



Draft Floodplain Management Plan for the Macquarie Valley Floodplain 2018

Report card for Management Zone BH

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More information

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Report card for Macquarie Valley Management Zone BH (MZ BH)—major discharge areas in high-level floodways

Table 1. Overview of Management Zone BH

<p>Description</p>	<p>Major discharge areas in high-level floodways (bright blue areas on the draft management zone map)</p> <p>Management Zone BH (MZ BH) includes areas of the floodplain upstream of Warren where there are large areas of existing development subject to significant flood discharge during major flood events. It includes high floodway areas with major drainage lines and other areas where a significant discharge of floodwater occurs during the 1990 large design flood and larger floods.</p> <p>MZ BH does not include areas identified as MZ A.</p> <p>Uncontrolled flood work development in MZ BH may have a high impact on flood behaviour.</p> <p>Proposed rules for MZ BH will prevent flood flow redistribution and ensure there is continuity of flow paths to assist in maintaining the overall flow distribution on the floodplain while providing for appropriate flood work development.</p>	
<p>Ecological assets</p>	<p>MZ BH includes areas of ecological significance that are dependent on frequent flooding to maintain ecological character that were not captured in MZ A.</p> <p>MZ BH includes highly water-dependent ecological assets such as semi-permanent wetlands and areas of key fish passage.</p>	
<p>Cultural assets</p>	<p>MZ BH includes cultural assets such as:</p> <ul style="list-style-type: none"> scarred trees scarred trees that are/were associated with being a carved tree or ceremony location of special significance. <p>Cultural assets in MZ BH are likely to be associated with ecological assets that require frequent flooding.</p>	
<p>Key statistics</p>	<p>Area (ha)</p> <p>Area (% total floodplain area)</p>	<p>22,200ha</p> <p>2%</p>
<p>Flood works that can be applied for:</p>	<p>Any type of flood work can be applied for in MZ BH, but must be advertised.</p> <p>Flood works must also be assessed and approved against the proposed criteria.</p>	

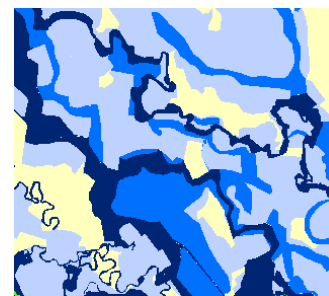


Figure 1. Sample map

Proposed management zone rules

Table 2. Advertising

Management	Advertising
Proposed rule (R1.)	An application for a new or amended flood work approval in MZ BH must be advertised.
Current management	<p><i>Macquarie (Narromine to Oxley Station) 2008 Floodplain Management Plan (FMP):</i></p> <p>Non-complying works require advertising and need to meet hydraulic and environmental assessment criteria. Within the floodway network, flood works are non-complying. Outside the floodway network, flood works on the boundaries of the floodway network upstream of Warren in excess of 1990 flood heights are non-complying.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Post-1999 <i>Water Act 1912</i> amendment. Approval and advertising is required for levees, access roads and storages if significant flood impacts are likely.</p>
Key factor(s) for decision-making	This rule provides the community with information about proposed flood works and allows them to raise issues about potential impacts.

Proposed assessment criteria

Table 3. Ecological impacts

Management	Ecological impacts
Proposed assessment criteria (AC1.)	A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH unless, in the minister's opinion, the flood work can be constructed to maintain adequate flood connectivity to ecological assets, and to facilitate fish passage, under a range of flood scenarios, including at a minimum, scenarios for the 1990, 2000 and 2012 design floods.
Current management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not block, impede or divert the natural flooding regimes in wetlands and related ecosystems, or in habitats benefiting from periodic flooding located in the FMP floodway network and other areas where works are specified as non-complying.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for:</p> <ul style="list-style-type: none"> the need to maintain the natural flood regimes in wetlands and related ecosystems and the preservation of any habitat, animals (including fish) or plants that benefit from flooding any geographic features, or other matters, of Aboriginal interest that may be affected by a controlled work the protection of the environment.
Key factor(s) for decision-making	The management zones were designed at a strategic scale and may not always account for the complex network of flow paths and pathways that are important for maintaining the ecological character of flood-dependent floodplain assets. Therefore, this criterion is proposed to ensure that all flood-dependent floodplain assets are specifically considered during the assessment of flood work applications. Flood connectivity that facilitates fish passage is specifically dealt with in the assessment criteria because consultation with agency experts determined that fish habitat on the

Management	Ecological impacts
	floodplain is a significant asset that requires additional protection measures.

