

Section 43 Review of 10 Southern Floodplain  
Management Plans

FINAL REPORT

June 2021

*alluvium*



Alluvium recognises and acknowledges the unique relationship and deep connection to Country shared by Aboriginal and Torres Strait Islander people, as First Peoples and Traditional Owners of Australia. We pay our respects to their Cultures, Country and Elders past and present.

*Artwork by Vicki Golding. This piece was commissioned by Alluvium and has told our story of water across Country, from catchment to coast, with people from all cultures learning, understanding, sharing stories, walking to and talking at the meeting places as one nation.*

This report has been prepared by Alluvium Consulting Australia Pty Ltd for DPIE Water under the contract titled 'Review method development and application to floodplain management plans'.

Authors: Andrew Little  
Review: David Winfield, Neal Albert  
Approved: Amanda Wealands

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# Executive Summary

Floodplain Management Plans (FMPs) provide a framework for coordinating the development of flood works in New South Wales. FMPs were historically developed under the *Water Act 1912* (Water Act or WA) across 10 southern floodplain areas between 2004 and 2014 before being designated as Ministers Plans under Section 50 of the Act. More recently six northern valley FMPs prepared under the *Water Management Act 2000* (the Act) have replaced multiple FMPs prepared under the Water Act.<sup>1</sup>

FMPs are designed to manage the development of new flood works and amendments to existing flood works to:

- Facilitate the orderly passage of floodwaters through the floodplain,
- Maintain flood connectivity to wetlands, other floodplain ecosystems, and areas of groundwater recharge,
- Contribute to the protection of ecological assets and values of the floodplain,
- Contribute to the protection of cultural, heritage and spiritual features of the floodplain that are significant to Aboriginal people and other stakeholders,
- Provide the strategic planning framework through which floodplain works are regulated by flood work approval application, assessment, issuing or rejection, and conditioning.

Under the Act, review responsibilities are specified for management plans, with those with provisions dealing with water sharing (S43A) the responsibility of the NRC, and all others (S43) by DPIE Water. A review under s.43 must be undertaken for the purpose of ascertaining whether the FMPs provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles ('the Principles', which are provided by s.5 of the Act). The review is to be conducted in consultation with the Minister for the Environment and the Natural Resources Commission.

A Section 43 Review has been conducted on ten FMPs across the Lachlan, Murray and Murrumbidgee valleys to determine if they remain adequate and appropriate for ensuring the effective implementation of the water management principles.

**The review found that all 10 FMPs subject to this review are not adequate and appropriate to effectively implement the water management principles.**

Table 1 summarises the overall findings and recommendations from the review. Due to the volume of recommendations and the fact that they relate to the structural approach of the FMPs, the language used and the procedural references in the FMPs to repealed legislation, the key recommendation is that **the 10 FMPs should be replaced with three valley-based plans and the boundaries expanded to include the local ecosystems, flood fringe areas and upstream extents consistent with the Act.**

As it is understood that not all the recommendations may be able to be implemented, the review has included both the recommendation to replace and the recommendations regarding amendments to the existing FMPs. DPIE Water should seek Legal and/or Parliamentary Counsels Office advice regarding the options following the s43 Review. This should include options regarding replacement or amending the FMPs.

While the findings detail the areas that the FMP can improve, it is important to note that there were many positives that were taken from the review. In addition to the findings in Table 1, it is noted that:

- The plans provided a framework for floodplain management in an area that appears to have been lacking this prior to the development of the FMPs. In the context of floodplain management within

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<sup>1</sup> In this report, the *Water Management Act 2000* (the legislation now in force for FMPs and flood work approvals) is referred to as 'the Act'. The FMPs under review include multiple references to provisions in the *Water Act 1912* (as amended for floodplains in 1999). To avoid confusion, the *Water Act 1912* is referred to in full. Floodplain, Management Plan and Flood work approval provisions in the *Water Act 1912* were repealed in September 2015, the FMPs subject to this review were adopted as Minister's Plans under s.50 of the Act and transitional provisions commenced in the *Water Management Regulations 2018*.

NSW the FMPs reviewed here were part of a program that was important in improving NSW floodplain management practices.

- The plan development and implementation engaged communities to balance maintaining conveyance of flood flows while ensuring the social and economic benefits through not unnecessarily restricting land use and precluding development.
- The FMPs used the best technology available at the time of creation to detail the information. Spatial representation was likely to be limited to the A3 mapping method used in the FMPs.

Table 1 Summary of findings

Finding	Recommendation	Step in the review assessment that informed finding					
		Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
<i>General Findings</i>							
F1.01	<p><b>Ambiguity in the FMPs makes an ineffective compliance instrument.</b> The FMPs are written as NRM plans, not legislative texts with suggestive instructions rather than prescriptive, enforceable rules.</p>	<p><b>Replace each FMP with a new statutory instrument aligned to the requirements of the Act.</b> The number of amendments identified in the review are significant and the amount of work to amend would be better spent in preparing for full replacement of the FMPs. Consideration should be given to whether interim amendments may be required to tighten up the language to improve compliance outcomes in the immediate future while the FMPs are being replaced<sup>2</sup>.</p>		■	■	■	■
F1.02	<p><b>The FMPs are not based on contemporary legislation and difficult to ensure alignment with principles.</b> The FMPs are reliant on the Water Act 1912 frameworks as implemented via transitional Water Management (General) Regulations 2018</p>	<p>Work should commence immediately on the technical work in preparation for the replacement FMPs. FMPs should be built on a valley scale, i.e., one for each of the Murray, Lachlan and Murrumbidgee Rivers, combining the historical FMPs and expanding the area if required. FMPs should seek to expand their boundaries where areas located on their boundaries are considered important to FMP outcomes, such as the Lowbidgee Wetlands</p>		■	■	■	■
F1.03	<p><b>Mapping is in hard-copy format and lacks accuracy at a property scale, making it difficult to enforce.</b> Mapping of floodways and information is difficult to read.</p>	<p><b>Update existing shape files to meet the spatial data standards and make available on the Department Website</b> (online mapping). On replacement of the FMPs, use digitally available spatial data for mapping for all FMPs.</p>		■	■	■	■
F1.04	<p><b>Consideration of many water management principles (s.5 of the Act) is missing.</b> Some water management principles are not clearly considered. Principles that are not clearly considered are areas of Aboriginal or Cultural significance; water quality; and cumulative impacts.</p>	<p><b>On replacement of the FMPs, ensure that the Principles are included in, and given effect to, by the FMP.</b> At a minimum, this should include:</p> <ul style="list-style-type: none"> <li>• Protection of areas of Aboriginal or cultural significance</li> <li>• Protection and, wherever possible, enhancement of water quality provisions, such as blackwater</li> <li>• Consideration and minimisation of cumulative impacts of works</li> <li>• Impacts if approved works are removed</li> <li>• Avoidance or minimisation of land degradation</li> </ul>		■	■	■	■

<sup>2</sup> Subject to Parliamentary Counsel and legal drafting requirements.  
Review of 10 Southern Floodplain Management Plans

Finding	Recommendation	Step in the review assessment that informed finding					
		Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
F1.05 <b>Required modifications have not been addressed</b> The subject FMPs have included 'required modifications' but these have not been implemented. Nominated works obstruct the desired flow path, impacting environmental, cultural and potentially life and property outcomes.	<b>Resources must be allocated to implement the required modifications identified in the FMPs.</b> If modifications are included in FMPs, there must be an associated commitment to implement the modifications, which comes with associated funding and resources.  <u>Note</u> - no recommended amendment to the FMPs, as this is an implementation issue.		■	■	■	■	■
F1.06 <b>In most of the FMPs<sup>3</sup>, the format requirements of the FMPs under s.35 of the Act have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable due to the lack of information around the "current conditions".</b> Objectives are included in the FMPs, but they are not consistent with the requirements of the Water Management Act	<b>On replacement of the FMPs, ensure that the objectives include more information about the conditions the FMP is to be assessed against.</b> Performance indicators should be written as a stand-alone section to increase clarity. The update of objectives will need to ensure that they are clear and consistent with the Water Management Act and the vision statement.	■					■
F1.07 <b>FMPs use ambiguous language that leads to difficulties with implementation and enforcement</b>	<b>Amend the FMP to replace ambiguous language.</b> Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Act, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.	■	■		■		■
F1.08 <b>Detail on the natural and existing flooding regimes is included to varying levels of quality, but no imagery of prior events is included.</b>	<b>Amend the FMP to provide detail on the natural flood characteristics and the existing conditions flood characteristics</b> Include more detail in the worded descriptions to differentiate between existing and natural flooding. Include detail on frequency duration and extent for existing and natural flood events. Include any available flood imagery that would improve the presentation of this information (include imagery as FMP schedule or make imagery available on-line through the FMP page) to support the worded description		■		■		■
F1.09 <b>Existing works have not been mapped in the FMPs.</b> The existing flood works in the FMP area have not been identified as required under the provisions of the Act	<b>Amend the FMPs to include clear detail on the existing works in the FMP area including spatial mapping.</b>		■				■

<sup>3</sup> Note that this does not apply to the Edward and Wakool Rivers Noorang Road to Wakool Murray Junction (Stage 4) or Tuppal and Bullatale Creeks Murray River Offtake to Deniliquin 2004  
Review of 10 Southern Floodplain Management Plans

Finding	Recommendation	Step in the review assessment that informed finding					
		Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
F1.10 Ecosystems and environmental assets in the FMP areas are not clearly shown. Ambiguity and inconsistency in ecosystem and environmental asset identification creates difficulty in locating the areas that are expected to benefit from the FMPs.	<b>Amend the FMPs to include specific detail and mapping of the ecological assets in the FMP areas.</b> This should include clearer representation of the ecosystems and environmental assets in the FMP with linkages to information on how there are expected to benefit from the implementation of the FMP. Include a description of the strategies that are used to reach the objectives including how the FMP protects ecological assets.		■		■		■
F1.11 Details on the assets of Aboriginal cultural significance is minimal, if included at all, and does not appear to have informed the development of the FMP	<b>Amend the FMP to ensure that assets of Aboriginal cultural significance are recognised and protected.</b> Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.		■		■		■
F1.12 The NRC Audit report included multiple recommendations that would help ensure the effective implementation of the water management principles.	<b>Implement the recommendations and actions contained in the NRC Audit Report</b>			■			■
F1.13 FMPs do not include detail on the social or economic impacts of the FMP	<b>Amend the FMPs to include social and economic benefits of the FMP and how they can be maximised.</b> A social and economic evaluation of the FMP and flood-work relevant impacts and benefits should be conducted on the FMP areas and the inclusion of a social and economic evaluation and impacts in the approval assessment. The detail may be able to reside in background documentation but there should be clear reference to the expected outcomes and inclusion in the rules and criteria.		■		■		■
F1.14 FMPs do not include specific measures to ensure responses to monitoring, improved understanding or technology, watering requirements or adaptive management	<b>Amend the FMPs to include specific amendments that can be made from updated information and triggers for the amendments to be considered.</b> Inclusion of measures to ensure the FMP is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, climate change and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans. This amendment would help to ensuring the effective implementation' (s43) of the principles of adaptive management (s5).		■				■

		Step in the review assessment that informed finding					
Finding	Recommendation	Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
F1.15	<p>The data and information used to develop the FMPs is likely to be outdated</p> <p><b>The technical detail that was used to build the FMP should be updated and the FMP amended to reflect this.</b>            This should include the modelling of the chosen flood events and the resultant delineation of the floodway network area. Any new FMP should include a trigger for future reviews, such as future flooding, technology updates, increased understanding of the areas of ecological, Aboriginal, or cultural significance and climate change or if a chosen time period have elapsed. Urban and rural modelling should be assessed together where relevant, and urban modelling should provide input to the valley FMP where appropriate. A method for the review of the technical detail and potential amendments to the plan should be developed prior to the review to allow consistent review methods are used each time a technical review is conducted.</p>					■	■
F1.16	<p>The FMPs indicate that the detail around nature and extent of flooding, hydraulic, environmental, social and environmental issues are held in the Flood Studies (FS) and Flood Risk Management Studies (FRMS) that informed the FMPs development and not the FMP itself. These documents have not been released so its content could not be assessed.</p> <p><b>Amend the FMPs to include the FS and FRMS as attachments to the FMP</b> or links to the studies added and a review conducted to ensure that their inclusion increases the adequacy and appropriateness of the FMP. A review should be conducted on the FS and FRMS to ensure the finding in the studies are still accurate and relevant.</p>				■		■



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## Acronyms and Abbreviations

CSS	Catchment Simulation Solutions, primary contractor to WaterNSW for flood work application assessment
DPIE	The Department of Planning, Industry & Environment
EES	Environment, Energy and Science within DPIE
FMP	Floodplain Management Plan
FRMS	Flood Risk Management Study
FS	Flood Study
HFP	Healthy Floodplains Project
NRAR	Natural Resources Access Regulator
NRC	Natural Resources Commission
NRM	Natural Resource Management
WA	<i>The Water Act 1912 (NSW)</i>
WMA	<i>The Water Management Act 2000 (NSW)</i>

# 1 Introduction

Floodplain Management Plans (FMPs) provide a framework for coordinating the development of flood works on a whole-of-valley basis in New South Wales. FMPs were historically developed under the *WA* across 10 southern floodplain areas between 2004 and 2014 before being designated as Ministers Plans under Section 50 of the Act. More recently six northern valley FMPs have been prepared under the more recent *Water Management Act 2000* ('the Act')<sup>4</sup>.

FMPs are designed to manage the development of new flood works and amendments to existing flood works to:

- Facilitate the orderly passage of floodwaters through the floodplain,
- Maintain flood connectivity to wetlands, other floodplain ecosystems, and areas of groundwater recharge,
- Contribute to the protection of ecological assets and values of the floodplain,
- Contribute to the protection of cultural, heritage and spiritual features of the floodplain that are significant to Aboriginal people and other stakeholders,
- Provide the strategic planning framework through which floodplain works are regulated by flood work approval application, assessment, issuing or rejection, and conditioning,

NRC has carried out s.44 Audits of the FMPs and the Audit report has been released. Under the Act, review responsibilities are specified for management plans, with those with provisions dealing with water sharing (S43A) the responsibility of the NRC, and all others (S43) by DPIE Water. A review under s.43 must be undertaken for the purpose of ascertaining whether the FMPs provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles ('the Principles', which are provided by s.5 of the Act). The review is to be conducted in consultation with the Minister for the Environment and the Natural Resources Commission.

## 1.1 Review objective

The objective of the review was to determine, in accordance with Section 43 of the Act, whether provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles (s.43) for the following 10 FMPs:

### Lachlan FMPs

- Lachlan River Gooloogong to Jemalong Gap 2011
- Lachlan River Jemalong Gap to Condobolin 2012
- Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005

### Murray FMPs

- Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2011
- Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2011
- Edward and Niemur Rivers Moama-Moulamein Rly to Liewah and Mallan (Stage 3) 2011
- Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2000
- Tuppall and Bullatale Creeks Murray River offtake to Deniliquin 2004

### Murrumbidgee FMPs

- Murrumbidgee River Hay to Maude 2014
- Billabong Creek (Walbundie to Jerilderie) 2006

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<sup>4</sup> In this report, the *Water Management Act 2000* (the legislation now in force for FMPs and flood work approvals) is referred to as 'the Act'. The FMPs under review include multiple references to provisions in the *Water Act 1912* (as amended for floodplains in 1999). To avoid confusion, the *Water Act 1912* is referred to in full. Floodplain, Management Plan and Flood Work Approval provisions in the *Water Act 1912* were repealed in September 2015, the FMPs subject to this review were adopted as Minister's Plans under s.50 of the Act and transitional provisions commenced in the *Water Management Regulations 2018*.

Maps of the areas covered by the subject FMPs is provided in Attachment A. The scope of this review has been to review the FMPs and not the technical detail that informed their creation. Future applications of the review method should include a review and update of the information that informed the FMPs creation, including hydraulic modelling, flood frequency, ecological analysis, Aboriginal and Cultural detail and the social and economic impacts of floodplain management in the valleys.

## 2 About the Review

### 2.1 Purpose of the Section 43 Review under the Act

Section 43 of the Act determines the durations of management plans, with subsection (2) holding the requirement that is the basis for this review. It states that:

*(2) Within the fifth year after it was made, the Minister is to review each management plan (other than provisions dealing with water sharing) for the purpose of ascertaining whether its provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles.*

### 2.2 FMP requirements under the Act

The Act includes requirements for the principles (s.5) and format (s.35) of management plans.

The following general principles of water management are stated in Section 5 (2):

- (a) water sources, floodplains and dependent ecosystems (including groundwater and wetlands) should be protected and restored and, where possible, land should not be degraded, and*
- (b) habitats, animals and plants that benefit from water or are potentially affected by managed activities should be protected and (in the case of habitats) restored, and*
- (c) the water quality of all water sources should be protected and, wherever possible, enhanced, and*
- (d) the cumulative impacts of water management licences and approvals and other activities on water sources and their dependent ecosystems, should be considered and minimised, and*
- (e) geographical and other features of Aboriginal significance should be protected, and*
- (f) geographical and other features of major cultural, heritage or spiritual significance should be protected, and*
- (g) the social and economic benefits to the community should be maximised, and*
- (h) the principles of adaptive management should be applied, which should be responsive to monitoring and improvements in understanding of ecological water requirements.*

The following specific principles relate to floodplain management are stated in Section 5(6):

- (a) floodplain management must avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, acidity, waterlogging, decline of native vegetation or, where appropriate, salinity and, where possible, land must be rehabilitated, and*
- (b) the impacts of flood works on other water users should be avoided or minimised, and*
- (c) the existing and future risk to human life and property arising from occupation of floodplains must be minimised.*

Section 35(1) states the required format of a management plan:

- (1) A management plan must include the following components—*
  - (a) a vision statement,*
  - (b) objectives consistent with the vision statement,*
  - (c) strategies for reaching those objectives,*
  - (d) performance indicators to measure the success of those strategies.*

The following core provisions relating to floodplain management are stated in Section 29:

*The floodplain management provisions of a management plan for a water management area must deal with the following matters—*

- (a) identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding,*
- (b) the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge,*
- (c) the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,*
- (d) the risk to life and property from the effects of flooding.*

The following additional provisions relating to floodplain management are stated in Section 30:

*The floodplain management provisions of a management plan for a water management area may also deal with the following matters—*

- (a) proposals for the construction of new flood works,*
- (b) the modification or removal of existing flood works,*
- (c) restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the following—*
  - (i) the passage, flow and distribution of floodwater,*
  - (ii) existing dominant floodways and exits from floodways,*
  - (iii) rates of flow, floodwater levels and duration of inundation,*
  - (iv) downstream water flows,*
  - (v) natural flood regimes, including spatial and temporal variability,*
- (d) the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area,*
- (e) the preservation and enhancement of the quality of water in the water sources in the area during and after flooding,*
- (f) other measures to give effect to the water management principles and the objects of this Act,*
- (g) such other matters as are prescribed by the regulations.*

## 2.3 Method applied to this review

The review of the 10 Southern FMPs was conducted between 1 February 2021 and 30 April 2021. .

### Review steps

The review was conducted using the six-step process shown in Figure 1, each producing an assessment table to display the findings from the step. The 10 FMPs have been reviewed following the process outlined in the “Review method for Floodplain Management Plans under Section 43 of the Water Management Act 2000 NSW” (Alluvium, 2021). The process, as shown in Figure 1, follows a review of the plan logic, that it has dealt with the provisions and that it is adequate and appropriate for ensuring the effective implementation of the water management principles (s.42(2)).

The steps undertaken were:

- Step 1 assessed the FMP logic (how its provisions and action contribute to achieving outcomes and objectives).
- Step 2 assessed if the FMP is in accordance with the Act requirements for FMP provisions.
- Step 3 takes the outcomes of the NRC s.44 Audit of FMP if it was able to be implemented.
- Steps 4 and 5 assess whether the FMP is adequate and appropriate in accordance with the principles (s.5) by reviewing the FMP document (Step 4) and supporting documentation and consultation (Step 5)



- Step 6 synthesises the information to form an assessment regarding whether the FMPs provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles and make recommendations based on the assessment.

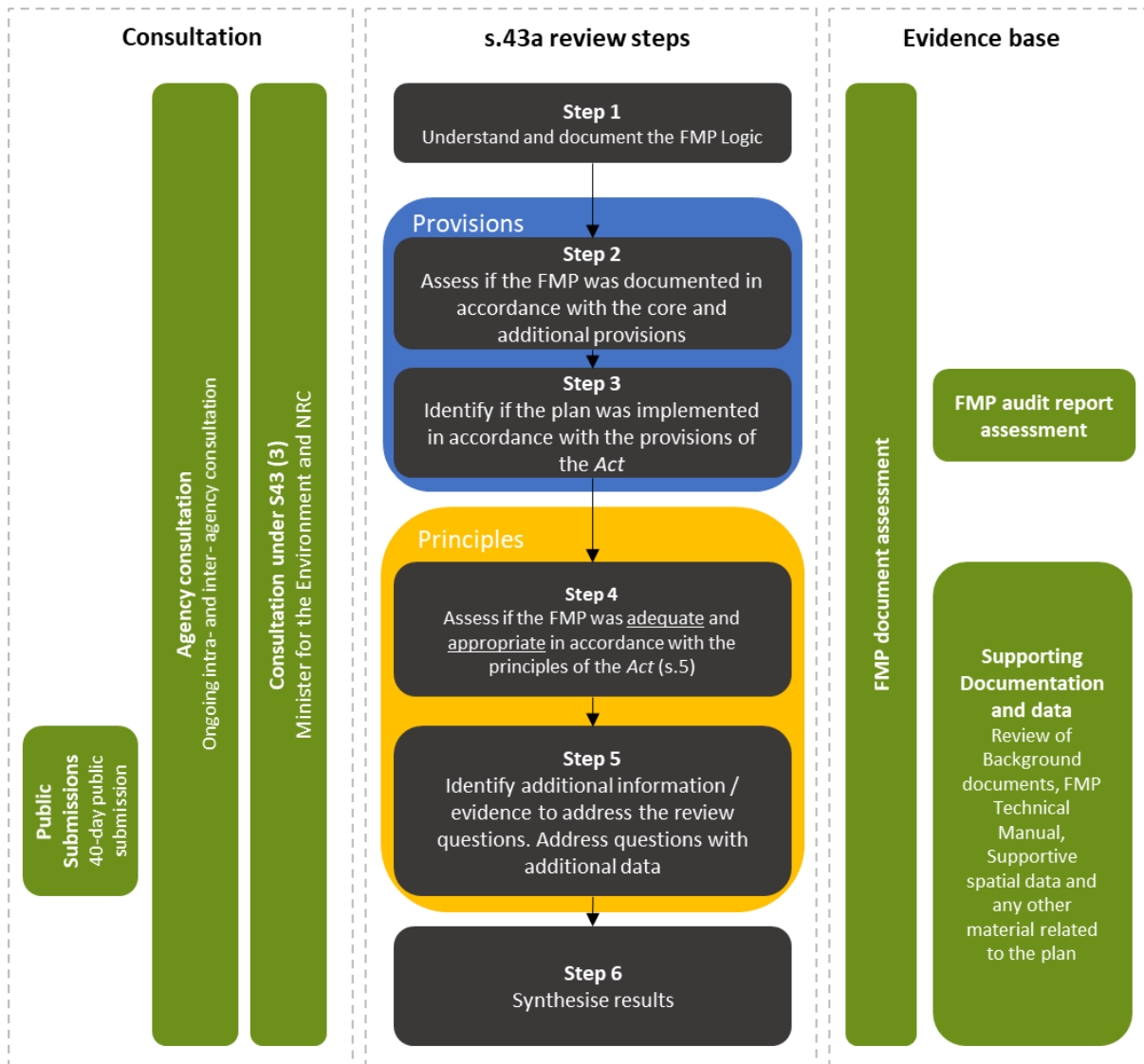


Figure 1. Review method (Alluvium 2021)

### Evidence base

The review of the FMPs has included consideration on the FMP documents, informed by supporting documentation if available, consultation with agency representatives and submissions from the public and stakeholder organisations against the logic, provisions and principles requirements under the Water Management Act. The information sources used during the review were:

- The 10 Southern FMPs
- Submissions from public and stakeholder organisations
- Targeted interviews with DPIE Water, DPIE EES, NRC, NRAR and WaterNSW
- The “Rural floodplain management plans: technical manual for plans developed under the Water Management Act 2000”

The FMPs were developed following a Flood Study (FS) and a Flood Risk Management Study (FRMS). These were made available during public exhibition during the plans development and have been passed to DPIE Water. These reports did not form part of the review.

## Assessment

The s.43 review has been conducted for the purpose of ascertaining whether the FMPs provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles. The review has also determined if the plan has met the requirements of a plan under s.35 of the Act, as well as if it has dealt with the provisions under s.29 and s.30 of the Act. The details of how the FMP was assessed against the requirements is shown in Table 2.

**Table 2 Assessment definitions**

Item	Detail
<b>FMP Logic (s.35)</b>	
✓	The item as listed as a requirement under Section 35 of the Act has been included in the FMP.
X	The item that is listed has not need included in the FMP.
<b>Provisions (S.29 and s.30)</b>	
✓	The FMP utilises clearly defined and enforceable strategies to deal with all of the items detailed within the provision being assessed.
○	The FMP has either dealt with some of the aspects of the provision but not all, or there is detail held in the FMP on the provision but has not dealt with it through clearly defined strategies.
X	The FMP does not contain detail on any of the aspects of the provision being assessed.
<b>Principles (s.5)</b>	
Adequate and appropriate	The FMP ensures the effective implementation of the principle by being an appropriate legislative tool of an adequate level of detail and enforceability. The FMP has a strategy for implementing the water management principles that uses prescriptive language, measurable detail, and enforceable rules. The FMP meets the requirements of the Act and is fit for purpose.
Adequate but not appropriate	The FMP holds the level of detail and rules for ensuring the effective implementation of the water management principles but is not appropriate to be enforced as a legislative tool. The FMP may hold the detail and information that could be used to implement the principles but may not be enforceable, have measurable standards and criteria that would allow the effective implementation. The FMP may hold up to date and clearly defined information, but the FMPs strategies may not be suited for the management of the floodplain and the implementation of the water management principles.
Appropriate but not adequate	The format, wording and enforceability of the plan may be appropriate for a legislated FMP, but the detail, rules and criteria are not to a level that allows effective implementation of the plan. The FMP may be suited for the management of the floodplain and implementing the water management principles, but the information may be outdated or insufficient.
Included but not adequate or appropriate	The FMP includes information on the water management principle, but it is not in a way that provides any detail on strategies for its implementation, criteria or rules that can be use or any other planning detail that would allow effective implementation.
Not included so not adequate or appropriate	The FMP does not make mention of the water management principle and it does not appear to have informed its development.

## Consultation

The opportunity to make public submissions was made available through the DPIE Water Website. Submissions were able to be made through an online tool, through a designated email address or through mail to a Post Office Box between 18 February 2021 and 30 March 2021. The submissions page asked to provide feedback on the FMPs in relation to:

- *Is the floodplain management plan(s) adequate and appropriate for ensuring the effective implementation of the water management principles?*
- *Are there issues with the plan(s) that were identified since commencement and impact on effectiveness of implementation?*
- *Are there potential amendments to the plan(s) that should be considered?*

The agencies that were involved in the targeted consultation were:

- DPIE Water
- DPIE Environment, Energy and Science (DPIE EES)
- Natural Resources Access Regulator (NRAR)
- NRC
- WaterNSW (WaterNSW input was provided on their behalf by Catchment Simulation Solutions, the primary contractor for review of flood work approval application)

The reviewed included engagement with a Working Group of agency representatives to assist with the process and give guidance on the scope and interpretation of evidence. The Working Group consisted of representatives from:

- DPIE Water
- DPIE EES
- NRC

## Out of scope

In accordance with the agreed scope, the review of the FMPs did not:

1. Conduct an Audit of the FMPs, rather it draws on the previously completed NRC s.44 Audit as part of the review.
2. Consider the process applied to develop the FMPs.
3. Review the outputs of hydraulic modelling or be conducting a review of the models themselves.
4. Examine accuracy of spatial data. The review will assess the functionality of the mapping but not the accuracy of the content.

The s.43 review(s) will identify issues as they are raised and include them in the assessment but may not provide a recommended solution.

## 3 Background and context to the Floodplain Management Plans subject of this review

The FMPs were originally made under the Water Act but were adopted as ministers plans under the Act in September 2015. The Act includes requirements for the structure and content of the FMPs.

### 3.1 Background

#### Murray Darling Basin Plan

Current management of water for the environment in the Murray-Darling Basin must meet Basin Plan 2012 requirements. The FMPs were designed to provide benefits to rural communities and the floodplain environment allowing farmers to plan for future sustainable development based on a strategic scheme for the management of floodwaters (NSW DPIE, 2020). The Basin Plan is the legal framework to reset the balance of water use in the Basin. The Plan sets environmental and other objectives for the Basin (supported by the Basin-wide Environmental Watering Strategy and Long-Term Watering Plans) and establishes new, lower sustainable extraction limits (SDLs) to achieve them. It also outlines the key actions, processes, and timeframes that Governments are to adopt to implement the Plan.

Water-related environmental values of the Murray-Darling Basin were recognised, and a key feature in recent reform. A primary objective of recent water reform has been to protect and restore “water dependent” ecosystems of the Basin and their ecological functions. This included establishing the institutions and structures to allow environmental water to be recovered and delivered at a Basin-wide scale. Reform was required at a Basin scale to deliver a ‘healthy working basin’ with healthy and resilient ecosystems, vibrant and strong regional communities, and productive and sustainable water-dependent industries.

#### Healthy Floodplains Project

Since the adoption of the FMPs in the Lachlan, Murrumbidgee and Murray river valleys, six new FMPs have been developed for the northern NSW MDB, five of which have commenced. These have presented a new method for FMP development under the Act and the Murray-Darling Basin Plan.

Commencing in 2013, the Healthy Floodplain Project (HFP) has aimed to drive reform in water management in northern NSW basin areas. Included in the scope of the project was the development of six new, valley-wide FMPs for the Border Rivers, Gwydir, Upper Namoi, Lower Namoi, Barwon-Darling and Macquarie valleys (NSW DPIE, 2021).

The HFP project has been implemented over a seven-year period for rural floodplains in the northern Murray-Darling Basin as part of the transition of water management from the provisions of the Water Act to the provisions of the Water Management Act. The FMPs were created under a new approach to FMP development, utilising the 10-step process outlined in the “Rural floodplain management plans: technical manual for plans developed under the Water Management Act 2000” (NSW DPIE, 2020).

#### Development of the plans

Prior to the commencement of the Act, rural floodplains were developed under Part 8 of the *Water Act 1912* (Water Act). Localised FMPs prepared under Part 8 of the Water Act are superseded upon the commencement of a FMP under the Act. Of the 22 localised FMPs originally prepared under Part 8 of the Water Act, 10 remain in-force across New South Wales (NSW DPIE, 2020). As of 2015, floodplains that were designated under the Water Act are taken to be made under the Act (NSW DPIE Water, 2020). In order to be considered as plans under the Act the existing FMPs were designated as Ministers Plans under Section 50.

The first of the FMPs commenced in May 2004 (Tuppall and Bullatale Creeks: Murray River offtake to Deniliquin) with the final of the ten FMPs being reviewed here being adopted in April 2014 (Murrumbidgee River: Hay to Maude) (NSW DPIE, 2020).

## 4 Findings

### 4.1 Section 43 findings

**Key finding: The review found that all 10 southern FMPs were not adequate and appropriate to ensure the effective implementation of the water management principles.**

Each of the review areas were combined to build a set of findings and recommendations, shown in Table 3. There are 15 findings that were found in common among the 10 FMPs, shown in the General Findings, and then the additional findings for each valley included individually. Each of the FMPs contain numerous structural and change of language recommendations that would require a large number of amendments to rectify, so **the recommendation is that the FMPs are replaced**, with new FMPs developed with updated information, data and technology and developed in accordance with the Act and its provisions and principles.

The replacement FMPs need to present information that is clear and implementable at the property scale. It will need to ensure that the detail held in the existing FMPs is carried over to ensure existing knowledge is utilised, and any of the required modifications that are identified in the FMPs are progressed further through a separate program. FMPs lack the legislative authority to delegate funding to programs such as the required modification works so their implementation would likely become an issue for another department project. A lack of implementation of these required modifications will likely undermine the effectiveness of the replacement FMPs and cause reputational damage to the Department and the new FMPs.

The FMPs include a brief outline of how the FMPs can be amended in the future, but they did not include specific items that should be amended or a trigger for the amendments to occur. Any new replacement FMPs should include specific triggers that would result in an update of key areas such as model updates, flood events, increased understanding of the areas of ecological, Aboriginal, or cultural significance and climate change or if a predetermined time-period has elapsed.

The FMPs included some detail on the downstream impacts on flood activity and the benefits of managing the flows. This was often presented through the linkages to FMPs or wetlands at the downstream boundary. This meant that there often areas that had been identified as important to the FMP outcomes that were outside the FMPs area, such as the Lowbidgee wetlands. To ensure that all flood dependant ecosystems are protected, a wider, valley-based approach for the replacement FMPs is recommended.

**Key recommendation: The 10 FMPs should be replaced with three valley-based FMPs and the boundaries expanded to include the local ecosystems, flood fringe areas and upstream extents consistent with the Act.**

Table 3 provides the overall findings and recommendations from the review, including the findings and recommendations unique and specific to each FMP where applicable.

As it is understood that not all the recommendations may be able to be implemented, the review has included both the recommendation to replace and the recommendations regarding amendments to the existing FMPs. DPIE Water should seek Legal and/or Parliamentary Counsels Office advice regarding the options following the s43 Review. This should include options regarding replacement or amending the FMPs.

If the FMPs are to be replaced then the best practice available should be implemented for the replacement. The new FMP development template used in the northern valleys as part of the Healthy Floodplain Project should be considered as an option. If it is considered to be the best practice option then this would help address consistency issues across the state.

