



REPORT: Erosion report update for the Bell River - Duke of Wellington Bridge and Pioneer Park

DIVISION: Community, Culture and Places
REPORT DATE: 13 February 2023
TRIM REFERENCE: ID23/235

EXECUTIVE SUMMARY

Purpose	Seek direction or decision Strategic Project Update	
Issue	<ul style="list-style-type: none">Provide update on the assessment of damage to the Duke of Wellington Bridge and Pioneer Park and potential response to rectification works.	
Reasoning	<ul style="list-style-type: none">To progress the stabilisation works of the Pioneer Park / Bell River interface.To provide access to Pioneer Park for the winter sporting season.To progress options and cost estimates for the Duke of Wellington Bridge.	
Financial Implications	Budget Area	Community Culture and Places / Recreation and Open Space – Pioneer Park. Undetermined – Duke of Wellington Bridge
	Funding Source	Pioneer Park <ul style="list-style-type: none">Disaster Risk Reduction Fund \$300,000Severe Weather and Flood Grant - \$650,000Rates and General Revenue - \$295,000 Duke of Wellington Bridge - undetermined
	Proposed Cost	Pioneer Park - \$300,000 Duke of Wellington Bridge – undetermined.
	Ongoing Costs	Pioneer Park – negligible Duke of Wellington Bridge - undetermined
Policy Implications	Policy Title	No policy implication
	Impact on Policy	N/A
Consultation	Pioneer Park - Community sporting groups and Infrastructure Duke of Wellington Bridge - Infrastructure (internal)	

STRATEGIC DIRECTION

The Towards 2040 Community Strategic Plan is a vision for the development of the region out to the year 2040. The Plan includes six principle themes and a number of objectives and strategies. This report is aligned to:

Theme: 2 Infrastructure

CSP Objective:	2.1 The road transportation network is safe, convenient and efficient
Delivery Program Strategy:	2.1.2 The road network meets the needs of the community in terms of traffic capacity, functionality and economic and social connectivity
Theme:	5 Liveability
CSP Objective:	5.5 Our community has access to a diverse range of recreational opportunities
Delivery Program Strategy:	5.5.1 Passive and active open space is located to maximise access and use by the community

RECOMMENDATION

1. That at the location within Pioneer Park identified as site 2 (Spillway) in the body of the report, be prioritised for rectification works based on the extent of damage and associated risk.
2. That at the location within Pioneer Park identified as site 1 (Bank Stabilisation) in the body of the report have rectification works undertaken with any remaining funds after the completion of rectifications works on site 2 (Spillway).
3. That it be noted that works shall be commencing for the design and construction of an eastern entry and exit roadway in Pioneer Park with further works on the internal road and pathway to follow.
4. That detailed analysis of options 2 and 4 for the Duke of Wellington Bridge as identified in the report be undertaken including:
 - A structural assessment of the bridge
 - A “do nothing” option as the base case scenario.
5. That the Chief Executive Officer provide a subsequent report to Council that provides the business cases for each option and recommended action.

Jane Bassingthwaighte
Director Community, Culture and Places

IM
Manager Recreation and
Open Space

REPORT

During 2022 a series of flood events in the Bell River resulted in severe erosion at the confluence of the Macquarie and Bell rivers, that has effectively isolated the Duke of Wellington Bridge, and along the western riverbank of the Bell River, adjacent to Pioneer Park and directly opposite Cameron Park.

In July 2022, and to assist in the repair and stabilisation of the riverbank at Pioneer Park, Dubbo Regional Council applied for financial assistance through the NSW government's Disaster Risk Reduction Fund. As a result of this application Dubbo Regional Council was successful in securing \$300,000 towards the works.

Further damage to the Pioneer Park riverbank and to the confluence of the Macquarie and Bell rivers have occurred as a result of subsequent flood events.

To assist in the repair and recovery of Council controlled assets Dubbo Regional Council received \$1,000,000 from the State Government's Severe Weather and Flood grant (for non-essential infrastructure). An internal application was submitted by Recreation and Open Space requesting financial consideration to undertake an assessment of the damage and to identify potential reconstruction works that would be less prone to future flood events at both sites. To undertake these assessments \$17,100 was allocated. A further \$650,000 was allocated to the project to reconstruct the internal road and pathway (modified design and extent) and to provide armouring of the northern side of Showground Road, immediately south of Pioneer Park. As well as \$295,000 from Rates and General Revenue has also been approved for this project.

The resultant damage in Pioneer Park is shown below in photos 1 to 4.



Photograph 1. Internal road – west side Pioneer Park looking north.



Photograph 2. Carpark – west side Pioneer Park looking north. Many of the large river red gums have significant soil loss around their root zone.



Photograph 3. Internal road north, looking east.



Photograph 4. Internal road and previous location of pathway, which was located at the same grade of the road.



Photograph 5. Resultant damage to the reserve and approach to the southern end of the Duke of Wellington Bridge

To undertake the assessment of the erosion and provide options and recommendations Soil Conservation Services were engaged on the basis that they had previously carried out a river health inspection of the urban stretches of the Bell and Macquarie rivers in 2019.

