

12.9 Gibbergunyah Creek Floodplain Risk Management Study and Plan Report

Reference:	8100/12.1
Report Author:	Floodplain and Stormwater Engineer
Authoriser:	Manager Assets
Link to Community	
Strategic Plan:	Manage and plan for future water, sewer and stormwater infrastructure needs

PURPOSE

The purpose of this report is to advise Council on the outcomes of the Gibbergunyah Creek Floodplain Risk Management Study and Plan Report and recommend its adoption.

RECOMMENDATION

1. **THAT** the Gibbergunyah Creek Floodplain Risk Management Study and Plan Report be adopted
2. **THAT** Council proceed with the implementation of the risk management plan.
3. **THAT** a planning proposal be prepared to include the adopted Gibbergunyah Creek Floodplain Risk Management Study and Plan in the Wingecarribee Local Environmental Plan 2010.

REPORT

BACKGROUND

NSW Government's Flood Prone Land Policy, as outlined in the 'Floodplain Development Manual 2005', highlights that primary responsibility for floodplain risk management rests with councils, which are provided with financial and technical support by the State Government for the purposes of studies and the development of plans. Council has completed nine flood studies and seven flood risk management plans to date and has secured approximately \$750,000 in the last five years for flood studies and risk management plans from the NSW Government.

The floodplain management process as outlined in the Floodplain Development Manual consists of the following four stages:

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Stage	Description
1. Flood Study	Determines the nature and extent of the flooding problem
2. Floodplain Risk Management Study	Evaluates management options for existing and future development of the floodplain, taking into consideration the social, economic and environmental costs and benefits
3. Floodplain Risk Management Plan	Management plan for the risks identified in the risk management study
4. Plan Implementation	Implementation of actions identified in the plan

The NSW Government provides two-thirds funding for undertaking studies and preparing plans for stages 1, 2 and 3, subject to a competitive grant application process. It also provides two-thirds funding for undertaking remedial works identified from stage 3 that qualify for grant funding, subject to a competitive grant application process. Funds allocated for remedial works and probability of securing funds for remedial works are limited.

Flooding in various locations in the Gibbergunyah catchment has been experienced for many years and Council completed and adopted the Stage 1 Flood Study in 2013

REPORT

In 2015 Council commissioned WMA Water Pty Ltd to undertake the Stage 2 Gibbergunyah Creek Floodplain Risk Management Study & prepare the Stage 3 Risk Management Plan. The study was prepared in consultation with the residents and property owners, Wingecarribee Floodplain Risk Management Advisory Committee (WFRMAC), Council staff and the Office of Environment and Heritage.

In accordance with the recommendations of the WFRMAC the draft report was publicly exhibited for a period of 38 days from 15 July to 22 August 2016. No submissions were received following the exhibition. The executive summary of the Gibbergunyah Creek Floodplain Risk Management Study & Plan report is included as **Attachment 1** and a full copy of the report has been made available in the Councillors' Room. A plan of the Gibbergunyah Creek Catchment is included as **Attachment 2**.

IMPACT ON COUNCIL'S FIT FOR THE FUTURE IMPROVEMENT PLAN

The Gibbergunyah Creek Floodplain Risk Management Study & Plan meets the objectives of 'Fit For the Future' Implementation Plan.

CONSULTATION

Community Engagement

Community engagement was undertaken in 3 stages:

Stage 1: A community information brochure with survey questionnaire was distributed to 150 flood affected properties identified in the flood study. A total of 16 responses were received.

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Stage 2: A community meeting was held in Mittagong RSL Club on 24 August 2015 and seven residents attended.

Stage 3: The draft report on the Gibbergunyah Creek Floodplain Risk Management Study and Plan was placed on Public Exhibition from 15 July to 22 August 2016 for a period of 38 days. The public exhibition period was advertised in the local newspapers and the draft report was made available on Council's website, with hard copies made available at the following locations:

- Bowral Library
- Mittagong Library
- Moss Vale Library
- Moss Vale Civic Centre

No submissions were received on the draft report following the exhibition.

Internal Consultation

Development Services and Assets staff were consulted.

External Consultation

The Office of Environment & Heritage and Wingecarribee Floodplain Risk Management Advisory Committee were consulted.

