investigation)	Aim: Reduce inflows into Glenfield Drain to reduce demand on the existing open channel, by diverting flows to Ashmont Drain; Significant trunk drain installation, involving 3 x 1.8m diameter pipes from immediately downstream of the western railway culvert near Rabaul Place to the channel north of Ashmont Avenue.	Significant reductions in peak flood levels along Pearson Street and Dobney Avenue with some areas showing a 0.2 m reduction in flood level for the 1% AEP event. Effective in reducing peak flood levels in frequent events.	Increases peak flood levels at and around the northern end of the channel near the Sturt Highway. Staged construction would be required to allow affected roads to remain trafficable.	Low	WWCC Projects Contract awarded to Lyalls

Reference	Option and report Reference	Description	Priority	Responsibility	Status
PM01	Flood Planning Area and Level for each town (PM01)	A designated area in each town where Council planning controls, including minimum floor levels, apply to development.	High	WWCC Regional Activation	Amendments proposed to the DCP will incorporate FPA's identified in the 2021 VOFFS.
RM01 RM04	Update the Wagga Wagga Local Flood Plan section for each town (RM01, RM04,	Incorporate the consequences of flooding observed in the 2010 and 2012 floods in the Local Flood Plan, as well as flood risk information from	High	SES	
RM02 RM05 RM08	Update Flood Intelligence Cards for each town (RM02, RM05, RM08)	Updated information will list consequences of flooding in each town in relation to particular creek depths.	High	SES	
RM03	Install an automatic water level recorder on Umbango Creek (RM03)	Improve the warning system for flooding at Tarcutta by including the Umbango Creek catchment, which currently has no gauge.	High	WWCC in consultation with SES and BOM	
RM10	Community Flood Education (RM10)	Undertake various activities aimed at raising and maintaining public awareness of flooding.	High	WWCC	
TD01	Maintenance for Levee Cross-drainage for Tarcutta (TD01)	Undertake regular maintenance of the cross-drainage structures including clearing vegetation and sediment. SES own and maintain mobile pumps for use during a flood.	High	WWCC Operations and SES	
UL01	Uranquinty Levee System Upgrade (UL01)	Upgrade the levee by raising it to protect against the 1% AEP flood.	High	WWCC Projects	DPIE grant received 2021-22-FM-0032. project awarded to RHDHV, 50% design is completed and the first stage of community consultaion has been completed.
S06	Sandy Creek Regular Clearing of Sedimentation (S06)	Regularly remove built-up sediment from the creek bed to prevent blockage of the channel.	High	WWCC Operations	

UD01	Maintenance for Levee Cross-Drainage for Uranquinty (UD01)	Undertake regular maintenance of the cross-drainage structures including clearing vegetation and sediment. SES own and maintain mobile pumps for use during a flood.	High	WWCC Operations	
MEDIUM PRIORITY					
PM02	Updated information in the Local Environment Plan (PM02)	Revision of the LEP text to improve functionality and separate overland and mainstream flood risk.	Medium	WWCC Regional Activation	Recent changes to the LEP were undertaken by NSW Department of Planning & Environment. These changes resulted in two new clauses in the LEP dealing with flooding. These clauses provide controls on how Council must assess development applications that occur on land within the Flood Planning Area and provides flood risk considerations for certain types of developments that have a higher risk of life.
PM03	Adoption of matrix style Development Control Plan and related DCP changes (PM03)	Revision of the current planning controls to improve their clarity and prescribe specific controls on development based on its type and the flood risk present.	Medium	WWCC Regional Activation	The existing DCP controls cover Riverine Flooding only. An update to these controls commenced and was deferred until the completion of the 2021 MOFFS & VOFFS studies being completed. Changes to the existing flooding controls will recommence and include MOFFS and VOFFS.
PM04	Inclusion of Flood Risk Information on Section 10.7 (2) & (5) Planning Certificates (PM04)	Provision of detailed information on a site's flood risk via the existing planning certificates.	Medium	WWCC Regional Activation	Planning certificates identify whether the land is below the 1% Average Recurrence Interval and therefore flood related development controls may apply.
RM07	Install a telemetered pluviometer in the Sandy Creek catchment (RM07)	Improve the warning system for flooding at Uranquinty by installing a new rain gauge in the Sandy Creek catchment (currently none exists).	Medium	WWCC in consultation with SES and BOM	
RM09	Requirement for Site Specific Flood Emergency Plans (RM09)	For development in areas of high flood risk, require a site specific plan be prepared that details flood risk and evacuation.	Medium	WWCC	
LK01	Improved drainage on Cunningdroo Street (LK01)	Construct a kerb-gutter system at the end of Cunningdroo St, Ladysmith, to reduce ponding on the road area.	Medium	WWCC Projects	