Table 4. Aboriginal values and heritage site impacts

Management	Aboriginal values and heritage site impacts
Proposed assessment criteria (AC2.)	A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH unless, in the minister's opinion, the flood work can be constructed to maintain adequate flood connectivity to Aboriginal values and to heritage sites under a range of flood scenarios, including at a minimum, scenarios for the 1990, 2000 and 2012 design floods.
Current management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not block, impede or divert the natural flooding regimes in wetlands and related ecosystems, or in habitats benefiting from periodic flooding located in the FMP floodway network and other areas where works are specified as non-complying.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for:</p> <ul style="list-style-type: none"> the need to maintain the natural flood regimes in wetlands and related ecosystems and the preservation of any habitat, animals (including fish) or plants that benefit from flooding any geographic features, or other matters, of Aboriginal interest that may be affected by a controlled work the protection of the environment.
Key factor(s) for decision-making	The management zones were designed at a strategic scale and may not always account for the complex network of flow paths and pathways that are important for maintaining the character of flood-dependent floodplain Aboriginal value/heritage site assets. Therefore, this criterion is proposed to ensure that all flood dependent Aboriginal value/heritage site assets are specifically considered during the assessment of flood work applications.

Table 5. Heritage site impacts

Management	Heritage site impacts
Proposed assessment criteria (AC3.)	A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH if, in the minister's opinion, the construction of the flood work is likely to disturb the ground surface of a heritage site or cause more than minimal erosion to a heritage site.
Current management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not block, impede or divert the natural flooding regimes in wetlands and related ecosystems, or in habitats benefiting from periodic flooding located in the FMP floodway network and other areas where works are specified as non-complying.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for:</p> <ul style="list-style-type: none"> the need to maintain the natural flood regimes in wetlands and related ecosystems and the preservation of any habitat, animals (including fish) or plants that benefit from flooding any geographic features, or other matters, of Aboriginal interest that may be affected by a controlled work

Management	Heritage site impacts
	<ul style="list-style-type: none"> the protection of the environment.
Key factor(s) for decision-making	Consultation with agency experts identified that some heritage sites are at risk from being impacted during the construction of a flood work or as a result of erosion from changes to flood behaviour caused by a flood work. In combination with the <i>National Parks and Wildlife Act 1974</i> , and by referencing sources identified in Division 3 of the FMP this assessment criterion will help to ensure that the sites are not impacted by a flood work proposal.

Table 6. Drainage impacts

Management	Drainage impacts
Proposed assessment criteria (AC4.)	<p>A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH unless, in the minister's opinion, the flood work can be constructed to maintain adequate drainage on:</p> <ul style="list-style-type: none"> (i) adjacent landholdings, and (ii) other landholdings <p>that may be affected by the proposed flood work.</p>
Current management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not block, impede or divert the natural flooding regimes in wetlands and related ecosystems, or in habitats benefiting from periodic flooding located in the FMP floodway network and other areas where works are specified as non-complying.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for:</p> <ul style="list-style-type: none"> the need to maintain the natural flood regimes in wetlands and related ecosystems and the preservation of any habitat, animals (including fish) or plants that benefit from flooding any geographic features, or other matters, of Aboriginal interest that may be affected by a controlled work the protection of the environment.
Key factor(s) for decision-making	This criterion was developed to ensure that flood work applications do not impact drainage on neighbouring properties. The management zones were designed on a strategic scale and may not always account for the possibility that a type of flood work might impact on local drainage, which may cause a significant disruption to the daily life of surrounding landholders.

Table 7. Hydraulic—local impacts

Management	Hydraulic—local impacts
Proposed assessment criteria (AC5.)	<p>Redistribution</p> <p>A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH if, in the minister's opinion, construction of the flood work is likely to redistribute the peak flood flow by more than 2% on:</p> <ul style="list-style-type: none"> (i) adjacent landholdings, and (ii) other landholdings <p>that may be affected by the proposed flood work when compared to the peak flood flow under existing development conditions for a range of flood scenarios, including at a minimum, the 1990 design flood.</p>