An initial report on both sites by Soil Conservation Services has now been received and forms the basis of this report.

Pioneer Park

Soil Conservation Services identified 2 sites with options and recommendations for the Pioneer Park site. The two sites are shown below in figure 1.

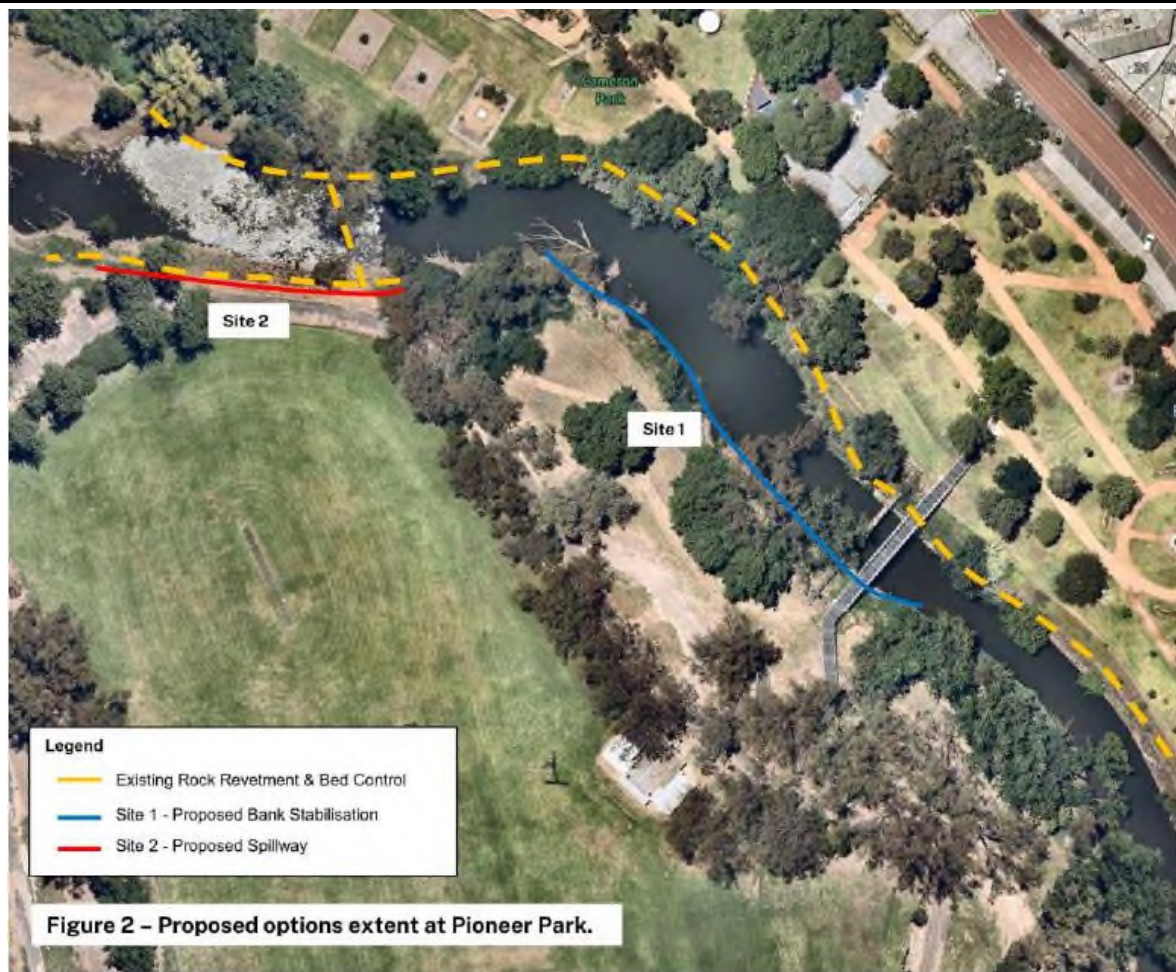


Figure 1. Pioneer Park showing extent of existing bank stabilisation works (yellow) and proposed extent of works at site 1 (blue) and site 2 (red).

Site 1. Bank stabilisation proposed options:

1. Bank stabilisation – rock revetment on left bank – approximately 125 metres OR
2. Bulk earthworks (where required) and revegetation to increase hydraulic roughness and resilience of the left bank (recommended).

Site 2. Spillway proposed option:

1. Rock spillway with vegetated verge tying into existing rock revetment.

A summary of the options and cost estimates are shown in Table 1.

Proposed Options - Site 1		Cost-estimate (ex GST)
1	Bank Stabilisation – Rock revetment left bank approximately 125m	Not recommended. Given the water depths at the site (3-4m) the min quantity of rock required for stabilisation is approx. 3000 tonnes. Cost-estimate for supply of this quantity of rock alone is in excess of \$250,000 ex gst. Option 2 is therefore recommended.
2	Bank re-profiling (where required) and revegetation with native species.	~\$150,000 - \$200,000
Proposed Options - Site 2		Cost-estimate (ex GST)
1	Rock spillway with vegetated verge. Tied into existing rock revetment.	~\$170,000 - \$200,000

*Cost-estimate should be considered high-level and for funding purposes only. If works are to be undertaken, scope of works and cost-estimate should be reviewed and revised. Does not include costing for revegetation, reinstatement of roads/footpaths, additional site investigations or specialists, environmental approvals, hydraulic modelling or development of design plans.

