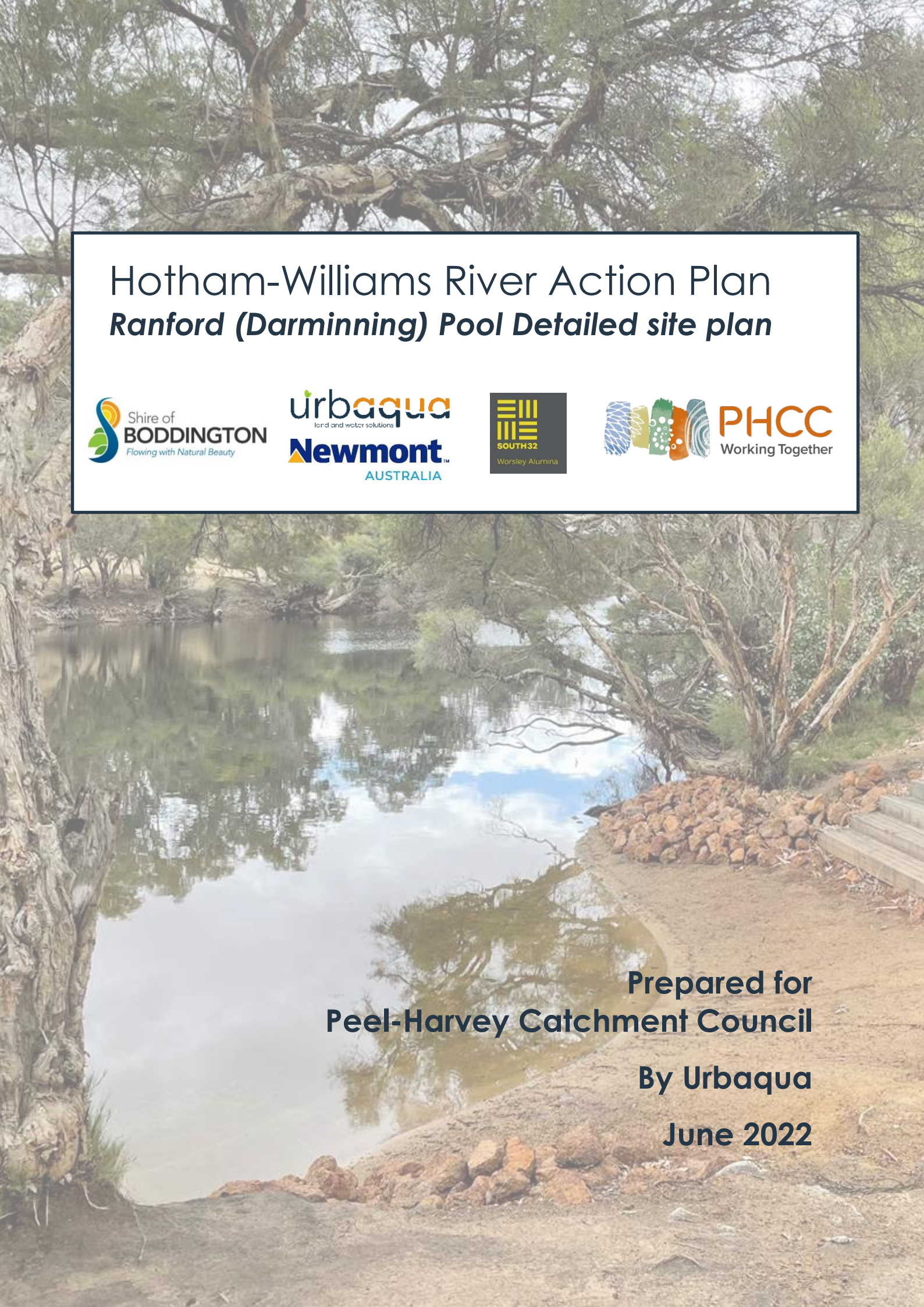


Hotham-Williams River Action Plan

Ranford (Darminning) Pool Detailed site plan

Shire of BODDINGTON
Flowing with Natural Beauty

urbaqua
land and water solutions

Newmont
AUSTRALIA

SOUTH32
Worsley Alumina

PHCC
Working Together

Prepared for
Peel-Harvey Catchment Council

By Urbaqua

June 2022

Disclaimer and Limitation

This document is published in accordance with and subject to an agreement between Urbaqua and the Client, Peel-Harvey Catchment Council (PHCC), for who it has been prepared for their exclusive use. It has been prepared using the standard of skill and care ordinarily exercised by environmental professionals in the preparation of such Documents.