Management	Hydraulic—local impacts
<p>Current management</p>	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not cause a redistribution of floodway flows of more than 10% of the unimpeded floodway flow distribution for all floods up to and including the adopted 1990 design peak floodway flows upstream of Warren.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for the effect or likely effect of a controlled work on the passage, flow and distribution of flood waters.</p>
<p>Key factor(s) for decision-making</p>	<ul style="list-style-type: none"> • This criterion ensures that flood work applications will not significantly change key hydraulic parameters in the local area. • The effect of a flood work on flood flow redistribution under existing development conditions rather than pre-development conditions is considered because there is general acceptance of current development levels and it is impractical to model flow redistribution under pre-development conditions. • Introducing a threshold to other areas improves consistency and effectiveness of flood-work approvals. • A range of flood scenarios can be considered if required.
<p>Proposed assessment criteria (AC6.)</p>	<p>Flood levels</p> <p>A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH if, in the minister's opinion, construction of the flood work is likely to increase flood levels by more than 10 cm on</p> <p>(i) adjacent landholdings, and</p> <p>(ii) other landholdings</p> <p>that may be affected by the proposed flood work when compared to flood levels under pre-development and existing development conditions for a range of flood scenarios, including at a minimum, the 1990 design flood.</p> <p>Note: What this means is that the summation of affluxes as described above cannot exceed 10 cm.</p>
<p>Current management</p>	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not cause increases in water levels for all floodway flows up to and including the adopted 1990 design flow conditions (upstream of Warren) that exceed 100 mm on neighbour's boundaries and must not create flood levels that exceed 1990 design flood levels.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for the effect or likely effect of a controlled work on the passage, flow and distribution of any flood waters.</p>
<p>Key factor(s) for decision-making</p>	<ul style="list-style-type: none"> • To ensure that the construction or amendment of flood works will not significantly change key hydraulic parameters in the local area. • The effect of a flood work on flood levels under pre-development and existing development conditions is considered. Flood level increases are assessed by comparing pre-development conditions with existing development conditions and then with the proposed development conditions. The impacts are compared to ensure the allowable threshold for 1990 design flood levels are not exceeded. • Introducing a threshold to other areas improves consistency and effectiveness of flood-work approvals.

Management	Hydraulic—local impacts
	<ul style="list-style-type: none"> The threshold is consistent with modelling accuracy limits. A range of flood scenarios can be considered if required.
Proposed assessment criteria (AC7.)	<p>Flood flow velocities</p> <p>A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH if, in the minister's opinion, construction of the flood work is likely to increase the flood flow velocity by more than 25% on:</p> <ul style="list-style-type: none"> (i) the landholding under application, and (ii) adjacent landholdings, and (iii) other landholdings <p>that may be affected by the proposed flood work when compared to a flow velocity under pre-development and existing development conditions for a range of flood scenarios including at a minimum the 1990 design flood, unless:</p> <ul style="list-style-type: none"> (i) increases by more than 25% are in isolated areas where the landholder mitigates the impact on the flood wave so that the average impact across the landholding under application is no greater than 25%, and (ii) flow velocity is not increased by more than 25% at the boundary of the landholding under application.
Current Management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not cause any significant increase in floodway velocities for all floodway flows up to and including the adopted 1990 design flow conditions (upstream of Warren). Velocities should be of an order that is below the threshold of erosion for the potential land usage.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for the effect or likely effect of a controlled work on the passage, flow and distribution of any flood waters.</p>
Key factor(s) for decision-making	<ul style="list-style-type: none"> To ensure that the construction or amendment of flood works will not significantly change key hydraulic parameters in the local area. Flow velocity increases will be assessed by comparing pre-development conditions with existing and proposed conditions to ensure the allowable threshold is not exceeded. Introducing a threshold to other areas improves consistency and effectiveness of flood-work approvals. A range of flood scenarios can be considered if required.
Proposed assessment criteria (AC8.)	<p>Flood levels and impact on high-value infrastructure</p> <p>A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH if, in the minister's opinion, construction of the flood work is likely to increase flood levels such that they impact high-value infrastructure when compared to flood levels under pre-development and existing development conditions for a range of flood scenarios including at a minimum the 1990 design flood.</p>
Current Management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>No equivalent assessment criteria for high-value infrastructure except for, non-complying works must not cause increases in water levels for all floodway flows up to and including the adopted 1990 design flow conditions (upstream of Warren) that exceed 100 mm on neighbour's boundaries and must not create flood levels that exceed 1990 design flood levels.</p>