Table 3. Findings and recommendations for the s.43 review of 10 southern Floodplain Management Plans

Finding	Recommendation	Step in the review assessment that informed finding						
		Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis	
<i>General Findings</i>								
F1.01	<p><b>Ambiguity in the FMPs makes an ineffective compliance instrument.</b> The FMPs are written as NRM plans, not legislative texts with suggestive instructions rather than prescriptive, enforceable rules.</p>	<p><b>Replace each FMP with a new statutory instrument aligned to the requirements of the Act.</b> The number of amendments identified in the review are significant and the amount of work to amend would be better spent in preparing for full replacement of the FMPs. Consideration should be given to whether interim amendments may be required to tighten up the language to improve compliance outcomes in the immediate future while the FMPs are being replaced<sup>5</sup>.</p>		■		■	■	■
F1.02	<p><b>The FMPs are not based on contemporary legislation and difficult to ensure alignment with principles.</b> The FMPs are reliant on the Water Act 1912 frameworks as implemented via transitional Water Management (General) Regulations 2018</p>	<p>Work should commence immediately on the technical work in preparation for the replacement FMPs. FMPs should be built on a valley scale, i.e., one for each of the Murray, Lachlan and Murrumbidgee Rivers, combining the historical FMPs and expanding the area if required. FMPs should seek to expand their boundaries where areas located on their boundaries are considered important to FMP outcomes, such as the Lowbidgee Wetlands</p>		■		■	■	■
F1.03	<p><b>Mapping is in hard-copy format and lacks accuracy at a property scale, making it difficult to enforce.</b> Mapping of floodways and information is difficult to read.</p>	<p><b>Update existing shape files to meet the spatial data standards and make available on the Department Website</b> (online mapping). On replacement of the FMPs, use digitally available spatial data for mapping for all FMPs.</p>		■		■	■	■
F1.04	<p><b>Consideration of many water management principles (s.5 of the Act) is missing.</b> Some water management principles are not clearly considered. Principles that are not clearly considered are areas of Aboriginal or Cultural significance; water quality; and cumulative impacts.</p>	<p><b>On replacement of the FMPs, ensure that the Principles are included in, and given effect to, by the FMP.</b> At a minimum, this should include:</p> <ul style="list-style-type: none"> <li>• Protection of areas of Aboriginal or cultural significance</li> <li>• Protection and, wherever possible, enhancement of water quality provisions, such as blackwater</li> <li>• Consideration and minimisation of cumulative impacts of works</li> <li>• Impacts if approved works are removed</li> </ul>		■		■	■	■

<sup>5</sup> Subject to Parliamentary Counsel and legal drafting requirements.  
Review of 10 Southern Floodplain Management Plans

Finding	Recommendation	Step in the review assessment that informed finding					
		Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
	Avoidance or minimisation of land degradation						
F1.05	<p><b>Required modifications have not been addressed</b> The subject FMPs have included 'required modifications' but these have not been implemented. Nominated works obstruct the desired flow path, impacting environmental, cultural and potentially life and property outcomes.</p> <p><b>Resources must be allocated to implement the required modifications identified in the FMPs.</b> If modifications are included in FMPs, there must be an associated commitment to implement the modifications, which comes with associated funding and resources.</p> <p><u>Note</u> - no recommended amendment to the FMPs, as this is an implementation issue.</p>		■	■	■	■	■
F1.06	<p><b>In most of the FMPs<sup>6</sup>, the format requirements of the FMPs under s.35 of the Act have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable due to the lack of information around the "current conditions".</b> Objectives are included in the FMPs, but they are not consistent with the requirements of the Water Management Act</p> <p><b>On replacement of the FMPs, ensure that the objectives include more information about the conditions the FMP is to be assessed against.</b> Performance indicators should be written as a stand-alone section to increase clarity. The update of objectives will need to ensure that they are clear and consistent with the Water Management Act and the vision statement.</p>	■					■
F1.07	<p><b>FMPs use ambiguous language that leads to difficulties with implementation and enforcement</b></p> <p><b>Amend the FMP to replace ambiguous language.</b> Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Act, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.</p>	■	■		■		■
F1.08	<p><b>Detail on the natural and existing flooding regimes is included to varying levels of quality, but no imagery of prior events is included.</b></p> <p><b>Amend the FMP to provide detail on the natural flood characteristics and the existing conditions flood characteristics</b> Include more detail in the worded descriptions to differentiate between existing and natural flooding. Include detail on frequency duration and extent for existing and natural flood events. Include any available flood imagery that would improve the presentation of this information (include imagery as FMP schedule or make imagery available on-line through the FMP page) to support the worded description</p>		■		■		■

<sup>6</sup> Note that this does not apply to the Edward and Wakool Rivers Noorang Road to Wakool Murray Junction (Stage 4) or Tuppall and Bullatale Creeks Murray River Offtake to Deniliquin 2004  
Review of 10 Southern Floodplain Management Plans

Finding	Recommendation	Step in the review assessment that informed finding					
		Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
F1.09	<b>Existing works have not been mapped in the FMPs.</b> The existing flood works in the FMP area have not been identified as required under the provisions of the Act		■				■
F1.10	<b>Ecosystems and environmental assets in the FMP areas are not clearly shown.</b> Ambiguity and inconsistency in ecosystem and environmental asset identification creates difficulty in locating the areas that are expected to benefit from the FMPs.		■		■		■
F1.11	<b>Details on the assets of Aboriginal cultural significance is minimal, if included at all, and does not appear to have informed the development of the FMP</b>		■		■		■
F1.12	<b>The NRC Audit report included multiple recommendations that would help ensure the effective implementation of the water management principles.</b>			■			■
F1.13	<b>FMPs do not include detail on the social or economic impacts of the FMP</b>		■		■		■
F1.14	<b>FMPs do not include specific measures to ensure responses to monitoring, improved understanding or technology, watering requirements or adaptive management</b>		■				■



			Step in the review assessment that informed finding					
			Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
Finding		Recommendation						
F1.15	The data and information used to develop the FMPs is likely to be outdated	<b>The technical detail that was used to build the FMP should be updated and the FMP amended to reflect this.</b> This should include the modelling of the chosen flood events and the resultant delineation of the floodway network area. Any new FMP should include a trigger for future reviews, such as future flooding, technology updates, increased understanding of the areas of ecological, Aboriginal, or cultural significance and climate change or if a chosen time period have elapsed. Urban and rural modelling should be assessed together where relevant, and urban modelling should provide input to the valley FMP where appropriate.					■	■
F1.16	The FMPs indicate that the detail around nature and extent of flooding, hydraulic, environmental, social and environmental issues are held in the Flood Studies (FS) and Flood Risk Management Studies (FRMS) that informed the FMPs development and not the FMP itself. These documents have not been released so its content could not be assessed.	<b>Amend the FMPs to include the FS and FRMS as attachments to the FMP</b> or links to the studies added and a review conducted to ensure that their inclusion increases the adequacy and appropriateness of the FMP. A review should be conducted on the FS and FRMS to ensure the finding in the studies are still accurate and relevant.				■		■
<b>Billabong Creek (Walbundrie to Jerilderie) 2006</b>								
F2.01	Plan does not include information on downstream benefits	Provide information on the downstream floodplain areas that are expected to benefit from the flow connectivity improvements		■				■
F2.02	The Audit found that the plan does not include specific flood monitoring or environmental monitoring triggers.	<b>Amend the FMP to include Environmental monitoring provisions and specific triggers for flood monitoring.</b>			■			■
<b>Edward And Niemur Rivers Moama-Moulamein Railway to Liewah and Mallan (Stage 3) 2011</b>								
F3.01	The Audit found that the plan does not include specific flood monitoring triggers.	The FMP should be amended to ensure the inclusion of specific triggers for flood monitoring			■			■
<b>Edward and Wakool Rives Deniliquin to Moama-Moulamein Railway (Stage 1) 2011</b>								
F4.01	The Audit found that the plan does not include specific flood monitoring triggers.	The FMP should be amended to ensure the inclusion of Environmental monitoring provisions and specific triggers for flood monitoring			■			■
<b>Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (stage 4) 2000</b>								
F5.01	FMP does not include a vision statement or performance indicators	Update the FMP to include a vision statement and performance indicators that are consistent with the requirements of the Act	■					■
F5.02	FMP relies on the Murray REP2 to guide most of the assessment of flood works	Remove linkages to the Murray REP2, ensuring that the requirement information, criteria and areas of application are held in the FMP		■		■		■

			Step in the review assessment that informed finding					
Finding	Recommendation		Step 1. FMP logic	Step 2. Provisions	Step 3. Implementation	Step 4. Principles	Step 5. Consultation	Step 6. Synthesis
F5.03	FMP guides application and assessment, linking to agencies that no longer exist	Remove reference to the Department of Land and Water Conservation, update to relevant agency		■		■		■
F5.04	Benefits of the FMP are not clearly articulated	Clearly identify the environmental, risk, economic and cultural benefits from the implementation of the FMP		■		■		
F5.05	The Audit found that the plan does not include specific flood monitoring or environmental monitoring triggers.	The FMP should be amended to ensure the inclusion of Environmental monitoring provisions and specific triggers for flood monitoring			■			■
<b>Lachlan River to Gooloogong Jemalong Gap 2011</b>								
F6.01	FMP does not include detail on natural or existing flood activity	Include details of previous flood events, including magnitude and ARI/AEP and imagery where available		■				■
<b>Lachlan River Jemalong Gap to Condobolin 2012</b>								
F7.01	The Audit found that the plan does not include specific flood monitoring triggers.	The FMP should be amended to ensure the inclusion of Environmental monitoring provisions and specific triggers for flood monitoring			■			■
<b>Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005</b>								
F8.01	FMP does not include a vision statement or performance indicators	Update the FMP to include a vision statement and performance indicators that are consistent with the requirements of the Act	■					■
<b>Murrumbidgee River Hay to Maude 2014</b>								
F9.01	Formatting errors	Reformatting of the FMP to cover formatting errors such as missing page 4	■	■		■		■
F9.02	The FMP references previous flood events but includes limited detail of the flooding that occurred	Inclusion of the March 2012 imagery, detail on the linkages to 1974, and natural flooding detail		■				■
F9.03	Plan makes efforts to ensure flows to the Lowbidgee wetlands, but these are outside the boundary and not protected by the rules of the plan	Inclusion of the Lowbidgee wetlands in the boundary				■		■
<b>Tuppall and Bullatale Creeks Murray River offtake to Deniliquin 2004</b>								
F10.01	The Audit found that the plan does not include specific environmental monitoring triggers.	The plan should be amended to ensure the inclusion of specific triggers for Environmental monitoring			■			
<b>Wakool River Moama-Moulamein Railway to Gee Gee Bridge (stage 2) 2011</b>								
F11.01	The Audit found that the plan does not include specific flood monitoring triggers.	The plan should be amended to ensure the inclusion of Environmental monitoring provisions and specific triggers for flood monitoring			■			■

## 4.2 Additional Findings

During the targeted consultation with agencies and through the review of the FMPs, there were additional findings that were considered to be important for inclusion in the findings, but out of scope of the review. These additional findings were:

- There is a lack of clarity regarding the areas subject to the rural FMPs such as the 10 reviewed here and an urban flood management FMP and if there is a hierarchy of FMPs or if they should be considered together
- There is uncertainty about how flood works should be assessed for approvals in areas that are not subject to an FMP. These works may still impact local flood activity but may not be in a designated floodplain and are not within an FMP area

The lack of clarity in these areas has the potential to create issues for the implementation of the FMPs. It may mean that compliance and enforcement activities are at risk, the principles of the Act may not have been given effect, and rural flood works applications might not be adequately considering risks to life and property in towns.

- A significant risk was identified around a loss of corporate knowledge. Consultation identified that this risk needs to be addressed to ensure any future updates and reviews and the FMP implementation can be conducted with the best available knowledge.
- There has been feedback that the requirements for a flood work approval create too high a cost on landholders and that there is a potential for a marginal cost structure based on the size of the works.
- If the FMPs are replaced, there is a need to progress with the schedules of recommended modification areas that are in the existing FMPs are unlikely to be able to be address in replacement FMPs. The lack of action on previously identified recommended modification areas creates a risk of loss of trust and buy in from landholders.
- There is a lack of clarity in the public and within agencies as to when FMPs can be amended and how to deal with issues that are identified. It may be beneficial to develop a process/methodology to allow updates to be made as feedback is provided from licencing or enforcement agencies and the general public, and/or a register created to record feedback for future reviews that can be easily communicated with stakeholders.

The review of the technical information was not included in the scope of this review, but the consultation process identified that it is likely to be outdated and developed using outdated technology resulting in an outdated FMP. The technical information that informed the FMPs development such as hydraulic modelling may need to be reviewed and updated if the FMPs are not replaced.

## 5 Summary of the Section 43 review assessment

This section outlines the assessment and findings under each step of the review method. Detailed step-by-step assessment for each FMP is provided in Attachments B to K of this report.

### 5.1 Step 1: Logic assessment

Each of the FMPs were assessed against a plan logic, informed by the requirements under Section 35(1) of the Act. Section 35(1) requires that every plan includes:

Section 35(1) states the required format of a management plan:

*(1) A management plan must include the following components—*

- (a) a vision statement,*
- (b) objectives consistent with the vision statement,*
- (c) strategies for reaching those objectives,*
- (d) performance indicators to measure the success of those strategies.*

The overall logic provided by s.35 (plan vision, objectives, strategies and performance indicators) can be used to develop a more specific plan logic. This more specific plan logic can articulate how the FMPs provisions (strategies, rules, obligations) will give effect to ('reach') the objectives of the FMP (s.35), while also 'ensuring effective implementation' (s.43) of and being 'in accordance with' and 'promoting' (s.9) the water management principles (s.5) and supporting the Objects of the Act (s.3) as they relate to FMPs.

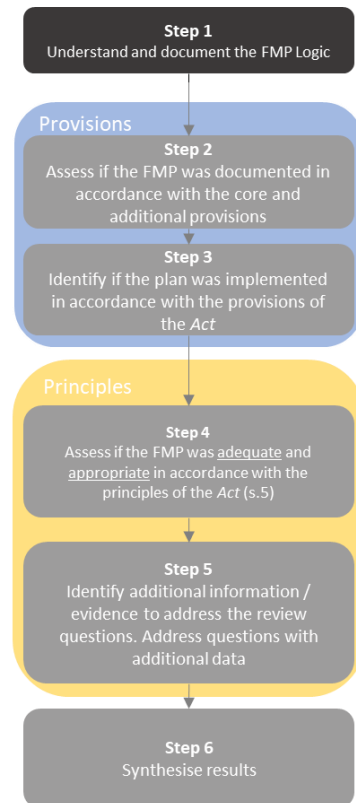
The requirements of management plans under s.35 (plan vision, objectives, strategies, and performance indicators) were identified within the FMP to determine if each s.35 requirement was present in the FMP. The requirements were then mapped against each other to determine if the objectives were consistent with the vision statement (s.53(b)), the strategies are reaching for the objectives (s.35(c)) and the performance indicators are design to measure the success of the strategies (s.35(d)). The assessment of the performance indicators included checking that that they were consistent with strategies of the FMP and that they were able to measure the success of the strategies by being SMART indicators (specific, measurable, attainable, relevant, time specific). To ensure that the objectives are being met, the FMP should:

- Be amended to include more information about the conditions the FMP is to be assessed against.
- Performance indicators should be written as a stand-alone section to increase clarity
- Include updated objectives to ensure that they are clear and consistent with the Act and the vision statement.

The review found that most FMPs met the requirements of Section 35(1), however as the performance indicators are not specific or measurable due to the lack of information around the "current conditions" so it is not possible to determine if the objectives and visions statement that they relate to are being met. Objectives are included in the FMPs, but they are not consistent with the requirements of the Act.

Two exceptions to this finding (F1.06) were:

1. Edward and Wakool Rivers Noorang Rd to Wakool -Murray Junction (Stage 4) 2000. The FMP does not contain a vision statement or performance indicators, therefore not meeting the format requirements of Section 35(1)



2. Tuppal and Bullatale Creeks Murray River Offtake to Deniliquin 2004. The FMP does not contain performance indicators, therefore not meeting the format requirements of Section 35(1)

The results of the assessment are show in Table 4, with a tick given if the FMP holds the requirement, with more detail on the quality held in the valley specific assessment tables in Attachments B to K.

**Table 4 Step 1 Logic Assessment**

Logic Assessment	Billabong Creek (Walbundrie to Jerilderie) 2006	Edward and Nierur Rivers Moama-Moulamein Railway to Liewah and Mallan (Stage 3) 2010	Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2010	Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2000	Lachlan River Gooloogong to Jemalong Gap 2011	Lachlan River Jemalong Gap to Condobolin 2012	Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005	Murrumbidgee River Hay to Maude 2014	Tuppal and Bullatale Creeks Murray River offtake to Deniliquin 2004	Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2011
Does the plan contain a vision statement (s.35(1)(a))	✓	✓	✓	X	✓	✓	✓	✓	✓	✓
Does the plan contain objectives (s.35(1)(b))	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Are the objectives consistent with the vision statement (NA if objectives or vision statement are not present) (s.35(1)(b))	✓	✓	✓	NA	✓	✓	✓	✓	✓	✓
Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	✓	✓	X	✓	✓	✓	✓	X	✓
Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	X	X	X	NA	X	X	X	X	NA	X

## 5.2 Step 2: Provisions assessment

Each of the plans were assessed against the provisions under Section 29 and 30 of the Act. The results of the assessment are show in Table 5, with each FMP assessed as to if the specific was dealt with (green tick) partially covered but not considered dealt with (orange circle) or not covered (red cross). More detail on the quality held in the valley specific assessment tables in Attachments B to K.

The following core provisions relating to floodplain management are stated in Section 29:

*The floodplain management provisions of a management plan for a water management area must deal with the following matters—*

*(a) identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding,*

*(b) the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge,*

*(c) the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,*

*(d) the risk to life and property from the effects of flooding.*

The following additional provisions relating to floodplain management are stated in Section 30:

*The floodplain management provisions of a management plan for a water management area may also deal with the following matters—*

*(a) proposals for the construction of new flood works,*

*(b) the modification or removal of existing flood works,*

*(c) restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the following—*

*(i) the passage, flow and distribution of floodwater,*

*(ii) existing dominant floodways and exits from floodways,*

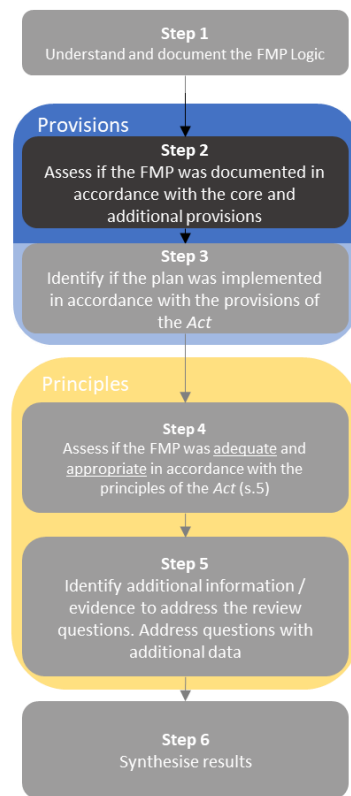
*(iii) rates of flow, floodwater levels and duration of inundation,*

*(iv) downstream water flows,*

*(v) natural flood regimes, including spatial and temporal variability,*

*(d) the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area,*

*(e) the preservation and enhancement of the quality of water in the water sources in the area during and after flooding,*



*(f) other measures to give effect to the water management principles and the objects of this Act,*

*(g) such other matters as are prescribed by the regulations.*

The assessment to determine if the FMP dealt with the core (s.29) and the additional (s.30) provisions involved reviewing the FMP against each specific provision to determine if they addressed each provision in detail, with relevant information and supported by sufficient rules to satisfy the provisions of the act.

The assessment found that the FMPs were not documented in accordance with the provisions of the Act. As shown in Table 5, the majority of provisions across the majority of FMPs were listed as “partially dealt with”. This was a result of a number of scenarios;

- The provision holds multiple requirements, and the FMP was considered to have dealt with some but not all of the requirements. This is especially true of 29(a) where the various characteristics of natural and existing flood patterns was required and most FMPs dealt with some characteristics such as frequency but not others like duration, or they dealt with existing flood characteristics but not natural (F1.01)
- The FMPs often dealt with the provision but the language used was not mandatory so the FMP wasn't considered to have dealt with the provision. The ambiguous language was a factor in determining if the FMPs 'dealt with' as is required by Sections 29 and 30 of the Act (F1.06 & F1.07)
- The FMPs often rely on repealed legislation, particularly the Water Act when dealing with the provisions. This occurs through applications being required to be assessed against the Water Act which, given it is no longer in force, is particularly problematic. (F1.02)
- Many of the provisions require restoration or rehabilitation. The FMPs are written more as NRM plans rather than legislative texts and do not contain the proactive requirements to be considered to be restoring or rehabilitating. (F1.01)

There were occasions that the FMPs were be considered to be in accordance with most but not all of the provisions of the Act, particularly in Billabong Creek (Walbundrie to Jerilderie) 2006 and Murrumbidgee River Hay to Maude 2014.

In many other cases, particularly as listed in F1.04, F1.09, F1.10, F1.11, F1.12, F1.13 and F1.14, the FMPs did not deal with the provisions at all.

Table 5. Step 2 Provisions assessment (tick – dealt with, circle partially dealt with, cross not dealt with)

		Billabong Creek (Walbundrie to Jerilderie) 2006	Edward and Niemur Rivers Moama-Moulamein Railway to Liewah and Maillan (Stage 3) 2010	Edward and Wakool Rivers Deniliquin to Moama- Moulamein Railway (Stage 1) 2010	Edward and Wakool Rivers Noorang Rd to Wakool- Murray Junction (Stage 4) 2000	Lachlan River Gooloogong to Jemalong Gap 2011	Lachlan River Jemalong Gap to Condobolin 2012	Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005	Murrumbidgee River Hay to Maude 2014	Tuppall and Bullatale Creeks Murray River offtake to Deniliquin 2004	Wakool River Moama- Moulamein Railway to Gee Gee Bridge (Stage 2) 2011
29. Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✓	○	○	○	○	○	○	○	○
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	○	○	○	○	○	✓	○	○
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,	○	✓	○	○	✗	✗	○	✗	○
	(d)	the risk to life and property from the effects of flooding	✓	✗	○	○	✗	○	○	○	○
30. Additional Provisions	(a)	proposals for the construction of new flood works	○	○	○	○	✗	○	✓	○	○
	(b)	the modification or removal of existing flood works	○	○	○	○	✗	○	✓	○	○
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	○	○	○	○	○	○	✓	○	○
	(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	○	○	✓	○	○	○	✓	○	○
	(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	○	○	○	✗	✗	○	○	○	○
	(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	○	○	○	✗	✗	✗	○	✓	○
	(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	○	✓	○	✗	○	○	○	✗
	(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	○	○	○	○	✗	○	○	✓	○
	(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	✗	○	✗	○	○	○	○	○
	(f)	other measures to give effect to the water management principles and the objects of this Act	✗	✗	○	✗	✗	✗	✗	✗	○
(g)	such other matters as are prescribed by the regulations	✗	✗	✗	✗	✗	✗	✗	✗	✗	



### 5.3 Step 3: Implementation assessment

Step 3 draws on the NRC s.44 audit as an evidence source to inform the review of the adequacy and appropriateness of the FMPs.

The findings of a s.44 Audit (by NRC) determine whether the plan was implemented ('whether the plan was given effect'). This step of the s.43 review is about using the s. 44 Audits findings, as one evidence base for s.43 review. The scope of the review is not to repeat the Audit and its scope, rather draw on the findings to inform the review of the plan, focussing on the areas of the Audit that can inform the adequacy and appropriateness of the FMP in implementing the Water Management Principles of the Act.

The implementation assessment was conducted by reviewing the NRC s.44 Audit report to consider:

1. Whether the source of a non-implementation finding identified in the Audit is due to the adequacy and appropriateness of the FMP.
2. Whether the non-implementation findings identified at point (1) are relevant to the effective implementation of the water management principles
3. Any issues identified in the Audit findings about whether the FMP fails to clarify roles and responsibilities in a way that prevents effective implementation of the water management principles.

#### General finding of the implementation assessment

The Audit Report found that the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements ('must', 'shall', 'require'), while others suggest more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed').

The findings and recommendations of the Audit are considered the items that are best to resolve the issues found and should be implemented (F1.12), though there is some overlap with the findings of the review.

In addition to the general findings, the Audit found that:

#### Billabong Creek (Walbundrie to Jerilderie) 2006

- Modification requirements are mandatory but contain mixed language, reducing effectiveness (F1.07)
- The performance indicator assessment includes discretionary language (F1.07)
- There are no environmental monitoring triggers (F2.03)

#### Edward and Niemur Rivers Moama-Moulamein Rly to Liewah and Mallan (Stage 3) 2010

- The FMP does not include triggers for flood monitoring (F3.02)

#### Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2010

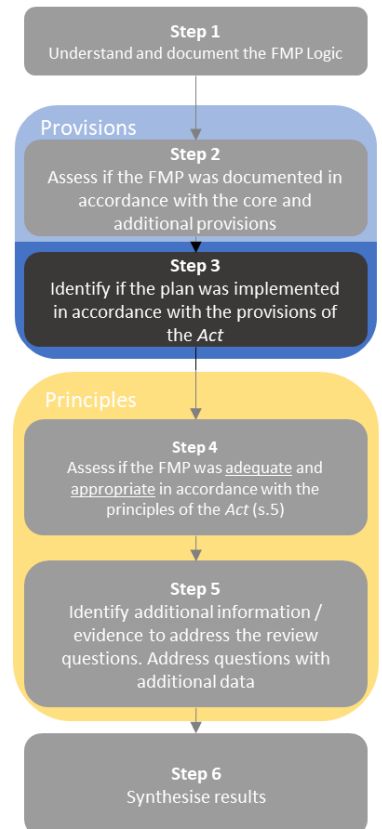
- The FMP does not include triggers for flood monitoring (F4.02)

#### Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2010

- Modification requirements are mandatory but contain mixed language, reducing effectiveness (F1.07)
- The FMP does not include triggers for flood monitoring (F5.05)

#### Lachlan River Gooloogong to Jemalong Gap 2011

No additional findings



**Lachlan River Jemalong Gap to Condobolin 2012**

- Modification requirements are mandatory but contain mixed language, reducing effectiveness (F1.07)
- The FMP does not include triggers for flood monitoring (F2.02)

**Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005**

- The performance indicator assessment includes discretionary language (F1.07)

**Murrumbidgee River Hay to Maude 2014**

No additional findings

**Tuppall and Bullatale Creeks Murray River offtake to Deniliquin 2004**

- The performance indicator assessment includes discretionary language (F1.07)
- The Audit found that the plan does not include specific environmental monitoring triggers (F10.01)

**Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2010**

- The FMP does not include triggers for flood monitoring (F11.02)

## 5.4 Step 4: Review of the plan against the Principles

Step 4 is a theoretical, desktop observation of the adequacy and appropriateness of the FMP provisions to achieve the water management principles. It is the step that assesses if the FMP is adequate and appropriate in accordance with the water management principles.

The following general principles of water management are stated in Section 5 (2):

- (a) water sources, floodplains and dependent ecosystems (including groundwater and wetlands) should be protected and restored and, where possible, land should not be degraded, and*
- (b) habitats, animals and plants that benefit from water or are potentially affected by managed activities should be protected and (in the case of habitats) restored, and*
- (c) the water quality of all water sources should be protected and, wherever possible, enhanced, and*
- (d) the cumulative impacts of water management licences and approvals and other activities on water sources and their dependent ecosystems, should be considered and minimised, and*
- (e) geographical and other features of Aboriginal significance should be protected, and*
- (f) geographical and other features of major cultural, heritage or spiritual significance should be protected, and*
- (g) the social and economic benefits to the community should be maximised, and*
- (h) the principles of adaptive management should be applied, which should be responsive to monitoring and improvements in understanding of ecological water requirements.*

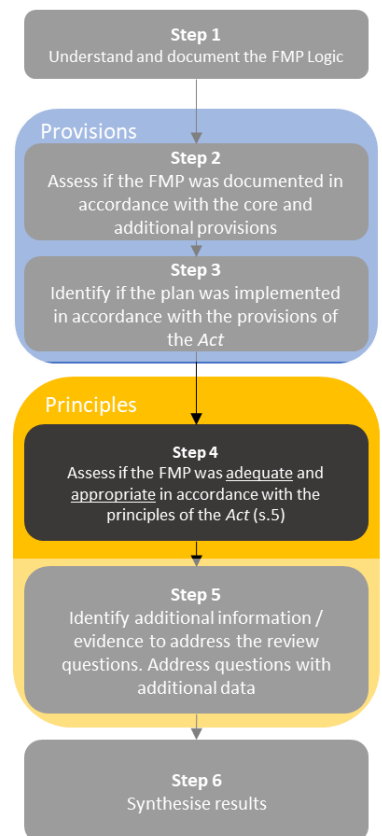
The following specific principles relate to floodplain management are stated in Section 5(6):

- (a) floodplain management must avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, acidity, waterlogging, decline of native vegetation or, where appropriate, salinity and, where possible, land must be rehabilitated, and*
- (b) the impacts of flood works on other water users should be avoided or minimised, and*
- (c) the existing and future risk to human life and property arising from occupation of floodplains must be minimised.*

The Step 4 assessment was done by assessing the FMP in isolation, with the understanding that additional documentation and consultation to better understand the FMP will come in step 5.

The FMPs were assessed against each Principle in s.5 to consider:

1. Are there rules designed to ensure the implementation of the principles?
2. Are the rules sufficient for the implementation to be effective?
3. Are the criteria used in the rules appropriate?
4. Have the steps outlined in the Technical Manual been followed using reasonable and well documented evidence?
5. Is there sufficient detail provided, such as mapping and data?
6. Is there sufficient supporting documentation to justify the rules and criteria of the FMP?



7. Does the FMP make provisions 'of a savings or transitional nature consequent on the replacement of the plan' as allowed under s.43 (4)?
8. Does the FMP make allowances for changes to data, such as return frequency/severity changes in flood events or the impacts of climate change?

### **General finding of the review of the FMPs against the Principles**

The common findings when reviewing the FMPs was that they were structured as guiding NRM plans under the Water Act. As a result, the FMPs are not structured as legislative texts and use suggestive language that is likely to make enforcement difficult (F1.07). As the Water Act contained flood work application processes, the FMPs reference the repealed act and rely on the Water Act for the approval requirements (F1.02).

The FMPs create a floodway network that is required to convey flows through the floodplain and are linked to specific rules that flood works must meet in order to gain approval. These areas have been shown in a pdf format that is unable to be zoomed to property scale, resulting in ambiguity around where the rules are applicable and if the location of works fall inside the floodway area (F1.03).

For most of the FMPs, the specific requirements that are included in the principles are referenced as included as covered under the Flood Study or Flood Risk Management Study that informed the FMPs development. In this instance the plans were not able to be considered adequate and appropriate, even in step 5, as these studies were not available at the time of review (F1.16).

There were many areas of the principles, such as water quality, cumulative impacts, land degradation and consideration of Aboriginal and Cultural assets that were not include in the FMPs nor referenced as included in its development (F1.04, F1.11). Additionally, existing works (F1.09) and environmental assets (F1.10) often appeared to have informed the FMPs the development but specific information was not included and the areas were not clearly mapped in the FMP document.

In many cases the FMPs assessment against the principles of the Act show that the FMPs were found to be adequate, in the way that they assess the flood regime of floodplain and delineate an area that require additional assessment to maintain flows relating to the requirements of the principles but were not considered appropriate as they were not written or displayed in a way that can be easily implemented or enforced as statutory instruments. Due to the number of recommendations for each FMP, and the fact that many of the recommendations refer to structural issues or apply across most of the document, it is considered to be more beneficial to replace the FMPs rather than try to resolve each of the individual findings (F1.01).

In addition to the general findings, the review of the FMPs found that:

#### **Billabong Creek (Walbundrie to Jerilderie) 2006**

- The FMP does not include detail on the downstream benefits

#### **Edward and Niemur Rivers Moama-Moulamein Rly to Liewah and Mallan (Stage 3) 2010**

No additional findings in step 4

#### **Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2010**

No additional findings in step 4

#### **Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2010**

- The FMP relies on the Murray REP2 to guide most of the assessment of flood works (F5.02). Needs to remove linkages to the Murray REP2, ensuring that the requirement information, criteria and areas of application are held in the FMP
- FMP guides application and assessment that links to agencies that no longer exist (F5.03)
- Benefits of the FMP are not clearly articulated (F5.04)

#### **Lachlan River Gooloogong to Jemalong Gap 2011**

- The FMP does not include detail on natural or existing flood activity (F6.01). Needs to include details of previous flood events, including magnitude and ARI/AEP and imagery where available

**Lachlan River Jemalong Gap to Condobolin 2012**

No additional findings in step 4

**Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005**

No additional findings in step 4

**Murrumbidgee River Hay to Maude 2014**

- The FMP contains formatting errors that should be fixed (F9.01)
- There is some reference but limited detail of previous flooding regimes (F9.02). Suggest the addition of the March 2012 imagery, detail on the linkages to 1974, and natural flooding detail that are referenced in the FMP
- FMP makes efforts to ensure flows to the Lowbidgee wetlands, but these are outside the boundary and not protected by the rules of the FMP (F9.03)

**Tuppal and Bullatale Creeks Murray River offtake to Deniliquin 2004**

No additional findings in step 4

**Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2010**

No additional findings in step 4

**Table 6 Step 4 Principles assessment**

Section	Principle	Billabong Creek (Walbundrie to Jerilderie) 2006	Edward and Niemur Rivers Moama-Moulamein Railway to Liewah and Mallan (Stage 3) 2010	Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2010	Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2000	Lachlan River Gooloogong to Jemalong Gap 2011	Lachlan River Jemalong Gap to Condobolin 2012	Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005	Murrumbidgee River Hay to Maude 2014	Tuppal and Bullatole Creeks Murray River offtake to Deniliquin 2004	Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2011
	is the management plan adequate an appropriate for ensuring the effective implementation of the general principles to;										
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate but not appropriate	Adequate but not appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Adequate but not appropriate	Adequate but not appropriate	Adequate and appropriate	Included but not adequate or appropriate	Adequate but not appropriate
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Included but not adequate or appropriate	Included but not adequate or appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Adequate but not appropriate	Adequate and appropriate	Not included so not adequate or appropriate	Adequate but not appropriate
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Not included so not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Not included so not adequate or appropriate	Included but not adequate or appropriate
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Included but not adequate or appropriate	Not included so not adequate or appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Not included so not adequate or appropriate	Adequate but not appropriate	Adequate but not appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate or appropriate	Included but not	Included but not	Included but not	Included but not	Included but not	Included but not	Adequate and appropriate	Not included so not	Partially Covered

Section	Principle	Billabong Creek (Walbundrie to Jerilderie) 2006	Edward and Niemur Rivers Moama-Moulamein Railway to Liewah and Mallan (Stage 3) 2010	Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2010	Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2000	Lachlan River Gooloogong to Jemalong Gap 2011	Lachlan River Jemalong Gap to Condobolin 2012	Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005	Murrumbidgee River Hay to Maude 2014	Tuppal and Bullatole Creeks Murray River offtake to Deniliquin 2004	Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2011
			adequate or appropriate	adequate or appropriate	adequate or appropriate	adequate or appropriate	adequate or appropriate	adequate or appropriate		adequate or appropriate	
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Not included so not adequate or appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Not included so not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Adequate and appropriate	Not included so not adequate or appropriate	Included but not adequate or appropriate
(2)(g)	Maximise social and economic benefits to the community	Included but not adequate or appropriate	Adequate but not appropriate	Adequate but not appropriate	Partially Covered	Adequate but not appropriate	Adequate but not appropriate	Not included so not adequate or appropriate	Not included so not adequate or appropriate	Adequate but not appropriate	Adequate but not appropriate
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Not included so not adequate or appropriate	Adequate and appropriate	Adequate but not appropriate	Not included so not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Not included so not adequate or appropriate	Not included so not adequate or appropriate	Adequate but not appropriate
(2)(h)	Apply the principles of adaptive management	Included but not adequate or appropriate	Adequate but not appropriate	Adequate but not appropriate	Not included so not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Not included so not adequate or appropriate	Not included so not adequate or appropriate	Adequate and appropriate
and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:											

Section	Principle	Billabong Creek (Walbundrie to Jerilderie) 2006	Edward and Niemur Rivers Moama-Moulamein Railway to Liewah and Mallan (Stage 3) 2010	Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2010	Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2000	Lachlan River Gooloogong to Jemalong Gap 2011	Lachlan River Jemalong Gap to Condobolin 2012	Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005	Murrumbidgee River Hay to Maude 2014	Tuppal and Bullatale Creeks Murray River offtake to Deniliquin 2004	Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2011
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Adequate but not appropriate	Adequate but not appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Adequate and appropriate	Included but not adequate or appropriate	Adequate but not appropriate
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Adequate but not appropriate	Adequate but not appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Adequate and appropriate	Not included so not adequate or appropriate	Adequate but not appropriate
(6)(c)	Minimise existing and future risk to human life and property from occupation of floodplain	Adequate but not appropriate	Included but not adequate or appropriate	Adequate but not appropriate	Included but not adequate or appropriate	Included but not adequate or appropriate	Not included so not adequate or appropriate	Not included so not adequate or appropriate	Adequate and appropriate	Included but not adequate or appropriate	Adequate but not appropriate



## 5.5 Step 5: Consultation to assess the plan against the principles

Consultation was conducted to gain input into the review of the FMPs against the principles. The consultation included targeted consultation with agency representatives from DPIE Water, DPIE EES, NRAR and NRC, along with an invitation for submissions for stakeholders. Email notifications were provided to key stakeholders encouraging submissions, and representatives from Aboriginal organisations were consulted and encouraged to provide submissions. Members of the following Aboriginal representation organisations were contacted seeking their input to the review and notifying them the submission process;

- Murray Lower Darling Rivers Indigenous Nations
- Native Title Service Corp
- NSW Aboriginal Land Council
- Yarkuwa Indigenous Knowledge Centre

The WaterNSW primary contractor for licencing, Catchment Simulation Solutions (CSS), provided input to the review on behalf of WaterNSW.