LOW PRIORITY

TL04	Upgrade Existing Tarcutta Levee (TL04)	Upgrade the levee by raising it to protect against the 1% AEP flood.	Low	WWCC Projects
------	--	--	-----	---------------

QUESTIONS WITH NOTICE

MINUTES of the FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE held on Thursday 15 February 2024.

PRESENT

The Mayor Councillor Dallas Tout
Councillor Rod Kendall
Councillor Richard Foley
Jenny Rolfe (via zoom)
Ros Prangnell
Tim Kurylowicz

IN ATTENDANCE

Peter Thompson	General Manager
Brett Koschel	State Emergency Service (SES)
Josh Sainsbury	State Emergency Service (SES)
Steve Manwaring	Department Planning, Industry & Environment
Erin Askew	WMAwater
Manoj Shretha	Stantec
Amox Micallef	Stantec
Andy Sheehan	Stantec
Nigel Rajaratnam	The Centre for International Economics (CIE)
Karyn Wong	Woolcott Research & Engagement
Liz Sparham	Woolcott Research & Engagement
Andrew Morris	Royal Haskoning DHV
Michael Friend	North Wagga Co-opted Community Member
Karen Murray	North Wagga Co-opted Community Member
Brian Mahoney	Uranquinty Co-opted Community Member
Phil McMurray	Director Projects and Strategy
Paul O'Brien	Manager Development Assessment & Building Certification
Carly Hood	Strategic Sustainability Advisor
Andrew Mason	Project Manager
Erin Brown	Project Communications Officer (via Zoom)
Brittany Fitzsimmons	Executive Assistant
Kori West	Corporate Governance Officer (Minute Taker)

The meeting of the Floodplain Risk Management Advisory Committee commenced at 8.33am.

ACKNOWLEDGEMENT OF COUNTRY

Wagga Wagga City Council acknowledges the traditional custodians of the land, the Wiradjuri people, and pays respect to Elders past, present and future and extends our respect to all First Nations Peoples in Wagga Wagga.

We recognise and respect their cultural heritage, beliefs and continuing connection with the land and rivers. We also recognise the resilience, strength and pride of the Wiradjuri and First Nations communities.

MINUTES of the **FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE** held on **Thursday 15 February 2024**.

DECLARATIONS OF INTEREST

Mr T Kurylowicz declared a general interest that he is a resident of North Wagga, however as a community representative he is representing the entire community.

Mr T Kurylowicz declared a significant non-pecuniary Interest RP-7 2018-19-FM-0071 - North Wagga Flood mitigation the reason being that his house is not able to be raised and remained within the meeting during its consideration.

Councillor R Kendall declared a non-significant non-pecuniary interest in RP-7 2018-19-FM-0071 - North Wagga flood the reason being that he owns property in central Wagga which is protected by the levee bank and remained in the meeting during its consideration.

Ms R Prangnell declared a non-significant non-pecuniary interest in RP-7 2018-19-FM-0071 - North Wagga flood the reason being that he owns property in central Wagga which is protected by the levee bank and remained in the meeting during its consideration.

APOLOGIES

Apologies for non-attendance were received and accepted for Councillor J McKinnon on the motion of Councillor Kendall and Mr T Kurylowicz.

REPORTS FROM STAFF

RP-1 SES INTRODUCTION

Recommendation:

On the Motion of R Kendall and R Prangnell

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to SES staff changes.

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

D Tout
R Kendall
J Rolfe
R Prangnell
T Kurylowicz
R Foley (alternate)

Against the Motion

MINUTES of the FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE held on Thursday 15 February 2024.

RP-2 2021-22-FM-0024 - GLENFIELD DRAIN AND FLOWERDALE STORAGE FLOOD MITIGATION WORKS

Recommendation:

On the Motion of R Foley (alternate) and R Kendall

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Glenfield Drain and Flowerdale Storage Area Flood Mitigation Works Project.