Management	Hydraulic—local impacts
	<p><i>Other areas within the Macquarie valley floodplain that are upstream of Warren:</i></p> <p>Part 8 Matters for General Consideration (Section 166C Water Act 1912) requires regard for the effect or likely effect of a controlled work on the passage, flow and distribution of any flood waters.</p>
Key factor(s) for decision making	High-value infrastructure is seen as important in terms of requiring a high level of protection. This criterion provides the capacity to consider whether or not the proposed construction or modification of a flood work in MZ BH may impact high value infrastructure by increasing flood levels.
Proposed assessment criteria (AC9.)	<p>Flow velocities and soil erodibility</p> <p>A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH if, in the minister's opinion, construction of the flood work is likely to increase flow velocity by an amount that is likely to have more than a minimum impact on soil erodibility on:</p> <ul style="list-style-type: none"> (i) the landholding under application, and (ii) adjacent landholdings, and (iii) other landholdings <p>that may be affected by the proposed flood work, taking into account the ground cover on those landholdings.</p>
Current Management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Non-complying works must not cause any significant increase in floodway velocities for all floodway flows up to and including the adopted 1990 design flow conditions (upstream of Warren). Velocities should be of an order that is below the threshold of erosion for the potential land usage.</p> <p><i>Other areas within the Macquarie valley floodplain that are upstream of Warren:</i></p> <p>Part 8 Matters for General Consideration (Section 166C <i>Water Act 1912</i>) requires regard for the effect or likely effect of a controlled work on existing dominant floodways or exits from floodways, rates of flow, flood water levels and the duration of inundation.</p>
Key factor(s) for decision making	<ul style="list-style-type: none"> • To ensure that the construction or amendment of flood works will not significantly change key hydraulic parameters in the local area. • This assessment criterion provides flexibility to consider ground cover when assessing the potential impact of a flood work on soil erodibility.

Table 8. Hydraulic—cumulative impacts

Management	Hydraulic—cumulative impacts
Proposed assessment criteria (AC10.)	<p>A flood work approval must not be granted or amended to authorise the construction or modification of a flood work in MZ BH if, in the minister's opinion:</p> <ul style="list-style-type: none"> • construction of the flood work is likely to redistribute the peak flood flow by more than 2% at any of the Peak Discharge Calculation Points shown on the Peak Flood Flows Distribution (1990) Map under existing development conditions, and • construction of the flood work is likely to redistribute the peak flood flow under existing development conditions by more than 2% at any location and under any flood scenario considered relevant by the minister.
Current management	<p><i>Macquarie (Narromine to Oxley Station) 2008 FMP:</i></p> <p>Requires that the cumulative impact on flooding characteristics of a proposed non-complying work</p>

Management	Hydraulic—cumulative impacts
	<p>be addressed comprehensively.</p> <p>Other areas within the Macquarie valley floodplain that are upstream of Warren:</p> <p>No equivalent assessment criteria.</p>
Key factor(s) for decision making	<p>This criterion was developed to prevent the approval of multiple flood work applications, which individually have an acceptable impact but in combination could have an unacceptable cumulative impact on a key hydraulic parameter(s).</p>

Statewide exemptions

Table 9. Statewide exemptions

Management	Statewide exemptions
Statewide exemptions	<p>As per the Water Management (General) Amendment (Flood Work Approvals) Regulation 2015, the following exemptions from the requirement to hold a flood work approval under the <i>Water Management Act 2000</i> apply in MZ BH:</p> <ul style="list-style-type: none"> • Works constructed by the State Emergency Service. • Works constructed by a local council within a managed, designated, high flood-risk area under a development authorisation granted by the local council. • Works constructed by a person (other than a local council) within a managed, designated, high flood-risk area, on a total area of no more than 0.2ha, under a development authorisation granted by the local council. • Ring embankments around homes and farm infrastructure, protecting not more than 2 ha in area and not more than 10% of the total property area. • Public roads and railways. <p>Earthworks less than 150 mm above natural surface level including farm tracks and check banks.</p>
Background information	<p>The exemptions are part of the Water Management (General) Amendment (Flood Work Approvals) Regulation 2015 and are not part of this plan.</p> <p>The exemptions are for works or types of works which are considered to be low-risk or necessary for public safety, or which are more appropriately overseen by another government body such as a local council. For these types of works, requiring a flood work approval is considered to be unnecessary red tape.</p>

Other key factors

- The construction of new flood works and the amendment of existing Part 8 *Water Act 1912* licensed flood works require approval under the *Water Management Act 2000*.
- Applications for the construction and/or amendment of all flood works types require advertising.
- Applications for the construction and/or modification of flood works may require the submission of technical studies or supporting information to demonstrate that the proposed flood work meets the assessment criteria for MZ BH.

Public exhibition

Feedback is sought from stakeholders on the proposed rules and assessment criteria for MZ BH.

More information

This report card has been provided as a summary of the rules and assessment criteria for Management Zone BH. To view the exact wording of the *Draft Floodplain Management Plan for the Macquarie Valley Floodplain 2018*, written in the required statutory format, please visit the NSW Department of Industry website.

www.industry.nsw.gov.au/water

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