This report is a qualitative assessment only, based on the scope of services defined by the Client, budgetary and time constraints imposed by the Client, the information supplied by the Client (and its agents), and the method consistent with the preceding. Urbaqua has not attempted to verify the accuracy or completeness of the information supplied.

Any person or organisation that relies upon or uses the document for purposes or reasons other than those agreed by Urbaqua and the Client without first obtaining the prior written consent of Urbaqua, does so entirely at their own risk and Urbaqua, denies all liability in tort, contract or otherwise for any loss, damage or injury of any kind whatsoever (whether in negligence or otherwise) that may be suffered as a consequence of relying on this Document for any purpose other than that agreed with the Client.

Acknowledgements

Urbaqua would like to acknowledge the following organisations for their significant contribution to this project:

1. Peel-Harvey Catchment Council.
2. Newmont Boddington.
3. Shire of Boddington.
4. South32 Worsley Alumina.

Peel-Harvey Catchment Council - Hotham-Williams River Action Plan
Figure 1: Ranford Pool Site Concept - Restoration Plan

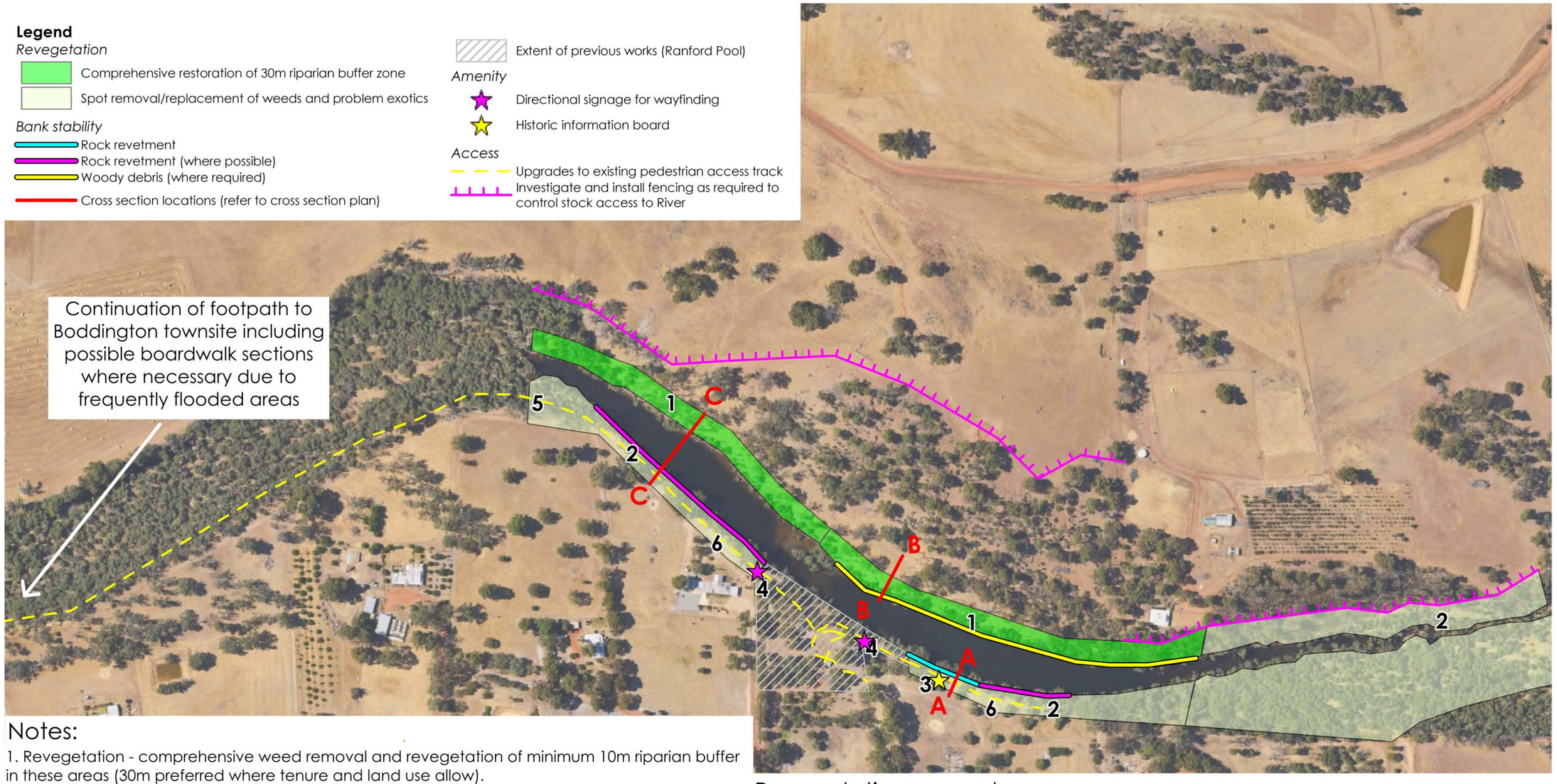
Legend

Revegetation
- Comprehensive restoration of 30m riparian buffer zone
- Spot removal/replacement of weeds and problem exotics

Bank stability
- Rock revetment
- Rock revetment (where possible)
- Woody debris (where required)
- Cross section locations (refer to cross section plan)
- Extent of previous works (Ranford Pool)

Amenity
- Directional signage for wayfinding
- Historic information board

Access
- Upgrades to existing pedestrian access track
- Investigate and install fencing as required to control stock access to River



Notes:

1. Revegetation - comprehensive weed removal and revegetation of minimum 10m riparian buffer in these areas (30m preferred where tenure and land use allow).
2. Revegetation - spot removal of weeds and problem exotics, replacement with native species where necessary.
3. Sympthetic restoration of historic pumping station with contextual information signage.