As previously identified Dubbo Regional Council has secured \$300,000 to undertake bank stabilisation works on the Bell River, adjacent to Pioneer Park. It is proposed to proceed with more detailed plans for both options and go to tender on a “separable portions” to gauge the extent of works that can be carried out with the available funds. Due to damage and the extent of the unstable bank at site 2 (photograph 4) it is proposed to prioritise this site, with approval from the grant fund agency (change of scope).

As shown in photographs 1 – 3 the internal road and pathway at Pioneer Park has been effectively washed away. \$650,000 has been allocated to restore access to the Pioneer Park and reconstruct the internal road and path system. Discussions have been held internally with Infrastructure Strategy and Design to look at options as well as external discussions with the user groups of Pioneer Park. The priority is to re-establish access at the eastern entry of Pioneer Park through to the amenity block. This is proposed to be a 2-way access and car parking area. The construction method of both the internal road and path system to reconnect the new bridge back through to Showground Road will help reduce future risk of damage.

Duke of Wellington Bridge.

Soil Conservation Services have identified four options at the Duke of Wellington Bridge site. These are:

1. Do nothing – bridge remains in place, no structural or stabilisation works.
2. Decommission bridge – remove the structure, undertake stabilisation works
3. Decommission bridge – retain structure, undertake stabilisation works
4. Reinstatement bridge – undertake a structural assessment of the bridge, stabilisation works and road works.

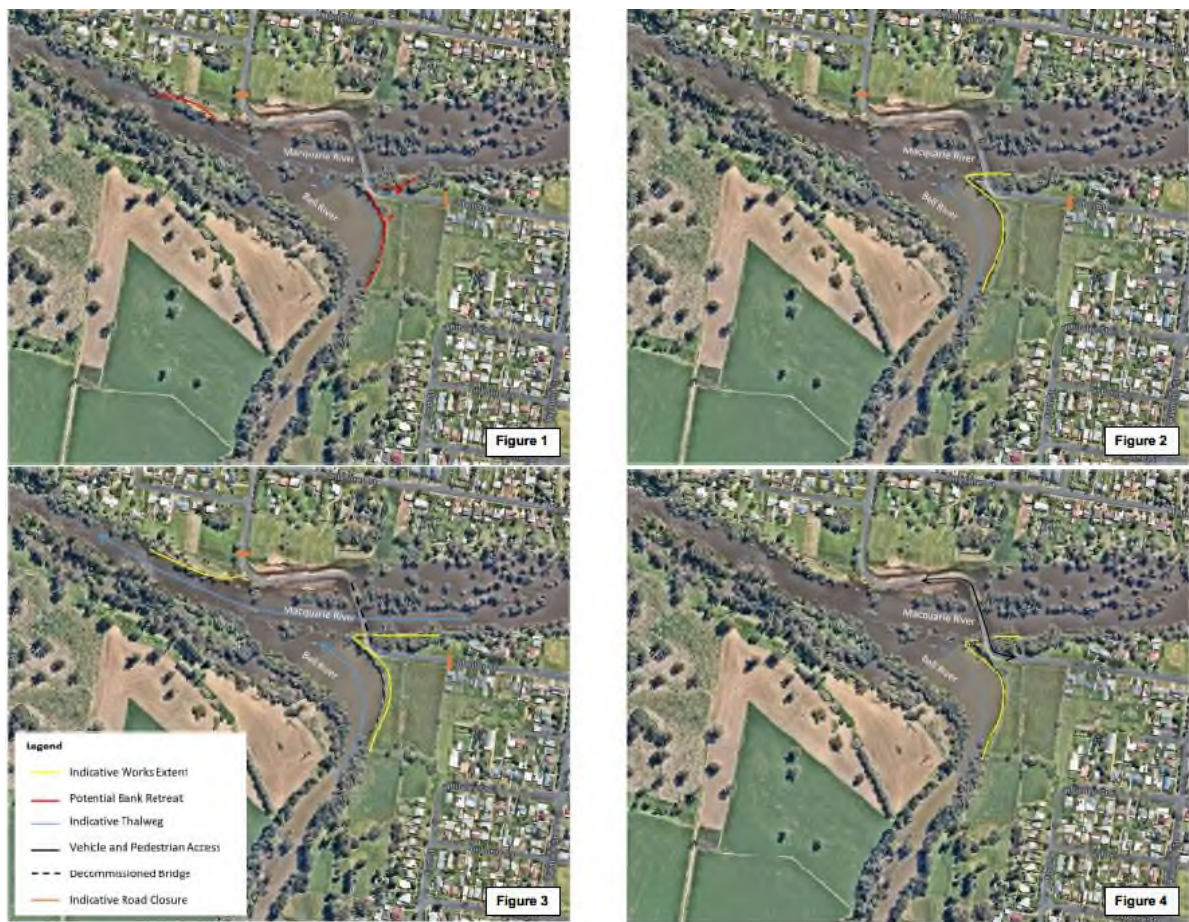
A summary of the four options identifying the benefits and limitations is shown below, along with projected future changes to the confluence.