The Step 5 assessment draws on the additional evidence to determine if any detail sitting outside the FMPs can show that the FMPs are adequate and appropriate for ensuring the effective implementation of the water management principles or highlight potential amendments to the FMPs that could improve it adequacy and appropriateness

### Public Submissions

#### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

#### General Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)

#### Valley Specific Feedback

##### Lachlan River Gooloogong to Jemalong Gap 2011

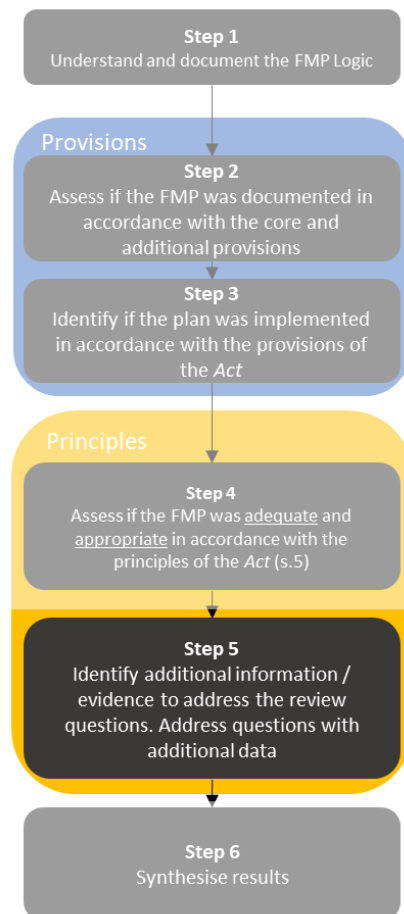
- FMP not considered adequate and appropriate. Particularly regarding the additional provisions. (1 submission)
- Environmental assessment requirements considered adequate (1 submission)
- Insufficient resources for implementation (1 submission, out of scope)
- Increased community communication and education required (1 submission)
- Improvements to Floodplain Harvesting Policy (1 submission, out of scope)

##### Lachlan River Jemalong Gap to Condobolin 2012 &

##### Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005

- Environmental assessment requirements considered adequate (1 submission)
- Insufficient resources for implementation (1 submission, out of scope)
- Increased community communication and education required (1 submission)
- Improvements to Floodplain Harvesting Policy (1 submission, out of scope)

##### Edward and Niemur Rivers Moama-Moulamein Rly to Liewah and Mallan (Stage 3) 2010,



Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2010,  
Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2000 &  
Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2010

- Lack of implementation and commitment of resources for the improvement of the FMP (1 submission, out of scope)

### Targeted Consultation

A summary of the feedback received in the targeted consultation is shown below in Table 7.

**Table 7 Summary of feedback from targeted consultation**

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)

Item	Description	Source
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## 5.6 Step 6: Synthesis of results

Step 6 involves the synthesis of the results of the earlier review steps to address the overall review question - "Has the plans provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles of the Act?".

The evidence that has been collated in steps 1 to 5 has allowed the population of the assessment tables and supportive evidence . The assessments were gathered to allow a full review of the FMPs and their provisions. The findings and the supportive evidence were gathered together, and recommendations made for each finding based on the results.

Upon collection of the findings from each of the steps, an individual assessment for each of the logic requirements, provisions and principles an assessment against the review question was able to be formed.

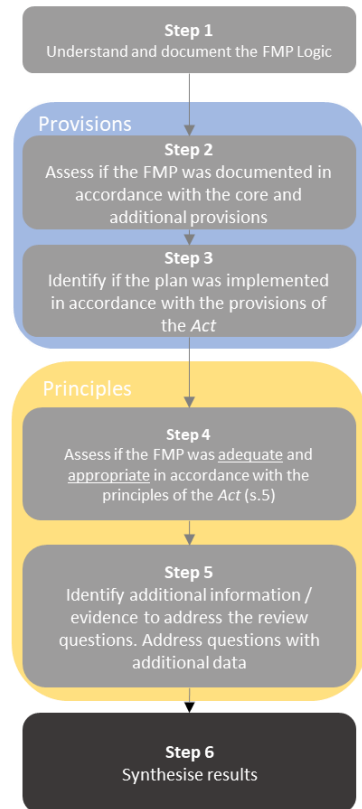
Once the FMP was assessed against the review question, a recommendation was determined based on the findings, and based on whether the FMPs provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles of the Act.

Once all of the findings and recommendations were collected, the scale of the finding informed an overall recommendation for the FMPs.

The recommendation was to decide if the FMPs should:

- Be extended if they are adequate and appropriate
- Be amended if they are mostly adequate and appropriate and amendments would make the FMPs adequate and appropriate
- Be replaced if the FMPs are not adequate and appropriate and the amendments are of a volume or nature that replacement is considered more practical

The Step 6 synthesis resulted in the findings and recommendations as outlined in Section 4.



## 6 References

Alluvium. (2021). *Review method for Floodplain Management Plans under Section 43 of the Water Management Act 2000 (NSW)*. Sydney.

NSW DPIE. (2020). *Historical floodplain management plans*. Retrieved April 27, 2021, from <https://www.industry.nsw.gov.au/water/plans-programs/healthy-floodplains-project/plans/rural-fmp-under-part-8>

NSW DPIE. (2020). *Rural floodplain management plans: technical manual for plans developed under the Water Management Act 2000*. NSW Department of Planning, Industry and Environment.

NSW DPIE. (2021, April 27). *NSW Healthy Floodplains Project*. Retrieved from PUB21/70: [https://www.industry.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0005/179933/nsw-healthy-floodplains-project-fact-sheet.pdf](https://www.industry.nsw.gov.au/__data/assets/pdf_file/0005/179933/nsw-healthy-floodplains-project-fact-sheet.pdf)

NSW DPIE Water. (2020). *Floodplain Management Changes*. Retrieved April 27, 2021, from [https://www.industry.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0017/143153/floodplain-management-under-the-WMA-2000-a-guide-to-changes.pdf](https://www.industry.nsw.gov.au/__data/assets/pdf_file/0017/143153/floodplain-management-under-the-WMA-2000-a-guide-to-changes.pdf)

# Attachment A: Floodplain Management Plan areas

## A.1 Lachlan FMP maps

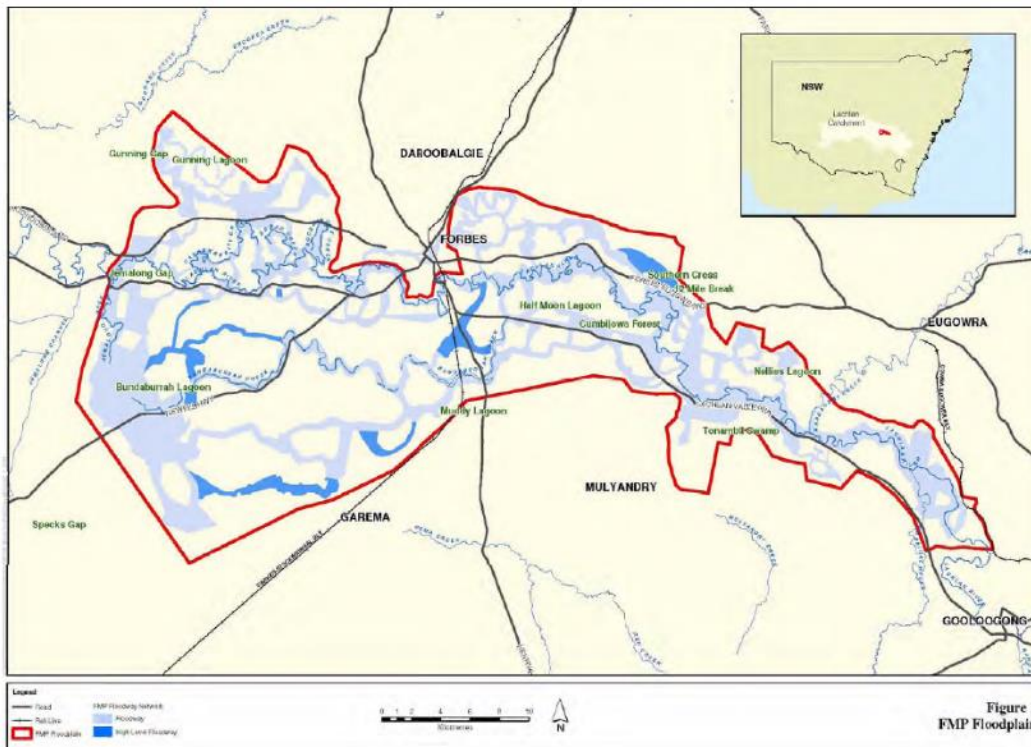


Figure 2. Lachlan River (Gooloogon to Jemalong Gap) 2011 FMP area

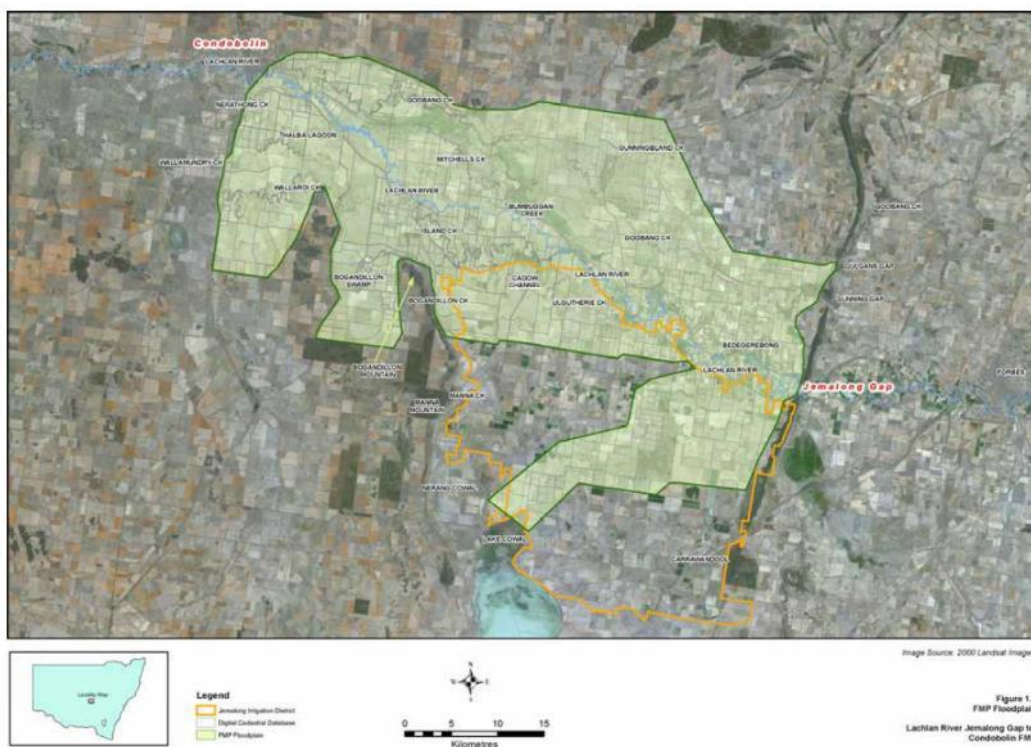


Figure 3. Lachlan River Jemalong Gap to Condobolin FMP area

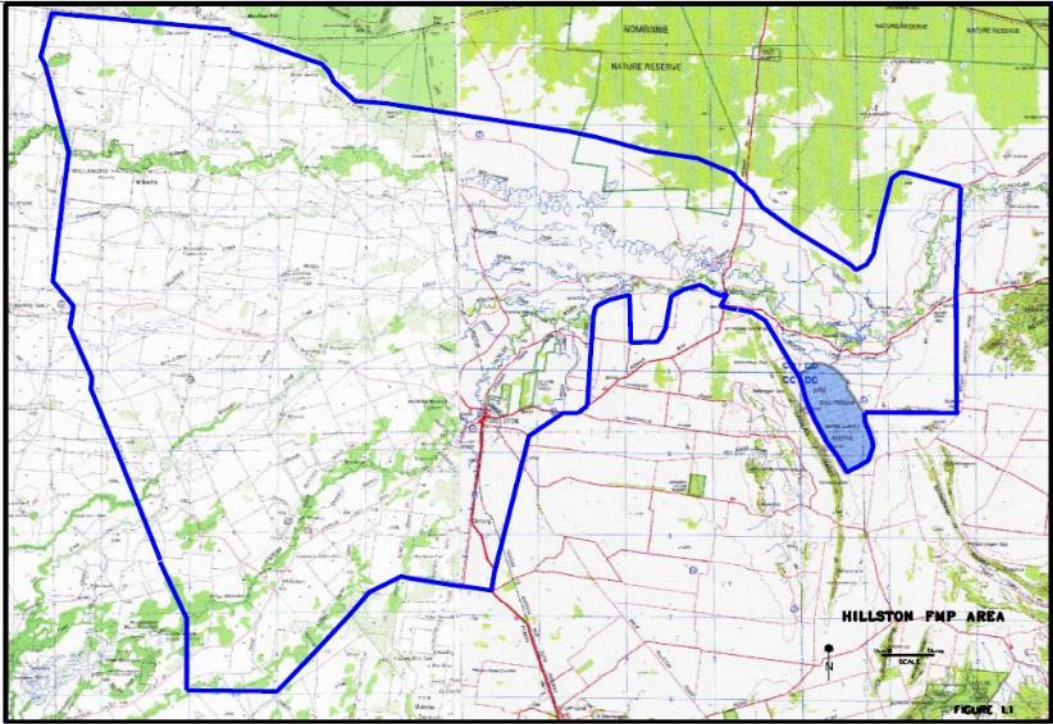


Figure 4. Lachlan River Hillston - Lake Brewster to Whealbah 2005 FMP area

A.2 Murray FMP maps

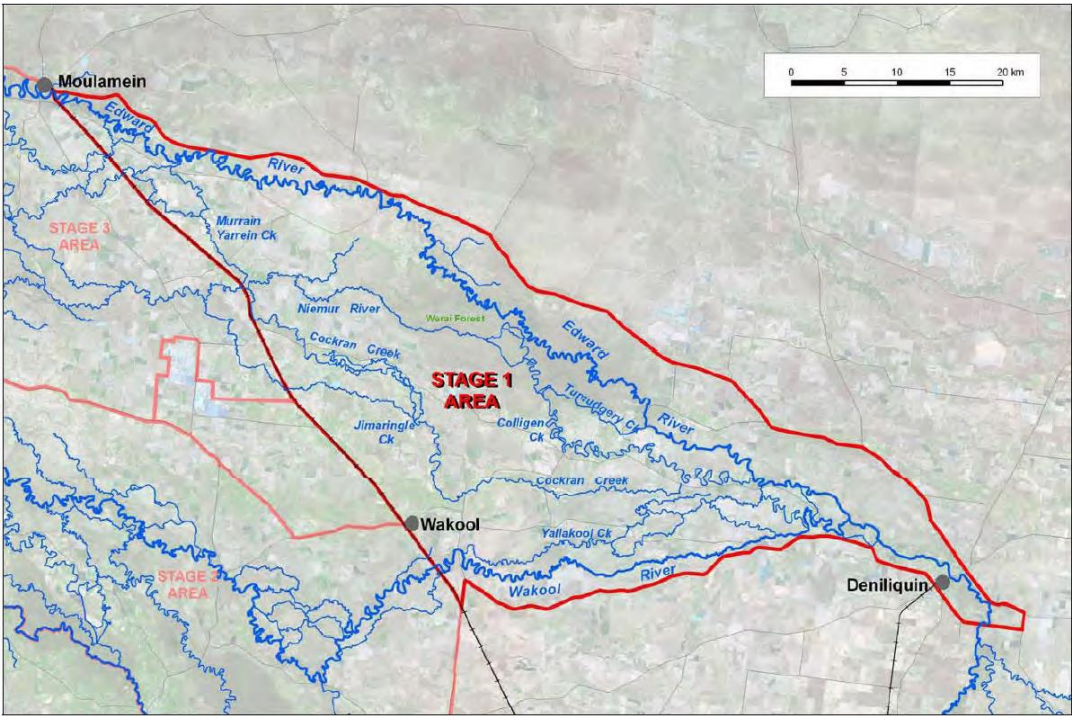


Figure 5. Edward and Wakool Rivers Stage 1 (Deiliquin to Moama-Moulamein Railway) FMP area

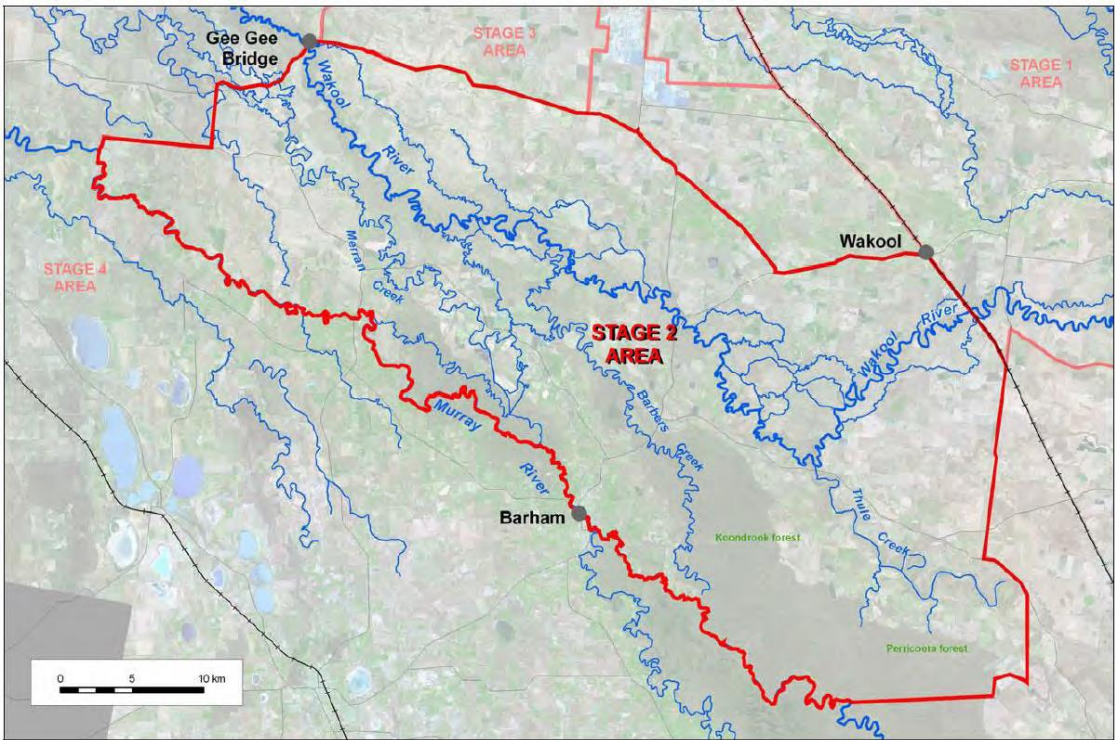


Figure 6. Wakool River Stage 2 (Moama-Moulamein Railway to Gee Gee Bridge) FMP area

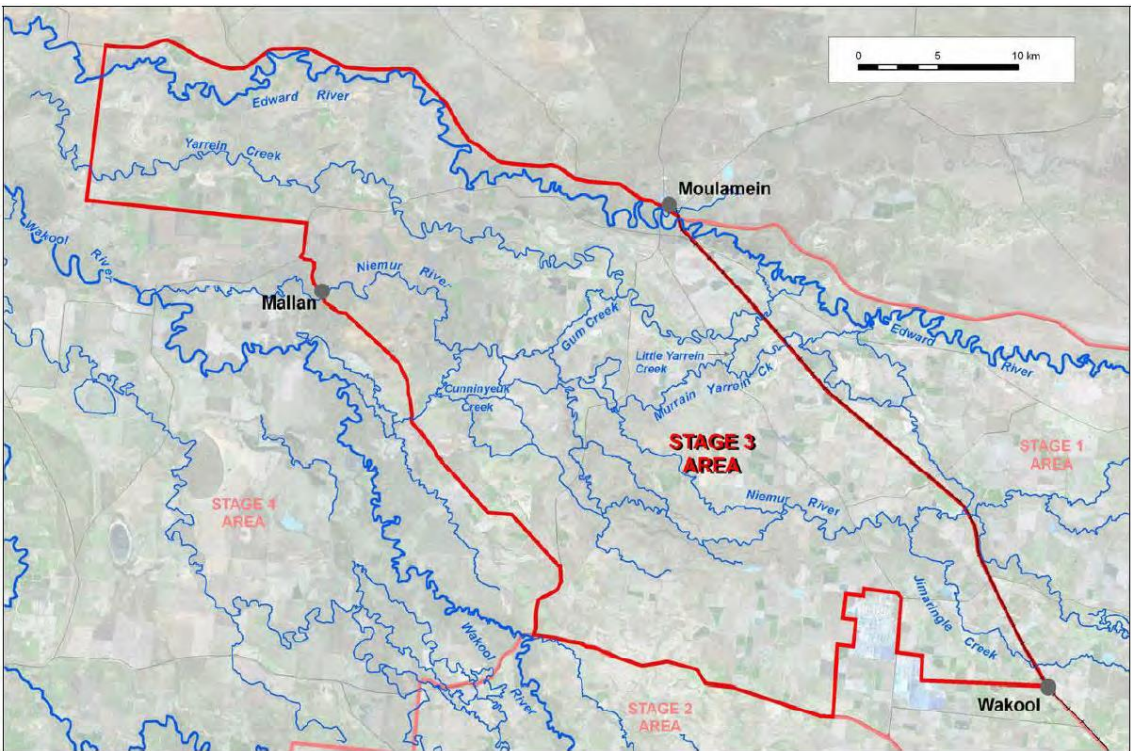


Figure 7. Edward and Niemur Rivers Stage 3 (Moama-Moulamein Railway to Liewah and Mallan) FMP area

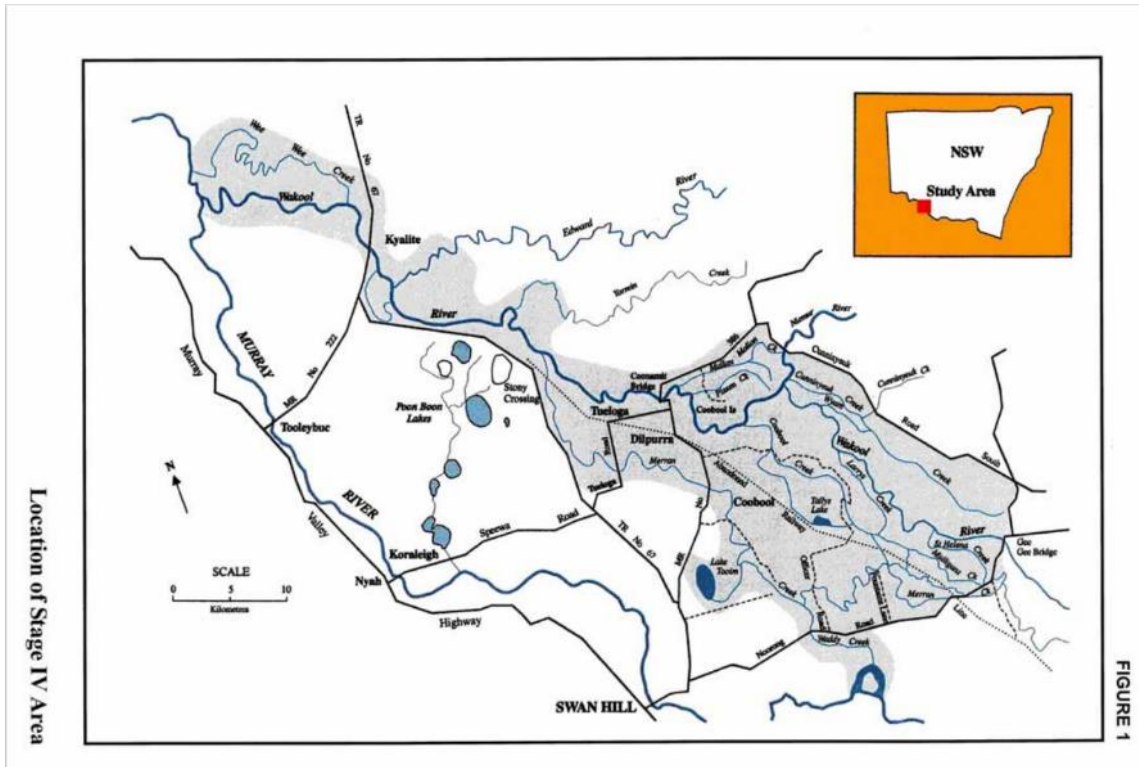


Figure 8. Edward and Niemur Rivers stage 4 (Noorong Rd to Wakool Murray Junction) FMP area

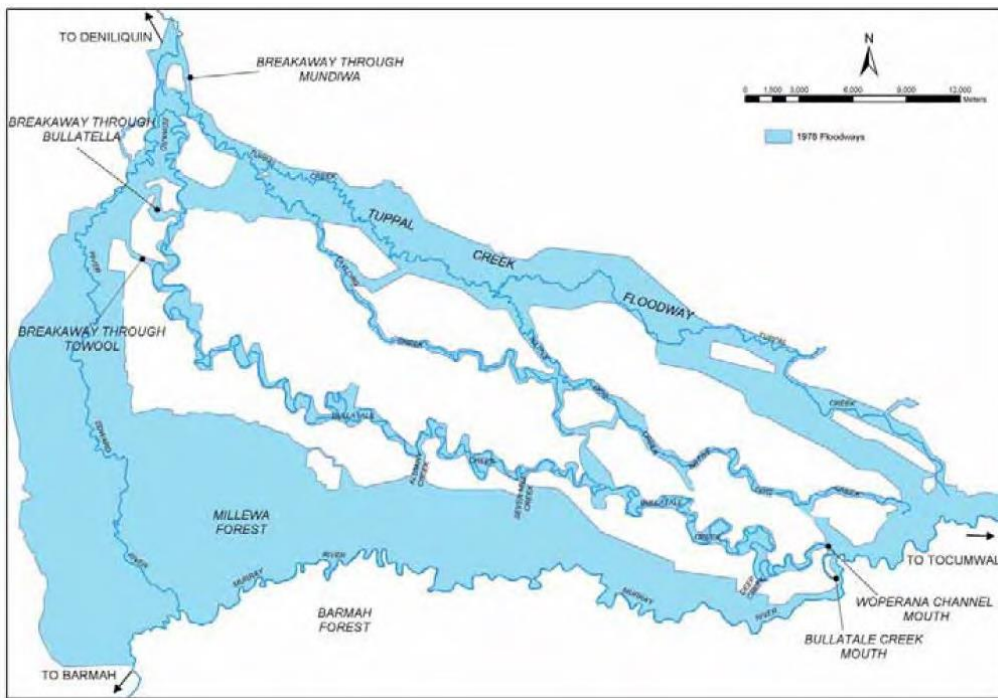


Figure 9. Tuppal and Bullatale Creeks (Murray River uptake to Deniliquin) FMP area



### A.3 Murrumbidgee FMP maps

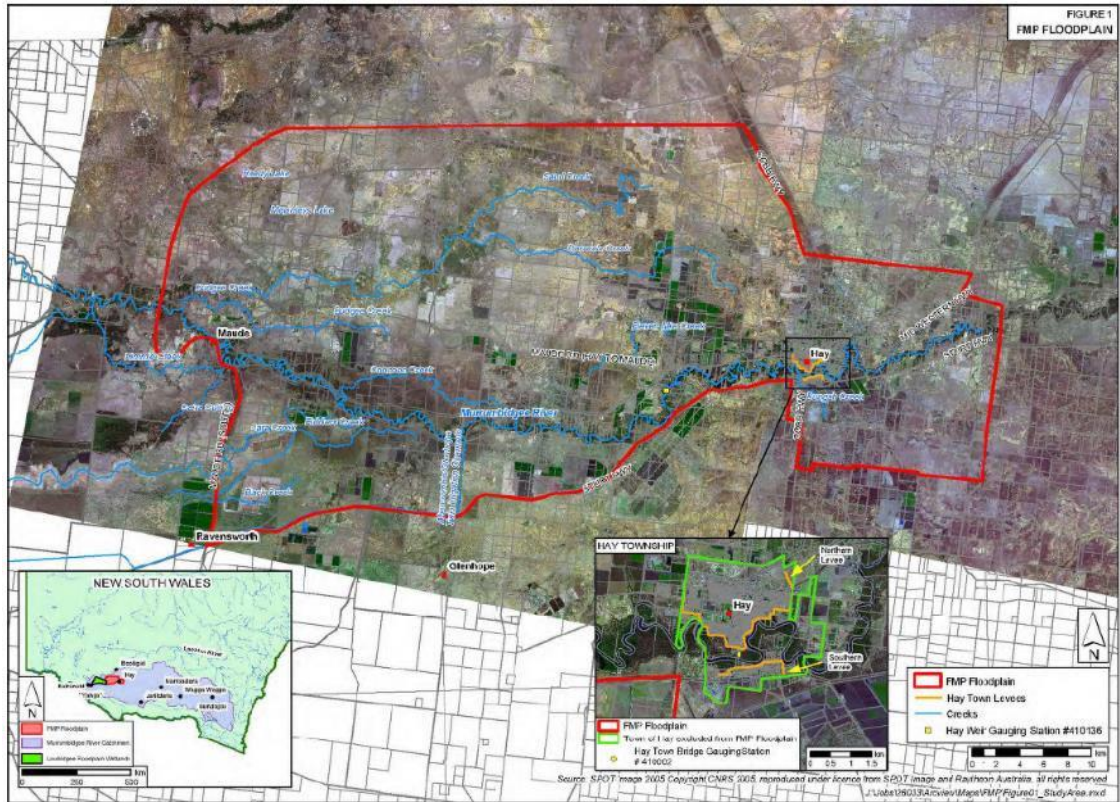


Figure 10. Murrumbidgee River Hay to Maude FMP area

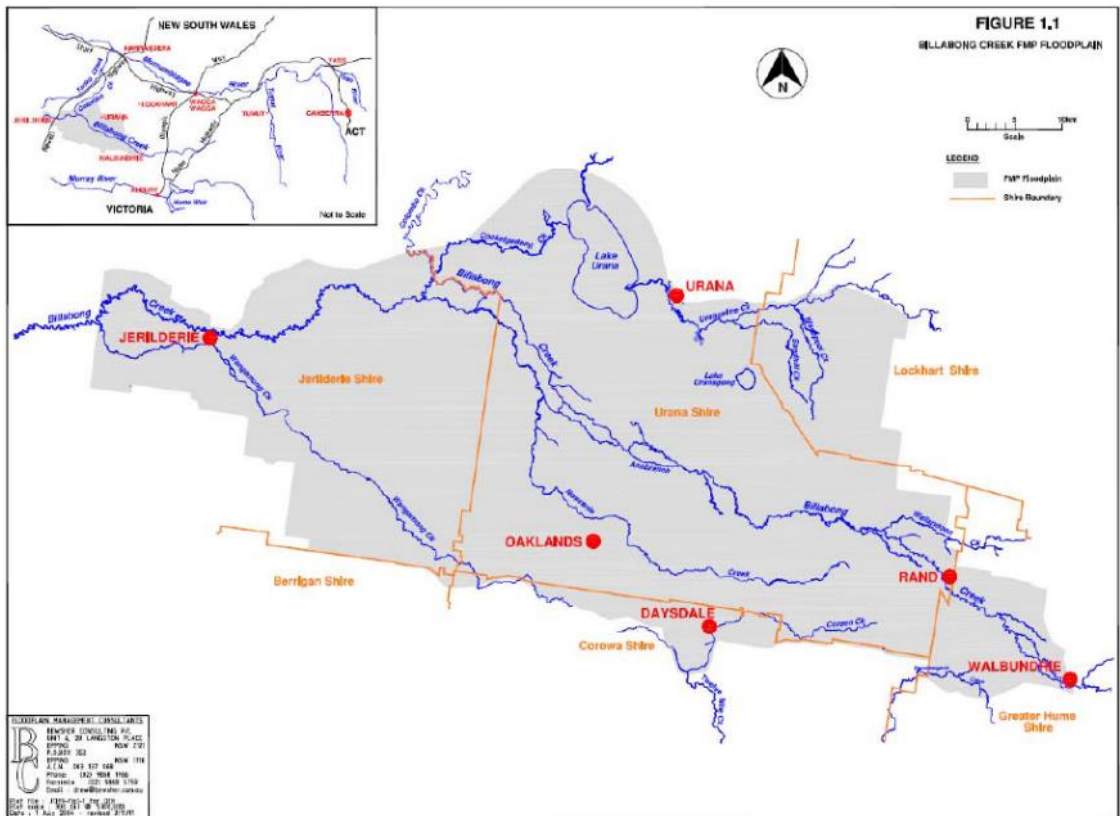


Figure 11. Billabong Creek FMP area

## Attachment B.

### Billabong Creek (Walbundrie to Jerilderie) 2006 – review assessment

#### B.1 Floodplain Management Plan Logic

##### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

	Logic Assessment	Assessment	Evidence	Reference
L1	Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The vision for the management of the Billabong Creek floodplain is as follows: <i>A floodplain managed for the socio-economic interest of the community that provides a healthy and sustainable environment for floodplain ecosystems.</i>	FMP Section 1.1
L2	Does the plan contain objectives (s.35(1)(b))	✓	From the plan (letters added here for mapping): The objectives linked to the above vision statement for the Billabong Creek FMP are as follows: <i>Coordinate floodplain development in order to minimise adverse changes to surface flow patterns.</i> <i>Develop and adopt floodplain management principles and development assessment criteria.</i> <i>Increase the sustainable social, economic, and ecological benefits of using the floodplain; and</i> <i>Improve and maintain the diversity and wellbeing of native riverine and floodplain ecosystems that depend on regular flood inundation.</i>	FMP Section 1.1
L3	Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	Vision statement elements: managed for the socio-economic interest of the community, provides a healthy and sustainable environment for floodplain ecosystems. Socio-economic goals are linked to objective c, with healthy and sustainable ecosystems linked to do. A and b offer methods to achieve the two.	Logic Assessment L1 and L2
L4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	The plan includes a floodway network and a list of criteria, although the linkage is not clear. The criteria are applicable to the whole FMP area, with the floodway network used to assess the hydraulic criteria of the plan and for a comparison for assessments of the success of the plan. Remediation measures are included, with descriptions shifting from 'required' to 'recommended'. Criteria for the assessment of flood work applications are the key strategy, aimed at implementing the four objectives in detail. There is a list of historical, socio-economic, ecological, and hydraulic criteria that is to be used to assess flood work applications.	FMP Section 3, Section 4, Section 5

	Logic Assessment	Assessment	Evidence	Reference
			<p>The language used in the criteria is not specific and is unclear, with work to be compared to predevelopment levels, with no information of a baseline for the levels that should be used, or if predevelopment refers to the time the plan was developed to the conditions of the floodplain at the time of application.</p> <p>There is a list of hydraulic and environmentally focused remedial measure included in the plan linked to existing works in the FMP area. These measures provide detail on works that should be conducted to existing flood works, including timeframes and parties responsible, aimed at improving connectivity in the floodplain and restoring flow to environmental assets. The effectiveness of the list is diminished using suggestive language, as opposed to mandatory language. The list includes a required timeframe for work to be completed but the measures are listed as recommended, or for structures to be reviewed rather than stricter requirements on changing the development.</p>	
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	Performance indicators are not shown in isolation; however, the plan does offer indicators for its success. The plan has monitoring activities included in the required/recommended measures and an appendix outlining additional recommended monitoring activities. The expected environmental impacts links to the monitoring and states the monitoring should be compared to prior conditions, with 'current floodplain conditions ... used as the benchmark'.	FMP Table 5.1, Section 6, Appendix A
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	✗	The performance indicators are specific and measurable in the way that they are described, however the plan does not include detail on the on the 'current floodplain condition' that the indicators are intended to be assessed against.	