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

D Tout
R Kendall
J Rolfe
R Prangnell
T Kurylowicz
R Foley (alternate)

Against the Motion

RP-3 LOCAL & REGIONAL RISK REDUCTION STREAM - LEVEE PUMP AUGMENTATION

M Shrestha – Santec entered the Meeting the time being 8.40am and presented a presentation to the Committee.

A Micallef – Santec entered the Meeting the time being 8.50am

A Sheehan – Santec entered the Meeting the time being 9.00am

A Morris entered the Meeting the time being 9.10am

Recommendation:

On the Motion of T Kurylowicz and R Foley (alternate)

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Levee Pump Augmentation Project.

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

D Tout
R Kendall
J Rolfe
R Prangnell
T Kurylowicz
R Foley (alternate)

Against the Motion

M Shrestha, Amos Micallef and Andy Sheehan vacated the meeting, the time being at 9.24am.

MINUTES of the FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE held on Thursday 15 February 2024.

P O'Brien, Manager Development Assessment & Building Certification vacated the meeting time being, 9.25am

RP-4 2021-22-FM-0039 - LAKE ALBERT FLOOD MITIGATION OPTIONS - FEASIBILITY STUDY

T Kurylowicz vacated the meeting the time being 9.34am

Recommendation:

On the Motion of T Kurylowicz and R Kendall

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Lake Albert Flood Mitigation Project.

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

Against the Motion

- D Tout
- R Kendall
- J Rolfe
- R Prangnell
- R Foley (alternate)

T Kurylowicz re-entered the meeting the time being 9.36am.

RP-5 2021-22-FM-0032 - URANQUINTY LEVEE UPGRADE - INVESTIGATION AND DESIGN

Brian Mahoney Uranquinty Co-opted Community Member and Erin Askew – WMAwater and Nigel Rajaratnam - The Centre for International Economics (CIE) entered the meeting the time being 9.35am.

Andrew Morris from Royal Haskoning DHV presented a presentation to the Committee via zoom.

Recommendation:

On the Motion of R Kendall and T Kurylowicz

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Uranquinty Levee project.

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

Against the Motion

- D Tout
- R Kendall
- J Rolfe
- R Prangnell
- T Kurylowicz
- R Foley (alternate)

MINUTES of the **FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE** held on **Thursday 15 February 2024**.

Brian Mahoney Uranquinty Co-Opted member vacated the chamber 9.56am.

RP-6 2022-FMP-0103 HUMULA AND MANGOPLAH FLOOD STUDIES

Erin Askew - WMAwater provided a presentation to the committee.
Karyn Wong and Liz Sparham - Woolcott Research & Engagement entered the meeting 10.00am

Recommendation:

On the Motion of R Foley (alternate) and R Prangnell

That the Floodplain Risk Management Advisory Committee receive and note the update provided in relation to the Humula and Mangoplah Flood Studies Project.

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

D Tout
R Kendall
J Rolfe
R Prangnell
T Kurylowicz
R Foley (alternate)

Against the Motion

PROCEDURAL MOTION - ELECTION OF THE CHAIRPERSON

Recommendation:

On the Motion of T Kurylowicz and R Foley

That the Floodplain Risk Management Advisory Committee elected Councillor R Kendall as the chairperson for the remainder of the meeting

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

D Tout
R Kendall
J Rolfe
R Prangnell
T Kurylowicz
R Foley (alternate)

Against the Motion

MINUTES of the FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE held on Thursday 15 February 2024.

Michael Friend and Karen Murray the North Wagga Co-opted Community Members entered the meeting the time being 10.30am.

Councillor R Kendall vacated the chamber and did not return the time being 10.30am.

Karyn Wong from Woolcott Research and Experience provided the Committee with a presentation.

The Mayor, Dallas Tout Vacated the Chairperson and the meeting the time being 10.45am and did not return to the meeting.

Councillor Rod Kendall assumed the position of the Chairperson the time being 10.45am.

General Manager, Peter Thompson vacated the meeting and did not return the time being 11.05am.

Jenny Rolfe vacated the meeting and did not return the time being 11.28am and Quorum was lost.

As there was no quorum it was the decision of the members present to receive and note the following reports.

