BERRY BYPASS OPTIONS REVIEW

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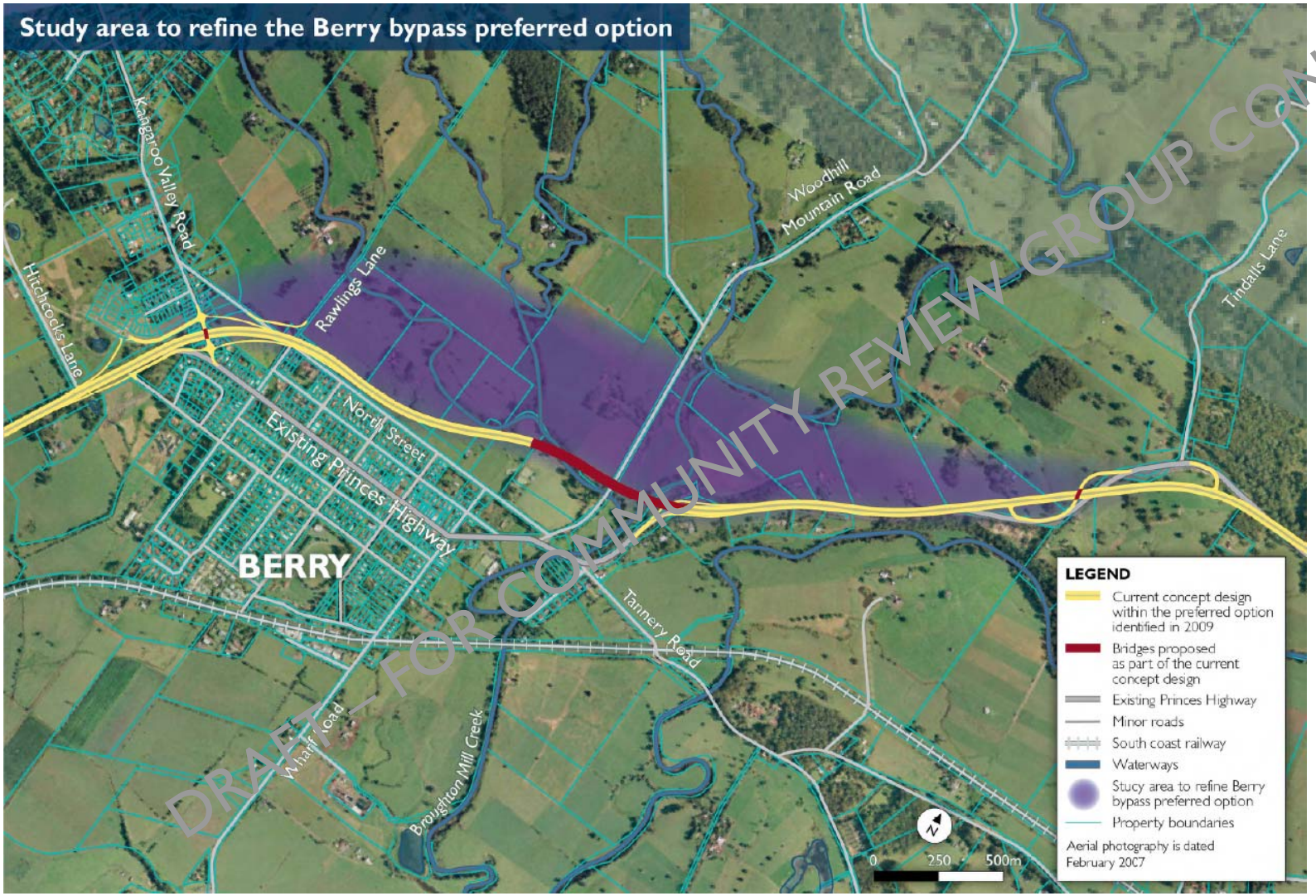
NSW GOVERNMENT



- Community review group meeting 4
- 12 October 2011

Approaching the problems and how to resolve

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1. Define a problem
2. Consider the actions
3. Understand the consequences
4. Mitigation of impact after that

Our problems

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Our problem

1. The amenity of North Street

Actions:

1.1. Explore the design of a lowered highway in the vicinity of North Street, and to examine the width of the cross section and the immediate drainage or water storage needs (see below). A further action was to examine an alignment shift slightly to the north.

1.2. Examine an alignment further to the north

1.3. Examine a design approach to these spaces

Our problems

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Our problem

2. Flooding and management along the alignment north of North Street

Actions:

Site visits, Ensure Council leading in design initiatives

2.1. Consider rerouting Town Creek to Bundewallah Creek. More work on topography needed. Looked at 2 potential cattle bridge sites over Bundewallah Creek to provide access to high ground in times of flooding - replacing the high ground lost to the highway.