SUSTAINABILITY ASSESSMENT

- **Environment**

There are no environmental issues in relation to this report.

- **Social**

There are no social issues in relation to this report.

- **Broader Economic Implications**

There are no broader economic implications in relation to this report.

- **Culture**

There are no cultural issues in relation to this report.

- **Governance**

There are no governance issues in relation to this report.

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COUNCIL BUDGET IMPLICATIONS

There are budgetary implications in relation to implementation of the risk management measures. Three priority projects have been included in the ten year draft capital works program and are listed below.

- Upgrade pipes in Main and Edward Streets, Mittagong: Estimated cost-\$570,000, Year-2019-20
- Upgrade Bessemer Street, Mittagong drainage: Estimated cost-\$800,000, Year-2026-27
- Culvert upgrade at Chinaman's Creek on Priestley Street, Mittagong: Estimated cost-\$200,000, Year-2025-26

The following projects identified in the study report at a total cost of \$1.4M will be considered for inclusion in future works program subjected to availability of funding.

- Culvert upgrades under Old Hume Highway at Gibbergunyah Creek
- Culvert upgrades under Old Hume Highway at Chinaman's Creek
- Culvert upgrades under Old Hume Highway at Iron Mines Creek

As outlined under the 'Background' section above, there is a possibility of securing two-thirds funding from the NSW Government for some of the above projects, which qualify for grant funding, subjected to a competitive grant application process.

A location map of the mitigation options is shown in **Attachment 3**.

RELATED COUNCIL POLICY

Nil.

OPTIONS

The options available to Council are:

Option 1

Council adopt the final report on the Gibbergunyah Creek Floodplain Risk Management Study and Plan-Stage 2.

Option 2

Council not adopt the final report on the Gibbergunyah Creek Floodplain Risk Management Study & Plan-Stage 2

Option 1 is the recommended option to this report.

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CONCLUSION

Councils are responsible for determining the extent of flooding within Council areas to determine future works, strategies to minimise the impacts of flooding and also to control developments on flood liable lands. The completion and adoption of this Risk Management Study and Plan will help Council to make informed decisions and the identified remedial works once implemented will substantially address the flooding issues in the Gibbergunyah Creek catchment.

ATTACHMENTS

1. Executive Summary-Gibbergunyah Creek FRMSP
2. Gibbergunyah Creek Catchment
3. Location Map Mitigation Options Gibbergunyah Creek

Barry W Paull
Deputy General Manager Operations, Finance and Risk

Friday 21 July 2017



ATTACHMENT 1

EXECUTIVE SUMMARY

This Floodplain Risk Management Study assesses floodplain management issues in the Gibbergunyah Creek catchment, and investigates potential management options for the area. The study, which follows on from the Gibbergunyah Creek Flood Study (Reference 3), has been undertaken in accordance with the NSW Government's Flood Prone Land Policy. A full assessment of the existing flood risk in the catchment has been carried out, including flood hazard across the catchment, over floor flooding of residential, commercial and industrial properties, road flooding and emergency response during a flood event. A range of measures aimed at managing this flood risk were also assessed for their efficacy across a range of criteria, which allowed certain options to be recommended, forming the basis of the Floodplain Risk Management Plan for the area. Measures included upgraded trunk drainage networks, emergency management measures, and various property modification measures including Development Control Planning. The mitigation options are outlined in Table 1.

Table 1: Gibbergunyah Creek Options for Investigation

Ref	Options
FM01	Resolve Main Street Flooding
FM02	Manage Flooding on Bessemer Street
FM03	Culvert Upgrade: Gibbergunyah Creek Old Hume Highway
FM04	Culvert Upgrade: Chinamens Creek Old Hume Highway
FM05	Culvert Upgrade: Iron Mines Creek at Old Hume Highway
FM06	Culvert Upgrade at Priestly Street
FM07	Riparian Management of River (All Creeks)
FM08	Retarding Basin on cnr Bessemer St and Regent Street
PM01	Changes to FPL and FPA
PM02	Amendments to s149 Certificates
PM03	Changes to Floodplain Risk Precincts
RM01	Amendments to Wingecarribee Shire Local Flood Plan (Volume 2)
RM02	Installation of Flood Signs and Depth Indicators at frequently inundated roads
RM03	Investigate Reduction in High Hazard Road Reserves