Table 2. Duke of Wellington Bridge site options.

	Proposed Option	Potential River Trajectory	Benefits	Limitations
1	Do nothing Bridge remains in place, no structural or stabilisation works	Figure 1	<ul style="list-style-type: none"> - Little cost to DRC 	<ul style="list-style-type: none"> - Further bank retreat of Bell River - Hydraulic impacts as a result of the remaining bridge structure and resulting future erosion of Macquarie River - Loss of vehicle and pedestrian access - Risk to public safety – bridge structure & unstable banks - Further loss of private and public lands/assets - Potential negative public perception
2	Decommission Bridge Remove structure, undertake stabilisation works	Figure 2	<ul style="list-style-type: none"> - Mitigate bank retreat and reduced public safety risk - Reduced loss of land and assets - Mitigate hydraulic impacts as a result of the remaining bridge structure and future erosion of Macquarie River 	<ul style="list-style-type: none"> - Cost of bridge removal - Substantial bank stabilisation works required to mitigate bank retreat of Bell River (similar to Option 3 and 4). - Loss of vehicle and pedestrian access - Potential negative public perception due to the closure of asset and access
3	Decommission Bridge Retain structure, undertake stabilisation works	Figure 3	<ul style="list-style-type: none"> - No bridge removal costs - Reduced loss of land and assets - Potential public asset/site to remain in place. 	<ul style="list-style-type: none"> - More extensive bank stabilisation works may be required to mitigate hydraulic impacts of bridge on Macquarie River. - Substantial bank stabilisation works required to mitigate bank retreat of Bell River (similar to Option 2 and 4). - Loss of vehicular and pedestrian access - Potential negative public perception due to the closure of asset and access
4	Reinstate Bridge & Road Access Structural assessment, bank and bridge stabilisation works, road works.	Figure 4	<ul style="list-style-type: none"> - No bridge removal costs - Mitigate bank retreat and reduce public safety risk - Reduced loss of land and assets - Vehicle and pedestrian access maintained. - Longer term stability 	<ul style="list-style-type: none"> - Structural assessment, road and drainage repairs, more extensive stabilisation works required to rebuild and establish tie-in downstream of bridge. - Substantial bank stabilisation works required to mitigate bank retreat of Bell River (similar to Option 2 and 3).

Table 1: Preliminary proposed options table for the future management of the Duke of Wellington Bridge and surrounding area.

Note: Bank stabilisation works on the Bell River are likely to involve bank reshaping to include bench and stable batter, planting with vegetation to stabilise and rock toe protection with deflector structures to push the thalweg away from the bank.



Following a meeting with the Chief Executive Officer and Director Infrastructure a decision was made to further investigate Options 2 and 4, as recommended within the report. The “do nothing” option will be also developed as a base line for comparison.

As part of the further development of Options 2 and 4 a structural assessment of the Duke of Wellington Bridge was identified. This assessment is being organised through the Infrastructure division.

A very high level and preliminary cost estimate for Option 4 – the reinstatement of the bridge and access road – has been identified as being in the range of \$1.5 – 2.5 million.

Consultation

Pioneer Park

Internally - Infrastructure Strategy and Design. An onsite meeting was also held with CEO, DCCP and other staff to progress the project.

Externally – Wellington rugby club, soccer club and an environmental group. Primary concern was access to the sporting facility for the upcoming winter season. Environmental concerns were raised about the bank erosion.

These concerns are being addressed by prioritising the re-establishment of the eastern entry/egress point to the oval, and through the further development of the river bank stabilisation plans.

Resourcing Implications

Pioneer Park

Soil Conservation Services will continue to develop the bank stabilisation works for Pioneer Park.

Infrastructure Strategy and Design has been engaged to develop plans for Stage 1 – re-establishment of access to Pioneer Park. However, an external party may be engaged to further develop construction plans for the re-establishment of the pathway back to Showground Road.

Total funds available:

Access and internal road	\$945,000
Bank stabilisation works	\$300,000

Duke of Wellington Bridge

No funds identified at this stage.

Note: this excludes the \$17,100 for the investigation and recommendation reports from Soil Conservation Services.

Total Financial Implications	Current year (\$)	Current year + 1 (\$)	Current year + 2 (\$)	Current year + 3 (\$)	Current year + 4 (\$)	Ongoing (\$)
a. Operating revenue	1,262,100	0	0	0	0	0

b. Operating expenses	0	0	0	0	0	0
c. Operating budget impact (a – b)	1,262,100	0	0	0	0	0
d. Capital Expenditure	420,700	841,400	0	0	0	0
e. Total net impact (c – d)	841,700	-841,700	0	0	0	0
Does the proposal require ongoing funding?			No			
What is the source of this funding?			No			

Table 1. Ongoing Financial Implications

Options Considered

Pioneer Park

Site 1. Proposed options:

1. Bank stabilisation – rock revetment on left bank – approximately 125 metres OR
2. Bulk earthworks (where required) and revegetation to increase hydraulic roughness and resilience of the left bank (recommended).