### Assumptions

1. Strategies are not clearly linked to the objectives, so links were made by the reviewer
2. The plan does not include the outcomes from the Flood Study or the FRMS, so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective c, d Remediation measures	(2)(e)	Objective c Criteria	(6)(a)	-
(2)(b)	Objective a, c, d Remediation measures, criteria	(2)(f)	-	(6)(b)	Objective a, b Criteria, remediation measures
(2)(c)	Objective a, b Criteria	(2)(g)	Objective c	(6)(c)	Objective b Criteria, remediation measures
(2)(d)	Objective a, b Criteria	(2)(h)	-		

### Recommendations

Finding number	Recommendations	Detail
F1.02	Amend	Update the plan to remove references to the WA 1912. Update to bring up to the Act
F1.03	Amend	Provide clarity around the areas that the assessment criteria are to be used in and the role of the floodway network
F1.06	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable due to the lack of information around the “current conditions”. To ensure that the objectives are being met the plan should include more information about the conditions the plan is to be assessed against.
F1.06	Amend	Extract the performance indicators to a separate section so that they are clearly identified. They are currently difficult to find, which is likely to affect their influence
F1.07	Amend	Update required measures to remove conflicting language and ensure works are mandatory

## B.2 FMP development in accordance with the Provisions

FMP Provisions Assessment Table

Provision	Detail	Assessment (circle one)			Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—					
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✓			<p><u>Frequency:</u> A series of flood events have been listed in the plan, including some return frequency for reference</p> <p><u>Duration:</u> Plan describes the variation in flood duration for the valley</p> <p><u>Nature and extent</u> are shown through the mapping of the floodway network</p>	Detail provided if relatively general and the spatial representation of the floodway is difficult to interpret at a property scale.
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge		○		The expected environmental benefits are shown in Table 6 .1. The table outlines ecological benefits of the plan, with specific reference to wetlands.	Spatial representation of the ecological areas is minimal with no specific information on the assets in the FMP area. No detail on groundwater recharge
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,		○		Specific guidelines for existing unapproved works, linking to ‘original’ criteria (not written as requirements, more suggestions, and it is unclear what the ‘original’ criteria are). Existing approved measures have no assessment criteria, remain approved. Plan includes recommended measures – undermined by use of suggestive language rather than prescriptive/	Existing works are identified as part of the floodway mapping, though very difficult to interpret. Information is included around the assessment of unapproved works. No detail on approved works and the benefits provided.
	(d)	the risk to life and property from the effects of flooding	✓			The socio-economic criteria include reference to the human risks and potential for infrastructure damage from flooding.	
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works		○		The criteria are not specified to only apply to the floodway network, but it is not clearly stated that it applies to the FMP area. Approval process is written in reference to the repealed WA 1912	Referenced to repealed legislation need updating and clarity around where the criteria apply, given the use of zones in other plans

Provision	Detail	Assessment (circle one)			Evidence	Comment
(b)	the modification or removal of existing flood works		○		Some existing works listed in the required/recommended measures. Most of these require the monitoring of flood water to inform potential changes. Only other reference is through the unauthorised works, through the requirements to be constructed in accordance with the approval	No specific reference to general modifications outside the recommended list
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		Summary of expected benefits contain reference to rehabilitation through the natural flow regimes.	Details of the floodplains and ecosystems expected to improve because of the plan are not listed or shown spatially, making assessment of success not possible
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		○		Summary of expected benefits contain reference to rehabilitation through the natural flow regimes.	Details of the floodplains and ecosystems expected to improve because of the plan are not listed or shown spatially, making assessment of success not possible
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		○		Additional inundation of wetlands in the FMP area and downstream are included among the expected environmental impact	Details of the floodplains and ecosystems expected to improve because of the plan are not listed or shown spatially, making assessment of success not possible
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows		○		Downstream flows are noted as expected to improve connectivity to downstream floodplains by allowing the orderly passage of flow through the floodplain. Connectivity within the FMP area also expected to increase ecosystem health	Details of the floodplains and ecosystems expected to improve because of the plan are not listed or shown spatially, making assessment of success not possible
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability			✗	Summary of expected benefits contain reference to rehabilitation through the natural flow regimes. Minimal description of the natural flow regime included	Details of the floodplains and ecosystems expected to improve because of the plan are not listed or shown spatially, nor the natural conditions of the floodplain, making assessment of success not possible
(d)	the control of activities that may affect or be affected by the frequency, duration, nature, or extent of flooding within the water management area		○		Redistribution of flows, control of flow velocities and the hydraulic capacity of the floodplain are included as assessment point in the criteria	Clarity on where the criteria are applied and updates to removed repealed legislation are required
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding			✗	Water quality is listed as an expected beneficiary of the implementation on the Plan though it 'will not have a significant impact' (Table 2). The primary benefit expected to be	The benefit of managing flood characteristics is mentioned but does not appear to have informed the process.

Provision	Detail	Assessment (circle one)			Evidence	Comment
					because of the management of flow velocity reducing erosion and sediment transport	
(f)	other measures to give effect to the water management principles and the objects of this Act			✗	No Aboriginal cultural sites, areas or values of significance were included when developing the plan though it is recognised that they are likely to exist in the FMP area	
(g)	such other matters as are prescribed by the regulations			✗	Not mentioned	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding number	Item	Detail
F1.02	Amend	Remove references to the WA 1912, updating to the Act, including terminology
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.08	Amend	Provide clarity on the natural flood characteristics and the existing conditions flooding including any available flood imagery that would improve the presentation of this information
F1.09	Amend	Include clear detail on the existing works in the FMP area including spatial mapping scalable to the property scale
F1.10	Amend	Include clearer representation of the ecosystems and environmental assets in the FMP and how there are expected to benefit from the implementation of the plan
F1.11	Amend	Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F2.01	Amend	Provide information on the downstream floodplain areas that are expected to benefit from the flow connectivity improvements
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and a review conducted to ensure that their inclusion increases the adequacy and appropriateness of the plan

## B.3 FMP Implementation in accordance with the Provisions

### General findings of the s.44 Audit

These findings are summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of 'whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles'. Note that this s.43 Review has not revisited, extended, or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.
- However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead to a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan was not implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolations may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

### Plan

The Audit Report found that 'the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements ('must', 'shall', 'require'), while others suggest more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed').

The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

### Implementation

The Audit found 'no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.'

There is limited expertise available to support ongoing FMP implementation

Procedures to guide the assessment process:

- are old and in draft form



- do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental, and cultural impact assessment for flood works approval applications

Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.

Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works

No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations to reduce risks of non-compliance

Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out

The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act but were developed under the WA 1912. This has added complexity in their interpretation and implementation.

A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.

The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period

The relevant NSW Government agencies have implemented plan provisions in relation to plan review

FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

## Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements environmental monitoring provisions, and no specific trigger for flood monitoring.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the 'provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review'.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters		
(a)	proposals for the construction of new flood works	✓	Three applications were made in the Audit period. Approval's assessment, granting or refusal and application of conditions were carried out in line with requirements. However, some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out.
(b)	the modification or removal of existing flood works	✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus on the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. The plan contains required modifications that are references as mandatory, but contain a mix of language, including 'recommendations'.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the

Provision	Detail	Assessment	Evidence
	the passage, flow, and distribution of floodwater		delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review.
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data

Provision		Detail	Assessment		Evidence
					<p>Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other.</p> <p>There has been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood events in the area but no assessment against the performance indicators has been completed. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements.</p> <p>The plan does not include environmental monitoring provisions.</p> <p>The plan has no specific trigger for flood monitoring</p>
	(g)	such other matters as are prescribed by the regulations		✘	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Findings number	Item	Detail
F1.03	Amend	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Amend	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying', and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.13	Implement	Implement the recommendations and actions contained in the Audit Report
F2.02	Amend	Inclusion of Environmental monitoring provisions and specific triggers for flood monitoring

## B.4 FMP assessed if adequate and appropriate against the Principles of the Act

Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
5	is the management plan adequate an appropriate for ensuring the	effective implementation of the general principles to;	
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate but not appropriate Criteria for development include hydraulic assessment to protect floodways and the modifications include remediation of flow path to ecosystems within the boundary and to floodplains downstream	Lack of clarity around the rules and where they are enforceable, links to repealed legislation, low quality spatial representations not visible at property scale and use of conflicting language in modifications
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Included but not adequate and appropriate Ecological assessment criteria include a requirement for assessment of impact on habitats, and the restoration of habit areas is listed as an expected outcome from the plan	Ecological requirements are only required to be assessed with no listed measure other than areas should not be 'isolated' leaving a greyscale of uncertainty
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Table 6.1 includes expected water quality benefits linked to management of flow velocity	Water quality is mentioned as an expected beneficiary of the rules relating to flow velocity but was not a driver in the plan development Potential water quality impacts from flood inundation are not mentioned.
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Included but not adequate and appropriate Cumulative impacts are incorporated using 'predevelopment levels', linked to the design flood levels, using levels and redistribution	A lack of clarity over the areas of the plan that are assessed, the use of repealed legislation and a lack of information on 'predevelopment' levels and flow hinders the plans adequacy
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate and appropriate Aboriginal sites are protected under the criteria, though none are identified by the plan and there is an allowance made for NPWS to permit the damage or destruction of a site	With no sites identified by the plan in its development or assessment of benefits the effectiveness is limited. Authority is given to NPWS over the protection of the sites rather than Aboriginal groups. The offence / permit system around cultural heritage surveys, conciliation and 'permit to destroy' remains in the National Parks and Wildlife Act (s.90; Aboriginal Heritage Impact Permit (AHIP)). However, the regulator these days is DPIE EES. DPIE EES operate using guidelines that require Aboriginal engagement, and this should be reflected in the plan
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Not included so not adequate and appropriate  No additional cultural sites identified	
(2)(g)	Maximise social and economic benefits to the community	Included but not adequate and appropriate	

Section	Principle	Step 4 Assessment	Comment
		Maximisation of social and economic benefits is through the protection of property. A mention is made that some development may need to include a cost/benefit analysis, but not details on a trigger	
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Not included so not adequate and appropriate No information has been included for improved understanding of ecological water requirements	
(2)(h)	Apply the principles of adaptive management	Included but not adequate and appropriate Appendix A includes an allowance for changes to be made to the FMP based on the review process, but monitoring is suggested and no possible triggers for amendment are included	
	and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:		
(6)(a)	Avoid or minimise land degradation from floodplain management (i.e., flood works)	Adequate but not appropriate Monitoring suggestions are included for erosion and siltation. Flow velocity criteria includes the restriction to velocities that will not 'significantly' increase erosion and siltation with maximum velocities included	
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Adequate but not appropriate Assessment criteria for hydraulic impacts are based around the changes that will be made to nearby properties	Assessment and approval criteria linked to repealed legislation and the data around the baseline hydraulic is hard to decipher and enforce
(6)(c)	Minimise existing and future risk to human life and property from occupation of floodplain	Adequate but not appropriate Impacts to human life and property are the major factors used in the assessment criteria	Assessment and approval criteria linked to repealed legislation and the data around the baseline hydraulic is hard to decipher and enforce

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Remove linkages to repealed legislation and contain the information and assessment requirements in the plan
F1.07	Amend	Update the language in the plan to ensure that they include mandatory requirements rather than recommendations or suggestions
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.10	Amend	Provide clear spatial representation of ecosystems in the FMP area and the floodway network at a property scale, including information on hydraulic characteristics that are used in assessments
F1.11	Amend	Conduct a study into the areas of cultural and Aboriginal significance and ensure the plans floodway network and criteria are protecting these assets. This should include engagement with Aboriginal Peoples and representative organisations
F1.13	Amend	Inclusion of a social and economic evaluation and impacts

F1.16	Amend	Addition of the Flood Study and FRMS as appendices
F2.02	Amend	Include provisions for updates to the plan triggered by monitoring, flood events, model updates and climate change impacts

## B.5 Consultation to assess the FMP

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)

Item	Description	Source
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

#### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

#### General Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)

#### Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend the plan to include clear, implementable rules that are not open to interpretation, and improve clarity of information as ease of understanding
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale
F1.06	Amend	Amend objectives to make them more in line with the Act.
F1.07	Amend	Amend to update the language to make it mandatory
F1.07	Amend	Amend the plan to include a clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F1.14	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area

## B.6 Synthesis of Results



## General findings

Having been developed under the provisions of the Water Act as a water management strategy rather than an FMP the plan requires amendments to bring it into line with the Act. Overall, the plan is not clear in its information leaves itself open to varied interpretation, reducing its effectiveness.

The area of the floodway network is included in the plan but is not clear as to its boundaries and is not able to be zoomed.

The criterion for assessment is vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear.

The plan includes several hydraulic and environmental required remedial measures to existing works aimed at improving connectivity through the floodway. The language in the remedial measures is not mandatory, vastly reducing the effectiveness and making them harder to enforce.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Overall, the foundations for an adequate and appropriate plan are there, but requires increased clarity on where the rules are applicable, and how the rules are applied are needed for the plan to be effective. The remediation works requires updating to include mandatory language, and some investigation should be done as to the budget implications for items that have not been implemented and now the responsibility of DPIE Water.

Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included.

The plan also requires update to remove reference to the repealed WA 1912 and is processes and terminology updated to the Act.

Following the review, **the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the Act.** The review details a number of amendments that can be made following the 5-year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

## Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove references to the Water Act 1912, updating to the Act, including terminology
F1.03	Amend	Provide clarity around the areas that the assessment criteria are to be used in and the role of the floodway network through better spatial mapping. Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater

Finding Number	Recommendations	Detail
F1.06	Amend	Extract the performance indicators to a separate section so that they are clearly identified. They are currently difficult to find, which is likely to affect their influence. The s.35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable due to the lack of information around the "current conditions". To ensure that the objectives are being met the plan should include more information about the conditions the plan is to be assessed
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying', and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.08	Amend	Provide clarity on the natural flood characteristics and the existing conditions flooding including any available flood imagery that would improve the presentation of this information
F1.09	Amend	Include clear detail on the existing works in the FMP area including spatial mapping scalable to the property scale
F1.10	Amend	Include clearer representation of the ecosystems and environmental assets in the FMP and how there are expected to benefit from the implementation of the plan
F1.11	Amend	Conduct a study on the areas of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.13	Amend	A social and economic evaluation should be conducted to the FMP areas and the inclusion of inclusion of a social and economic evaluation and impacts in the approval assessment.
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F2.01	Amend	Provide information on the downstream floodplain areas that are expected to benefit from the flow connectivity improvements
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and a review conducted to ensure that their inclusion increases the adequacy and appropriateness of the plan
F2.02	Amend	Inclusion of Environmental monitoring provisions and specific triggers for flood monitoring. Include provisions for updates to the plan triggered by monitoring, flood events, model updates and climate change impacts

## Attachment C. Edward and Niemur Rivers Moama-Moulamein Railway to Liewah and Mallan (Stage 3) 2011

### C.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered

Logic Assessment		Assessment	Evidence	Reference
L1	Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The vision for the Stage 3 FMP is: <i>to design a floodway network capable of transmitting the design flood volume, that minimises the social and economic impact of flooding, while maximising environmental watering within the floodplain where practically and economically possible.</i>	FMP Section 1.1
L2	Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added for mapping): The objectives linked to this vision statement are: <i>to achieve a coordinated, balanced approach to floodplain management, taking into account hydraulic, environmental and economic considerations, and legislative requirements to ensure the sustainable and equitable use of floodplain resources.</i>	FMP Section 1.1
L3	Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	The objectives are consistent with the vision statement without providing any further detail. More of a rewording rather than expanding on the statement	Logic assessment L1 and L2
L4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	Plan utilises a floodway network, environmental improvement, and assessment criteria as strategies to achieve the objectives. Assessment criteria is linked to a designated floodway and is reliant on the processes within the repealed WA 1912. Additional improvement requirements are included, linked to hydraulic and environmental outcomes. The floodway network was designed to provide the basis for determining flood work applications but outlining the area required to convey flood flows. The area was determined using the 1956 flood event (considered at the time to be the 1 in 100 yr. event) allowing records of flood levels and inundation areas combined with hydraulic modelling to delineate a floodway network. Environmental requirements were also considered with flood dependant ecosystems and the flow paths required to provide flood water to them included within the area. The formulation of a floodway network allows the plan to differentiate between complying and non-complying works as designated by <i>Part 8 of the WA 1912</i> . There are a set of assessment criteria included that link to the floodway network. The assessment process is dependent on the repealed WA 1912 and the criteria are designed to be used in that process. The criteria required assessments to be made on the potential impacts on FDEs, flood behaviour and the practicality of the flows in the area being restored rather than set, measurable criteria that 'must' be met for the works approval. This lack of mandatory language undermines the authority of the plan and its flood work assessment.	FMP Sections 6, 7 and 8

Logic Assessment		Assessment	Evidence	Reference
			The required hydraulic and environmental improvements included cover areas within the FMP area that have been identified. These cover works within the floodplain that effect flood flow characteristics, floodplain storage or the conveyance of flood water to flood dependant ecosystems. These improvement areas are clearly written, with responsibilities and timeframes clearly articulated, however the authority behind them resides with the <i>WA 1912</i> , making their effective application potentially hard to implement. There are also some that are split responsibilities with little clarity on who is the ultimate holder of the responsibility if agreements cannot be made. There are a number that have been assigned to the Wakool Shire Council or former government departments with a general reference to potential funding sources.	
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	Two performance indicators are included, flood control works are to comply with the criteria, and 'adequate' performance in a flood event. A list of hydraulic, environmental and economic guides is included that 'should be taken into account' when assessing the performance indicators	FMP Section 8
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	✗	The performance indicators include non-mandatory language such as 'should' and have non-specific, non-measurable indicators such as 'perform adequately' that are subjective in their application	FMP Section 8

### Assumptions

Strategies are not clearly linked to the objectives, so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS, so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective a, b Floodway, criteria, required improvements	(2)(e)		(6)(a)	Objective a,b Floodway, criteria, required improvements
(2)(b)	Objective a, b Floodway, criteria, required improvements	(2)(f)		(6)(b)	Objective a,b Floodway, criteria, required improvements
(2)(c)		(2)(g)	Objective a, b Floodway, criteria, required improvements	(6)(c)	
(2)(d)	Objective a, b	(2)(h)			

## Recommendations

No.	Recommendations	Detail
F1.02	Amend	Remove references to the WA 1912, updating to the Act, including terminology
F1.06	Amend	Revision of the objectives to provide more detail rather than paraphrasing the vision statement
F1.07	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable Redevelopment on the performance indicators to include specific and measurable targets with mandatory monitoring language

## C.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment	Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—			
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	○	<p>Flooding characteristics provided at a sub-basin and catchment scale. Influences on causes of flooding in the FMP from the surrounding areas is included.</p> <p><u>Frequency</u>: the ten largest events on record for the FMP area included, showing peak height and flow</p> <p><u>Nature</u>: Some detail on breakouts of floodwater into smaller branches that feed the floodplain provided</p> <p>No detail on duration or extend of previous flooding, with no distinction between natural and existing regimes</p>	No detail on natural flooding, and no spatial representation of the extent of flooding in the area More detail held in the FRMS
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	<p>Details provided on the floodplain environment described in the plan. Expected environmental impacts of the plan are outlined with special consideration given to wetlands, FDEs and groundwater recharge</p>	No spatial representation of FDEs More detail held in the FRMS
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,	✓	<p>Existing works are identified under hydraulic and environmental improvement requirements, including priority levels linked to timeframe requirements and identified responsibilities</p>	Existing works are not all mapped in the plan, just those identified for improvement More detail held in the FRMS

Provision		Detail	Assessment			Evidence	Comment
	(d)	the risk to life and property from the effects of flooding			✗	Risk to life and property identified in the plan as informing the FRMS that informed the FMP.	Not dealt with directly in the FMP
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works		○		Plan utilises the floodway network to inform the approval criteria, however this is linked to the repealed WA 1912	Approval process is based on the repealed Part 8 WA 1912 process and linked to floodway mapping that is not able to be zoomed to a property scale
	(b)	the modification or removal of existing flood works		○		Dealt with through the environmental and hydraulic improvement requirements that specify responsibility a timeframe. Unapproved work to be assessed under the criteria linked to the repealed WA 1912.	Approved worked not covered by the improvement requirements not listed or mapped
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		The plan identifies the required hydraulic and environmental improvements and the floodway network protection as the strategy for restoring and rehabilitating ecosystems. They combine to restore and protect existing pathways, The summary of expected benefits outlines the wetlands, FDEs and habitats expected to benefit and improve because of the plan. These are articulated as general areas or types and not linked to specific locations Downstream benefits are described as benefiting the Stage 4 FMP area (assessed separately).	Protections are linked to repealed legislation that requires updating. Required improvements indicate clear requirements, responsibilities, and timeframes for the remediation Wetlands, ecosystem areas and habitats are not mapped
	(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		○			
	(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		○			
	(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows		○			
	(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability		○			
	(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area		○		The plan utilises the floodway network and criteria to reduce the changes to flood characteristics that can affect the frequency, duration, nature, or extent of flooding	The assessment that are linked to flood characteristics are linked to the repealed WA 1912 and need to be updated

Provision	Detail	Assessment	Evidence	Comment	
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		✗	Water quality is listed as an expected beneficiary of the implementation on the Plan though it 'will not have a significant impact' (Table 6.1). The primary benefit expected to be because of the management of flow velocity reducing erosion and sediment transport	The benefit of managing flood characteristics is mentioned but does not appear to have informed the process.
(f)	other measures to give effect to the water management principles and the objects of this Act		✗	No Aboriginal cultural sites, areas or values of significance were included when developing the plan though it is recognised that they are likely to exist in the FMP area	The performance of the plan and its objectives is described as the strategy for dealing with the s30(f) requirements
(g)	such other matters as are prescribed by the regulations		✗	None	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding Number	Item	Detail
F1.02	Amend	Remove references to the WA 1912, updating to the Act, including terminology
F1.03	Amend	Provide mapping of the floodway network that can zoom to a property scale
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.09	Amend	Include clear detail on the existing works in the FMP area
F1.10	Amend	Include specific identification of the environmental assets in the FMP area
F1.11	Amend	Conduct an engagement study on the area's sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and a review conducted to ensure that they increase the adequacy and effectiveness of the plan

## C.3 FMP Implementation in accordance with the Provisions

### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of ‘whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles’. Note that this s.43 Review has not revisited, extended, or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.
- However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan was not implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolations may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

### Plan

- The Audit Report found that ‘the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

### Implementation

- The Audit found ‘no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.’
- There is limited expertise available to support ongoing FMP implementation



- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental, and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act38 but were developed under the WA 1912. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

#### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the ‘provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing

Provision	Detail	Assessment			Evidence
					decision making for FMP implementation, or to inform the five-year plan review'. The plan did not include a specific t
	(b) the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge		✗		The Audit found that the 'provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review'.
	(c) the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts		✗		Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
	(d) the risk to life and property from the effects of flooding		✗		The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters				
	(a) proposals for the construction of new flood works	✓			One application was made in the Audit period. Approval's assessment, granting or refusal and application of conditions were carried out in line with requirements. However, some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out.
	(b) the modification or removal of existing flood works		✗		Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus on the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood events in the area but no assessment against the performance indicators has been completed.
	(c)(i) restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		✗		Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
	(c)(ii) restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		✗		Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review

Provision	Detail	Assessment	Evidence
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring nor environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant, or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other. The plan has no specific trigger for flood monitoring

Provision	Detail	Assessment	Evidence
(g)	such other matters as are prescribed by the regulations	✘	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

## Recommendations

Finding number	Item	Detail
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Act, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report

## C.4 FMP assessed if adequate and appropriate against the Principles of the Act

### 4.1 Water Management Principles Assessment Table

Section	Principle	Assessment	Comment
	is the management plan adequate and appropriate for ensuring the effective implementation of the general principles to;		
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate but not appropriate Watercourses aim to be protected through the criteria, and restored through the required improvements	Linkage to repealed legislation undermines the assessment method. Some possibilities for inclusion of new information through the non-specific elements of Section 8
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Included but not adequate and appropriate Environmental assessment criteria include a requirement for assessment of impact on habitats, and the restoration of habitat areas is listed as an expected outcome from the plan	Ecological requirements are only required to be assessed with no listed measure other than areas should not be 'isolated' leaving a greyscale of uncertainty
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Table 6.1 includes expected water quality benefits linked to management of flow velocity	Water quality is mentioned as an expected beneficiary of the rules relating to flow velocity but was not a driver in the plan development Potential water quality impacts from flood inundation are not mentioned.
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Not included so not adequate and appropriate The plan does not include any specific requirements regarding cumulative impacts	
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate and appropriate	Sites are mentioned but are not included in the development of the plan

Section	Principle	Assessment	Comment
		Sites are considered to be protected using indicator vegetations rather than identifying the sites themselves. Some damage to Aboriginal cultural locations is expected.	
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Adequate and Appropriate Only one cultural asset was identified in the plan and the plan is not expected to impact this location	The plan included community consultation in its development and as a monitoring method so any future cultural sites are more likely to be identified
(2)(g)	Maximise social and economic benefits to the community	Adequate but not appropriate The social and economic benefits are expected to be achieved thorough the reduction in flood damage in the FMP area and is included in the recommended monitoring	No measures have been identified to maximise social and economic outcomes
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Adequate and Appropriate The overarching statement of 'changes to factors that influence decisions' as a trigger for amendments to the plan is non-restrictive and should allow for changes resulting from monitoring and ecological information	
(2)(a)	Apply the principles of adaptive management	Adequate but not appropriate Allowances have been made for the plan to be updated due to triggers from major flooding, land use change, impediments to implementation and climate change allowing the plan to adapt to changes in influences on decision making	
	and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:		
(6)(a)	Avoid or minimise land degradation from floodplain management (i.e., flood works)	Adequate but not appropriate The plain identifies management of flow velocities as the strategy of reducing erosion. The maintaining of the floodway is expected to allow the continues benefits of flooding, including moisture recharge, nutrient transport, and the related benefits	
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Adequate but not appropriate The criteria used to assess applications in the floodplain assesses the impacts on flood flows resulting from the flood works.	Assessment and approval criteria linked to repealed legislation and the data around the baseline hydraulic is extremely hard to decipher and enforce. Criteria are non-specific, assessing 'significant increase' or 'significant redistribution'
(6)(b)	Minimise existing and future risk to human life and property from occupation of floodplain	Included but not adequate and appropriate The plan identifies the risks to human life and property as a key informer for the plan, based on the information in the FRMS and FS	The plan identifies the risk to life and property through the FRMS, which should be included in the plan

## Recommendations

Finding Number	Item	Detail
F1.03	Amend	Provide clear spatial representation of ecosystems in the FMP area and the floodway network at a property scale, including information on hydraulic characteristics that are used in assessments
F1.04	Amend	Include specific criteria regarding the cumulative impacts of development in the floodplain
F1.07	Amend	Update the criteria for assessment to include specific and measurable changes to flood characteristics, rather than vague language like 'significant'
F1.08	Amend	Inclusion of existing works details and mapping to the plan
	Amend	Inclusion of a socio-economic evaluation and impacts
	Amend	Addition of the Flood Study and FRMS as appendices

## C.5 Consultation to assess the FMP

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC

Item	Description	Source
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

### Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)
- Lack of implementation and commitment of resources for the improvement of the plans (1 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend objectives to make them more in line with the Act.
F1.03	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area. Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale

F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
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## C.6 Synthesis of Results

### General findings

The plan is a fairly well written water resource plan with the strategies for achieving the objectives easy to find. The mandatory actions included regarding hydraulic and environmental issues are clear, assigned to responsible parties and timeframes. However, some split the responsibility with no clarity on how the split is divided and no sources or funding assigned to their remediation.

The floodway network is clear in its methodology however with basic mapping that is not able to be zoomed to locate boundaries and effected areas, there remains ambiguity on its exact locations. The floodway is linked to an assessment method and criteria; however these are based on the repealed Water Act 1912 (forming the foundation of the required modifications) that needs to be updated to the Act for it to be truly effective. The criterion for assessment is also vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Overall, the foundations for an adequate and appropriate plan are there, but requires increased clarity on where the rules are applicable, and how the rules are applied are needed for the plan to be effective. The plan requires updating to include mandatory language, and some investigation should be done as to the budget implications for remediation items that have not been implemented and now the responsibility of DPIE Water.

Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included. The plan also requires update to remove reference to the repealed Water Act 1912 and its processes and terminology updated to the Act.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the Act. The review details a number of amendments that can be made following the 5-year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

### Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove references to the Water Act, updating to the Act, including terminology
F1.03	Amend	Provide mapping of the floodway network that can zoom to a property scale. Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater

Finding Number	Recommendations	Detail
F1.06	Amend	Revision of the objectives to provide more detail rather than paraphrasing the vision statement. The s.35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable. Redevelopment on the performance indicators to include specific and measurable targets with mandatory monitoring language
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Act 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.09	Amend	Include clear detail on the existing works in the FMP area
F1.10	Amend	Include specific identification of the environmental assets in the FMP area
F1.11	Amend	Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and a review conducted to ensure that they increase the adequacy and effectiveness of the plan
F3.01	Amend	The plan should be amended to ensure the inclusion of Environmental monitoring provisions and specific triggers for flood monitoring

## Attachment D. Edward and Wakool Rivers Deniliquin to Moama-Moulamein Railway (Stage 1) 2011

### D.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

Logic Assessment	Assessment	Evidence	Reference
L1 Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The vision for the Stage 1 FMP is: <i>to design a floodway network capable of transmitting the design flood volume, that minimises the social and economic impact of flooding, while maximising environmental watering within the floodplain where practically and economically possible.</i>	FMP Section 1.1
L2 Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added here for mapping): The objectives linked to this vision statement are: <i>to achieve a coordinated, balanced approach to floodplain management, taking into account hydraulic, environmental and economic considerations, and legislative requirements</i> <i>to ensure the sustainable and equitable use of floodplain resources.</i>	FMP Section 1.1
L3 Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	The objectives are vague and difficult to directly link. They link in a generalised way but lack detail that would provide more substance to the vision statement	Logic Assessment L1 and L2
L4 Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	The strategies employed by the plan to achieve the objectives are the development of a floodway network that is used to categorise complying and non-complying work under the WA 1912, a set of criteria that is applicable for non-complying works and a list of hydraulic and environmental improvements. The plan designates a floodway network for the basis for determining flood work applications in the FMP area. The floodway network is outlined using historical data and model outputs for the 1975 design flood. This event was chosen as the 15–20-year ARI was considered to be of an appropriate magnitude and represents a reasonable compromise between flood protection and the economic impacts. Works in the floodway network are considered to be non-complying under <i>Part 8 of the WA 1912</i> and are required to undergo assessment against criteria included in the plan. The criteria requires assessments to be conducted without stringent requirements listed that can be applied. This creates uncertainty around the applicability of the criteria and makes it open to interpretation. The plan includes required modifications for flood works in the plan area that hinder natural flood behaviour, including a description of the issue, actions required, a priority level that is linked to timing and the parties responsible. Some of these are only amendments to the plan and should be considered by DPIE Water	FMP Sections 3 to 7

Logic Assessment		Assessment	Evidence	Reference
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	The performance indicators in the plan are that flood control works in the FMP area comply with the criteria and that the floodway network is performing adequately in flood events. There are also hydraulic, environmental, and economic objectives that should be taken into account when assessing the criteria	
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	✗	The criteria are vague in their descriptions and use non-measurable language. The addition of objectives that should be taken into consideration creates more uncertainty about how they would be measured	

### Assumptions

Strategies are not clearly linked to the objectives, so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS, so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective a, b Floodway, criteria, required improvements	(2)(e)		(6)(a)	Objective a,b Floodway, criteria, required improvements
(2)(b)	Objective a, b Floodway, criteria, required improvements	(2)(f)		(6)(b)	Objective a,b Floodway, criteria, required improvements
(2)(c)		(2)(g)	Objective a, b Floodway, criteria, required improvements	(6)(c)	
(2)(d)	Objective a, b	(2)(h)			

## Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove references to the Water Act, updating to the Act, including terminology
F1.06	Amend	Amend the objectives to provide more detail, with more specific goals that expand on the vision statement
F1.07	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies' (s35(1)(d)).

## D.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment	Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—			
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	○	<p>Flooding characteristics provided at a sub-basin and catchment scale. Influences on causes of flooding in the FMP from the surrounding areas is included.</p> <p><u>Frequency</u>: the ten largest events on record for the FMP area included, showing peak height and flow</p> <p><u>Nature</u>: Some detail on breakouts of floodwater into smaller branches that feed the floodplain provided</p> <p>No detail on duration or extend of previous flooding, with no distinction between natural and existing regimes</p>	No detail on natural flooding, and no spatial representation of the extent of flooding in the area More detail said to be held in the FRMS
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	Groundwater recharge is expected to be proportionate the area protected for flood flows but no specific detail in groundwater recharge	
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,	○	Some existing unapproved works in the flood plain have been considered through the required improvement works. The assessment on unapproved existing works is under the assessment criteria	The criteria and assessment process are linked to the repealed <i>Water Act 1912</i> . The plan does not include information for approved works, and there is no spatial identification of the existing works in the floodplain

Provision		Detail	Assessment		Evidence	Comment	
	(d)	the risk to life and property from the effects of flooding		○		The risks to life and property are included in the plan, with most of the detail being held in the FRMS. The plan includes specific allowances for flood protection of high value infrastructure.	Reference is made to the FRMS where the risks are said to be covered in detailed
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works		○		The plan outlines an application process linked to Part 8 of the <i>Water Act 1912</i> . Works that require approval are described as ‘under Part 8’. The plan contains criteria for works requiring approval, and within the floodway network developed.	Approval process is based on the repealed Part 8 <i>Water Act 1912</i> process and linked to floodway mapping that is not able to be zoomed to a property scale
	(b)	the modification or removal of existing flood works		○		Dealt with through the environmental and hydraulic improvement requirements that specify responsibility a timeframes. Unapproved work to be assessed under the criteria linked to the repealed <i>Water Act 1912</i> .	Approved worked not covered by the improvement requirements not listed or mapped
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		FDEs in the FMP area were assessed through a desktop assessment of survey data, prior research and satellite imagery. Improvement measures were then identified that would restore floodwater access or ensure current access is maintained. Improvements include responsibilities and timeframes for implementation	Ecological assets are not mapped in the plan. More detail is provided in the <i>Compendium of Data Report</i> (SMEC 2003) and the FRMS.
	(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✓			The required improvements are the strategy for reinstating dominant floodways and their exits that would restore and rehabilitate land	
	(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		○		Hydraulic improvements included in the plan aim to restore flood levels and velocities in the FMP area. The improvements include clear instruction, responsibilities and timeframes	Some requirements linked to the repealed <i>Water Act 1912</i> . Based on idea that flood works in the floodway are not permitted unless shown to not result in significant adverse impacts
	(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows		○		The plan is developed to ensure that the maintenance of the floodway network will allow the passage of flow into the stage 2 and stage 3 areas. As all FMPS have been developed in the same way it can be assumed that providing	Approval criteria linked to the repealed <i>Water Act 1912</i> .