4. Signage for wayfinding to Boddington townsite and pump station site.
5. Improvements to existing footpath to Boddington townsite as required to improve safety (eg: stabilisation & regrading of existing surface materials).

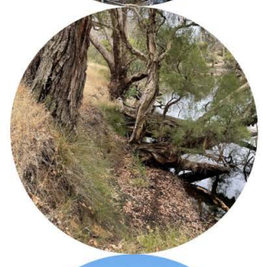
Fencing should be located outside of the riparian zone above the top-of-bank and at least 15m from the high water mark in accordance with PHCC minimum fencing requirements.

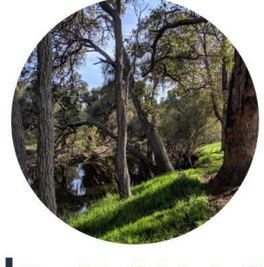
Signage will include information to acknowledge Noongar and European history of the River at Ranford Pool site and communicating its cultural and historical significance, including the way the Noongar people and Europeans have valued this place throughout history.

Project activities outside of the main focal areas on public land will be in close consultation with neighbouring landholders.

Revegetation examples:

Existing conditions:





Data source: PHCC, Created by:YY Projection: MGA: zone 50.

0 100
metres
Scale 1:4,000 @ A3

PHCC Working Together Peel-Harvey Catchment Council

Newmont AUSTRALIA

SOUTH32 Worsley Alumina

urbaqua land and water solutions

1 SITE DESCRIPTION

Ranford (Darminning) Pool is located upstream from Boddington and the confluence with the Bannister River in Ranford. The Hotham River at this location is a Registered Aboriginal Site of Mythological significance according to the Aboriginal Heritage Inquiry System on the Department of Lands and Heritage website. It is an area of high recreational value as it is a large, permanent pool in summer months. Part of the site is the subject of recent restoration works. The pool and channel upstream and downstream features similar issues of bank erosion and sedimentation.

Vegetation cover in this reach is generally dominated by tree cover (*Eucalyptus* sp. including Flooded Gums; and *Melaleuca* sp.) with a limited understorey and exotic grasses. The shrub layer has been reduced from stock access (northern bank) or human (southern bank, associated with Ranford Pool reserve and the presence of a track from the Boddington townsite). Vegetation cover improves downstream from Ranford Pool, which is attributed to greater canopy cover at this location.