Site 2. Proposed option:

1. Rock spillway with vegetated verge tying into existing rock revetment.

Preferred Option

For site 1 it is proposed to proceed with the recommended option of undertaking bulk earthworks (where required) and revegetation to increase hydraulic roughness and resilience of the left bank

For site 2 it is proposed to proceed with the recommended option of reinforcing the rock spillway with vegetated verge tying into existing rock revetment.

Site 2 will be prioritised due to the extent of the damage and to address public safety concerns.

Planned Communications

- A communication plan is being developed and the key stakeholders for Pioneer Park have already been informed of the proposed prioritisation of works. This communication plan will also be extended through to the Wellington community.

Duke of Wellington Bridge

Council will progress the structural of the bridge and development of Option 2 and 4, noting that a “do nothing” option will be also be considered as a bench mark.

Communication of these options can be provided once these have been considered by Council.

APPENDICES:

- 1 [↓](#) Site Summary - Pioneer Park
- 2 [↓](#) Memo - Flood Response 2022 - Duke Of Wellington Bridge
- 3 [↓](#) Attachment A



Soil Conservation Service



06/02/2022

Dubbo Regional Council – Flood Response 2022

Priority Site Summary – Site 2 – Pioneer Park, Wellington, NSW

The site visit at Pioneer Park, Wellington NSW involved a visual inspection of the creek conditions for approximately 300m downstream of the new footbridge. This reach includes the most upstream bed control on the Bell River.

River Context

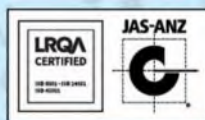
Pioneer Park is situated in the lower reaches of the Bell River which passes through highly erodible deep layers of soil. The Park is situated where the Wellington township first abuts the river on the right bank. This section of the Bell River has a moderate to high sinuosity and limited floodplain capacity due to past channel incision and the proximity to urban development. Floodplain capacity is reduced by Showground Road and the bridge (width and height) at the southern end of the park. A flood runner is present passing through Lot 29 DP759073 and along the western boundary of Pioneer Park re-entering downstream of the bed control. The reach is vegetated but heavily modified.



Figure 1 - Inspection extent and key geomorphic features at Pioneer Park.

The most upstream bed control is located to the north of Pioneer Park with rock revetment present on the full extent of the right bank to Showground Road and immediately downstream of the bed control on both banks. Figure 1 provides an overview of the inspection extent and key features at the site.

The Soil Conservation Service acknowledges the traditional custodians of the land where we live and work and pays respect to Elders past, present and emerging. Through our work on what was and always will be Aboriginal land, we commit to our shared responsibility to heal and protect Country for all future generations.



Connect with us

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www.linkedin.com/company/soil-conservation-service

Site Observations

A summary of key site observations is provided below:

- Capacity of the floodplain narrows due to Showground Road and the Bridge. Reduced capacity, potentially causing increased velocities within the Bell River at this location.
- Nearmap Imagery (9 January, 2023) suggests upstream of the bed control has remained relatively stable with vegetation remaining on both banks. Downstream bank retreat is evident on the unvegetated outside bends. Bank attached bars have been stripped with some evident vertical bare banks.
- Rip Rap placed in 1998 to protect Cameron Park is still in place and with no observed damage from initial site inspection.
- Due to rock revetment on the full extent of right bank (hard surface) the vegetated left bank has experienced erosion and some bank retreat.
- The bed control is still in place and performing its function. It appears to have prevented further lowering of the bed during recent flood events.
- Downstream of the bed control has experienced significant geomorphic change with stripped bars and banks. Aerial imagery suggested where vegetation is present on the banks less change has occurred.
- The flood runner and floodplain at Pioneer Park was engaged during the October and November 2022 flood events.
- Erosion occurred where flows re-entered the Bell River on the left bank immediately downstream of the bed control. Likely caused by flows passing over the rock revetment from the park and not from flows coming out of the river channel. Erosion at this location has the potential to compromise the rock revetment and bed control.
- Damage observed to Showground Road, footpath and road assets within Pioneer Park due to activation of floodplain (stripped pavement and vegetation)

Current and Likely Future Issues

Following further discussion with DRC and after preliminary desktop review, SCS have identified the following current and potential future issues for the inspection reach:

- Due to the highly modified reach and the lack of riparian vegetation, there is the potential for further erosion of the left bank within the site extent.
- Without remediation works, future floods would likely erode the existing rock revetment on the left bank (Site 2) where floodplain flows re-enter the river below the bed control.
- If stabilisation works are not undertaken at Site 2 there is the potential for the Rock Bed Control to be outflanked. Outflanking or damage to the bed control could lead to the progression of bed lowering and bank erosion further upstream along the Bell River.