Provision	Detail	Assessment			Evidence	Comment
					these flows will provide the benefits outlined in the downstream plans	
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✓			The improvement works are designed to reinstate flow to FDEs that have had access reduced due to the development.	
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area		○		The criteria used in the assessment of flood works restrict redistribution of flows, velocities and depths that influence the frequency, duration, nature or extent of flooding.	Approval criteria linked to the repealed <i>Water Act 1912</i> . Erosion criteria link to land use thresholds not included in the plan
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		○		Plan states that it will not have significant impacts on water quality outside of reduced erosion sediment transport and agricultural chemical contamination from inundation	
(f)	other measures to give effect to the water management principles and the objects of this Act		○		No Aboriginal cultural sites, areas or values of significance were included when developing the plan though it is recognised that they are likely to exist in the FMP area	
(g)	such other matters as are prescribed by the regulations			✗	Plan states that 'currently no matters have been prescribed by the regulations'	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding Number	Item	Detail
F1.02	Amend	Remove references to the WA 1912, updating to the Act, including terminology and clear instructions for flood work assessment
F1.04	Amend	Inclusion of water quality provisions, such as blackwater prevention
F1.11	Amend	Conduct an engagement study on the areas sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.16	Amend	Inclusion of the Flood Study, FRMS and Compendium of Data Report as attachments to the plan and review to ensure that the increase the adequacy and appropriateness of the plan

### D.3 FMP Implementation in accordance with the Provisions

### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. Note that the assessment has been conducted as a pass/fail test. No partial marks were considered. The Review summarises the findings here in order to inform the review of ‘whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles’. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to implement the principles.
- However, the plan may be adequate and appropriate to implement the principles even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan wasn’t implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

### Plan

- The Audit Report found that ‘the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

### Implementation

- The Audit found ‘no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.’
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form



- do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act<sup>38</sup> but were developed under the *Water Act 1912*. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

#### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the ‘provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review’. The plan includes no specific trigger for flood monitoring.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard	✗	The Audit found that the ‘provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit

	to wetlands and other floodplain ecosystems and groundwater recharge				period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review'.
(C)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts		✗		Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding		✗		The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters				
(a)	proposals for the construction of new flood works			NA	No applications were received during the s.44 Audit period
(b)	the modification or removal of existing flood works		✗		Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There is evidence that unauthorised works may have been constructed in the FMP area, with the Audit recommending further investigations. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood events in the area but no assessment against the performance indicators has been completed.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		✗		Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		✗		Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		✗		Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in		✗		Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network

	particular in relation to downstream water flows			allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability		✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area		✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act		✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other. The plan contains no specific trigger for flood monitoring
(g)	such other matters as are prescribed by the regulations		✗	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

## Recommendations

Finding Number	Item	Detail
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F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F4.01	Update	Include specific flood monitoring trigger

#### D.4 FMP assessed if adequate and appropriate against the Principles of the Act

**Water Management Principles Assessment Table**

Section	Principle	Step 4 Assessment	Comment
	is the management plan adequate an appropriate for ensuring the effective implementation of the general principles to;		
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate but not appropriate FDEs in the existing floodway were considered to be protected by the criteria for assessment of flood work approvals, and required environmental improvements are the strategy for restoration efforts	Ecological and environmental assets are not shown spatial or specific locations identified
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Adequate but not appropriate FDEs that act as habitat in the existing floodway were considered to be protected by the criteria for assessment of flood work approvals	Ecological and environmental assets are not shown spatial or specific locations identified
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Water quality is considered by the plan to be minimally impacted by its implementation. The only benefits will be a result of reduced sedimentation and irrigation chemical transport	
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Adequate but not appropriate The required improvements included and the criteria for assessment are designed to minimise the cumulative impacts of flood works	More detail on the cumulative effects of flood works is included in the FRMS
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate and appropriate The plan details that some Aboriginal assets exist in the plan area though the locations were not considered in depth. Some sites are known to be in the floodway area and should benefit from the plan	Some information was gathered but not much, and no consultation requirements are listed
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Included but not adequate and appropriate	Some information was gathered but not much, and no consultation requirements are listed

Section	Principle	Step 4 Assessment	Comment
		Two locations of cultural significance are mentioned but are on high ground and are not expected to be impacted by the plan	
(2)(g)	Maximise social and economic benefits to the community	Adequate but not appropriate The plans adoption of the 1975 event as the design flood was chosen in part to avoid significant adverse social or economical impacts. It was seen as the appropriate balance between flood risk and unnecessarily tying up large areas of floodway network linked to rare events	The influence on the choice of design flood to maximise social and economic benefits ensures that it is built into the decision making of the plan
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Adequate but not appropriate The allowance for review of the plan allows for a review to be triggered including 'change to factors that influence decisions'.	The plan does not specify that improvements in understanding of ecological can trigger a response under the plan, it should be considered and factor that influences decisions and therefore fall under that broader category
(2)(h)	Apply the principles of adaptive management	Adequate and appropriate The plan includes the allowance for review following a performance review following a major flood	The plan makes allowances for adaption to changes to the floodplain characteristics, resulting in climate change or anything else that influences decision making
and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:			
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Adequate but not appropriate Land degradation is minimised by reducing the impact on FDEs and reducing velocities that can cause erosion through the assessment criteria for flood work approvals	The criteria are implemented through an application process linked to the repealed <i>Water Act 1912</i>
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Adequate but not appropriate The hydraulic assessment criteria require works in the floodway network to not cause redistribution and minimise changes in flood level on neighbouring properties	The approval process that enforces the hydraulic criteria are linked to the repealed <i>Water Act 1912</i>
(6)(c)	Minimise existing and future risk to human life and property from occupation of floodplain	Adequate but not appropriate The plan states that the FRMS did a detailed risk analysis that led to the adoption of the floodway network. The hydraulic assessment criteria and improvements aim to minimise the impacts on flow that would result from flood works	The FRMS holds most of the information regarding risks to human life and property

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend the plan to remove reference to the repealed <i>WA 1912</i> and update to assessment, terminology and any other reference to the Act

F1.04	Amend	Include specific criteria regarding the cumulative impacts of development in the floodplain
F1.07	Amend	Update the criteria for assessment to include specific and measurable changes to flood characteristics, rather than vague language like 'significant'
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.10	Amend	Provide clear spatial representation of ecosystems in the FMP area and the floodway network at a property scale, including information on hydraulic characteristics that are used in assessments
F1.11	Amend	Conduct a study into the areas of cultural and Aboriginal significance and ensure the plans floodway network and criteria are protecting these assets. This should include engagement with Aboriginal Peoples and representative organisations
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Investigate	Investigate the FMPs capacity to adapt to the impacts of climate change, and how those changes will influence flood risk exposure, FDEs and rural economies as recommended by the plan
F1.16	Amend	Addition of the Flood Study and FRMS as appendices

## D.5 Consultation to assess the FMP

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC

Item	Description	Source
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

### Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)
- Lack of implementation and commitment of resources for the improvement of the plans (1 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend objectives to make them more in line with the Act.
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale

F1.07	Amend	Amend to update the language to make it mandatory. Amend the plan to include clear, implementable rules that are not open to interpretation, and improve clarity of information as ease of understanding
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.

## D.6 Synthesis of Results

### General findings

The plan is a fairly well written water resource plan with the strategies for achieving the objectives easy to find. The mandatory actions included regarding hydraulic and environmental issues are clear, assigned to responsible parties and timeframes. However, some split the responsibility with no clarity on how the split is divided and no sources or funding assigned to their remediation.

The floodway network is clear in its methodology however with basic mapping that is not able to be zoomed to locate boundaries and effected areas, there remains ambiguity on its exact locations. The floodway is linked to an assessment method and criteria; however these are based on the repealed *Water Act 1912* (forming the foundation of the required modifications) that needs to be updated to the Act for it to be truly effective. The criteria for assessment is also vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Overall, the foundations for an adequate and appropriate plan are there, but requires increased clarity on where the rules are applicable, and how the rules are applied are needed for the plan to be effective. The plan requires updating to include mandatory language, and some investigation should be done as to the budget implications for remediation items that have not been implemented and now the responsibility of DPIE Water.

Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included. The plan also requires update to remove reference to the repealed Water Act 1912 and is processes and terminology updated to the Act.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the Act. The review details a number of amendments that can be made following the 5 year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

### Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove references to the Water Act, updating to the Act, including terminology and clear instructions for flood work assessment



Finding Number	Recommendations	Detail
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale. Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater prevention. Include specific criteria regarding the cumulative impacts of development in the floodplain
F1.06	Amend	Amend the objectives to provide more detail, with more specific goals that expand on the vision statement. The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.10	Amend	Provide clear spatial representation of ecosystems in the FMP area and the floodway network at a property scale, including information on hydraulic characteristics that are used in assessments
F1.11	Amend	Re draft the floodway network include Aboriginal and cultural heritage information
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Investigate	Investigate the FMPs capacity to adapt to the impacts of climate change, and how those changes will influence flood risk exposure, FDEs and rural economies as recommended by the plan. Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F1.16	Amend	Inclusion of the Flood Study, FRMS and Compendium of Data Report as attachments to the plan and review to ensure that the increase the adequacy and appropriateness of the plan
F4.01	Update	Include specific flood monitoring trigger

## Attachment E. Edward and Wakool Rivers Noorang Rd to Wakool-Murray Junction (Stage 4) 2000

### E.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

Logic Assessment		Assessment	Evidence	Source
1	Does the plan contain a vision statement (s.35(1)(a))	✗	The plan does not include a vision statement	
2	Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added for mapping) <i>The objectives of the floodplain management strategy are:</i> <i>to provide floodways with adequate capacity for the orderly passage of floodwaters;</i> <i>to maintain or restore as far as feasibly possible, the natural pattern of flooding;</i> <i>to enable flood protection for agricultural land and other property;</i> <i>to enable flooding to support the floodplain environment, particularly flood-dependent ecosystems such as wetlands, riverine forests and woodlands;</i> <i>to implement floodplain management consistent with the planning principles of the Murray Regional Environmental Plan No 2, and to implement floodplain management consistent with State natural resource management policies.</i>	FMP Executive Summary
3	Are the objectives consistent with the vision statement (NA if objectives or vision statement are not present) (s.35(1)(b))	NA	The plan does not include a vision statement	
4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	The plans strategy is to manage flood risk through the development of a system of floodways that indicate the area of the floodplain where flood control works will not be permitted unless a detailed assessment is conducted that allows any potential impacts to be assessed against the planning principles of the REP2. They floodways identify hydraulically sensitive areas where flood works can significantly affect the behaviour and distribution. All flood works require an approval, describing the requirement as under <i>Part 8 of the WA 1912</i> (now repealed).  The floodway was designed based on the 1956 flood event, estimated to be a 1% AEP event. The event was chosen as it was the largest on record and caused significant damage within the floodplain. The floodway was modified in parts as in some areas re-establishing natural patterns was not considered practical due to the economic toll placed on landholders. Some areas were added if they were considered to be areas of potential wetland value. Flood distribution was designated through a hydraulic assessment based on the gauged data from the 1956 flood event, which was	Strategies are described throughout FMP

Logic Assessment		Assessment	Evidence	Source
			<p>informed by detailed analysis of later events (such as the 1993 flood) using satellite imagery and gauged data to estimate the 1956 flood characteristics. The floodplain has been broken into 5 sections, with detailed information regarding the floodway area and the characteristics of the floodplain, such as the width of floodplain required to convey flow downstream.</p> <p>Works that fall into this area are then designated as subject to inundation and are required to undergo a detailed assessment of impact to show that they are consistent with the planning principles in Section 10 of the <i>Murray Regional Environmental Plan 2</i>.</p> <p>Some works will be considered to be in hydraulically sensitive areas or wetland value areas that require consultation between the Department of Land and Water Conservation and landholders to try and remedy the flood impacts of the works. The plan states that the failure of this process would result in contestation under the now repealed <i>WA 1912</i>.</p>	
5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✗	Not included	
6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	NA		

### Assumptions

Strategies are not clearly linked to the objectives so links were made by the reviewer

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective b, d Further consultation areas	(2)(e)	Objective a, c	(6)(a)	
(2)(b)	Objective b, d Further consultation areas	(2)(f)		(6)(b)	
(2)(c)		(2)(g)		(6)(c)	Murray REP2 assessment
(2)(d)	Objective e Murray REP2 assessment	(2)(h)			

### Recommendations

Finding Number	Recommendations	Detail
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F.01	Amend	The plan is long and difficult to understand with information spread throughout. Amend the plan to include on vital information for ensuring the effective implementation of the water management principles of the Act, with the remainder to be held in a background document, included as a reference of attachments.0 Amend the plan to include its own set of assessment criteria rather than leaning on the principles of another act
F1.02	Amend	Remove references to the Water Act and replace with information relevant to the FMP and the Act
F1.06	Amend	Include performance indicators (s35(1)(d) that are specific and measurable, to ensure that the objectives are being met. Use specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.07	Amend	Improve the language of the required actions, assessment criteria and performance indicators to remove ambiguity.
F5.01	Amend	Include in the plan a visions statement. Update the objectives to ensure they are linked to the vision statement

## E.2 FMP development in accordance with the Provisions

FMP Provisions Assessment Table

Provision	Detail	Assessment (circle one)	Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—			
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	○	Identification linked to mapping that is not clear or applicable to property scale viewing. Flooding is described through the watercourses effected and the areas of breakouts. Historic flooding provided in terms of year, peak flow, duration above 5m and comparisons of the largest events along the system. More detailed descriptions of the major flood events included.	Some detail on creeks that have been blocked since settlement, but no other distinction between existing and natural flooding, though larger events are described in more detail. Mapping of floods difficult to interpret
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	Environmental benefits of flooding, including wetlands, water quality and floodplain ecosystems included in general terms initially. Groundwater recharge is discussed generally but only in its linkage to the Murray REP2	
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,	○	Existing or proposed unlicensed flood works is clearly referenced as not being approved through the creation of a new plan, however they are subject to the same approval process as new works.	Existing works are not clearly mapped in the plan
	(d)	the risk to life and property from the effects of flooding	○	The effect to life and property is discussed in general terms relating to the risks associated to developing in a floodplain. HVI protections are given allowances to protect home, and the control of flood works is aimed towards	No specific criteria in the plan due to the linkage to the Murray REP and no mention in that legislation of the risk to life and property

Provision		Detail	Assessment (circle one)			Evidence	Comment
						reducing the potential risks created by the changes in flood characteristics to other floodplain users	
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works		○		Application procedures for new works are described through the definition of works requiring approval and the process for assessment as they are described in the Water Act 1912 and the Murray REP2. Applications are required to be assessed by a department that is no longer in existence (NSW Department of Land and Water Conservation)	
	(b)	the modification or removal of existing flood works		○		Some existing works have been identified due to the potential impacts to flood characteristics. These are stated to be subject to consultation with the Department of Land and Water Conservation (no longer exists) to determine an agreement on remediation. There are no mention removal of flood works and the risks that may pose to other users.	
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		The rehabilitation of flood dependant ecosystem is considered through some of the areas requiring consultation to remediate the impacts on flood flow. This is not the case for all areas as the plan considers some of the required remediation to place too high of a cost on landholders.	
	(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		○		Restoration of land through natural flood regimes is considered through the areas requiring consultation. Other areas are stayed as not aiming to be restored due to the costs to landholders.	
	(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation			✗	The benefits are then linked to wetlands areas in the FMP area. Locations are not detailed here, rather linked to research. It is acknowledged that some areas of wetland are blocked from flood flows. These are drawn onto the 5 map areas and the works blocking access	Potential wetland areas drawn into the map areas though mapping is not clear.

Provision	Detail	Assessment (circle one)			Evidence	Comment
					are expected to undergo the consultation process to remedy the impacts	
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows			✗	Downstream flows not considered	
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability		○		Restoration of land through natural flood regimes is considered through the areas requiring consultation. Other areas are stayed as not aiming to be restored due to the costs to landholders.	
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area		○		The strategies of the plan is aimed towards managing flood flow against the 19765 event conditions. The areas in the floodway require analysis, but this is under a different act and assessment is done as under guideline principles rather than rules	
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding			✗	Water quality is mentioned as a general benefit from flood activity and floodplain management but this does not appear to have informed the plan	
(f)	other measures to give effect to the water management principles and the objects of this Act			✗	No Aboriginal cultural sites, areas or values of significance were included when developing the plan though it is recognised that they are likely to exist in the FMP area	
(g)	such other matters as are prescribed by the regulations			✗	Plan states that 'currently no matters have been prescribed by the regulations'	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

## Recommendations

Finding number	Item	Detail
F1.02	Amend	Remove references to the Water Act, updating to the Act, including terminology.
F1.03	Amend	Improve the mapping of the plan to increase clarity of the area influenced
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.09	Amend	Amend the plan to clearly identify existing works in the FMP area
F1.10	Amend	Amend the plan to include clear mapping of environmental assets and wetlands in the FMP area
F1.14	Amend	Amend the plan to include provisions to allow the addition of adaptive management principles. The plan should include allowances for updates to the plan using recommendations from NRAR following compliance activities, updates to flood data from monitoring activities, ecological information, and modelling technology
F5.01	Amend	Amend the plan to include assessment criteria, specifically aimed at floodplain management in accordance with the principles of the Act
F5.02	Amend	Remove linkages to the Murray REP2, ensuring that the requirement information, criteria and areas of application are held in the plan
F5.03	Amend	Remove reference to the Department of Land and Water Conservation, update to relevant agency
F5.04	Amend	Clearly identify the environmental, risk, economic and cultural benefits from the implementation of the plan

## E.3 FMP Implementation in accordance with the Provisions

### General findings of the s.44 Audit

These findings are summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of 'whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles'. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.
- However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan wasn't implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.

- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

### Plan

- The Audit Report found that ‘the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

### Implementation

- The Audit found ‘no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.’
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act38 but were developed under the Water Act 1912. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review



- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements ('must', 'shall', 'require'), while others suggest more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed').

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs'. The plan contains no trigger for flood monitoring and no provisions for environmental monitoring, no performance indicators and the required modifications are mandatory but contains a mix of language, including 'recommendations'.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the 'provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs'. The plan contains no trigger for flood monitoring and no provisions for environmental monitoring, no performance indicators and the required modifications are mandatory but contains a mix of language, including 'recommendations'.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters		
(a)	proposals for the construction of new flood works	✓	One application was made in the Audit period. Approvals assessment, granting or refusal and application of conditions were carried out in line with requirements. However, some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out.

Provision	Detail	Assessment	Evidence
(b)	the modification or removal of existing flood works	✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There has also been no active monitoring undertaken over the review period, and the plan contains no trigger for flood monitoring and no provisions for environmental monitoring, no performance indicators and the required modifications are mandatory but contains a mix of language, including 'recommendations'.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs'.
(e)	the preservation and enhancement of the quality of water in the water	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs'.

Provision	Detail	Assessment	Evidence
	sources in the area during and after flooding		
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	<p>Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily;</p> <p>Provisions relating to flood monitoring were not implemented within the Audit period</p> <p>Provisions relating to environmental monitoring were not implemented within the Audit period</p> <p>Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data</p> <p>Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other.</p> <p>The plan contains no trigger for flood monitoring and no provisions for environmental monitoring.</p>
(g)	such other matters as are prescribed by the regulations	✗	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

## Recommendations

Item	Detail
F1.03	Update Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Update Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.12	Implement Implement the recommendations and actions contained in the Audit Report
F5.05	Update Include triggers for flood monitoring, environmental monitoring, and provisions for assessment against performance indicators, including triggers.

## E.4 FMP assessed if adequate and appropriate against the Principles of the Act

### Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
	is the management plan adequate and appropriate for ensuring the effective implementation of the general principles to;		

Section	Principle	Step 4 Assessment	Comment
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Partially covered Protection of flood dependant ecosystems is considered in the choice of the 1976 flood for designating the floodway, and for areas required to undergo consultation with landholders to remediate impacts on flood flow	Criteria for the assessment of works that would consider and minimise the cumulative effect is held in the Murray REP2, and is only requires consideration, no set rules
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Partially covered Plan details the fauna in the FMP area that is likely to benefit from the plan, but habitat locations are not clearly mapped.	Criteria for the assessment of works that would consider and minimise the cumulative effect is held in the Murray REP2, and is only requires consideration, no set rules
(2)(c)	Protect (or enhance) water quality of all sources	Not Covered	Water quality is mentioned as a potential benefit from flooding but no reference is made to benefits from the plan
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Partially Covered	Listed as a consideration, but the criteria for the assessment of works that would consider and minimise the cumulative effect is held in the Murray REP2, and is only requires consideration, no set rules
(2)(e)	Protect geographical and other features of Aboriginal significance	Partially Covered No Aboriginal cultural sites, areas or values of significance were included when developing the plan though it is recognised that they are likely to exist in the FMP area	
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Not covered	
(2)(g)	Maximise social and economic benefits to the community	Partially covered The choice of the 1976 flood was aimed providing adequate protection against flooding. Impact of development on other users mentioned	No effective protection against flood impacts as criteria for the assessment of works that would consider and minimise the cumulative effect is held in the Murray REP2, and is only requires consideration, no set rules
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Not Covered	Monitoring only mentioned in reference to monitoring activities in the 1993 flood and how this informed the development of the plan.
(2)(a)	Apply the principles of adaptive management and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:	Not covered	
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Partially Covered Plan includes a linkage to land degradation planning principles held in the Murray REP2. Plan states that “development should seek to avoid land degradation processes such as erosion, native vegetation decline, pollution of ground or surface water, groundwater	Requirement either link to another plan or states a suggestion rather than a requirement.

Section	Principle	Step 4 Assessment	Comment
		accession, salination and soil acidity, and adverse effects on the quality of terrestrial and aquatic habitats”.	
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Partially Covered Impacts on other users discussed as a driver for the requirement for the plan development and the development of the floodway network but is undermined by that fact that the criteria for the assessment of works that would consider and minimise the cumulative effect is held in the Murray REP2, and is only requires consideration, no set rules	
(6)(c)	Minimise existing and future risk to human life and property from occupation of floodplain	Partially covered Informed the choice of the flood event. Allowances made in the plan for housing and HVI	Criteria for the assessment of works that would consider and minimise the cumulative effect is held in the Murray REP2, and is only requires consideration, no set rules

## Recommendations

Finding Number	Recommendation	Detail
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.02	Amend	Remove linkages to repealed legislation and contain the information and assessment requirements in the plan
F1.04	Amend	Include clear criteria on the limits on the potential impacts on other water users and the cumulative effects of development
F1.02	Amend	Update approval process with clearly measurable criteria and an assessment process that is updated to be in line with the Water Management Act 2000. Criteria and approval process should be able to be applied clearly, with all information held within the plan
F1.11	Amend	Conduct an engagement study on the areas sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.

## E.5 Consultation to assess the FMP

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)

Item	Description	Source
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

## Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)
- Lack of implementation and commitment of resources for the improvement of the plans (1 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.01	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area
F1.02	Amend	Amend objectives to make them more in line with the Act.
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale
F1.07	Amend	Amend to update the language to make it mandatory. Amend the plan to include clear, implementable rules that are not left open to interpretation
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.

## E.6 Synthesis of Results

### General findings

Having been developed under the provisions of the *Water Act 1912* as a water management strategy rather than an FMP the plan and requires amendments to bring it into line with the Act. The plan does not contain a vision statement, performance indicators, and the key strategy for achieving the objectives is through assessment under a separate act that requires consideration of separate principles rather than mandatory.

The plan contains a large volume of information regarding the characteristics of flooding and the areas covered by the floodway. This information could be better held in a background document as an attachment that is supported by detailed mapping of the information that is viewable at a property scale. The additional information results in the plan being difficult to navigate and understand, reducing its effectiveness.

The plan is clearly informed by the hydraulic mapping of the 1976 flood event in the area, but the areas of environmental assets and their benefits are not clear, similarly the areas of cultural or Aboriginal significance are not built into the plans protected area.

The information used to develop the floodway network is likely to be based on out-of-date information and using out of date technology. When the plan is updated, a review should be conducted of the floodway network to ensure that it is an accurate representation of flood behaviour.



The plan will require a large number of amendments to ensure that it is adequate and appropriate for ensuring the effective implementation of the water management principles.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the WMA 2000. The review details a number of amendments that can be made following the 5 year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

### Recommendations

Finding Number	Recommendations	Detail
F1.01	Amend	The plan is long and difficult to understand with information spread throughout. Amend the plan to include on vital information for ensuring the effective implementation of the water management principles of the Act, with the remainder to be held in a background document, included as a reference of attachments
F1.02	Amend	Amend the plan to include its own set of assessment criteria rather than leaning on the principles of another act
F1.03	Amend	Improve the mapping of the plan to increase clarity of the area influenced
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.06	Amend	Include performance indicators (s35(1)(d) that are specific or measurable, to ensure that the objectives are being met Use specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.07	Amend	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.09	Amend	Amend the plan to clearly identify existing works in the FMP area
F1.10	Amend	Amend the plan to include clear mapping of environmental assets and wetlands in the FMP area
F1.02	Amend	Remove references to the <i>Water Act 1912</i> and replace with information relevant to the FMP and the <i>Water Management Act 2000</i>
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F5.01	Amend	Include in the plan a visions statement. Update the objectives to ensure they are linked to the vision statement
F5.02	Amend	Remove linkages to the Murray REP2, ensuring that the requirement information, criteria and areas of application are held in the plan
F5.03	Amend	Remove reference to the Department of Land and Water Conservation
F5.04	Amend	Clearly identify the environmental, risk, economic and cultural benefits from the implementation of the plan
F5.05	Update	Include triggers for flood monitoring, environmental monitoring and provisions for assessment against performance indicators, including triggers.

## Attachment F. Lachlan River Gooloogong to Jemalong Gap 2011

### F.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered

Logic Assessment	Assessment	Evidence	Reference	
L1	Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The overall vision for the FMP is: <i>to coordinate floodplain development to minimise flood risk to occupiers and users of the floodplain while addressing the environmental, social and economic interests of the Lachlan River Valley.</i>	FMP Section 1.1, page 1
L2	Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added for mapping in L1 and L3): The floodplain management objectives of the FMP linked to its overall vision are: to achieve a coordinated, balanced approach to floodplain management taking into account hydraulic, environmental and economic considerations and legislative requirements to ensure the sustainable and equitable use of floodplain resources to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible (NSW Flood Prone Land Policy objective) to coordinate floodplain development in order to minimise adverse changes to flood flow patterns to increase the sustainable social, economic and ecological benefits of using the floodplain to improve and maintain the diversity and well being of riverine and floodplain ecosystems that depend on flood inundation, and to take into account the cumulative impact on flooding behaviour of individual developments.	FMP Section 1.1, page 1
L3	Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	Key points from the visions statement are coordination of floodplain development to minimise risk and to address environmental, social and economic interests. Coordinated approach is included as floodplain management and floodplain development principles, with reductions in impacts of flooding and flood liability included. Environmental, social and economic interests are included as a unique objective (e) in addition to ecologically positive methods, well-being of ecosystems, sustainable and	Logic Assessment L1 and L2

Logic Assessment	Assessment	Evidence	Reference
		equitable use of floodplain resources and a balanced hydraulic, environmental and economic approach included in objectives	
L4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	<p>✓</p> <p>The plan outlines required actions, approval of works and future property planning as the implementation of the plan, and that the plan 'outlines the strategies to manage flood risk and flood management issues'.</p> <p>Locations identified as potential hydraulic restrictions have been investigated and a series of required actions listed. These have been stated to attempt to minimise social and economic impact by generally condoning approved flood control works. The required actions relate to areas of potential hydraulic restrictions. None of the 'actions' prescribe remediation activity however, with 'monitor', 'carry out an inspection' or 'no action required' and no timeframes on the actions reducing the capacity for the strategy to have effect.</p> <p>The plan has identified a floodway network as a 'coordinated and integrated network of flood flow paths of adequate hydraulic capacity and continuity to effectively convey floodwaters and support the floodplain environment.' Works in these areas will be assessed as non-complying works and will likely be refused'. Works can still be applied for based on Section 166C of the WA 1912 (which is no longer in effect) and part 5 of the EP&amp;A Act and be assessed against criteria linked to the 15-year ARI event (a measurement superseded by the ARR2019). Terminology is non-specific, using 'significant' as a measure. Works outside these areas are considered complying works and are only required to be assessed for environmental impacts under the EP&amp;A Act .</p> <p>No clear link is identified in the plan between the strategies and the objectives.</p>	<p>FMP Preface, page v</p> <p>FMP Section 5</p>
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	<p>✓</p> <p>Performance indicators are included, linked to the management of flood control works, the orderly passage of flood water through the floodway network and connectivity of floodwaters to wetlands. Plan states that the information from monitoring activities should be measured against the objectives and considered against historical flood events. Includes requirements for flood on environmental monitoring but language is not prescriptive</p>	FMP Section 9
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	<p>✗</p> <p>Performances indicators are not specific or measurable, rather use subjective language like 'orderly passage of floodwaters'. Indicators for hydraulic, environmental, economic and social impacts are included, stating that when compared to historical events items are judged against terms such as 'improved' and 'lesser'</p>	FMP Section 9

### Assumptions

Strategies are not clearly linked to the objectives so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective a, b, d, e, f, g Floodway network and criteria, required actions	(2)(e)	Floodway network and criteria	(6)(a)	Objective f Floodway network and criteria
(2)(b)	Objective a, b, d, e, f, g Floodway network and criteria, required actions	(2)(f)	-	(6)(b)	Objective a, b, c, d, f Zone, FW approval criteria, required actions
(2)(c)	Floodway network and criteria	(2)(g)	Objective a, b, c, e	(6)(c)	Objective a, b, c, d Zone, FW approval criteria
(2)(d)	Objective a, g Floodway network and criteria	(2)(h)	-		

### Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove criteria from and references to the <i>WA 1912</i> and replace with information relevant to the FMP and the <i>Water Management Act 2000</i>
F1.06	Amend	The performance indicators (s35(1)(d)) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.07	Amend	Improve the language of the required actions, assessment criteria and performance indicators to remove ambiguity.

## F.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment	Evidence	Comment
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—		
Core Provisions	(a) identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding		<p><b>Frequency:</b> Years of significant flood events listed though plan does not include details on the severity of each event.</p> <p><b>Duration:</b> No information provided</p> <p><b>Nature:</b> Flooding sources are outlined as arising from multiple sources. Plan details channel capacity in different areas in relation to the</p>	Plan states that more detailed information on flooding is available in the FS and FRMS, though these are not attached to the plan. No differentiation between existing and natural flooding. Events years are listed and the nature of flooding but the nature is not linked to an event. Extent is shown through some mapping of the floodway network though this is not clear and not a complete picture.

Provision		Detail	Assessment			Evidence	Comment
						ability to move flood waters through and where the floodplains are more likely to be engaged.  <u>Extent:</u> Extent is shown through the mapping of the floodway network, a 15-year ARI. Flow distribution is detailed in the FRMS report	
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge		○		The plan includes a summary of environmental impacts, with a particular regard for wetlands, floodplain ecosystem, and groundwater recharge. Environmental information is held in the FS and FRMS. Assets are included in mapping attachments but hard to decipher	Plan outlines expected ecological benefits and mapping of assets. Maps are not clear and the plan states that most of the ecological information is held in the FS and FRMS.
	(C)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,			✗	Plan states that assessment will apply to 'existing (unauthorised) works' – defined in 3.1.8 as works constructed without and approval or contravening and approval or not in accordance with approval conditions. Some information on existing work is described in the actions section but this is limits	No mapping or major detail on existing works has been included. Plan includes definition of existing work that require approval and the consequence of not gaining an approval, however time period for this is defined as a 'reasonable time period'. No detail on 'their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts' as required under s29(c)
	(d)	the risk to life and property from the effects of flooding			✗	The plan outlines that the information regarding the flood risk to life and property are part of the FRMS and that the FMP is a strategic plan to coordinate floodways to manage flood risk	This information is held in the FRMS and not in the plan.
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works			✗	Section 7 of the plan includes details on the approval process for flood works. The information in this section and the other sections it links to includes ambiguous language that would be difficult to implement or enforce. Assessments area to be made against the repealed WA 1912.	Assessment criteria and process is not clear due to the language used and the linkages to outdated legislation.
	(b)	the modification or removal of existing flood works			✗	Modification of existing works is included regarding works build without an approval or contrary to the approval. Modifications or	Language on modification is nonprescriptive, with any modifications

Provision	Detail	Assessment			Evidence	Comment
					removals will be imposed after a 'reasonable' amount of time or actions that 'may be used as a means of encouraging landholders' to lodge an approval	that are imposed would be linked to the repealed WA 1912
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		Flow pattern are identified and the restrictions to the passage flow and distribution of floodwater are managed through the required actions in the plan, though these do not contain detailed requirements or timeframes for actions to occur	Restoration and management of flow pattern and distribution is managed by approval requirements that is not clear sure to the language used and the linkages to outdated legislation.
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		○		The benefits to ecosystems within the floodplain is referenced though the spatial representation of this is limited. Restoration of flow paths is managed through required actions that do not contain timeframes of prescriptive language	Restoration efforts are listed and some detail on ecosystems available but linkages of information and requirements for rehabilitation activity are not strong
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation			✗	Rehabilitation of ecosystems as a result of inundation is described to be linked to the required actions list that contains no prescriptive language. Mapping links the asset areas to the actions table and not an asset table	Assets not identified and action to maintain areas are suggested or monitor actions with no requirement to remediate
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows			✗	Assets not identified, with the action list stated as the strategy for providing flows to ecosystems, though no requirements to provide flows to downstream areas is identified	No downstream assets or the requirement to provide downstream flows is identified
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability			✗	The restoration on natural flood regimes is not identified as a restoration or rehabilitation effort. Plan generally focusses on maintaining flow patterns of the developed 15 year ARI event	Natural flow regimes not identified, and actions not aimed to natural flow regimes.
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area			✗	The plan includes an outline of criteria for assessing work with the 15 year ARI event dictating the two areas (inside and outside the floodway network	Control of activities through required actions, zoning by floodway area and the approval processes are not prescriptive, may vary in interpretation and use repealed legislation as the framework for assessment
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		○		Water quality benefits expected from the FMP implementation listed as reduced risk of surplus nutrient and pesticide transport and scour or	The benefit of managing flood characteristics is mentioned but does not appear to have informed the process

Provision		Detail	Assessment			Evidence	Comment
						erosions through the limiting of inundation of cropped areas and the reduction flow velocities through the floodway network.	
	(f)	other measures to give effect to the water management principles and the objects of this Act			✗	Aboriginal heritage information is listed as an included consideration but primarily in the FS and FRMS. Assets are detailed as being expected to be in some vegetation, acting as an indicator for Aboriginal areas	The lack of inclusion of Aboriginal assets is a failure to give effect to the water management principles and the objects of this Act
	(g)	such other matters as are prescribed by the regulations			✗	Plan states that 'currently no matters have been prescribed by the regulations'	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding Number	Item	Detail
F1.01	Amend	Update approval process to Water Management Act requirements containing measurable goals and requirements with regulatory language and taking into account the cumulative effects of development
F1.02	Amend	Remove references to the Water Act, updating to the Act, including terminology
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.07	Amend	Update required actions to create mandatory requirements under set timeframes
F1.10	Amend	Include mapping of ecosystems in the FMP area and detail actions with measurable and unambiguous requirements to ensure flows to these areas and to provide linkages to areas downstream
F1.11	Amend	Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F6.01	Amend	Include details of previous flood events, including magnitude and ARI/AEP and imagery where available
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan

## F.3 FMP Implementation in accordance with the Provisions

### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of 'whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles'. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.
- However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan wasn't implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

#### Plan

- The Audit Report found that 'the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements ('must', 'shall', 'require'), while others suggest more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed').
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

#### Implementation

- The Audit found 'no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.'
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance



- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act but were developed under the *Water Act 1912*. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the ‘provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review’.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the ‘provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review’.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.