This reach was also covered by the Boddington Flood Modelling Report (SKM, 2009) that determined the floodplain for a major flood event (100 yr ARI) is approximately 300 m wide in the downstream areas.

2 CONSULTATION

Consultation with key stakeholders and the community commenced in February 2021 and has included the following:

- Meeting with Noongar Elder Greg Thorne, who provided a letter of support.
- Site visit with Shire of Boddington.
- Formal presentation to Shire of Boddington, with direct feedback.
- Information session for the local community, with direct feedback.

Key comments from the consultation include:

- The opportunity to restore the pump house and provide access to a viewing platform.
- Retention of fallen trees and need to protect strategic trees susceptible to bank erosion.
- Inclusion of interpretive signage along track and/or a mural on the pump house.
- The need for increased vegetation between the river and the track in some areas.
- Careful species selection to address possible causes of current tree death.

3 CONCEPT DESCRIPTION

The restoration concept (Figure 1, Figure 2 and Figure 3) is informed by the desktop assessment, site visits and stakeholder consultation. It is an extension of the previous restoration works, which were focussed on improving access to the pool, increasing amenity, and providing low-key community facilities.

This concept is focused beyond the earlier restoration site and includes areas up and down-stream, as well as the other side of the river, providing further linkages and stability to the site. Implementation of the recommended fencing, bank stabilisation measures, and revegetation should result in improvements to river health.

The improvements to path networks and restoration of the pump station will enhance community amenity and connections to heritage and ecological values.

4 PROPOSED WORKS

The proposed works are detailed in Figures 1, 2 and 3 as follows.

4.1.1 River restoration

- Comprehensive weed removal in degraded areas with spot weed removal and control of exotics in other areas (see Figure 1).
- Bank stabilisation works (See Figure 3 for examples). Where banks are modified but unable to achieve a 1:3 grade, some form of matting or other stabilisation is likely to be required. This may also be required where the sediment is sandy or otherwise unstable. In general:
    - Banks steeper than 1:3 should be gently regraded where possible without damage to existing vegetation.
    - Banks up to approx. 1m high and steeper than 1:3 that cannot be regraded should be covered with pinned geofabric prior to revegetation with native riparian species.
    - Banks greater than 1m high and steeper than 1:3 that cannot be regraded should be stabilised at the toe with rock revetment or secured woody debris, covered with pinned geofabric above and vegetated with native riparian species.
- Revegetation of riparian corridor to minimum of 30m from each bank where possible.
- Monitor tree stability along steep sections of the bank. Add spot re-enforcement where required. If trees fall, align with flow of water to provide protection to the bank. Tree succession planting should be undertaken in these areas.

Estimated quantities for river restoration works:

Item	Unit	Amount
Temporary fencing	Length (m)	750
Rocks (d50 = 300mm)	Volume (cum)	190
Geofabric	Area (sqm)	610
Revegetation	Area (sqm)	19,270

Notes:

1. Temporary fencing will be installed to protect sections of comprehensive and demonstration revegetation.
2. Rock pitching will be installed to banks identified for "Rock Revetment" with 100% coverage, to banks identified for "Rock revetment (where possible)" with 50% coverage (as per Figure 1).
3. Geofabrics will be installed to banks identified for bank stability measures (as per Figure 1).

4.1.2 Public amenity, access and use

The majority of public access and use works are detailed on Figure 2. This includes:

- Incorporation of wayfinding principles into directional signage and improvements of the path network to the Boddington townsite and the pump station.
- Planting of trees for increased canopy and amenity, particularly along the pedestrian network.
- Signage to acknowledge Noongar and European history of the River at Ranford Pool (Darminning) site and communicating its cultural and historical significance, including the way the Noongar people and Europeans have valued this place throughout history.
- Sympathetic restoration of historic pumping station to create a viewing tower with contextual information signage.

Signage examples

Wayfinding

River restoration information

Natural and cultural stories

Historic information

Access treatment examples

Bollards or large boulders for vehicle access control

Boardwalk

Pedestrian access and wayfinding

4.1.3 Adjacent landowner management

PHCC works with landholders in offering advice about managing natural areas, and opportunities for access to funding when it is available.