Steve Manwaring - Department Planning, Industry & Environment vacated the meeting and did not return, the time being 11.36am.

Brett Koschel State Emergency Service vacated the meeting and did not return the time being 11.47am.

RP-7 2018-19-FM-0071 - NORTH WAGGA FLOOD MITIGATION OPTIONS

As there was no quorum it was the decision of the members present that 2018-19-FM-0071 - NORTH WAGGA FLOOD MITIGATION OPTIONS be deferred to the future Extraordinary Committee meeting.

RP-8 FLOOD PROJECT IMPLEMENTATION STATUS

As there was no quorum it was the decision of the members present that FLOOD PROJECT IMPLEMENTATION STATUS be deferred to the future Extraordinary Committee meeting.

QUESTIONS WITH NOTICE

No Questions with Notice were received.

The Floodplain Risk Management Advisory Committee rose at 12.11pm.

MINUTES of the **FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE** held on **Tuesday 27 February 2024.**

PRESENT

The Mayor Councillor Dallas Tout
Councillor Jenny McKinnon
Councillor Rod Kendall (arrived 9.46am)
Jenny Rolfe (via Zoom)
Ros Prangnell
Patricia Murray
Tim Kurylowicz (via Zoom)

IN ATTENDANCE

Peter Thompson	General Manager
Josh Sainsbury	State Emergency Service (SES)
Steve Manwaring	Department Planning, Industry & Environment
Erin Askew	WMAwater (via Zoom)
Nigel Rajaratnam	The Centre for International Economics (CIE) (via Zoom)
Karyn Wong	Woolcott Research & Engagement (via Zoom)
Liz Sparham	Woolcott Research & Engagement(via Zoom)
Michael Friend	North Wagga Co-opted Community Member
Phil McMurray	Director Projects and Strategy
Janice Summerhayes	Director Community
Scott Gray	Chief Operating Officer
Carly Hood	Strategic Sustainability Advisor
Andrew Mason	Project Manager
Erin Brown	Project Communications Officer (via Zoom)
Brittany Fitzsimmons	Executive Assistant
Kori West	Corporate Governance Officer (Minute Taker)

The meeting of the Floodplain Risk Management Advisory Committee commenced at 9.00am.

ACKNOWLEDGEMENT OF COUNTRY

Wagga Wagga City Council acknowledges the traditional custodians of the land, the Wiradjuri people, and pays respect to Elders past, present and future and extends our respect to all First Nations Peoples in Wagga Wagga.

We recognise and respect their cultural heritage, beliefs and continuing connection with the land and rivers. We also recognise the resilience, strength and pride of the Wiradjuri and First Nations communities.

DECLARATIONS OF INTEREST

Mr T Kurylowicz declared a general interest that he is a resident of North Wagga, however as a community representative he is representing the whole community.

MINUTES of the FLOODPLAIN RISK MANAGEMENT ADVISORY COMMITTEE held on Tuesday 27 February 2024.

APOLOGIES

Co-opted Member for North Wagga – Karen Murray

REPORTS FROM STAFF

RP-1 2018-19-FM-0071 - NORTH WAGGA FLOOD MITIGATION OPTIONS

T Kurylowicz vacated the meeting, the time being 9:59am and did not return.

Recommendation:

On the Motion of Councillor J McKinnon and R Prangnell

That the Floodplain Risk Management Advisory Committee receive and note the draft report and recommends to the Council that it receive the report and places it on Public Exhibition.

The committee notes its preliminary view is to recommend a combined approach that is staged and includes:

- a. Upgrading the existing North Wagga Levee system (Stage 1 of L4B - 5% AEP (1 in 20)) and offering Voluntary House Raising and Purchase subject to risk reduction and cost effectiveness**
- b. Increasing the road heights and bridges along Hampden Ave to provide a safe evacuation route (Stage 2 of Option L4B) subject to funding**

This preliminary view will be updated following the Public Exhibition before a final recommendation from the Floodplain Risk Management Advisory Committee is made to Council.

CARRIED

RECORD OF VOTING ON THE MOTION

For the Motion

D Tout
R Kendall
J McKinnon
J Rolfe
R Prangnell
P Murray

Against the Motion

QUESTIONS WITH NOTICE

No Questions with Notice were received.

The Floodplain Risk Management Advisory Committee rose at 10.34am.