Provision	Detail	Assessment	Evidence
(d)	the risk to life and property from the effects of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters		
(a)	proposals for the construction of new flood works		NA No applications were received during the s.44 Audit period
(b)	the modification or removal of existing flood works	✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood events in the area but no assessment against the performance indicators has been completed.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review

Provision	Detail	Assessment	Evidence
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other.
(g)	such other matters as are prescribed by the regulations	✗	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

## Recommendations

Finding Number	Item	Detail
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report

## F.4 FMP assessed if adequate and appropriate against the Principles of the Act

Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
	is the management plan adequate and appropriate for ensuring	the effective implementation of the general principles to;	
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Included but not adequate and appropriate Floodway network dictated the area the is considered by the plan for approval requirements. Requirements are linked to repealed legislation and timeframes are ambiguous	Plan has some assessment requirements, zoning and required actions but they are not mandatory in their language
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Included but not adequate and appropriate Expected benefits of the plan include floodplain vegetation, terrestrial and aquatic fauna and wetlands but this is reliant on actions that are not mandatory and that construction and clearing outside the floodway network being unlikely	The actions are not mandatory and the approval process is linked to repealed legislation and non specific timeframes. Habitats in the FMPS area are not defined
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Allowing protection of cropping area and of the floodway network aims to reduce erosion and	Water quality is mentioned as an expected beneficiary of the rules relating to flow velocity but was not a driver in the plan development
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Not included so not adequate and appropriate Cumulative impacts not covered in the plan.	
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate and appropriate The plan states that areas of aboriginal significance have been considered and that they all within the floodway network. Flows are described to be maintained to these areas but velocities managed to minimise damage	Details of the Aboriginal sites mentioned are not included in the plan. No community consultation or cultural monitoring activities listed
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Included but not adequate and appropriate A single cultural asset was listed. It was considered to be on high ground outside the floodway network and therefore not impacted by flooding	The plan states that there is no action required for the lone site. Consultation activities should include cultural information but this is not listed as a requirement
(2)(g)	Maximise social and economic benefits to the community	Adequate but not appropriate The choice of design flood was stated to be made based on social and economic considerations.	Social and economic reasoning has been the basis of the design of the floodway network in an effort to minimise costs of protection against larger flooding. Allows the inundation of larger floods that may minimise damage from increased velocities and depths
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Included but not adequate and appropriate Section 9.4 covers scenarios such as data, land use changes, impediments to implementation that may result in the plan being updated. Climate change and changes in	The plan gives opportunity for adaption that could include improvements in understanding of ecological water requirements as a 'factor that influence decisions'

Section	Principle	Step 4 Assessment	Comment
		water management practices also listed as triggers. Outlines for monitoring are included as an appendix to the plan	As the performance indicators are vague the adaptive management opportunities have been undermined
(2)(a)	Apply the principles of adaptive management	Included but not adequate and appropriate  Section 9.4 outlines the scenarios in which the plan should be amended, including climate change or adequacy of performance or 'factors that influence decisions'	The plan gives opportunity for adaption, though is not prescriptive enough to limit unknown adaptive opportunities As the performance indicators are vague the adaptive management opportunities have been undermined
and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:			
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Included but not adequate and appropriate Minimising the development in the floodway network is the key strategy around the floodplain management but the vague language undermines the effectiveness	
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Included but not adequate and appropriate  Some criteria around the management on development but these are not linked to clear requirements	
(6)(b)	Minimise existing and future risk to human life and property from occupation of floodplain	Not included so not adequate and appropriate Existing and future risk to life and property does not make up part of the plan as it is stated to be the strategy to manage the risks identified in the FS and FRMD	

## Recommendations

Finding Number	Recommendation	Detail
F1.01	Amend	Update approval process with clearly measurable criteria and an assessment process that is updated to be in line with the Water Management Act 2000. Criteria and approval process should be able to be applied clearly, with all information held within the plan
F1.02	Amend	Remove linkages to repealed legislation
F1.04	Amend	Include clear criteria on the limits on the potential impacts on other water users and the cumulative effects of development
F1.04	Amend	Update the performance indicators to include clear language that can inform adaption of the plan to monitoring information
F1.07	Amend	Update the plans required actions to include mandatory language for actions identified and clearly measurable scenarios with mandatory actions linked to the areas listed as monitor
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts

F1.16	Amend	Addition of the Flood Study and FRMS as appendices
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## F.5 FMP assessed if adequate and appropriate against the Principles of the Act

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW

Item	Description	Source
		(Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

### Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)
- Environmental assessment requirements considered adequate (1 submission)
- Insufficient resources for implementation (1 submission, out of scope)
- Increased community communication and education required (1 submission)
- Improvements to Floodplain Harvesting Policy (1 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend objectives to make them more in line with the Act.
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale
F1.03	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area
F1.07	Amend	Amend to update the language to make it mandatory
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.

## F.6 Synthesis of Results

## General findings

Having been developed under the provisions of the *Water Act 1912* as a water management strategy rather than an FMP the plan and requires amendments to bring it into line with the Act. Overall the plan is not clear in its information leaves itself open to varied interpretation, reducing its effectiveness. The area of the floodway network is included in the plan but is not clear as to its boundaries and is not able to be zoomed. The criteria for assessment is vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear. The plan includes a number of hydraulic and environmental required remedial measures to existing works aimed at improving connectivity through the floodway. The language in the required actions is not mandatory, vastly reducing the effectiveness and making them harder to enforce. The remediation works requires updating to include mandatory language, and some investigation should be done as to the budget implications for items that have not been implemented and now the responsibility of DPIE Water. Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included.

The lack of clarity around the criteria and where they are to be implemented, well as the suggestive language in the required actions vastly reduces the adequacy and effectiveness of the plan. The information could be accurate and the best fir for managing the floodplain and ensuring the effective implementation of the water management principles but the difficulties created by the language and issues around applying the maps to a property scale undermine this. Furthermore, the linkages to the Water Act 1912 that has since been repealed create further issues around the clarity of the assessment process and the plan itself. The plan requires update to remove reference to the repealed Water Act 1912 and is processes and terminology updated to the Act.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the Act. The review details a number of amendments that can be made following the 5 year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

## Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove criteria from and references to the Water Act 1912 and replace with information relevant to the FMP and the <i>Water Management Act 2000</i>
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Include clear criteria on the limits on the potential impacts on other water users and the cumulative effects of development. Inclusion of water quality provisions, such as blackwater
F1.06	Amend	The performance indicators (s35(1)(d)) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.07	Amend	Improve the language of the required actions, assessment criteria and performance indicators to remove ambiguity.



F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Water Management Act 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.10	Amendment	Include mapping of ecosystems in the FMP area and detail actions with measurable and unambiguous requirements to ensure flows to these areas and to provide linkages to areas downstream
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F6.01	Amendment	Include details of previous flood events, including magnitude and ARI/AEP and imagery where available
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F1.16	Amendment	Inclusion of the Flood Study and FRMS as attachments to the plan, and review the documents to ensure that they increase the adequacy and appropriateness of the plan

## Attachment G. Lachlan River Jemalong Gap to Condobolin 2012

### G.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

Logic Assessment		Assessment	Evidence	Reference
L1	Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The vision for managing the Jemalong Gap to Condobolin floodplain is: <i>To manage the floodplain of the Lachlan River between Jemalong Gap and Condobolin township in an equitable and sustainable manner through careful use of parts of the floodplain for agricultural activities, while allowing for the floodplain's natural flood distribution and storage functions, and enhancing its environmental values.</i>	FMP Section 1.1, page
L2	Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added for mapping in L1 and L3): The objectives linked to this vision for the FMP are: <i>To achieve a coordinated, balanced approach to floodplain management, taking into account hydraulic, environmental and economic considerations, and legislative requirements.</i> <i>To ensure the sustainable and equitable use of floodplain resources.</i> <i>To ensure that the current, accepted flow distribution to the north and south of the floodplain is retained.</i>	FMP Section 1.1, page 1
L3	Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	The vision statement prioritises managing the floodplain in an equitable and sustainable manner and careful use of the floodplain for agriculture and maintaining flood distribution and storage and enhancing environmental values. Objectives reflect these points, aiming for a coordinated and balanced approach (a) and sustainable and equitable use of the floodplain (b) linking to vision of sustainable and equitable management. Retaining the current, 'accepted' flow distribution to the north and south of the floodplain allows for the maintained flood distribution. Objectives don't address agriculture and environmental factors of the vision statement so this must be inferred	Logic assessment L1 and L2
L4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	Floodway network is the zoning mechanism of the plan, providing areas for flood passage, connectivity to ecosystems and groundwater recharge. The floodway network is divided into 4 zones of varied 'significance' and provides a basic but overarching hydraulic criteria for approvals. The upstream zone is described of high significance, distributing flows downstream, with the downstream areas categorised by the level of development in the area and the capacity for new flood works to be built without significant impacts. The criteria use a resultant hydraulic criterion instead of a change criterion, in affect taking into account cumulative changes. Also require that works 'do not block, impede or divert the flooding regimes in flood	FMP Section 5

Logic Assessment		Assessment	Evidence	Reference
			dependent ecosystems within the FMP floodway network. Mapping includes some information regarding maximum flow velocities and heights from the design flood model though these are at points along the network and values would need to be extrapolated in between. Environmental management measures have been included, including detail on the works required, the parties responsible and the priority level of each measure. However, these do not include timeframes for remediation and are only recommendations for approved works. The lack of mandatory language or timeframes reduces the effectiveness of the measures.	
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	Performance indicators are included in the plan and link directly to the objectives.	FMP Section 8
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	✗	Performance indicators are clear and attainable though lack the specific and measurable components. 'orderly passage' of flow is ambiguous as to its definition. Delivery of floodwater and flood works being constructed modified and maintained in accordance with measurable elements of the plan are well written criteria. Specific criteria broken down into hydraulic, environmental, economic and social indicators are less specific, using 'improved' and 'less' rather than more specific language	

### Assumptions

Strategies are not clearly linked to the objectives, so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS. It has been assumed that the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective a, b, c Zones and criteria, Environmental management measures	(2)(e)	-	(6)(a)	Objective a, b, c Zones and criteria, Environmental management measures
(2)(b)	Objective a, b, c Zones and criteria, Environmental management measures	(2)(f)	-	(6)(b)	Objective a, b, c Zones and criteria, Environmental management measures
(2)(c)	-	(2)(g)	Objective a Zones and criteria,	(6)(c)	-

			Environmental management measures		
(2)(d)	Objective a, b, c Zones and criteria, Environmental management measures	(2)(h)	-		

## Recommendations

Finding Number	Recommendations	Detail
F1.07	Amend	Recording of the objectives to include that agriculture and environmental factors of the vision statement, and removal of ambiguous language such as 'accepted' (accepted by whom)?
F1.02	Amend	Redefine the performance indicators to use more measurable language
F1.06	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)). Create more specific objectives

## G.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment (circle one)	Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—			
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	○	A brief outline of existing flood patterns linked to mapping is included in the plan, linked to mapping of the floodway network. Reference is made that more detail, including flood imagery is available in the FRMS.	Information in the plan is minimal. Details in the FS and FRMS should be included
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	Ecological assets have been mapped in the plan, though on online map to zoom to property scale information should be included. Wetland connectivity helped inform the design of the floodway network. Groundwater recharge was one of the listed considerations when designing the floodway network, stating that recharge occurred in 2 known events through flood runners and the	Details from the FS and FRMS should be included

Provision	Detail	Assessment (circle one)			Evidence	Comment	
					inclusion of all watercourses was in part to aid future recharge Referenced that more information is available in the FRMS.		
	(C) the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,			✗	Some existing works have been identified for environmental management works with clear requirements for unapproved works but no timeframes for completion. Plan includes definitions on complying and non-complying works focussing on approval status and alignment with the requirements of the FMP. Does not specifically address approved existing works outside the environmental measures that contain suggested modifications when approval is due for renewal. No mapping of existing works has been included. Referenced that more information is available in the FRMS.	Update environmental measures to include timeframes Details in the FS and FRMS should be included	
	(d) the risk to life and property from the effects of flooding		○		The plan developed the floodway network using the 1990 event (25 year ARI) to maintain existing protection to life and property and larger protection works able to be developed outside the network. Referenced that more information is available in the FRMS.	Details in the FS and FRMS should be included	
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works		○		Section 3 outlines the assessment area and criteria for the construction of new flood works. The assessment process is linked to the repealed WA 1912.	Approval process is linked to repealed legislation but the requirements are clear and measurable
	(b)	the modification or removal of existing flood works		○		Environmental management measures are listed for unapproved and approved works, though approved works carry suggestions only and there are no timeframes on unapproved works. Unapproved works are assessed under the FMPs requirements when approval is lodged	Approval process is linked to repealed legislation and there is no spatial identification of existing works.

Provision	Detail	Assessment (circle one)			Evidence	Comment
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		Stated to have helped inform the decision making while preparing the FMP. Environmental management measures will potentially restore flood dependant ecosystems and vegetation	FMP expects to provide increased connectivity to FDEs but the measures are not mandatory
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		○		Stated to have helped inform the decision making while preparing the FMP. Existing flow path are maintained, with connectivity to ecosystems an informer of the floodway network	FMP expects to provide increased connectivity to FDEs and the floodway network maintains existing floodways but the linkage to repealed legislation reduces this assurance
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		○		Stated to have helped inform the decision making while preparing the FMP. The plan primarily aims to maintain flow characteristics, with some flow restoration resulting from environmental management measures, if they are implemented	FMP expects to provide increased connectivity to FDEs and the floodway network maintains existing flood characteristics but the linkage to repealed legislation reduces this assurance
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows			✗	Stated to have helped inform the decision making while preparing the FMP. Connectivity to downstream ecosystems is not further reflected in the plan	Not clearly identified
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability		○		Stated to have helped inform the decision making while preparing the FMP. Existing flow path are maintained, with connectivity to ecosystems an informer of the floodway network	FMP expects to provide increased connectivity to FDEs and the floodway network maintains existing flood characteristics but the linkage to repealed legislation reduces this assurance
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area		○		Changes to flow characteristics is the key driver of the hydraulic assessment criteria within the floodway network. Changes in velocity and distribution that can then influence frequency nature and extent of flooding is managed under the criteria. Plan outlines an approval process as detailed in the repealed WA 1912 and agency names that are no longer valid.	Changes to flow velocity and distribution are clear and measurable but enforcement through approvals is linked to repealed legislation
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		○		Water quality benefits expected from the FMP implementation listed as reduced risk of surplus nutrient and pesticide transport and scour or erosions through the limiting of inundation of cropped areas and the reduction flow velocities through the floodway network.	The benefit of managing flood characteristics to manage water quality is mentioned but does not appear to have informed the process

Provision		Detail	Assessment (circle one)			Evidence	Comment
	(f)	other measures to give effect to the water management principles and the objects of this Act			✗	Aboriginal heritage information is listed as an included consideration but primarily in the FS and FRMS. Assets are detailed as being expected to be in some vegetation, acting as an indicator for Aboriginal areas	The lack of inclusion of Aboriginal assets is a failure to give effect to the water management principles and the objects of this Act
	(g)	such other matters as are prescribed by the regulations			✗	Plan states that 'currently no matters have been prescribed by the regulations	The power under s.30(g) has not been exercised in the Water Management (General) Regulation 2018.

### Recommendations

Finding Number	Item	Detail
F1.11	Amend	Conduct an engagement study on the areas sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan
F1.02	Amend	Remove references to the Water Act 1912, updating to the Act, including terminology
F1.04	Amend	Inclusion of water quality provisions, such as blackwater. Include details on the benefits of flows to downstream environmental assets

## G.3 FMP Implementation in accordance with the Provisions

### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of 'whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles'. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.

However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.

A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.

Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.

The root cause identified in Audit report as to why the plan wasn't implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.

An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

### Plan

- The Audit Report found that 'the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements ('must', 'shall', 'require'), while others suggest more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed').
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

### Implementation

- The Audit found 'no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.'
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as 'Minister's Plans' under the Act38 but were developed under the WA 1912. This has added complexity in their interpretation and implementation.



- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements ('must', 'shall', 'require'), while others suggest more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed').

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

#### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'. Furthermore, the plans contains no specific trigger for flood monitoring.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the 'provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review'.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring

Provision	Detail	Assessment	Evidence
			performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters		
(a)	proposals for the construction of new flood works		NA No applications were received during the s.44 Audit period
(b)	the modification or removal of existing flood works	✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There is evidence that unauthorised works may have been constructed in the FMP area, with the Audit recommending further investigations. The plan does include modifications to development in the FMP area but the modifications listed in the plan are not mandatory. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood events in the area but no assessment against the performance indicators has been completed. There is also no specific trigger for flood monitoring activities.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with

Provision	Detail	Assessment	Evidence
	extent of flooding within the water management area		the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other.
(g)	such other matters as are prescribed by the regulations	✗	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

## Recommendations

Finding Number	Item	Detail
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Act, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report

F7.01	Update	Include a specific trigger for flood monitoring
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#### G.4 FMP assessed if adequate and appropriate against the Principles of the Act

##### Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
5	is the management plan adequate an appropriate for ensuring the effective implementation of the general principles to;		
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate but not appropriate FDEs are included as assets within the floodway networks and delivery to assets protected in the assessment criteria, thought assessment approach is linked to repealed legislation.	Improvement opportunities are available through plan revision recommendations. Appropriateness would be through the update of ecosystem information to online mapping capable of property scale zoom
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Included but not adequate and appropriate FDEs are included as assets within the floodway networks and these are linked to habitat outcomes for terrestrial and aquatic fauna with delivery to assets protected in the assessment criteria, thought assessment approach is linked to repealed legislation.	Key habitats are not identified in the mapping of the wetland vegetation
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Management of the flow regime is linked in the plan as a method of reducing peak velocities that can cause erosion, and minimising inundation of agriculture to reduce risk of nutrient and pesticide transport. Maintaining flow corridors expected to allow dilution and flushing of flood water	Water quality is mentioned as an expected beneficiary of the rules relating to flow velocity but was not a driver in the plan development
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Adequate but not appropriate The use of peak velocity and redistribution means that cumulative effects are an implied element of the plan	Plan does not explicitly identify the cumulative effects of development and its risks
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate and appropriate The plan states that areas of aboriginal significance have been considered and that they all within the floodway network. Flows are described to be maintained to these areas but velocities managed to minimise damage	Details of the Aboriginal sites mentioned are not included in the plan. No community consultation or cultural monitoring activities listed
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Included but not adequate and appropriate A number of cultural assets were listed. They are considered to be on high ground outside the floodway network and therefore not impacted by flooding	The plan states that there is no action required for the lone site. Consultation activities should include cultural information but this is not listed as a requirement
(2)(g)	Maximise social and economic benefits to the community	Adequate but not appropriate The plan identifies the protection of the 25 year ARI flood as the driver of social and economic benefits in addition to allowances for	Social and economic reasoning has been the basis of the design of the floodway network in an effort to minimise costs of protection against

Section	Principle	Step 4 Assessment	Comment
		higher protection outside the network and allowances for high value infrastructure	larger flooding. Allows the inundation of larger floods that may minimise damage from increased velocities and depths
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Included but not adequate and appropriate Plan includes scenarios such as data, land use changes, impediments to implementation that may result in the plan being updated. Climate change and changes in water management practices also listed as triggers. Outlines for monitoring are included as an appendix to the plan	The plan gives opportunity for adaption that could include improvements in understanding of ecological water requirements as a 'factor that influence decisions' As the performance indicators are vague the adaptive management opportunities have been undermined
(2)(a)	Apply the principles of adaptive management	Included but not adequate and appropriate Triggers for review, including model, data and land use changes as well as the impacts of climate change of flooding and agriculture identified, aiming to allow adaptive responses to decrease the longer term vulnerability	The plan gives opportunity for adaption, though is not prescriptive enough to limit unknown adaptive opportunities
	and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:		
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Minimising the development in the floodway network is the key strategy around the floodplain management. Reliance on repealed legislation hinders the effectiveness	Included but not adequate and appropriate
(6)(b)	Avoid or minimise the impacts of flood works on other water users	The implied cumulative impact criteria minimise the impacts on other water users but not explicitly covered	Included but not adequate and appropriate
(6)(c)	Minimise existing and future risk to human life and property from occupation of floodplain	Existing and future risk to life and property does not make up part of the plan as it is stated to be the strategy to manage the risks identified in the FS and FRMD	Not Covered so not adequate and appropriate

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend the performance criteria to include more specific measures that link to amendment or update opportunities
F1.03	Amend	Mapping of spatial products in maps able to accurately zoom the property scale
F1.04	Amend	Amend the plan and the assessment criteria to include descriptions of the cumulative effects of development
F1.06	Investigate and Amend	Conduct a climate change adaption assessment and amend the plan based on the advice of the assessment
F1.09	Amend	Inclusion of details and mapping of existing works and environmental assets to the plan
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.16	Amend	Addition of the Flood Study and FRMS as appendices

## G.5 FMP assessed if adequate and appropriate against the Principles of the Act

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)

Item	Description	Source
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

### Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)
- Environmental assessment requirements considered adequate (1 submission)
- Insufficient resources for implementation (1 submission, out of scope)
- Increased community communication and education required (1 submission)
- Improvements to Floodplain Harvesting Policy (1 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.03	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area. Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale
F1.02	Amend	Amend objectives to make them more in line with the Act.
F1.07	Amend	Amend to update the language to make it mandatory
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.

## G.6 Synthesis of Results

### General findings

Having been developed under the provisions of the *Water Act 1912* as a water management strategy rather than an FMP the plan and requires amendments to bring it into line with the Act. Overall, the plan is not clear in its information leaves itself open to varied interpretation, reducing its effectiveness. The area of the floodway network is

included in the plan but is not clear as to its boundaries and is not able to be zoomed. The criteria for assessment are vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear. The plan includes a few hydraulic and environmental required remedial measures to existing works aimed at improving connectivity through the floodway. The language in the required actions is not mandatory, vastly reducing the effectiveness and making them harder to enforce. The remediation works requires updating to include mandatory language, and some investigation should be done as to the budget implications for items that have not been implemented and now the responsibility of DPIE Water. Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included.

The lack of clarity around the criteria and where they are to be implemented, well as the suggestive language in the required actions vastly reduces the adequacy and effectiveness of the plan. The information could be accurate and the best fir for managing the floodplain and ensuring the effective implementation of the water management principles, but the difficulties created by the language and issues around applying the maps to a property scale undermine this. Furthermore, the linkages to the *Water Act 1912* that has since been repealed create further issues around the clarity of the assessment process and the plan itself. The plan requires update to remove reference to the repealed *Water Act 1912* and is processes and terminology updated to the Act.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the Act. The review details a number of amendments that can be made following the 5 year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

## Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove references to the Water Act 1912, updating to the Act, including terminology
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater Include details on the benefits of flows to downstream environmental assets
F1.06	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)). Create more specific objectives. Redefine the performance indicators to use more measurable language Recording of the objectives to include that agriculture and environmental factors of the vision statement, and removal of ambiguous language such as 'accepted' (accepted by whom)?
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Act, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.09	Amend	Inclusion of details and mapping of existing works and environmental assets to the plan



Finding Number	Recommendations	Detail
F1.11	Amend	Include information on sites of importance to Aboriginal communities to the plan and amend the floodway network and criteria to ensure they are protected and maintained.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Investigate and Amend	Inclusion of measures to ensure adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other updates to knowledge, data or technology. Conduct a climate change adaption assessment and amend the plan based on the advice of the assessment
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and conduct a review to ensure that they increase the adequacy and appropriateness of the plan
F7.01	Update	Include a specific trigger for flood monitoring

## Attachment H. Lachlan River Lake Brewster Weir to Whealbah (Hillston) 2005

### H.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

Logic Assessment		Assessment	Evidence	Reference
L1	Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The vision for the FMP is: <i>A floodplain managed for the social and economic interest of the community that contributes to a healthy and sustainable environment.</i>	FMP Section 1.3
L2	Does the plan contain objectives (s.35(1)(b))	✓	From the plan (letters added here for mapping): The strategic objectives of the FMP are to: <i>reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible (NSW Flood Prone Land Policy objective);</i> <i>coordinate floodplain development in order to minimise adverse changes to flood flow patterns;</i> <i>increase the sustainable social, economic and ecological benefits of using the floodplain;</i> <i>improve and maintain the diversity and well being of native riverine and floodplain ecosystems that depend on flood inundation; and,</i> <i>take into account the cumulative impact on flooding behaviour of individual developments.</i>	FMP Section 1.4
L3	Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	The vision statement splits into two main themes; social and economic interests of the community, and a healthy and sustainable environment. Social and environmental impacts link to reducing the impacts on flood prone property and private and public losses (a) and to increase sustainable social, economic and ecological benefits of the floodplain (c). A healthy and sustainable environment links to the diversity and well being of native riverine and floodplain ecosystems that depend on flood inundation (d) Both aspects link to minimising adverse changes to flow (b) and the cumulative impacts of developments (e)	Logic Assessment L1 and L2
L4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	The strategies in the plan are through modifications to existing flood control works and the identification of a floodway network. The network area is used to identify 'non-complying works' that are then assessed against hydraulic criteria and on an Environmental Rating Assessment Criteria Scoring system. The assessment methodology used is taken directly from <i>Part 8 of the WA 1912</i> (repealed). This means that the plan designates a floodway network that determines if a flood work is complying (outside the floodway) or non-complying (in the floodway) and requires assessment against the FMP criteria.	

Logic Assessment		Assessment	Evidence	Reference
			<p>The floodway network was delineated using the 1990 flood event, utilising historic data and model outputs to determine the area.</p> <p>The plan contains hydraulic and environmental criteria that the non-complying works are to be assessed against. These result in a scoring system that results in an overall score for the flood work that ultimately determines if it is approved. The scoring system is clearly designed to take into account a wholistic approach to assessing the applications, but the results are very difficult to understand. The criteria involves assessment against the existing of 1990 flood levels, or states no increases, but no base case levels are provided, and there is a lack of clarity around which of levels the increases are to be compared to.</p> <p>The plans include required modifications, including responsibilities, priority levels and contingency actions. The areas are shown in the mapping but the detail is hard to decipher, and the language used in the modifications contains a level of uncertainty around the work required and their enforceability. The works contain parties responsible but there is no clarity around the sources of funding.</p>	
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	Performance indicators are included in the plan. These link to hydraulic, environmental, economic and social criteria that is required to be compared to historic flood events.	FMP Section 9
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	✗	<p>The hydraulic criteria for development is to be assessed in the performance identified in the application which should be expected to be specific and measurable. The other criteria use non specific language and targets that are difficult to measure</p> <p>All of these areas have the issue that the historic flood events to be compared against are not specified and is left open to interpretation</p>	FMP Section 9

### Assumptions

Strategies are not clearly linked to the objectives so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective c, d Floodway network, criteria Required modifications	(2)(e)	-	(6)(a)	Objective c, d Floodway network, criteria Required modifications
(2)(b)	Objective c, d Floodway network, criteria Required modifications	(2)(f)	-	(6)(b)	Objective a, b, c Floodway network, criteria Required modifications

(2)(c)	-	(2)(g)	Objective a, b, c Floodway network, criteria Required modifications	(6)(c)	Floodway network, criteria Required modifications
(2)(d)	Objective a, b Floodway network, criteria Required modifications	(2)(h)	-		

## Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove criteria from and references to the Water Act and replace with information relevant to the FMP and the Act
F1.06	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)). Improve the language of the required actions, assessment criteria and performance indicators to remove ambiguity.

## H.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment	Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—			
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	○	<p><u>Frequency</u>: Some information on frequency through the listing of previous events but not identified with a corresponding magnitude</p> <p><u>Duration</u>: flooding duration identified through previous events, by potential length of flood and time to arrival</p> <p><u>Nature and Extent</u>: Nature and extent of flooding is shown through the mapping of the floodway network with minimal description</p>	Most of this information is assumed to be held in the FS or FRMS
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	The plan includes a summary if the expected environmental benefits with wetlands and floodplain vegetation given special consideration	Plan includes no mapping of ecological assets
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they	○	Existing works are identified through the required modifications table. All other existing flood work information is linked to approval requirements. A scoring system for the potential	Plan includes no mapping of existing

Provision		Detail	Assessment			Evidence	Comment
		give to life and property, and their ecological impacts, including cumulative impacts,				for environmental impacts is included but this is not a clear system	
	(d)	the risk to life and property from the effects of flooding			✗	The plan makes no specific reference to life and property	
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works		○		Approval process and requirements are outlined in the plan but link to repealed legislation.	Links to repealed legislation need to be updated
	(b)	the modification or removal of existing flood works		○		Plan outlines that non-complying works are assessed as new works. A list of required modifications is listed within the plan. These contain clear instructions for remediation with emergency actions if the short-term work is not completed	The Required Modification in the plan are clear in their instruction but are only lacking in timing definitions and differentiation of responsibility if the short-term outcomes are not met.
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		The list of required modifications is listed as a key method for delivering flows to restore ecosystems but the specific benefit of each requirement is not listed. Plan expects around 6,000 ha of wetland to have water access restored	Distribution of flood flows is expected to have positive benefits on wetland and FDE restoration, the requirements just need clarity on timeframes and updated legislation linkages
	(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		○		Existing floodways are intended to be protected by the plan. The requirements for approval are linked to repealed legislation	Links to repealed legislation need to be updated
	(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		○		Modifications within the floodway are to be assessed against impacts on rates of flow and flood levels prior to approval. The requirements for approval are linked to repealed legislation	Links to repealed legislation need to be updated.
	(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows		○		The plan states that the preservation of flood flows within the floodway network is in part aimed to allow for future delivery of the flooding to downstream ecosystems and that this has been included in the expected benefits	Downstream benefits have been identified, relying on the required modifications and the approval process to preserve the passage of flow. Linkages to repealed legislation requires updating and

Provision	Detail	Assessment	Evidence	Comment		
				enforcement of the required modifications for these to be realised		
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability		○	The choice of the 60-70 year ARI event is said to be chosen to reflect the natural flood patterns of the area, covering an area that will account for the variability in flooding. The requirements for approval are linked to repealed legislation	Links to repealed legislation need to be updated.	
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area		○	Changes to flow characteristics is the key driver of the hydraulic assessment criteria within the floodway network. Changes in velocity and distribution that can then influence frequency nature and extent of flooding is managed under the criteria. Plan outlines an approval process as detailed in the repealed <i>WA 1912</i> and agency names that are no longer valid.	Changes to flow velocity and distribution are clear and measurable but enforcement through approvals is linked to repealed legislation	
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		○	Water quality benefits expected from the FMP implementation listed as reduced risk of surplus nutrient and pesticide transport and scour or erosions through the limiting of inundation of cropped areas and the reduction flow velocities through the floodway network.	The benefit of managing flood characteristics to water quality is mentioned but does not appear to have informed the process	
(f)	other measures to give effect to the water management principles and the objects of this Act			✗	Aboriginal heritage information is listed as an included consideration but primarily in the FS and FRMS. Assets are detailed as being expected to be in some vegetation, acting as an indicator for Aboriginal areas	The lack of inclusion of Aboriginal assets is a failure to give effect to the water management principles and the objects of this Act
(g)	such other matters as are prescribed by the regulations			✗	Plan states that 'currently no matters have been prescribed by the regulations	The power under s.30(g) has not been exercised in the Water Management (General) Regulation 2018.

## Recommendations

Finding Number	Item	Detail
F1.02	Amend	Remove references to the Water Act, updating to the Act, including terminology
F1.03	Amend	Include clear mapping of the ecological assets, existing works and the floodway network on zoomable spatial mapping
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.07	Amend	Update the required modifications to include mandatory language for the work

F1.11	Amend	Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and conduct a review to ensure that they increase the adequacy and appropriateness of the plan

### H.3 FMP Implementation in accordance with the Provisions

#### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of ‘whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles’. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:



- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.
- However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan wasn’t implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

#### Plan

- The Audit Report found that ‘the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

#### Implementation

- The Audit found ‘no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.’
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act<sup>38</sup> but were developed under the *WA 1912*. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented		The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented		The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision



### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the 'provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review'. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters		
(a)	proposals for the construction of new flood works		An application was made in the Audit period. Approvals assessment, granting or refusal and application of conditions were carried out in line with requirements. However, some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out.
(b)	the modification or removal of existing flood works	✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood events in the area but

Provision	Detail	Assessment	Evidence
			no assessment against the performance indicators has been completed. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.' Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than mandatory requirements.
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period

Provision		Detail	Assessment		Evidence
					Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other.
	(g)	such other matters as are prescribed by the regulations		✗	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding Number	Item	Detail
F1.01	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the Act, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works. Update the performance indicators to include mandatory language
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report

## H.4 FMP assessed if adequate and appropriate against the Principles of the Act

### Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
	is the management plan adequate an appropriate for ensuring the effective implementation of the general principles to;		
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate but not appropriate The plan aims to achieve this through environmental assessment criteria for licence assessment and the required modifications. Also includes a long-term strategy from changes in land use over time but this is a suggested practice	Plan needs to update linkages to repealed legislation and needs timeframes to be added to required modifications to facilitated enforcement.

Section	Principle	Step 4 Assessment	Comment
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Adequate but not appropriate The floodway network has been developed to include flood dependant ecosystems and environmental criteria are included as part of assessment of works but this is linked to repealed legislation	Plan needs to update linkages to repealed legislation and needs timeframes to be added to required modifications to facilitated enforcement
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Management of the flow regime is linked in the plan as a method of reducing peak velocities that can cause erosion, and minimising inundation of agriculture to reduce risk of nutrient and pesticide transport. Maintaining flow corridors expected to allow dilution and flushing of flood water	Water quality is mentioned as an expected beneficiary of the rules relating to flow velocity but was not a driver in the plan development
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Adequate but not appropriate The use of peak velocity and flood levels means that cumulative effects are an implied element of the plan	Plan does not explicitly identify the cumulative effects of development and its risks
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate and appropriate The plan includes requirements flood works will not destroy or damage any Aboriginal site or block or restrict the delivery of flood flows to sites that rely on flood waters	Details of the Aboriginal sites mentioned are not included in the plan. No community consultation or cultural monitoring activities listed
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Included but not adequate and appropriate Cultural sites are listed as all on high ground unlikely to be affected by flooding	The plan states that there is no action required for the lone site. Consultation activities should include cultural information but this is not listed as a requirement
(2)(g)	Maximise social and economic benefits to the community	Not included so not adequate and appropriate Social and economic benefits are not covered in the plan. Potential part of the FS or FRMS	
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Included but not adequate and appropriate Plan includes guidelines for monitoring, but this is not a requirement and there is no options listed for reviews based on monitoring	
(2)(h)	Apply the principles of adaptive management	Not included so not adequate and appropriate The plan includes monitoring requirements to assist in the assessment of the effectiveness of the plan but review options only allow for the 5-year review	
	and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:		
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Included but not adequate and appropriate Minimising the development in the floodway network is the key strategy around the floodplain management.	

Section	Principle	Step 4 Assessment	Comment
		Reliance on repealed legislation hinders the effectiveness	
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Included but not adequate and appropriate The implied cumulative impact criteria minimises the impacts on other water users but not explicitly covered	
(6)(b)	Minimise existing and future risk to human life and property from occupation of floodplain	Not included so not adequate and appropriate Existing and future risk to life and property does not make up part of the plan as it is stated to be the strategy to manage the risks identified in the FS and FRMD	

### Recommendations

Finding	Recommendation	Detail
F1.02	Amend	Update the plan to remove references, terminology and processes linked to the Water Act and update to the Act
F1.03	Amend	Mapping of spatial products in maps able to accurately zoom the property scale
F1.04	Amend	Include information and assessment requirements for the cumulative impacts of flood works. This should include base case information, including model outputs, for the flood characteristics that the new flows should be compared against. Amend the plan and the assessment criteria to include descriptions of the cumulative effects of development
F1.10	Amend	Inclusion of details and mapping of existing works and environmental assets to the plan
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.16	Amend	Addition of the Flood Study and FRMS as appendices and conduct a review
F1.14	Amend	Amend the plan to include requirements for monitoring of flood activity, and for the assessment of the monitoring results against clear and measurable performance indicators. This should include options around updating the plan following monitoring activities. Conduct a climate change adaption assessment and amend the plan based on the advice of the assessment

## H.5 FMP assessed if adequate and appropriate against the Principles of the Act

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES

Item	Description	Source
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

## Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)
- Environmental assessment requirements considered adequate (1 submission)
- Insufficient resources for implementation (1 submission, out of scope)
- Increased community communication and education required (1 submission)
- Improvements to Floodplain Harvesting Policy (1 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.01	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area
F1.02	Amend	Amend objectives to make them more in line with the Act.
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale
F1.07	Amend	Amend to update the language to make it mandatory
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.