This communication process can occur with owners of properties located next to the Ranford Pool (Darminning) site, with the aim of future on-ground projects such as revegetation, weed control, and protection of existing vegetation, particularly in relation to the River ecosystem.

Fencing is required to control stock access to the northern bank of the River. Where possible, this should be located outside of the riparian zone above the top-of-bank and at least 15m from the high water mark in accordance with PHCC minimum fencing requirements. Access points for controlled stock access can be included where bank grades and vegetation permit. This may be in the context of water access and crash grazing if and when required, both of which need to be at appropriate locations and durations.

5 NEXT STEPS

Delivery of the plan will be guided by available funding. At this stage, weeding and revegetation can be undertaken without any further investigation, however further detailed design cannot be undertaken without detailed site survey and is required for:

- Improvements to pedestrian path network.
- Bank and bed stabilisation techniques.

- Restoration of pumping station.

Other considerations for the implementation of the works include:

- Prioritisation of environmental restoration aspects of the plan, with secured funding.
- Further funding for restoration activities to be investigated and applied for with project partners.
- Aboriginal Heritage Approvals process through Department of Planning, Lands and Heritage.
- Approvals for modification of bed and banks through Department of Water and Environmental Regulation.
- Implementation of low impact activities such as revegetation, weed control and feral animal control.
- Formal partnership with representatives from the Noongar community.
- Formal partnership with Local Governments to seek funding for the parts of the plans involving public amenity.

The works can be undertaken collectively or individually, and consideration should be given to the following:

- Materials, quantities and installation of bank stabilisation structures and formal/informal access points for recreation.
- The location of the path network and road extension should minimise the need for tree removal.
- The choice of materials will be a key factor in the cost of the path network.
- The need for a structural assessment of the pump station prior to any works.

Peel-Harvey Catchment Council - Hotham-Williams River Action Plan
Figure 2: Ranford Pool Site Concept - Detailed Restoration Plan

Legend

- Cadastre
- Cross section locations (refer to cross section plan)
- Extent of previous works (Ranford Pool)
- Current trees

Amenity

- Historic information & Directional signage for wayfinding
- Directional signage for wayfinding
- Upgrades to existing pedestrian access track
- Historic pump station site

Bank stability

- Rock revetment
- Rock revetment (where possible)
- Woody debris (where required)

Revegetation

- Comprehensive restoration of 30m riparian buffer zone
- Spot removal/replacement of weeds and problem exotics
- Proposed trees

Sympathetic restoration of historic pumping station to create viewing tower with contextual information signage

Monitor trees on steep sections of bank, some spot reinforcements of the lower bank may be necessary and where trees fall they should be aligned to the direction of flow in the river and stabilised as bank protection. Succession planting of trees is a priority in these areas.

Notes:

1. Information will be displayed to acknowledge Noongar and European history of the River at Ranford Pool site and communicating its cultural and historical significance, including the way the Noongar people and Europeans have valued this place throughout history.
2. Project activities outside of the main focal areas on public land will be in close consultation with neighbouring landholders.

0 25
metres
Scale 1:1,000 @ A3

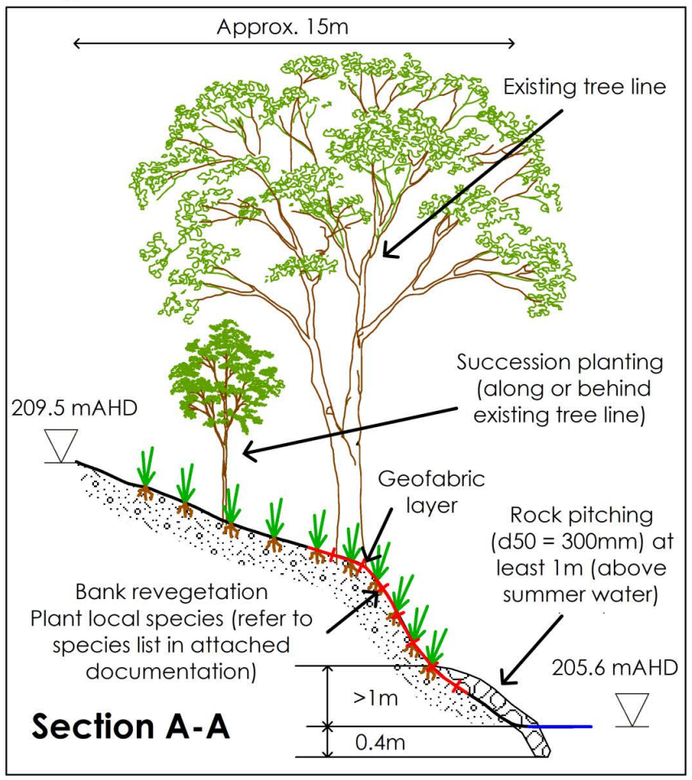
PHCC Working Together
Peel-Harvey Catchment Council