Flood Response 2022 - Site Summary – Pioneer Park, Wellington NSW

Proposed Options

Following further discussion with DRC and after preliminary desktop review, SCS propose the following options to address priority issues at Pioneer Park:

Site 1 – Proposed Options:

1. Bank Stabilisation – rock revetment left bank approximately 125m OR
2. Bulk earthworks (where required) and revegetation to increase hydraulic roughness and resilience of the left bank in the event of future floods. (recommended)

Site 2 – Proposed Options:

1. Rock spillway with vegetated verge tying into existing rock revetment

Figure 2 below provides an overview of the extent of works with a preliminary sketch attached.



Flood Response 2022 - Site Summary – Pioneer Park, Wellington NSW

Cost-estimate

SCS propose the following high-level cost-estimate to undertake the proposed options at the site (see detailed scope of works and concept sketch at **Appendix A**):

Proposed Options - Site 1		Cost-estimate (ex GST)
1	Bank Stabilisation – Rock revetment left bank approximately 125m	Not recommended. Given the water depths at the site (3-4m) the min quantity of rock required for stabilisation is approx. 3000 tonnes. Cost-estimate for supply of this quantity of rock alone is in excess of \$250,000 ex gst. Option 2 is therefore recommended.
2	Bank re-profiling (where required) and revegetation with native species.	~\$150,000 - \$200,000
Proposed Options - Site 2		Cost-estimate (ex GST)
1	Rock spillway with vegetated verge. Tied into existing rock revetment.	~\$170,000 - \$200,000

*Cost-estimate should be considered high-level and for funding purposes only. If works are to be undertaken, scope of works and cost-estimate should be reviewed and revised. Does not include costing for revegetation, reinstatement of roads/footpaths, additional site investigations or specialists, environmental approvals, hydraulic modelling or development of design plans.

Post-flood Site Recommendations

To address the identified issues at Pioneer Park, DRC should consider and implement the following:

- Pioneer Park is an important floodplain for the Bell River and any future repairs, treatments or uses for the park should consider future flow velocities and flow paths.
- Undertake spillway works as a priority due to proximity and tie-in to the Rock Bed Control.
- Monitor downstream bends and bank retreat.
- Investigate opportunities to increase capacity of the floodplain near Showground Road.
- Undertake hydraulic modelling and geomorphic investigation to support future decisions.
- Revegetate the left bank with native species to increase hydraulic roughness and resilience in future flood events.

APPENDIX A

Site 1 – Bank Reprofilng and Revegetation

Proposed Scope of Works

Based on visual inspection and basic measurements, SCS propose to undertake bulk earthworks to reinstate stable batters suitable for planting and to construct benches to increase flood capacity where possible. SCS also propose to undertake revegetation with native species to increase hydraulic roughness and resilience of the left bank in the event of future floods. This would also improve habitat for the Platypus.

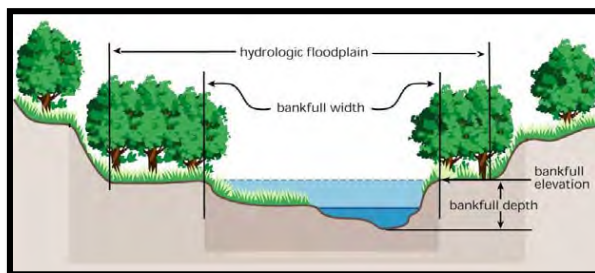


Figure 1: Schematic illustrating a benched channel form in section.

SCS have allowed for and propose the following scope of works:

- Project management and preparation of WHS and IMS documentation.
- Site establishment and delivery of plant machinery, materials and equipment.
- Provision of basic laser level survey to check levels, dilapidation report and service location prior to the works.
- Preparation of a Vegetation Management Plan.
- Vegetation removal where required to access and undertake bank re-profiling.
- Undertake upper bank and bench reprofiling to achieve stable batter (max slope 2:1) for replanting. Disposal of excess material to be determined.
- After earth-reshaping, spread and place topsoil and organic matter as required.
- Supply and place mulch and jute mesh as required to disturbed benches and batters.
- Site decommission and make good to disturbed areas.
- Revegetate with native species to create a well-structured riparian zone.
- Provision of water cart (five visits) to supply water to vegetated area.

SCS propose to undertake the works utilising the following plant and equipment:

- 20T Excavator (wet) – Reprofiling of banks.
- 9T Articulate Haul Truck – Transport spoil locally to stockpiles.
- 12T Rigid Trucks – Cartage of spoil offsite.

Flood Response 2022 - Site Summary – Pioneer Park, Wellington NSW**Exclusions**

- Topographic survey, site set-out, hydraulic modelling or Work as Executed (WAE) Survey after the completion of the works.
- Removal, management, and disposal of unforeseen hazardous waste or waste materials during construction.
- Classification or lawful disposal of spoil generated by construction.
- Turfing of any disturbed areas.
- Construction of haul road or remediation and construction of roads, pathways or access ways.
- Ongoing maintenance of revegetation.
- Provision of Traffic Control Plan or Traffic Control throughout the works.
- Provision of Environmental assessment permits or approvals (as required), Vegetation Management Plan or Landscape Designs Plans.