## H.6 Synthesis of Results

### General findings

Having been developed under the provisions of the *Water Act 1912* as a water management strategy rather than an FMP the plan and requires amendments to bring it into line with the Act. Overall the plan is not clear in its information leaves itself open to varied interpretation, reducing its effectiveness. The area of the floodway network is included in the plan but is not clear as to its boundaries and is not able to be zoomed. The criteria for assessment is vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear. The criteria also utilise a scoring system that, while potentially useful for providing a wholistic review of flood work assessment, it is extremely difficult to follow and would be tough to use effectively.

The plan includes a number of hydraulic and environmental required remedial measures to existing works aimed at improving connectivity through the floodway. The language in the required actions is not mandatory, vastly reducing the effectiveness and making them harder to enforce. The remediation works requires updating to include mandatory language, and some investigation should be done as to the budget implications for items that have not been implemented and now the responsibility of DPIE Water. Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included.

The lack of clarity around the criteria and where they are to be implemented, well as the suggestive language in the required actions vastly reduces the adequacy and effectiveness of the plan. The information could be accurate and the best fit for managing the floodplain and ensuring the effective implementation of the water management principles but the difficulties created by the language and issues around applying the maps to a property scale undermine this. Furthermore, the linkages to the Water Act that has since been repealed create further issues around the clarity of the assessment process and the plan itself. The plan requires update to remove reference to the repealed Water Act and is processes and terminology updated to the Act.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the Act. The review details a number of amendments that can be made following the 5 year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

## Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove criteria from and references to the <i>Water Act</i> and replace with information relevant to the FMP and the <i>Act</i> .
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.04	Amend	Include information and assessment requirements for the cumulative impacts of flood works. This should include base case information, including model outputs, for the flood characteristics that the new flows should be compared against
F1.06	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d)) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.07	Amend	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the WMA 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.  Improve the language of the required actions, assessment criteria and performance indicators to remove ambiguity. Update the required modifications to include mandatory language for the work.
F1.07	Amend	Amend the plan to include requirements for monitoring of flood activity, and for the assessment of the monitoring results against clear and measurable performance indicators. This should include options around updating the plan following monitoring activities.
F1.09	Amend	Inclusion of details and mapping of existing works and environmental assets to the plan
F1.10	Amend	Include clear mapping of the ecological assets, existing works and the floodway network on zoomable spatial mapping
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report



F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and conduct a review to ensure that they increase the adequacy and appropriateness of the plan

## Attachment I. Murrumbidgee River Hay to Maude 2014

### I.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

Logic Assessment	Assessment	Evidence	Reference
L1 Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The vision for the FMP is: <i>an environment where flood risk to occupiers and users of the floodplain is minimised and flood dependent ecosystems within the floodplain and on the downstream Lowbidgee floodplain are sustained by access to floodwaters.</i>	FMP Section 1.1, page 1
L2 Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added for mapping in L1 and L3): The FMP has the following strategic objectives, linked to the above vision statement: <i>to achieve a coordinated, balanced approach to floodplain management taking into account hydraulic, environmental, social and economic considerations and legislative requirements</i> <i>to ensure the sustainable and equitable use of floodplain resources</i> <i>to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically methods wherever possible (NSW Flood Prone Land Policy objective)</i> <i>to coordinate floodplain development to minimise adverse changes to flow patterns</i> <i>to improve and maintain the diversity and well being of riverine and floodplain ecosystems that depend on flood inundation</i> <i>to take into account the cumulative impact on flooding behaviour of individual developments</i> <i>to provide flow paths to effectively support the downstream Lowbidgee floodplain wetlands, and</i> <i>to maintain areas of Aboriginal cultural significance that are flood dependent.</i>	FMP Section 1.1, page 1
L3 Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	Key points of the vision include minimising flood risk to occupiers and users, and sustained access to floodwaters by the flood dependant ecosystems. Reduced impact of flooding, reduced changes to flow patterns and cumulative impacts to reduce risk to occupiers and users Flow paths to the Lowbidgee floodplain specified, along with 'improving and maintaining' ecosystems Balanced approach across, requirements and a sustainable and equitable use of the floodplain balances both areas	Logic assessment L1 and L2

Logic Assessment	Assessment	Evidence	Reference	
L4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	<p>Development of three zones (A,B and C) that allow 'suitable zone-specific hydraulic and environmental criteria to be used during the assessment process for flood control works'. Zones are linked to the objectives, focussing on the safe discharge of flood flows by protecting major discharge areas (A) and flood storage areas that influence natural flood attenuation (B). FDEs are identified through flow path connectivity. Delineation of zone included social and economic influences. Zones are clearly shown in mapping in Figures 2A to 2E</p> <p>Zones are linked to complying works criteria that assess existing and proposed flood control works. Plan states that 'all flood control works situated on or proposed to be constructed on land within the designated floodplain will be determined in accordance with the FMP and Part 8 of the [Water] Act'. Plan outlines works that require approval (6.2.2), application process (6.2.3), and the determination process (6.2.4). Determination is under a complying works criteria (Table 5) outlining the hydraulic and environmental criteria that works are assessed against, depending on their location (6.3.1). If the work do not comply with the criteria linked to the location they are considered non-complying resulting in requirement for advertising and potential for further information requirements(6.3.2). These may lead to rejection. Works are considered unauthorised if there is no approval in force or the work is not constructed in accordance with the approval (6.4).</p> <p>A list of hydraulic and environmental improvement measures that have been identified in the FRMS 'to be affecting flood flows or an identified flood dependant ecosystem'. The plan states that the works identified by the measures are not permitted in the floodway area unless the applicant can demonstrate that the works do not result in any significant adverse impacts on flooding behaviour or FDEs. Each item is clearly prioritised and each has responsibility assigned. In cases that the landholder is the responsible party the plan placed the onus on the landholder to seek design information. Priority levels assign timeframes for remediation.</p>	<p>FMP Section 3.4, page 16</p> <p>FMP Section 6</p> <p>FMP Table 5, page 36</p> <p>FMP Section 4, page 20</p>
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	<p>Performance indicators are included, linked to the management of flood control works, the orderly passage of flood water through the floodway network and connectivity of floodwaters to support FDEs</p>	<p>FMP Section 7.1, page 40</p>
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	✗	<p>Performance indicators are generalised and are not SMART. As they are generalised they can be interpreted as attainable and relevant, however without specific, measurable targets there remains room for doubt. Some of the detail in the criteria in Table 2 but this is separate to the performance indicators and not listed as a target</p>	<p>FMP Section 7.1, page 40</p>

### Assumptions

Strategies are not clearly linked to the objectives so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act


General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective a, c, d, e, f and g Zone, FW approval criteria, improvement measures	(2)(e)	Objective h Zone, FW approval criteria, improvement measures	(6)(a)	Objective f FW approval criteria
(2)(b)	Objective a, c, d, e, f and g Zone, FW approval criteria, improvement measures	(2)(f)	-	(6)(b)	Objective a, b, c, d, f Zone, FW approval criteria, improvement measures
(2)(c)	FW approval criteria	(2)(g)	-	(6)(c)	Objective a, b, c, d, f Zone, FW approval criteria, improvement measures
(2)(d)	Objectives c, d and f FW approval criteria	(2)(h)	-		

### Recommendations

Finding Number	Recommendations	Detail
F1.07	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F9.01	Amend	Reformatting of the plan to cover formatting errors such as missing page 4

## I.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment	Evidence	Comment
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—		
Core Provisions	(a) identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding		 <u>Frequency</u> : Plan outlines multiple flood events, detailing return magnitude and frequency of the design floods of 1974 and 1956, compares the two flows and peak levels as pre- and post-major development examples (noting 'since the 1956 flood, significant changes have taken place within the FMP floodplain') and identifies events after the Hay Town Bridge gauge was removed	Information is generally easy to find, split between sections 1.2.1 Flooding Characteristics and Section 3 FMP Floodway network. Natural and existing scenarios not clearly shown independently, plan does not clearly split the two. Flooding is detailed with frequency, nature and extent shown but

Provision		Detail	Assessment		Evidence	Comment
					<p><u>Duration:</u> Variation of duration is noted, simply stating that the floodplain can be flooded for months at a time</p> <p><u>Nature:</u> The 1974 flood (40 year ARI) is used as an example for distribution, identifying the Murrumbidgee River as the key flow path with four flood runners and breakouts described with clear geographic linkages. Zone A major discharge areas are shown clearly in zone mapping and Figure 1 map shows the geographic locations linked to the descriptions of breakouts though note shown on the map (some assumptions regarding paths are required by linking descriptions and zones).</p> <p><u>Extent:</u> Flood extent shown through the application of the 40 year ARI event to 2006 topography and visualised through the Zone B mapping</p> <p>The March 2012 event is noted as being similar to the 1974 event, stating that aerial imagery is available, and that it helped validate the model and confirmed the improvement measures.</p>	<p>not clearly separated from the theoretical scenario model used in zone delineation. The similarities to the March 2012 flood show that the information is still relevant, however the imagery from the 2012 event was not included.</p> <p>The plan mentions that more information on this is covered in the FRMS that was used to inform the modelling in Section 3</p>
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✓		<p>The ecological benefits are clearly articulated. FDEs are articulated through species and habitat requirements and then mapped across the FMP area. The disbenefits of not protecting the flows to FDEs is articulated through the loss of floodplain vegetation and connectivity in the floodplain prior to the FMP development.</p> <p>The plan identifies the Lowbidgee wetlands as a major beneficiary of the plan's connectivity, though the wetlands are not included in the plan area.</p> <p>Connectivity to FDEs is facilitated through Zone C areas, and flow paths maintained through zones A and B. Environmental measures in Table 1 are the strategic measure for restoring connectivity to FDEs, and the benefits are detailed in Table 2</p>	<p>The information regarding ecological benefits is clearly and explicitly articulated. Information is easy to find in 1.2.2 floodplain environment and shown well in figures 3A to E. Environmental Impacts covered in Section 5 links to the mapping and details the expected ecological benefits. Groundwater recharge is mentioned as to be similar to natural conditions. Indicator fauna is used to show areas that ground water recharge is expected to occur.</p> <p>Relevance and sufficiency of the information is dependant on the status of the vegetation itself.</p>
	(C)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological		✗	<p>Existing works have not been mapped in the plan. Wording of Part 8 approval process implies that they are applicable to existing works.</p>	<p>The information on existing works is not clearly shown, rather implied in Part 8 assessment wording.</p>

Provision	Detail	Assessment			Evidence	Comment
	impacts, including cumulative impacts,					
	(d) the risk to life and property from the effects of flooding		○		The plan articulates that it is informed by the findings of the FRMS where the risk to life and property is investigated and used to inform the design of the floodway network. The design flood used to design the floodway network was chosen to provide an 'acceptable level of flood risk for property and infrastructure'. Allowances are included for levees designed to protect high value infrastructure only. In these instances approvals are not required.	The plan does not specify the details of risks to life and property, relying on information covered in the FRMS. For increased clarity on these risks the Flood study and FRMS could be included in the plan as attachments.
-+Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—				
	(a)	proposals for the construction of new flood works	✓		Section 6 provides a clear process and criteria for the assessment of proposed works. This includes the assessment of unauthorised and non-complying works including staged contingencies to cover varied scenarios, such as objections to works, additional information requirements and processes where unauthorised works are identified.	The assessment process is clear in the terms of the old WA 1912 and the current Water Management Regulations for 'converted' FMPs.  Note that Unauthorised works are no longer tolerated, unless they were subject to an application before embargo.
	(b)	the modification or removal of existing flood works	✓		Modification of works is included in Section 6. Modifications to works are covered under Section 6.4, including directions to modify Unauthorised Works that can be issued under Section 180D of the WA 1912	Section 6 is a clear, staged section providing a framework the assessment of existing and proposed flood works however the process relates to the WA 1912  The s.180D is a reference to the repealed WA 1912. So it is no longer valid.
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	✓		Environmental improvement measures have been included to restore flood connectivity to FDEs, designed to reinstate flow paths to areas that are available for rehabilitation. These expected benefits are detailed in a summary of FMP environmental benefits	The environmental improvement works are shown clearly and are able to be linked to the mapping of ecosystems and the summary of environmental impacts.

Provision	Detail	Assessment		Evidence	Comment
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✓		The improvement measures are shown on the mapping of the Zones and the benefits to reinstating natural floodways is well detailed. The Flood runners of Zone A match the natural paths outlined in 1.2.1 and the hydraulic improvement measures show how they except to assist the flow paths	Information on improvement works that the assistance to the reinstatement of flow paths easy to find and understand, with clear links from information to mapping.
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		○	The water quality impact of Table 2 show that the FMP is expected to reduce velocities. The Floodway network has been designed using depth and velocity criteria on the design flood to manage flow velocity and as a result durations and levels. Improvement measures are included for areas that exceed these levels as hydraulic issues requiring modification to restore natural inundation.	Restoration of natural flood characteristics is dealt with through the use of the design flood criteria informing hydraulic improvement measures
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✓		Delivery of flows to the downstream Lowbidgee wetlands is listed as a key driver to the development of the plan and the floodway network. The connectivity provided through the zones connects to the downstream boundary where the plan area meets these wetlands	The measures taken are more around maintaining flows to the downstream areas, but the remediation of the improvement measures will likely facilitate flows to the downstream wetlands. There remains a need to address restoration or rehabilitation of water dependent ecosystems <i>within</i> the FMP area.
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability		○	The restoration of land and FDEs is the key strategy used by reinstating flow paths. The improvement measures are generally located within Zone A aimed at reopening flow paths that will reinstate water sources for ecosystems.	Based on the assumption linking the reinstatement of floodways and the initial FMP comments regarding the impacts of development on spatial and temporal variability of flooding since the 1956 event, the reinstatement of flow paths will restore much of the natural spatial and temporal flow characteristics

Provision	Detail	Assessment			Evidence	Comment
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✓			Complying works criteria, particularly in Zone A articulate that the restrictions on changes to flood flows are linked to management of floodways and flood behaviour.	The criteria for assessment shows the reasoning and the links to flood behaviour. It is assumed that these thresholds are linked to the Flood Prone Land policy that is listed in 2.2.3 as informing the decision making though this is not articulated. Terminology around 'complying' and non-complying' works needs updating to reflect the WMA 2000.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		○		Water quality is listed as an expected beneficiary of the implementation on the Plan though it 'will not have a significant impact' (Table 2). The primary benefit expected to be as a result of the management of flow velocity reducing erosion and sediment transport	The benefit of managing flood characteristics is mentioned but does not appear to have informed the process.
(f)	other measures to give effect to the water management principles and the objects of this Act			✗	No Aboriginal cultural sites, areas or values of significance were included when developing the plan though it is recognised that they are likely to exist in the FMP area	The Plan makes an effort to include areas outside the core and additional provisions to give effect to the principles and the objects of the Act. It is noted that consultation is a requirement under Division 8 of the Act. However, the lack of inclusion of cultural assets is a failure to give effect to the water management principles and the objects of this Act
(g)	such other matters as are prescribed by the regulations			✗	Plan states that 'currently no matters have been prescribed by the regulations'	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding number	Item	Detail
F1.01	Amend	Increase clarity around the risk to life and property and how this is managed
F1.02	Amend	Remove references to the WA 1912, updating to the WMA 2000, including terminology
F1.04	Amend	Inclusion of water quality provisions, such as blackwater prevention
F1.07	Amend	Remove ambiguity about unauthorised works
F1.10	Amend	Amend the plan to include clear spatial representation of ecosystems and environmental assets in the floodplain



F1.11	Amend	Conduct an engagement study on the areas sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F9.02	Amend	Inclusion of the March 2012 imagery, detail on the linkages to 1974, and natural flooding detail
F9.03	Amend	Inclusion of the Lowbidgee wetlands in the boundary
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and an review conducted to ensure that their inclusion increases the adequacy and appropriateness of the plan

### I.3 FMP Implementation in accordance with the Provisions

#### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of ‘whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles’. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to implement the principles.
- However, the plan may be adequate and appropriate to implement the principles even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan wasn’t implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

#### Plan

- The Audit Report found that ‘the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

### Implementation

- The Audit found ‘no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.’
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act<sup>38</sup> but were developed under the *WA 1912*. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision

Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision
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### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the 'provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review'.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters		
(a)	proposals for the construction of new flood works		NA No applications were received during the s.44 Audit period
(b)	the modification or removal of existing flood works	✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There is evidence that unauthorised works may have been constructed in the FMP area, with the Audit recommending further investigations. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood

Provision	Detail	Assessment	Evidence
			events in the area but no assessment against the performance indicators has been completed.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period

Provision	Detail	Assessment	Evidence
			Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other.
(g)	such other matters as are prescribed by the regulations	✗	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding Number	Item	Detail
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.06	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the WMA 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report

## I.4 FMP assessed if adequate and appropriate against the Principles of the Act

### Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
5	is the management plan adequate and appropriate for ensuring the effective implementation of the general principles to;		
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate and Appropriate Zones are designed to protect connectivity of flows to FDEs, with Zone A restricting impediments to FDEs. Improvement measures are included to reinstate lost connectivity, for the effective protection and restoration of water resources floodplains and dependent ecosystems. Specific expected benefits to flora and fauna are outlined in Table 2 of the FMP.	Zones clearly articulate the ecological reasoning, improvement measures detail environmental issues and Table 2 clearly provides the expected benefits from the plan. Section 7.4 allows for updates due to climate change or other factors restricting the adequacy of performance

Section	Principle	Step 4 Assessment	Comment
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Adequate and appropriate Aquatic and terrestrial fauna are included as part of the expected environmental impacts. Where available specific FDEs or fauna are listed as the habits for the referenced fauna allowing connection to the mapped information. In addition, connectivity assessed in 2(a) above is assumed to benefit a range of animals and plants.	The linkage to the FDEs for habitat locations link it to the Section 7.4 review criteria around flow behaviour and climate change impacts.
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Table 2 includes expected water quality benefits linked to management of flow velocity	Water quality is mentioned as an expected beneficiary of the rules relating to flow velocity but was not a driver in the plan development Potential water quality impacts from flood inundation are not mentioned.
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Adequate but not appropriate Cumulative impacts is included in the assessment criteria for Zone A for redistribution of flow and obstruction of floodways is measured against the floodway width.	The Plan includes the cumulative impacts in the criteria but it is assumed that much of the detail on expected impacts is in the Flood Study or FRMS
(2)(e)	Protect geographical and other features of Aboriginal significance	Adequate and Appropriate Areas of Aboriginal significance included in ecological areas and consultation built into plan development and approval assessment	Assets are stated to be identified and included but the detail is not, with consultation during plan development and requirements for ongoing consultation related to approvals.
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Adequate and Appropriate Indigenous features included in (2)(e). Plan mentions that other cultural assets were included. Consultation activities with landholders and stakeholders is assumed to have covered this	Measures are included for the identification and protection of cultural assets though none are included
(2)(g)	Maximise social and economic benefits to the community	Not Covered so not adequate and appropriate No socio-economic detail included	
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	May no longer be Adequate and Appropriate Section 7.4 outlines the scenarios in which the plan should be amended, including climate change or adequacy of performance or 'factors that influence decisions'	The plan gives opportunity for adaption that could include improvements in understanding of ecological water requirements as a 'factor that influence decisions' however the inadequacy of the performance indicators limits this ability However, since the FMP was made, the Basin Watering Strategy and Murrumbidgee Long-term Watering Plan have improved understanding of ecological water requirements.
(2)(a)	Apply the principles of adaptive management	May no longer be Adequate and Appropriate	The plan gives opportunity for adaption, though is not prescriptive enough to limit unknown adaptive opportunities

Section	Principle	Step 4 Assessment	Comment
		Section 7.4 outlines the scenarios in which the plan should be amended, including climate change or adequacy of performance or 'factors that influence decisions'	However, since the FMP was made, the Basin Watering Strategy and Murrumbidgee Long-term Watering Plan have improved understanding of ecological water requirements.
6	and to determine is the management plan adequate and appropriate for ensuring the effective implementation of the floodplain management principles to:		
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Adequate and appropriate Maintaining flow paths to FDEs is key to the plan's development. Plan lists reduction in erosion due to management of flow velocities as an expected outcome of the plan	Degradation of ecosystems and erosion and sedimentation transport are expected benefits from the plans implementation. More detail is likely to be in the Flood Study or the FRMS
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Adequate and Appropriate The impacts on adjacent properties and the cumulative impacts of development are included as assessment criteria for Zones A and B	
(6)(c)	Minimise existing and future risk to human life and property from occupation of floodplain	Adequate and Appropriate Exclusion of high value infrastructure allows current and future protection of life and valuable assets. Section 7.4 recommends a climate change study to be conducted to inform potential adaption amendments	Plan recommends climate change adaption study to be conducted

## Recommendations

Finding Number	Recommendation	Detail
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.16	Amend	Addition of the Flood Study and FRMS as appendices and conduct a further review to ensure their inclusion increases the adequacy and appropriateness of the plan
F1.14	Investigate and Amend	Conduct a climate change adaption assessment under the Section 7.4 guidance and amend the plan based on the advice of the assessment
F1.14	Amend	Update the plan to ensure the objectives of the Murrumbidgee water sharing plans and long term watering plan are reflected in the FMP
F1.06	Amend	Update the performance indicators to ensure there are triggers for future plan amendments and adaptations

## I.5 FMP assessed if adequate and appropriate against the Principles of the Act

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)



## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

### Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.01	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area
F1.02	Amend	Amend objectives to make them more in line with the WMA 2000.
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale
F1.07	Amend	Amend to update the language to make it mandatory. Amend the plan to include clear, implementable rules that are not left open to interpretation
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.

## I.6 Synthesis of Results

### General findings

Having been developed under the provisions of the *WA 1912* as a water management strategy rather than an FMP the plan and requires amendments to bring it into line with the WMA 2000. Overall the plan is not clear in its information leaves itself open to varied interpretation, reducing its effectiveness. The area of the floodway network is included in the plan but is not clear as to its boundaries and is not able to be zoomed. The criteria for assessment is vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear. The plan includes a number of hydraulic and environmental required remedial measures to existing works aimed at improving connectivity through the floodway. The language in the remedial measures is not mandatory, vastly reducing the effectiveness and making them harder to enforce.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Overall the foundations for an adequate and appropriate plan are there, but requires increased clarity on where the rules are applicable, and how the rules are applied are needed for the plan to be effective. The plan is just lacking in fact that it has not utilised mandatory language to give effect to the details it holds

Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included. The plan also requires update to remove reference to the repealed WA 1912 and its processes and terminology updated to the WMA 2000.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the WMA 2000. The review details a number of amendments that can be made following the 5 year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

### Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove references to the WA 1912, updating to the WMA 2000, including terminology and objectives
F1.03	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater prevention
F1.04	Amend	Increase clarity around the risk to life and property and how this is managed
F1.05	Update	Update implementation activities, with a focus of clarity of approval type definition, knowledge base development, update of procedures and data sharing capabilities.
F1.06	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.06	Amend	Update the performance indicators to ensure there are triggers for future plan amendments and adaptations
F1.07	Amend	Remove ambiguity about unauthorised works
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the WMA 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.07	Amend	Amend the plan to include clear, implementable rules that are not open to interpretation, and improve clarity of information as ease of understanding
F1.10	Amend	Amend the plan to include clear spatial representation of ecosystems and environmental assets in the floodplain
F1.10	Amend	Inclusion of existing works details and mapping to the plan
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts

F1.14	Investigate and Amend	Conduct a climate change adaption assessment under the Section 7.4 guidance and amend the plan based on the advice of the assessment
F1.14	Amend	Update the plan to ensure the objectives of the Murrumbidgee water sharing plans and long-term watering plan are reflected in the FMP
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F9.01	Amend	Reformatting of the plan to cover formatting errors such as missing page 4
F9.02	Amend	Inclusion of the March 2012 imagery, and detail on the linkages to 1974, and limitation on natural flooding detail
F9.03	Amend	Inclusion of the Lowbidgee wetlands in the boundary
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and an review conducted to ensure that their inclusion increases the adequacy and appropriateness of the plan

## Attachment J. Tuppal and Bullatale Creeks Murray River offtake to Deniliquin 2004

### J.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

	Logic Assessment	Assessment	Evidence	
L1	Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: <i>The vision for the management of the Tuppal and Bullatale Creeks floodplain is as follows: To manage the floodplain of Tuppal and Bullatale Creeks in an equitable and sustainable manner through careful use of parts of the floodplain for agricultural activities whilst allowing for the floodplain's natural flood distribution and storage functions and enhancing its environmental values.</i>	FMP Section 1
L2	Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added for mapping): <i>The objectives linked to the above vision statement for the Tuppal and Bullatale Creeks FMP are as follows: To achieve a coordinated balanced approach to floodplain management taking into account hydraulic, environmental and economic considerations, and legislative requirements. To ensure the sustainable and equitable use of floodplain resources.</i>	FMP Section 1
L3	Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	The objectives are consistent with the vision statement in the way that they are both written in a very similar way and using the same language. While the objectives meet the criteria for consistency with the vision statement they lack the level of detail that would make the plan more effective.	Logic Assessment L1 and L2
L4	Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	The plan utilises a list of required environmental and hydraulic modifications, and a floodway network based on the 1975 design flood that links to a set of assessment criteria. These criteria are considered to be applied to works that are deemed non-complying under the Section 8 assessment of the WA 1912 (repealed) and in conjunction with the Murray Regional Environmental plan No 2. The required modifications are linked to hydraulic and environmental outcomes that are considered me 'floodplain management issues'. They include a description of the issue and the modification works required to resolve the issue. Most are linked to a priority levels that correspond to the timeframes that they are required to be resolved. The works are also listed to the responsible parties, however these include government agencies that no longer exist and make no reference to the sources of funding expected to resolve the issues. The floodway network has been created using the 1975 design, chosen to represent a flood event of reasonable size but to not unnecessarily tie up areas of the floodplain that are only engaged in larger flood events. The network is drawn onto	FMP Sections 3, 4, 5, 6

	Logic Assessment	Assessment	Evidence	
			<p>separate mapping, that is largely unclear as to the boundaries of the network, inevitably making it difficult to know where the rules would be applied in the boundary areas.</p> <p>There are also criteria linked to the floodway network that are designed to be the driving force of the plan, however these are spread across the plan, making them difficult to understand, and link to the repealed WA 1912 and the Murray Regional Environmental plan No 2. The overlap with other legislation, particularly as one is repealed, makes understanding the assessment criteria and determining where they apply incredibly difficult.</p>	
L5	Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✗	The plan includes a requirement for performance indicators to be developed as part on state management policy, and provides guidance for the development of the performance indicators but does not outline indicators for the plans itself	
L6	Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	NA		

### Assumptions

Strategies are not clearly linked to the objectives so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective a, b Floodway network, Criteria, modifications	(2)(e)	-	(6)(a)	Objective a, b Floodway network, Criteria, modifications
(2)(b)	Objective a, b Floodway network, Criteria, modifications	(2)(f)	-	(6)(b)	Objective a, b Floodway network, Criteria, modifications
(2)(c)	-	(2)(g)	Objective a, b Floodway network, Criteria, modifications	(6)(c)	Objective a, b Floodway network, Criteria, modifications
(2)(d)	-	(2)(h)	-		

## Recommendations

Finding Number	Recommendations	Detail
F1.01	Amend	Update the objectives to include more detail, rather than a paraphrase of the vision statement
F1.02	Amend	Remove criteria from and references to the <i>WA 1912</i> and replace with information relevant to the FMP and the <i>WMA 2000</i>
F1.07	Amend	Improve the language of the required actions, assessment criteria and performance indicators to remove ambiguity.
F8.01	Amend	Include in the plan a visions statement. Update the objectives to ensure they are linked to the vision statement

## J.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment (circle one)	Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—			
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	○	Some detail has been included with the general characteristics of flooding in the region. It covers the flow pattern and breakout points in the FMP area. Does not state if natural or existing flooding, frequency, duration, nature or extent in detail	Plan refers to the FMS Report, but they are not included in the plan
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	Plan mentiokns groundwater recharge, saying the ‘FMP will not have a measurable impact on groundwater characteristics’. Wetlands and floodplain ecosystems are listed with the estimated areas that will benefit.	Most of the information is stated to be held in the FMS.
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,	○	Some existing works posing floodplain management issues have been listed as needing to be ‘investigated and resolved’. The list included the issue, responsible parties and timeframes for resolution. Some contain mandatory language but not all. Existing works without and are detailed as being subject to the approval requirements in the plan and the repealed <i>WA 1912</i> .	No specific detail on existing works, approval status or location. Approval process linked to the repealed <i>WA 1912</i> . Some of the modification language is mandatory but not all
	(d)	the risk to life and property from the effects of flooding	○	The impacts on risks to life and property are considered through the choice of design flood and allowances for protection of housing and property.	Most of the information is said to be held in the FMS which should be included as an attachment

Provision	Detail	Assessment (circle one)	Evidence	Comment	
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—			
	(a)	proposals for the construction of new flood works	○	Application procedures for new works are included. Linked to the WA 1912, they include detail on the types of works requiring approval and the process. Much of the criteria links back to the Murray Regional Environmental Plan No. 2 (which in turn states that it covers an area as shown in 'the map', with no map included). The assessment criteria are separated across various sections creating confusion. Criteria are either linked to flow levels that haven't been included or are written as guidance not mandatory requirements.	Overall the process is unclear, links to repealed legislation and appears extremely difficult to implement
	(b)	the modification or removal of existing flood works	○	Required modifications are included for works that are considered to be inhibiting the effectiveness of the plan. They include timeframes and responsible parties but some use non-mandatory language. Plan states that unapproved works are required to undergo approval as if it is a new work and may receive notice to remove if not complying however this is linked to the WA 1912 which limits its effectiveness	
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater	○	The environmental and hydraulic works are expected to maintain or restore flood pathways allow flow through natural water sources. Plan lists area estimates of wetlands and FDEs that are expected to benefit from the plan but specific details are not included.	
	(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	○	The environmental and hydraulic works are expected to maintain or restore flood pathways allow flow through natural water sources. Plan lists area estimates of wetlands and FDEs that are expected to benefit from the plan but specific details are not included.	
	(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in	○	The states that plan the adoption of the 1975 flood event as the design event in combination with the required modifications is excepted to	

Provision	Detail	Assessment (circle one)			Evidence	Comment
	particular in relation to rates of flow, floodwater levels and duration of inundation				restore or maintain flows to flood dependant ecosystems. Plan lists area estimates of wetlands and FDEs that are expected to benefit from the plan but specific details are not included.	
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows		○		Downstream flows are considered only through the representation of the FMP being upstream of the Stage 1, 2, 3 and 4 FMP areas	Benefits would need to be assessed through the downstream plans
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability			✗	Natural flooding doesn't seem to have been considered. The existing flood regime appears to be the dominant consideration	
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area		○		The use of a floodway network and the linked criteria are the strategies aimed at control activities in the floodplain but these are unclear, linked to repealed legislation and difficult to understand	The strategies in the plan are designed to control their effectiveness but the lack of clarity and the linkage to the WA 1912 limit their effectiveness
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding		○		The plan states that it is not expected to have significant benefit to water quality	Dealt with but no benefit
(f)	other measures to give effect to the water management principles and the objects of this Act		○		Most of the water management principles are covered under the provisions except for Aboriginal and Cultural benefits. The plan does not expect to have any significant benefit to either.	Deal with but no benefit
(g)	such other matters as are prescribed by the regulations			✗		The power under s.30(g) has not been exercised in the Water Management (General) Regulation 2018.

## Recommendations

Finding Number	Item	Detail
F1.01	Amend	Amend the plan to restructure information. Combine the approval information and approval process in one location to ensure clarity in interpretation
F1.02	Amend	Remove references to the WA 1912, updating to the WMA 2000, including terminology
F1.03	Amend	Update the plan to improve the spatial representation of the floodway network
F1.04	Amend	Inclusion of water quality provisions, such as blackwater



F1.11	Amend	Conduct an engagement study on the areas sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.16	Amend	Inclusion of the FS and FRMS as attachments to the plan or links to the studies added and a review conducted to ensure that their inclusion increases the adequacy and appropriateness of the plan

### J.3 FMP Implementation in accordance with the Provisions

#### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. The s.44 Audit was undertaken by the Natural Resources Commission and this section is a summary for the purpose of the s.43 review. The Review summarises the findings here in order to inform the review of ‘whether [the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles’. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:



- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.
- However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan wasn’t implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

#### Plan

- The Audit Report found that ‘the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

#### Implementation

- The Audit found ‘no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.’
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.
- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act38 but were developed under the WA 1912. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented		The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented		The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'. Furthermore, the FMP contains discretionary requirements for performance indicator assessment rather than actual indicators
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the 'provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review'.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters		
(a)	proposals for the construction of new flood works		NA No applications were received during the s.44 Audit period
(b)	the modification or removal of existing flood works	✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. This is through a lack of target monitoring and discretionary performance indicator requirements
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway

Provision	Detail	Assessment	Evidence
	particular in relation to the passage, flow and distribution of floodwater		network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data

Provision	Detail	Assessment	Evidence
			Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other. The FMP contains discretionary requirements for performance indicator assessment rather than mandatory indicators linked to the plan itself
(g)	such other matters as are prescribed by the regulations		X The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding Number	Item	Detail
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the WMA 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report

## J.4 FMP assessed if adequate and appropriate against the Principles of the Act

### Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
	is the management plan adequate and appropriate for ensuring the effective implementation of the general principles to;		
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Included but not adequate and appropriate The protection of ecological assets is included as assessment criteria, but they are written as suggestions, or guidance on how do assess rather than clear assessment criteria	The guidance style criteria, confusing layout and linkages to repealed legislation remove any effectiveness
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Included but not adequate and appropriate  Habitat not detailed in the plan. FDEs are considered from the fauna perspective only	
(2)(c)	Protect (or enhance) water quality of all sources	Not included so not adequate and appropriate	

Section	Principle	Step 4 Assessment	Comment
		FMP states that it will have no measurable impact on water quality.	
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Included but not adequate and appropriate Cumulative impacts from flood works is considered though the assessment against 1975 levels and not	Some consideration but not in relation water sources or ecosystems
(2)(e)	Protect geographical and other features of Aboriginal significance	Not Covered so not adequate and appropriate	
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Not Covered so not adequate and appropriate	
(2)(g)	Maximise social and economic benefits to the community	Adequate but not appropriate The adoption of the 1975 event as the design flood was in part to allow the maximisation of social and economic benefits through a balance of mitigating flood risk and not unnecessarily tying up a large floodway area	
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Not Covered so not adequate and appropriate	
(2)(a)	Apply the principles of adaptive management	Not Covered so not adequate and appropriate	
	and to determine is the management plan adequate an appropriate for ensuring the effective implementation of the floodplain management principles to:		
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Included but not adequate and appropriate An assessment criteria is include to manage flow velocity aimed at reducing erosion.	Detail on the limit chosen and the erosion in the 1975 event is assume to be held in the FMS
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Not included so not adequate and appropriate  Redistribution of flows is considered but has no clear linkage to other water users	
(6)(b)	Minimise existing and future risk to human life and property from occupation of floodplain	Included but not adequate and appropriate The plan is stated to have considered the existing and future risk to life and property though the selection of the larger 197y5 flood (while considering economic and social impacts). The detail on the consideration is held in the FMS	The plan considered the risks, but the information is not held in the plan. Additionally, the limitations placed on the through the reference to the repealed legislation, the non-mandatory language and the confusing presentation of the plan make the minimisation of the risks extremely difficult

## Recommendations

Finding Number	Recommendation	Detail
F1.03	Amend	Mapping of spatial products in maps able to accurately zoom the property scale

F1.04	Amend	Include specific criteria linked to mitigating risk to life and property, and minimising the impacts on other water users
F1.04	Amend	Amend the plan to include water quality considerations
F1.04	Amend	Amend the plan to include considerations on land degradation
F1.06	Amend	Amend the plan and the assessment criteria to include descriptions of the cumulative effects of development
F1.06	Amend	Amend the plan to include information and assessment criteria linked to land and aquatic habitats
F1.07	Amend	Amend the performance criteria to include more specific measures that link to amendment or update opportunities
F1.09	Amend	Inclusion of details and mapping of existing works and environmental assets to the plan
F1.11	Amend	Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Amend	Amend to include allowances for adaptive management, and allow for the plan to be updated based on updated information or technology
F1.14	Investigate and Amend	Conduct a climate change adaptation assessment and amend the plan based on the advice of the assessment
F1.16	Amend	Addition of the Flood Study and FMS as appendices

## J.5 FMP assessed if adequate and appropriate against the Principles of the Act

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR

Item	Description	Source
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

### Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)



## Recommendations

Finding Number	Recommendation	Detail
F1.03	Amend	Mapping of spatial products in maps able to accurately zoom the property scale
F1.04	Amend	Amend the plan to include water quality considerations
F1.04	Amend	Amend the plan to include considerations on land degradation
F1.04	Amend	Amend the plan to include information and assessment criteria linked to land and aquatic habitats
F1.04	Amend	Amend the plan and the assessment criteria to include descriptions of the cumulative effects of development
F1.07	Amend	Amend the performance criteria to include more specific measures that link to amendment or update opportunities
F1.07	Amend	Include specific criteria linked to mitigating risk to life and property, and minimising the impacts on other water users
F1.09	Amend	Inclusion of details and mapping of existing works and environmental assets to the plan
F1.11	Amend	Include consultation for Aboriginal and cultural assets in the area for identification and monitoring
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Amend	Amend to include allowances for adaptive management, and allow for the plan to be updated based on updated information or technology
F1.14	Investigate and Amend	Conduct a climate change adaption assessment and amend the plan based on the advice of the assessment
F1.16	Amend	Addition of the Flood Study and FMS as appendices

## J.6 Synthesis of Results

### General findings

The plan is a fairly well written water resource plan with the strategies for achieving the objectives easy to find. The mandatory actions included regarding hydraulic and environmental issues are clear, assigned to responsible parties and timeframes. However, some split the responsibility with no clarity on how the split is divided and no sources or funding assigned to their remediation.