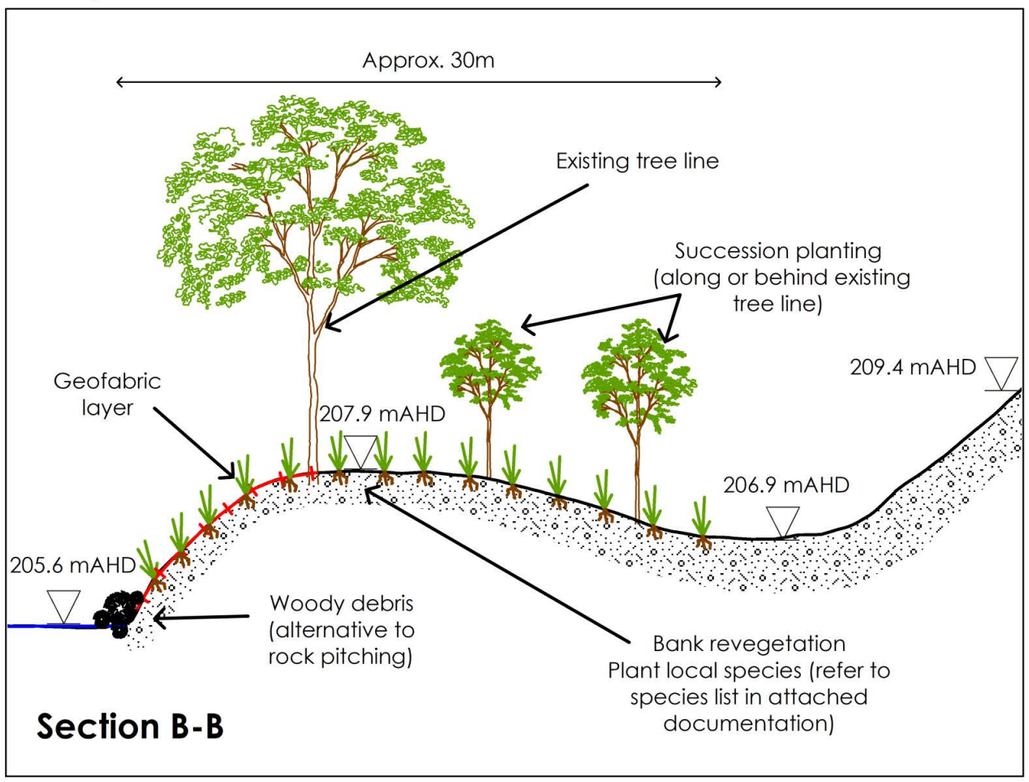
Newmont AUSTRALIA

SOUTH32 Worsley Alumina

urbaqua land and water solutions

Peel-Harvey Catchment Coucil - Hotham-Williams River Action Plan
Figure 3: Ranford Pool Site Concept - Cross Section Plan