Site 2 – Proposed Spillway – Cost-estimate

Proposed Scope of Works:

Based on visual inspection and basic onsite measurements, SCS propose to construct a rock spillway and drop structure tying-in to the existing rock revetment wall. SCS have also allowed for a vegetated verge at the crest of the structure to add hydraulic roughness and resilience to the rock revetment wall in the event of future floods. The verge would also act as a natural barrier discouraging pedestrian access. Plantings should be species that will survive during dry periods and bend over when submerged during inundation so as to not form a flood barrier.

SCS have allowed for and propose the following scope of works:

- Project management and preparation of WHS and IMS documentation.
- Site establishment and delivery of plant machinery, materials and equipment.
- Provision of basic laser level survey, dilapidation report and service location prior to the works.
- Undertake minor bulk earthworks to prepare the area for rock placement.
- Construction of rock spillway and drop structure tying-in to the existing rock revetment wall (see Concept Design attached).
- Importation of approximately 350 tonne of Oversize Rock (300-1000mm) and 70 tonne of Cobble (70-100mm) to complete the works.
- Supply and spread ANL 'Forest Blend' mulch to disturbed areas.
- Supply and spread Topsoil (0.3m x 2m x 45m) and ANL 'Forest Blend' mulch (8approx. 15m³) to vegetated verge area.
- Allowance for 500 plantings (species guided by DRC).
- Provision of water cart (five visits) to supply water to vegetated area.
- Site decommission and make good to disturbed areas.

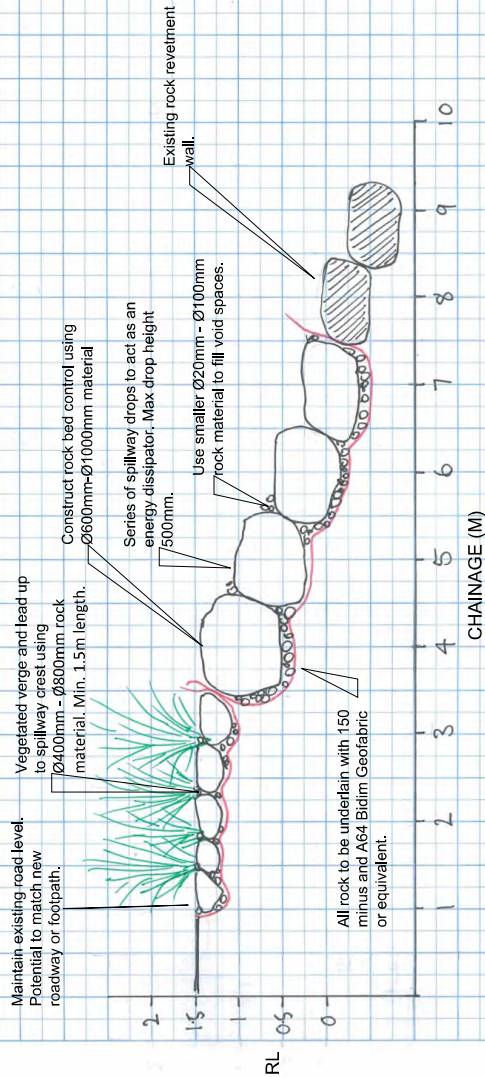
SCS propose to undertake the works utilising the following plant and equipment:

- 14T Excavator (wet) with Grabs – Excavation, loading and placing rock.
- 8T Excavator (wet) with Grabs – Sorting and loading rock at the stockpile area.
- 9T Articulate Haul Truck – Transport rock from the stockpile area to construction area.
- 12T Rigid Trucks – Rock, Cobble and Topsoil importation

Exclusions:

- Topographic survey, site set-out, hydraulic modelling or Work as Executed (WAE) Survey after the completion of the works.
- Removal, management, and disposal of unforeseen hazardous waste or waste materials during construction.
- Classification or lawful disposal of spoil generated by construction.
- Turfing of any disturbed areas.
- Construction of haul road or remediation and construction of roads, pathways or access ways.
- Ongoing maintenance of revegetation.
- Provision of Traffic Control Plan or Traffic Control or throughout the works.
- Provision of Environmental assessment, permits or approvals (as required).

ROCK SPILLWAY - LONG-SECTION (TYPICAL)



NOTES

- Long-section length may vary.
- Approximate extent of works 45m
- Plantings to include native species that will survive during dry periods and bend over when submerged during inundation so as not to form a flood barrier e.g. Lomandra Longifolia.
- Special attention should be taken at the upstream extent to ensure flows are captured by the structure.



Note: Concept Design only. Actual alignment and placement of rock to be determined onsite.