The floodway network is clear in its methodology however with basic mapping that is not able to be zoomed to locate boundaries and effected areas, there remains ambiguity on its exact locations. The floodway is linked to an assessment method and criteria; however these are based on the repealed *WA 1912* (forming the foundation of the required modifications) that needs to be updated to the WMA 2000 for it to be truly effective. The criteria for assessment is also vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

Overall, the foundations for an adequate and appropriate plan are there, but requires increased clarity on where the rules are applicable, and how the rules are applied are needed for the plan to be effective. The plan requires updating to include mandatory language, and some investigation should be done as to the budget implications for remediation items that have not been implemented and now the responsibility of DPIE Water.

Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included. The plan also requires update to remove reference to the repealed WA 1912 and is processes and terminology updated to the WMA 2000.

## Recommendations

Finding Number	Recommendations	Detail
F1.01	Amend	Amend the plan to restructure information. Combine the approval information and approval process in one location to ensure clarity in interpretation
F1.02	Amend	Remove criteria from and references to the <i>WA 1912</i> and replace with information relevant to the FMP and the <i>WMA 2000</i>
F1.03	Amend	Update the plan to improve the spatial representation of the floodway network
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater
F1.04	Amend	Include specific criteria linked to mitigating risk to life and property, and minimising the impacts on other water users
F1.04	Amend	Amend the plan to include water quality considerations
F1.04	Amend	Amend the plan to include considerations on land degradation
F1.04	Amend	Amend the plan to include information and assessment criteria linked to land and aquatic habitats
F1.04	Amend	Amend the plan and the assessment criteria to include descriptions of the cumulative effects of development
F1.05	Amend	Improve the language of the required actions, assessment criteria and performance indicators to remove ambiguity.
F1.06	Amend	Update the objectives to include more detail, rather than a paraphrase of the vision statement
F1.06	Amend	Amend the performance criteria to include more specific measures that link to amendment or update opportunities
F1.07	Amend	Most of the s35 requirements of the plan have all been met, however the plan only outlines that performance indicators are required under state policy without actually detailing them. To ensure that the objectives are being met the performance indicators should be amended to create specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the WMA 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.09	Amend	Inclusion of details and mapping of existing works and environmental assets to the plan
F1.11	Amend	Include consultation for Aboriginal and cultural assets in the area for identification and monitoring
F1.11	Amend	Include information on sites of importance to Aboriginal communities to the plan and amend the floodway network and criteria to ensure they are protected and maintained.

Finding Number	Recommendations	Detail
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.14	Investigate and Amend	Conduct a climate change adaption assessment and amend the plan based on the advice of the assessment
F1.14	Amend	Amend to include allowances for adaptive management, and allow for the plan to be updated based on updated information or technology
F1.16	Amend	Inclusion of the Flood Study and FMS as attachments to the plan and conduct a review to ensure that they increase the adequacy and effectiveness of the plan

## Attachment K. Wakool River Moama-Moulamein Railway to Gee Gee Bridge (Stage 2) 2011

### K.1 Floodplain Management Plan Logic

#### Review

Note that the assessment has been conducted as a pass/fail test. No partial marks were considered.

Logic Assessment	Assessment	Evidence
Does the plan contain a vision statement (s.35(1)(a))	✓	From the plan: The vision for the Stage 2 FMP is: <i>to design a floodway network capable of transmitting the design flood volume that minimises the social and economic impact of flooding, while maximising environmental watering within the floodplain where practically and economically possible.</i>
Does the plan contain objectives (s.35(1)(b))	✓	From the plan (lettering added for mapping): <i>The objectives linked to this vision statement are: to achieve a coordinated, balanced approach to floodplain management taking into account hydraulic, environmental and economic considerations, and legislative requirements to ensure the sustainable and equitable use of floodplain resources.</i>
Are the objectives consistent with the vision statement (NA if objectives are not present) (s.35(1)(b))	✓	Vision statement focuses on transmission of flood flow, minimising social and economic impacts, maximising environmental watering where practical and economically possible. The objectives can be linked to these in theory but they are very general.
Are there strategies for achieving the objectives (NA if objectives are not present) (s.35(1)(c))	✓	The plan aims to provide for floodplain management by 'establishing a coordinated network of floodways ... to effectively convey floodwaters and support the floodplain environment' that is linked to assessment criteria that is to be used in the assessment process under Part 8 of the now repealed WA 1912. The floodway network is based on modelling of the 1975 design flood event, chosen for its relatively low estimated return interval (15-20 years ARI), restricting the social and economic impacts and the majority of the floodplain has been developed to protect against the levels of this event. The area inundated in the modelling was then adjusted to ensure that FDEs are included within the area.  The floodway network is identified as the key factor for assessing flood work approvals, guided by Part 8 of the now repealed WA 1912. Proposed works outside floodway network are considered to be 'complying works' under the Part 8 assessment and the approval process is considered to be 'relatively straightforward'.  Flood work applications within the floodway network are considered to be 'non-complying works' under Part 8 and required assessment against the FMP criteria. The works that require approval and are therefore non-complying are earthworks, embankments, levees, or any other work considered to be a controlled work under the WA 1912. The non-complying works are then assessed against the environmental and hydraulic criteria of the plan, aimed at protecting flows to FDS and requiring no redistribution of flood flow in the design flood and minimal redistribution in smaller events.

Logic Assessment	Assessment	Evidence
		The plan includes a list of identified hydraulic and environmental improvement measures the recommend action to restore flood flow in the area or re-establish flows to FDEs. The improvements include the required actions to restore flows through the area, the responsible parties, and a priority level for the work. However, the priority levels do not include timing for the completion of the work and the measures are recommendations, not mandatory actions
Are there performance indicators to measure the success of the strategies (NA if strategies are not present) (s.35(1)(d))	✓	Performance indicators are included, linked to the management of flood control works, the adequate performance of the floodway network in flood events. The plan includes hydraulic, environmental and economic points that 'should be taken into account' when assessing the performance of the FMP.
Are the performance indicators SMART goals and clear (NA if performance indicators are not present)	✗	Performance indicators are generalised and are not SMART. As they are generalised they can be interpreted as attainable and relevant, however without specific, measurable targets there remains room for doubt.

### Assumptions

Strategies are not clearly linked to the objectives so links were made by the reviewer

The plan does not include the outcomes from the Flood Study or the FRMS so it is assumed the plan accurately reflects the outcomes of those reports

### Logic mapping to the Principles of the Act

General Principles	Plan Logic	General Principles	Plan Logic	Floodplain management Principles	Plan Logic
(2)(a)	Objective a, b Floodway network, criteria, improvement measures	(2)(e)	-	(6)(a)	Objective a
(2)(b)	Objective a Floodway network, criteria, improvement measures	(2)(f)	-	(6)(b)	Objective a, b
(2)(c)	-	(2)(g)	Objective a Floodway network	(6)(c)	Objective a, b Floodway network, criteria, Improvement measures

(2)(d)	Objective b Criteria	(2)(h)	-		
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## Recommendations

Finding Number	Recommendations	Detail
F1.06	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.06	Amend	Amend the objectives to provide more detail, with more specific goals that expand on the vision statement

## K.2 FMP development in accordance with the Provisions

### FMP Provisions Assessment Table

Provision	Detail	Assessment	Evidence	Comment	
	29	The floodplain management provisions of a management plan for a water management area must deal with the following matters—			
Core Provisions	(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	○	The plan outlines the influences on flooding in the FMP area. The engagement of flood runners and their location is detailed along with the peak flow and levels of the ten largest floods on record	The majority of the information on the natural and existing flood characteristics is held in the FRMS
	(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	○	Groundwater recharge is expected to be proportionate the area protected for flood flows. The ecological benefits that arise from groundwater is not considered. The benefits to wetland areas and FDEs is covered in the plan	The groundwater recharge in the plan area in flood events is expected to be lower than in natural conditions More information is held in the FRMS
	(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they give to life and property, and their ecological impacts, including cumulative impacts,	○	Some existing works and their ecological impacts are considered in the Environmental Improvement measures. Unapproved works undergo the same approval process as new works	The plan states that more information is held in the FS and FRMS. Approval process linked to repealed WA 1912
	(d)	the risk to life and property from the effects of flooding	○	The risks to life and property are included in the plan, with most of the detail being held in the FRMS. The plan includes specific allowances for flood protection of high value infrastructure.	Reference is made to the FRMS where the risks are said to be covered in detailed

Provision		Detail	Assessment			Evidence	Comment
Additional Provisions	30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters—					
	(a)	proposals for the construction of new flood works		○		The plan outlines an application process linked to Part 8 of the <i>WA 1912</i> . Works that require approval are described as ‘under Part 8’. The plan contains criteria for works requiring approval, and within the floodway network developed.	Approval process is based on the repealed Part 8 <i>WA 1912</i> process and linked to floodway mapping that is not able to be zoomed to a property scale
	(b)	the modification or removal of existing flood works		○		Dealt with through the environmental and hydraulic improvement requirements that specify responsibility a timeframes. Unapproved work to be assessed under the criteria linked to the repealed <i>WA 1912</i> .	Approved worked not covered by the improvement requirements not listed or mapped
	(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		○		FDEs in the FMP area were assessed through a desktop assessment of survey data, prior research and satellite imagery. Improvement measures were then identified that would restore floodwater access or ensure current access is maintained. Improvements include responsibilities and timeframes for implementation	Ecological assets are not mapped in the plan. More detail is provided in the <i>Compendium of Data Report</i> (SMEC 2003) and the FRMS.
	(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		○		The improvement measures are the strategy for reinstating dominant floodways and their exits that would restore and rehabilitate land	Improvement measures aim to restore flood access to FDEs, though no timeframes are linked to the measures
	(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		○		Hydraulic and environmental improvements included in the plan aim to restore flood levels and velocities in the FMP area. The improvements include clear instruction and responsibilities but no timeframes for completion	Some requirements linked to the repealed <i>WA 1912</i> . Based on idea that flood works in the floodway are not permitted unless shown to not result in significant adverse impacts
	(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows		○		The plans floodway network and associated approval criteria is designed to allow the flow of floodwaters through the plan area to the stage 3 and stage 4 area	Approval criteria linked to the repealed <i>WA 1912</i> .

Provision	Detail	Assessment	Evidence	Comment	
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood regimes, including spatial and temporal variability	○	The improvement works are designed to reinstate flow to FDEs that have had access reduced due to the development.	Natural flood detail held in the FS and FRMS not the FMP. Required improvements have no timeframe linkages to the priorities	
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	○	The criteria used in the assessment of flood works restrict redistribution of flows, velocities and depths that influence the frequency, duration, nature or extent of flooding.	Approval criteria linked to the repealed <i>WA 1912</i> . Erosion criteria link to land use thresholds not included in the plan	
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	○	Plan states that it will not have significant impacts on water quality outside of reduced erosion sediment transport and agricultural chemical contamination from inundation		
(f)	other measures to give effect to the water management principles and the objects of this <i>Act</i>	✓	The plan describes the performance indicators and review method as assessing the performance of the plan against the objects of the act.		
(g)	such other matters as are prescribed by the regulations		✗	Plan states that 'currently no matters have been prescribed by the regulations'	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

### Recommendations

Finding Number	Item	Detail
F1.02	Amend	Remove references to the WA 1912, updating to the WMA 2000, including terminology and clear instructions for flood work assessment
F1.04	Amend	Inclusion of water quality provisions, such as blackwater prevention
F1.05	Amend	Amend the priority levels in the improvement measures to include timeframes that the works are to be completed by
F1.06	Amend	Update the plan to include the erosion thresholds for land use referenced in Section 7.5.2
F1.16	Amend	Inclusion of the FS and FRMS as attachments to the plan or links to the studies added and a review conducted to ensure that their inclusion increases the adequacy and appropriateness of the plan

### K.3 FMP Implementation in accordance with the Provisions

#### General findings of the s.44 Audit

These findings area summarised from the s.44 Audit whether the FMP was given effect, carried out and reported by the Natural Resources Commission. Note that the assessment has been conducted as a pass/fail test. No partial marks were considered. The Review summarises the findings here in order to inform the review of 'whether



[the FMP] provisions remain adequate and appropriate for ensuring the effective implementation of the water management principles'. Note that this s.43 Review has not revisited, extended or interpreted the Audit findings. The Audit findings may be relevant for the following reasons:

- Some implementation difficulties may be due to the adequacy and appropriateness of the plan. This information may inform the review of whether the plan is adequate and appropriate to **implement the principles**.
- However, the plan may be adequate and appropriate to **implement the principles** even if the Audit found provision/s have not been implemented for other reasons not relevant to adequacy and appropriateness of the plan.
- A plan that is not adequate and appropriate to implement the principles may be implemented perfectly. This may shed light on what needs to change in the plan if you can compare it to evidence showing the plan is inadequate.
- Theoretical observation of the plan provisions may also lead a determination regarding if plan provisions are adequate.
- The root cause identified in Audit report as to why the plan wasn't implemented may be useful in the review insofar as they lead to inadequate provisions rather than just administration / circumstantial cause.
- An Audit report may say whether MER, flood monitoring, environmental monitoring was undertaken. This may help understand if the plan is adequate or not (only if it is implemented). Some extrapolation may be needed where there is partial implementation using the theoretical observation as to whether a provision should deliver its intended outcome.

#### Plan

- The Audit Report found that 'the FMPs contain ambiguous language directions. The Audit states that in addition to the legislative complexity described in the previous section, the FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements ('must', 'shall', 'require'), while others suggest more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed').
- The Audit has found opportunity for improvement of the plans through a spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement.

#### Implementation

- The Audit found 'no evidence was provided to demonstrate that provisions related to required modifications to existing works have been implemented during the Audit period. In interviews, NRAR staff indicated that a compliance Audit of unauthorised works that may be identified as requiring modifications in the FMPs has not been carried out. It was also suggested that local councils, where identified in the FMPs, have not implemented the required modifications. There was no evidence of systems, policies or procedures available for the Audited agencies to oversee the implementation or track the status of the required modifications.'
- There is limited expertise available to support ongoing FMP implementation
- Procedures to guide the assessment process:
  - are old and in draft form
  - do not provide detailed guidance material to support a consistent approach and appropriate level of hydraulic, environmental and cultural impact assessment for flood works approval applications
- Interviews with NRAR staff indicated that no guidance was available in relation to processing multipurpose works approvals. On-farm storages and water supply channels within the floodplain network may be both a water supply work and flood work.

- Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works
- No evidence of landholder engagement undertaken by NSW Government agencies to raise the awareness of flood work approval obligations in order to reduce risks of non-compliance
- Approval processes in the southern valleys have been carried out in line with the requirements. some improvements could be made regarding how the hydraulic, environment and cultural impact assessments are carried out
- The FMPs were adopted from 21 September 2015 as ‘Minister’s Plans’ under the Act38 but were developed under the WA 1912. This has added complexity in their interpretation and implementation.
- A reactive compliance and enforcement regime was in place during the Audit period and is ongoing.
- The relevant NSW Government agencies have implemented plan provisions in relation to flood monitoring though provisions relating to environmental monitoring were not implemented within the Audit period
- The relevant NSW Government agencies have implemented plan provisions in relation to plan review
- FMPs are written in the style of advisory natural resource management plans, rather than as statutory instruments. They contain provisions that use a mix of regulatory and guidance language. For example, verbs used include terms that suggest mandatory requirements (‘must’, ‘shall’, ‘require’), while others suggest more discretionary advice (‘should’, ‘may’, ‘recommended’, ‘encouraged’, ‘proposed’).

Implementation Assessment Criteria		
Assessment		Description
Implemented	✓	The Audit found that the plan was implemented in accordance with the particular provision
Not Implemented	✗	The Audit found that the plan was not implemented in accordance with the particular provision
Not reviewed	NA	The Audit did not review the particular provision, or the Audit was not able to draw enough evidence to make a determination in relation to the particular provision

### Implementation Assessment Table

Provision	Detail	Assessment	Evidence
29	The floodplain management provisions of a management plan for a water management area must deal with the following matters-		
(a)	identification of the existing and natural flooding regimes in the area, in terms of the frequency, duration, nature and extent of flooding	✗	The Audit found that the ‘provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review’. The plan includes no specific trigger for flood monitoring.
(b)	the identification of the ecological benefits of flooding in the area, with particular regard to wetlands and other floodplain ecosystems and groundwater recharge	✗	The Audit found that the ‘provisions relating to environmental monitoring were not implemented within the Audit period. Environmental monitoring provisions were not implemented in the Audit period in accordance with the provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation or to inform the five-year plan review’.
(c)	the identification of existing flood works in the area and the way they are managed, their benefits in terms of the protection they	✗	Implementation activities to identify existing works and their impacts has not been undertaken. There was found to be an inadequate sharing of spatial data between agencies making it impossible to assess flood works in terms of the protection they give to life and property, and their ecological impacts,

Provision	Detail	Assessment		Evidence
	give to life and property, and their ecological impacts, including cumulative impacts			including cumulative impacts. No flood or environmental monitoring has occurred to determine ecological impacts of impacts on flood behaviour.
(d)	the risk to life and property from the effects of flooding		✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
30	The floodplain management provisions of a management plan for a water management area may also deal with the following matters			
(a)	proposals for the construction of new flood works			NA No applications were received during the s.44 Audit period
(b)	the modification or removal of existing flood works		✗	Existing works were not the subject of proactive compliance works during the review period. Compliance activity in NSW has been found to focus in the Northern Murray Darling Basin. Management of approval information also makes approval reviews difficult, with limitations in the data management systems means filtering by FMP is not possible. The reasoning for a lack of approval applications in the review period is not known, so the existence of unapproved works in the areas cannot be ruled out. There has also been no active monitoring undertaken over the review period for assessment of performance indicators. Some monitoring has been undertaken of flood events in the area but no assessment against the performance indicators has been completed.
(c)(i)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to the passage, flow and distribution of floodwater		✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(ii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to existing dominant floodways and exits from floodways		✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iii)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to rates of flow, floodwater levels and duration of inundation		✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(iv)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to downstream water flows		✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review
(c)(v)	restoration or rehabilitation of land, water sources or their dependent ecosystems, in particular in relation to natural flood		✗	Provisions relating to neither flood monitoring or environmental monitoring were implemented within the Audit period. No monitoring or evaluation for assessment of whether the floodway network allows for the delivery of floodwater to support floodplain ecosystems has occurred to be able to inform the 5-year review

Provision	Detail	Assessment	Evidence
	regimes, including spatial and temporal variability		
(d)	the control of activities that may affect or be affected by the frequency, duration, nature or extent of flooding within the water management area	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review'.
(e)	the preservation and enhancement of the quality of water in the water sources in the area during and after flooding	✗	The Audit found that the 'provisions relating to flood monitoring were not implemented within the Audit period. Flood monitoring was not implemented during the Audit period in accordance with the mandatory and discretionary provisions of the FMPs for the purpose of monitoring performance indicators, informing decision making for FMP implementation, or to inform the five-year plan review.'
(f)	other measures to give effect to the water management principles and the objects of the Act	✗	Measures to give effect to the water management principles of the act were not able to be assessed due to an absence of implementation activities, primarily; Provisions relating to flood monitoring were not implemented within the Audit period Provisions relating to environmental monitoring were not implemented within the Audit period Inadequate sharing of spatial data between NSW Government agencies to support assessments of approvals and impacts from flood works. Assessment of the cumulative impact of flood works as required in the Act cannot be undertaken without modelling the cumulative impacts which produces relevant derivative spatial data Inadequate systems for managing approvals and enforcement in relation to spatial data capture, informing overall compliance at the FMP scale, enabling public transparency of flood works approvals. There are systems and procedures in place for NRAR and WaterNSW to receive, assess, grant or refuse, and apply conditions to flood work approvals. However, there is a lack of systems functionality, which adversely affects the ability for officers to understand how many approvals are in an FMP area and where works are in relation to each other. The plan contains no specific trigger for flood monitoring
(g)	such other matters as are prescribed by the regulations	✗	The power under s.30(g) has not been exercised in the <i>Water Management (General) Regulation 2018</i> .

## Recommendations

Finding Number	Item	Detail
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the WMA 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement

F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.05	Update	Update implementation activities, with a focus of clarity of approval type definition, knowledge base development, update of procedures and data sharing capabilities.
F1.06	Update	Include specific a flood monitoring trigger in the monitoring provisions

#### K.4 FMP assessed if adequate and appropriate against the Principles of the Act

##### Water Management Principles Assessment Table

Section	Principle	Step 4 Assessment	Comment
	is the management plan adequate an appropriate for ensuring the effective implementation of the general principles to;		
(2)(a)	Ensure the effective protection and restoration of water resources floodplains and dependent ecosystems	Adequate but not appropriate FDEs in the existing floodway were considered to be protected by the criteria for assessment of flood work approvals, and required environmental improvements are the strategy for restoration efforts	Ecological and environmental assets are not shown spatial or specific locations identified
(2)(b)	Protect habitat animals and plants that benefit from water (across the floodplain) or potentially affected by managed activities (flood work)	Adequate but not appropriate FDEs that act as habitat in the existing floodway were considered to be protected by the criteria for assessment of flood work approvals	Ecological and environmental assets are not shown spatial or specific locations identified
(2)(c)	Protect (or enhance) water quality of all sources	Included but not adequate and appropriate Water quality is considered by the plan to be minimally impacted by its implementation. The only benefits will be a result of reduced sedimentation and irrigation chemical transport	Not a major driver of the plan development
(2)(d)	Consider and minimise cumulative impacts of flood work approvals on water sources and their dependent ecosystems	Included but not adequate and appropriate The required improvements included and the criteria for assessment are designed to minimise the cumulative impacts of flood works	More detail on the cumulative effects of flood works is included in the FRMS
(2)(e)	Protect geographical and other features of Aboriginal significance	Included but not adequate and appropriate The plan details that some Aboriginal assets exist in the plan area though the locations were not considered in depth. Some sites are known to be in the floodway area and should benefit from the plan	Some information was gathered but not much, and no consultation requirements are listed
(2)(f)	Protect geographical and other features of major cultural heritage or spiritual significance	Included but not adequate and appropriate Two locations of cultural significance are mentioned but are on high ground and are not expected to be impacted by the plan	Some information was gathered but not much, and no consultation requirements are listed

Section	Principle	Step 4 Assessment	Comment
(2)(g)	Maximise social and economic benefits to the community	Adequate but not appropriate The plans adoption of the 1975 event as the design flood was chosen in part to avoid significant adverse social or economical impacts. It was seen as the appropriate balance between flood risk and unnecessarily tying up large areas of floodway network linked to rare events	The influence on the choice of design flood to maximise social and economic benefits ensures that it is built into the decision making of the plan
(2)(h)	Respond to monitoring and improvements in understanding of ecological water requirements	Adequate but not appropriate The allowance for review of the plan allows for a review to be triggered including 'change to factors that influence decisions'.	The plan does not specify that improvements in understanding of ecological can trigger a response under the plan, it should be considered and factor that influences decisions and therefore fall under that broader category
(2)(a)	Apply the principles of adaptive management	Adequate and appropriate The plan includes the allowance for review following a performance review following a major flood	The plan makes allowances for adaptation to changes to the floodplain characteristics, resulting in climate change or anything else that influences decision making
and to determine is the management plan adequate and appropriate for ensuring the effective implementation of the floodplain management principles to:			
(6)(a)	Avoid or minimise land degradation from floodplain management (ie flood works)	Adequate but not appropriate Land degradation is minimised by reducing the impact on FDEs and reducing velocities that can cause erosion through the assessment criteria for flood work approvals	The criteria are implemented through an application process linked to the repealed <i>WA 1912</i>
(6)(b)	Avoid or minimise the impacts of flood works on other water users	Adequate but not appropriate The hydraulic assessment criteria require works in the floodway network to not cause redistribution and minimise changes in flood level on neighbouring properties	The approval process that enforces the hydraulic criteria are linked to the repealed <i>WA 1912</i>
(6)(b)	Minimise existing and future risk to human life and property from occupation of floodplain	Adequate but not appropriate The plan states that the FRMS did a detailed risk analysis that led to the adoption of the floodway network. The hydraulic assessment criteria and improvements aim to minimise the impacts on flow that would result from flood works	The FRMS holds most of the information regarding risks to human life and property

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend the plan to remove reference to the repealed <i>WA 1912</i> and update to assessment, terminology and any other reference to the <i>WMA 2000</i>
F1.04	Amend	Include specific criteria regarding the cumulative impacts of development in the floodplain

F1.06	Amend	Update the criteria for assessment to include specific and measurable changes to flood characteristics, rather than vague language like 'significant'
F1.09	Amend	Inclusion of existing works details and mapping to the plan
F1.10	Amend	Provide clear spatial representation of ecosystems in the FMP area and the floodway network at a property scale, including information on hydraulic characteristics that are used in assessments
F1.11	Amend	Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.13	Amend	Inclusion of a socio-economic evaluation and impacts
F1.14	Investigate	Investigate the FMPs capacity to adapt to the impacts of climate change, and how those changes will influence flood risk exposure, FDEs and rural economies as recommended by the plan
F1.16	Amend	Addition of the Flood Study and FRMS as appendices

## K.5 FMP assessed if adequate and appropriate against the Principles of the Act

### Targeted Agency Feedback

Item	Description	Source
1	There has been a lack of implementation of the FMPs rules and the required actions and modifications detailed in the FMP due in part to the non-mandatory wording and as a result the uncertainty in the legislative authority. The language is seen as guidelines and not rules. This makes them neither adequate or appropriate as they lack the authority	EES
2	DPIE Water has received feedback since commencement around the mapping of the FMPs, primarily that they are difficult to determine the boundaries and that the floodway is inaccurate	EES
3	A lack of information passed to land users and a lack of enforcement has resulted in development contrary to the rules in the FMP	EES
5	If the information FMP in the plan such as the floodway network isn't accurate, the FMP will not hold the confidence of the stakeholders which will make them harder to implement	EES
6	Changes to the FMPs need to include detail on what is going to happen with the required actions and modifications held in the FMP. If nothing has been done and then they get ignored again or removed, then the FMPs face backlash	EES
7	A clear road map regarding the rules linked to development and the measures to be taken if they are not followed to reduce uncertainty	EES
8	NRAR have noted that feedback on the FMPs is difficult prior to enforcement programs due to commence Q3 of 2021. A framework for providing feedback on the FMP to DPIE Water is being set up that can inform amendments.	NRAR
9	Southern FMPs are less stringent in their wording than the more recent northern plans and as a result more difficult to enforce. This effects the adequacy	NRAR
10	The borders of the FMP area, the rules and their active locations are not clear.	NRAR
11	The plans don't currently align with the Act and need to be updated reflect the changes in legislation.	NRC

Item	Description	Source
12	Provisions are unclear out of date	NRC
13	The maps in the FMPs are unclear and make it difficult for assessing officers to apply rules. There are gaps in the plan area where rules don't apply and the urban interface needs to be considered.	NRC
14	Need a plan for the required modifications if they are to be removed as they have been in the north.	NRC
16	The FMPs identified issues that require remediation but does not have the legislative authority to delegate funds	DPIE Water
17	Rules are not clear and remain open to interpretation. The FMPs need to be updated to be clearer not subject to debate.	DPIE Water
18	There is a lack of clarity around the requirements in urban areas in an FMP area. This needs to be made clear but is outside the scope of this review	DPIE Water
19	There needs to be a trigger system around updates to the FMPs	WaterNSW (Consultant)
20	The FMPs need a balance between prescription and flexibility	WaterNSW (Consultant)
21	The FMPs are likely to be 'adequate' in their approach but there are issues with implementation and gaps in the plan	WaterNSW (Consultant)
22	Technical detail requires review and management zone areas updated based on the outcomes of that review	WaterNSW (Consultant)

## Submissions

### Summary of submissions received

- 4 Submissions received
- 3 provided through the webpage, 1 provided to the email address
- 2 individuals, 2 organisations

### Feedback from submissions

- Landholder seeking increased consultation and communication in the s.43 review (2 submissions)
- Feedback on specific works (3 works over 2 submission, out of scope)

## Recommendations

Finding Number	Recommendation	Detail
F1.02	Amend	Amend objectives to make them more in line with the WMA 2000.
F1.03	Amend	Amend the plans to update the floodway network based on updated modelling and clear boundaries to the area
F1.03	Amend	Amend the plan to include clear mapping of the areas that require additional assessment that can zoom to property scale



F1.07	Amend	Amend to update the language to make it mandatory. Amend the plan to include clear, implementable rules that are not open to interpretation, and improve clarity of information as ease of understanding
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.

## K.6 Synthesis of Results

### General findings

Having been developed under the provisions of the *WA 1912* as a water management strategy rather than an FMP the plan and requires amendments to bring it into line with the WMA 2000. Overall the plan is not clear in its information leaves itself open to varied interpretation, reducing its effectiveness. The area of the floodway network is included in the plan but is not clear as to its boundaries and is not able to be zoomed. The criteria for assessment is vague in its language, creating uncertainty around their application, with language used being suggestive rather than mandatory and the baseline development that applications are to be assessed against unclear. The plan includes a number of hydraulic and environmental required remedial measures to existing works aimed at improving connectivity through the floodway. The language in the remedial measures is not mandatory, vastly reducing the effectiveness and making them harder to enforce.

Areas of cultural or Aboriginal significance are not covered in the plan. The areas of cultural or Aboriginal significance within the FMP area should be investigated, including consultation with the relevant stakeholders, and the floodway network and assessment criteria reviewed to ensure the assets are protected with any required updates made.

A lot of the basis for a plan to be adequate and appropriate are present in the plan, but it is lacking in the mandatory language and detail of information that would it allow it to be adequate and appropriate. The plan needs certainty around the rules and criteria around assessing flood works, clear delineation of the areas effected, clarity around the required improvements and updates to the remove reliance on the *WA 1912*, transitioning to the WMA 2000

Provisions for response to monitoring and ongoing amendments to the plan following updates to the information that informs its development of 5-year review amendments should be included. The plan also requires update to remove reference to the repealed *WA 1912* and is processes and terminology updated to the WMA 2000.

Following the review, the plan is not considered to be adequate and appropriate for ensuring the effective implementation of the water management principles of the WMA 2000. The review details a number of amendments that can be made following the 5 year review, but the process for the development of a new valley wide plan (in combination with the other plans in the valley) should begin in order to replace the plan at the time of the 10 year review.

### Recommendations

Finding Number	Recommendations	Detail
F1.02	Amend	Remove references to the <i>WA 1912</i> , updating to the WMA 2000, including terminology and clear instructions for flood work assessment

F1.03	Update	Update plan to include spatial definition of the floodway network and floodway boundaries supported by updated modelling. Boundaries should be clear at the property and paddock scale, including zone boundaries, to allow better support for approvals and enforcement
F1.04	Amend	Inclusion of water quality provisions, such as blackwater prevention
F1.04	Amend	Update the plan to include the erosion thresholds for land use referenced in Section 7.5.2
F1.05	Amend	Amend the priority levels in the improvement measures to include timeframes that the works are to be completed by
F1.06	Amend	Amend the objectives to provide more detail, with more specific goals that expand on the vision statement
F1.07	Amend	The s35 requirements of the plan have all been met, however the performance indicators (s35(1)(d) are not specific or measurable. To ensure that the objectives are being met the performance indicators should be amended to create more specific and measurable goals to 'measure the success of the strategies'(s35(1)(d)).
F1.04	Amend	Include specific criteria regarding the cumulative impacts of development in the floodplain
F1.07	Update	Update the plan to replace ambiguous language. Use mandatory requirements ('must', 'shall', 'require') rather than more discretionary advice ('should', 'may', 'recommended', 'encouraged', 'proposed'). Replace ambiguous terms and terms no longer in currency in the WMA 2000, such as 'complying' and 'non-complying' works. Remove references that appear to condone unauthorised works.
F1.09	Amend	Include existing works details and mapping to the plan
F1.10	Amend	Provide clear spatial representation of ecosystems in the FMP area and the floodway network at a property scale, including information on hydraulic characteristics that are used in assessments
F1.11	Amend	Conduct an engagement study on the areas, sites, or values of significance of Aboriginal significance in the FMP area and amend the plan to ensure that they are recognised and protected. First Nations engagement reports collected during Water Resource Plan development may be a first point of reference. However, specific FMP engagement with First Nations will be needed.
F1.12	Implement	Implement the recommendations and actions contained in the Audit Report
F1.13	Amend	Include a socio-economic evaluation and impacts in the plan
F1.14	Investigate and Amend	Inclusion of measures to ensure the plan is adequate and appropriate to respond to monitoring and improvements in understanding of ecological water requirements, and adaptive management to respond to new knowledge in the Long-term Watering Plan and any other relevant plans.
F1.14	Investigate	Investigate the FMPs capacity to adapt to the impacts of climate change, and how those changes will influence flood risk exposure, FDEs and rural economies as recommended by the plan
F1.16	Amend	Inclusion of the Flood Study and FRMS as attachments to the plan and review the documents to ensure that they increase the adequacy and appropriateness of the plan
F11.01	Update	Include specific flood monitoring triggers in the monitoring provisions