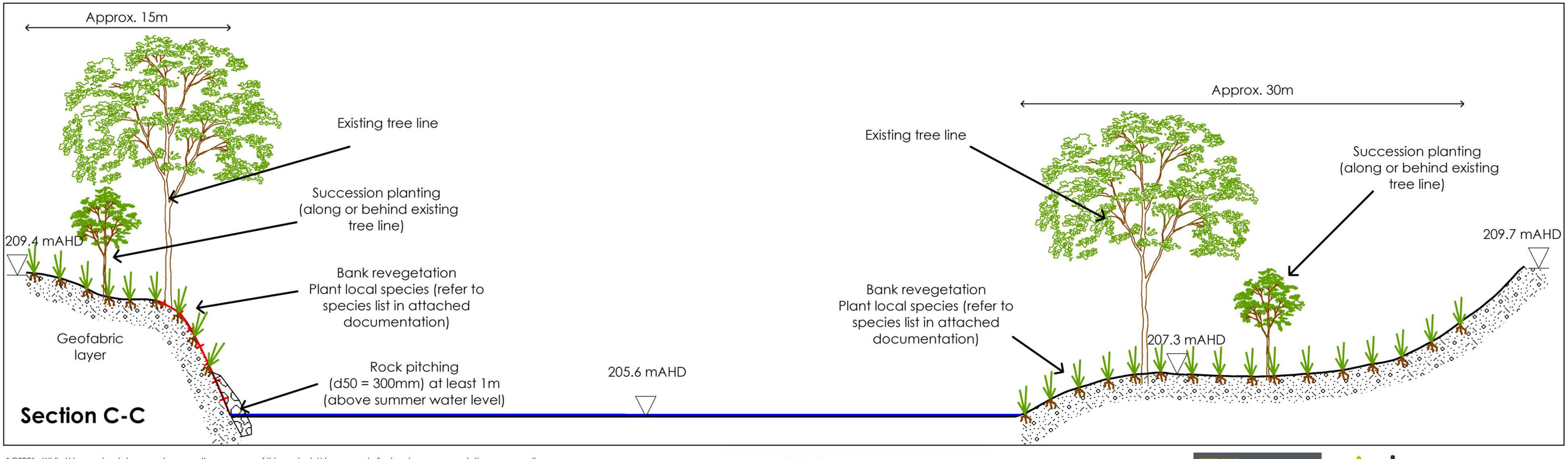




Notes:

Minor modification of bank shape may be required for vehicle/ equipment access and/or local stabilization.

- Geo-fabric (slopes steeper than 1:3):
  - o Install below summer water levels (under rock pitching).
  - o Install Around existing vegetation where required.
  - o Laid in direction of flow at base of slopes (to 1m above summer w.l.).
  - o Roll geofabric downslope over remainder of bank.
  - o Bury at top of bank.
  - o Pin as per manufacturer requirements.
  - o Overlap geo-fabric maps by 100mm.
  - o Include slits for planting.
- Rock pitching (slopes steeper than 1:3 and higher than 1m):
  - o d50 size of 300mm.
  - o Hard, durable rocks that are not susceptible to weathering.
  - o Larger rocks to be installed at the base of the slopes.
  - o Smaller rocks to be used to fill gaps and form tightly packed layer.
  - o Two layers of rocks.
  - o Rock pitching grade >1:2.
  - o Rock pitching to be installed to at least 1m above summer w.l.
  - o Toe trench, up to 400mm (back filled with rocks).
- Woody debris (tree trunks, collapsed trees) may be installed instead of rock pitching depending on local conditions, access or availability of material:
  - o Pinned/anchored to (or buried into) the bank.
  - o Aligned in a downstream direction.
  - o Use only native species.



Not to scale
Levels shown are approximate based on LiDAR elevations

PHCC Working Together Peel-Harvey Catchment Council

Newmont AUSTRALIA

SOUTH32 Worsley Alumina

urbaqua land and water solutions

Client: Peel-Harvey Catchment Council

Report	Version	Prepared by	Reviewed by	Submitted to Client	
				Copies	Date
Draft	V1	SSh	HBr	electronic	4 October 2021
Revised draft	V2	SSh/HBr	HBr	electronic	2 December 2021
Final report	V3	SSh/HBr	HBr	electronic	15 February 2022
Revised final report	V4	SSh/HBr	HBr	electronic	8 April 2022
Revised final report	V5	SSh/HBr	HBr	electronic	27 April 2022
Revised final report	V6	SSh/HBr	HBr	electronic	28 June 2022

Urbaqua
land & water solutions
Suite 4/226 Carr Place
p: 08 9328 4663 | f: 08 6316 1431
e: info@urbaqua.org.au
www.urbaqua.org.au