DUBBO REGIONAL COUNCIL - PIONEER PARK - SITE 2
DESIGN CONCEPT
Rev 1 - 04-02-2023



Soil Conservation Service



Memorandum

To	Ian McAlister
From	Guy Lampert
Date	08/12/2022
Subject	Flood Response 2022 - Duke of Wellington Bridge – Preliminary Options

The Soil Conservation Service (SCS) undertook visual site inspections at the following sites with Dubbo Regional Council (DRC) on 28/11/2022 and 29/11/2022:

- Duke of Wellington Bridge - Wellington
- Pioneer Park - Wellington
- Lady Cutler Park – downstream Pedestrian Bridge - Dubbo

The above sites were identified as high priority sites for action in the *River Health Report - Macquarie and Bell Rivers, Dubbo and Wellington* (SCS 2018) and experienced significant damage in the October and November 2022 Flood Events.

SCS understand the most urgent priority site for DRC is the Duke of Windsor Bridge. SCS will look to provide further detail on the remaining sites listed above with the next stage of reporting.

Proposed Options

Following further discussion with DRC and after preliminary desktop review, SCS propose the following options for the future management of the Duke of Wellington Bridge and surrounding area:

1. Do nothing – bridge remains in place, no structural or stabilisation works
2. Decommission Bridge – remove structure, undertake stabilisation works
3. Decommission Bridge - retain structure, undertake stabilisation works
4. Reinstate Bridge – structural assessment, stabilisation works, road works

A summary of the expected river trajectory, limitations and benefits of each option is provided in **Attachment A**.

The Soil Conservation Service acknowledges the traditional custodians of the land where we live and work and pays respect to Elders past, present and emerging. Through our work on what was and always will be Aboriginal land, we commit to our shared responsibility to heal and protect Country for all future generations.



Memorandum: Flood Response 2022 - Duke of Wellington Bridge – Preliminary Options

Proposed Recommendations

- Initial investigations suggest works need to be undertaken at the site to mitigate:
 - o The rate of bank retreat on the Bell River
 - o The hydraulic impact of the bridge structure
 - o Ensure public safety and reduce risk to public and private assets in the locality.
- Due to the potential river trajectory and hydraulic behaviour of the site, SCS recommend undertaking either Option 2 or Option 4. This would depend on DRC preference for maintaining vehicle and pedestrian access.
- Further develop Option 2 and Option 4
- Explore opportunities for funding sources.
- Undertake cost-benefit analysis for the provided options.

Clarifications and limitations

Information and options provided above are based on preliminary desktop assessment and initial site inspections only. Hydraulic analysis or detailed design has not been completed. Options should be considered high-level and require further investigations, risk assessment and cost-benefit analysis.

ATTACHMENT A

Proposed Option	Potential River Trajectory	Benefits	Limitations
1 Do nothing Bridge remains in place, no structural or stabilisation works	Figure 1	<ul style="list-style-type: none"> - Little cost to DRC 	<ul style="list-style-type: none"> - Further bank retreat of Bell River - Hydraulic impacts as a result of the remaining bridge structure and resulting future erosion of Macquarie River - Loss of vehicle and pedestrian access - Risk to public safety – bridge structure & unstable banks - Further loss of private and public lands/assets - Potential negative public perception
2 Decommission Bridge Remove structure, undertake stabilisation works	Figure 2	<ul style="list-style-type: none"> - Mitigate bank retreat and reduced public safety risk - Reduced loss of land and assets - Mitigate hydraulic impacts as a result of the remaining bridge structure and future erosion of Macquarie River 	<ul style="list-style-type: none"> - Cost of bridge removal - Substantial bank stabilisation works required to mitigate bank retreat of Bell River (similar to Option 3 and 4). - Loss of vehicle and pedestrian access - Potential negative public perception due to the closure of asset and access
3 Decommission Bridge Retain structure, undertake stabilisation works	Figure 3	<ul style="list-style-type: none"> - No bridge removal costs - Reduced loss of land and assets - Potential public asset/site to remain in place. 	<ul style="list-style-type: none"> - More extensive bank stabilisation works may be required to mitigate hydraulic impacts of bridge on Macquarie River. - Substantial bank stabilisation works required to mitigate bank retreat of Bell River (similar to Option 2 and 4). - Loss of vehicular and pedestrian access - Potential negative public perception due to the closure of asset and access
4 Reinstate Bridge & Road Access Structural assessment, bank and bridge stabilisation works, road works.	Figure 4	<ul style="list-style-type: none"> - No bridge removal costs - Mitigate bank retreat and reduce public safety risk - Reduced loss of land and assets - Vehicle and pedestrian access maintained. - Longer term stability 	<ul style="list-style-type: none"> - Structural assessment, road and drainage repairs, more extensive stabilisation works required to rebuild and establish tie-in downstream of bridge. - Substantial bank stabilisation works required to mitigate bank retreat of Bell River (similar to Option 2 and 3).

Table 1: Preliminary proposed options table for the future management of the Duke of Wellington Bridge and surrounding area.

Note: Bank stabilisation works on the Bell River are likely to involve bank reshaping to include bench and stable batter, planting with vegetation to stabilise and rock toe protection with deflector structures to push the thatweg away from the bank.



DUBBO REGIONAL COUNCIL