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FRMSP**



Background

Gibbergunyah Creek catchment is located in Wingecarribee Shire Southern Highlands of NSW 130 km south west of Sydney. The study area is shown in Figure 1. The catchment is part of the Nattai River catchment which drains to Lake Burragorang as part of the Hawkesbury/Nepean catchment. Gibbergunyah Creek drains in a northerly direction through the Mittagong urban area where it is joined by tributaries Chinamans Creek and Iron Mines Creek. It continues to flow beneath the Hume Highway until its confluence with the Nattai River.

The Gibbergunyah Creek Flood Study (2013) was carried out to define existing flood behaviour for the catchment in terms of flood levels, depth, velocities, flows, hydraulic categories and provisional hazard. An XP-RAPTS hydrological model was adopted to convert rainfall into runoff hydrographs to be applied as input boundaries into the hydraulic model. The TUFLOW model consisted of a linked 1D/2D hydraulic model of the creek, floodplain, stormwater network and overland flow path. The model was used to define flood depths and levels for the 5 year ARI, 10%, 5%, 2%, 1%, 0.2% AEP design flood and PMF events. Several flooding hot spots were also identified in the study. In addition, a desktop floor level survey and damages assessment were undertaken to identify properties that are liable to over floor inundation.

Existing Flood Environment

A number of locations within the catchment are flood liable. This flood liability mainly relates to the nature of the topography within the study area as well as the capacity of service provided by drainage assets. Furthermore, a number of buildings have been constructed on overland flow paths or in unrelieved sags (for example the Main Street shops). Due to these drainage restrictions, topographic depressions can cause localised flooding as excess flows have no opportunity to escape via overland flow paths. Sub-surface drainage is not able to route flow from these ground depressions unrelieved by overland flow paths, as the majority of the drainage network reaches capacity during small events (i.e. 0.2 EY).

48 residential properties within the catchment are liable to inundation on the property in the 1% AEP event, while 18 properties are liable in the 5 year ARI event. Of these, 21 properties are liable to over floor inundation in the 1% AEP event, and 5 in the 5 year ARI event. A flood damages assessment for existing development was undertaken, with the average annual damages (for residential properties) estimated to be approximately \$205,000 for the catchment. With a number of commercial properties in the catchment, the damages were also calculated for non-residential properties. The 5 year ARI event causes inundation of 9 properties above floor level, and the 1% AEP event affected 19 properties above floor level. The annual average damages was calculated to be approximately \$370,000 for the catchment.

Flooding hotspots in the catchment were identified at the following locations: Main Street, Bessemer Street and at the crossings of Gibbergunyah Creek, Chinamans Creek and Iron Mines Creek with the Hume Highway.

Flood Risk Management Options

The Floodplain Risk Management Study includes an investigation of possible options for the

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ATTACHMENT 1 Executive Summary-Gibbergunyah Creek FRMSP



management of flood risk in the area. These included structural works such as drainage upgrades, as well as planning measures and SES-related actions. The measures were assessed for their ability to reduce flood risk while also considering their economic, social and environmental impact. A multi-criteria matrix assessment was used to directly compare the options. Of the options investigated, 8 were recommended for implementation, with a priority assigned to each. The options are outlined in Table 2.

Table 2: Gibbergunyah Creek Options for Implementation

Ref	Options	Priority
FM06	Culvert Upgrade at Priestly Street	High
FM01	Resolve Main Street Flooding	High
FM02	Manage Flooding on Bessemer Street	Medium
FM05	Culvert Upgrade: Iron Mines Creek at Old Hume Highway	Low
PM01	Changes to FPL and FPA	Medium
PM02	Amendments to s149 Certificates	Medium
PM03	Changes to Floodplain Risk Precincts (FPRs)	Medium
RM01	Amendments to Wingecarribee Shire Local Flood Plan (Volume 2)	High
RM02	Installation of Flood Signs and Depth Indicators at frequently inundated roads	High

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ATTACHMENT 3