2.2. Investigate retaining walls within the highway cross section to minimise the cross section.

2.3. Consider using pumps in the lowered highway area.

Our problems

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Our problem

3. The visual impact and amenity of the highway at Woodhill Mountain Road

Actions:

3.1. Examine Woodhill Mountain overbridge over the highway, the clearance required for flooding and trucks to pass underneath. Examine Council's and Cardno's estimate of heights for 1:20 and 1:100. Look for other circumstances where this design level has been adopted.

3.2. Consider how to reduce the height of the bridge at the eastern end - Bruce's ideas: Examine lowering the highway with a cutting in the ridge

3.3. Examine a cut and cover tunnel in the ridge.

3.4 Examine other construction types (more piers) to reduce costs.

3.5. Examine alignments including the shifting or diverting to the north of the current alignment.

Our problems

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Our problems

4. The design and aesthetics of the Berry bridge

Actions:

4.1. Give special attention to the bridge's proportions and aesthetic befitting of its vicinity to Berry. Get urban designers on board.

5. Noise – noise management and resident impacts

Actions:

5.1. Examine the appearance of a lowered bridge and what that entails

5.2. Examine the noise wall options with the lowering of the highway in the vicinity of North Street

6. (subset of noise) Shadow impact for residents of North Street

6.1. Build a virtual reality to examine potential shadowing issues at various locations.

Our problems

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Our problems

7. The noise generated from the design of joints on the bridge

Actions:

7.1. RTA examine

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Problem 1
The amenity of North Street

Action: 1. The amenity of North Street - Explore the design of a lowered highway

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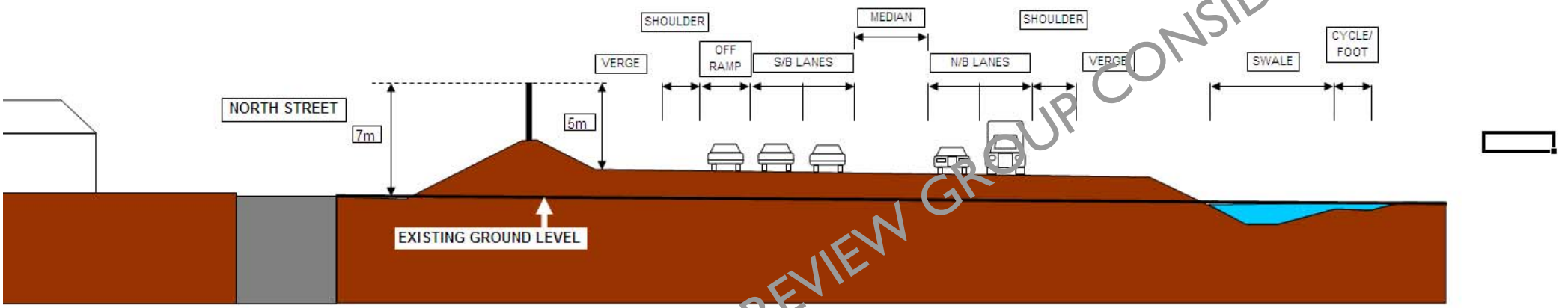
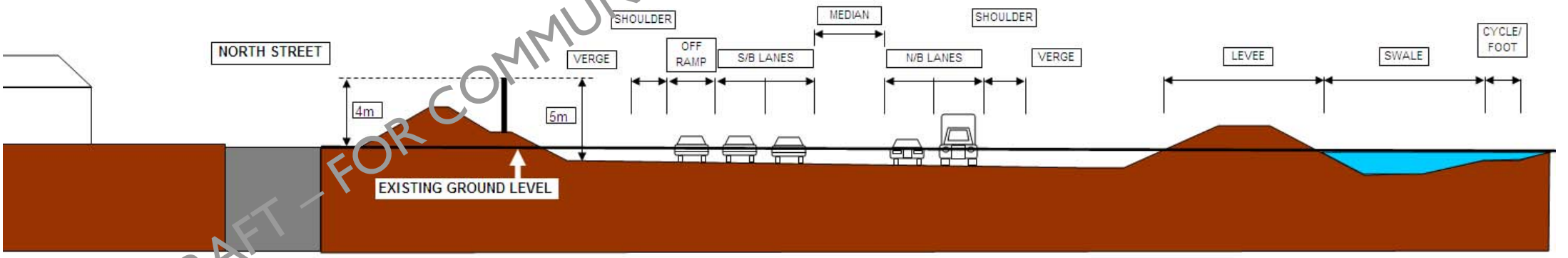


SECTION THROUGH CURRENT HIGHWAY ALIGNMENT BETWEEN EDWARD & ALBANY STREETS



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Action 1. The amenity of North Street - Explore the design of a lowered highway

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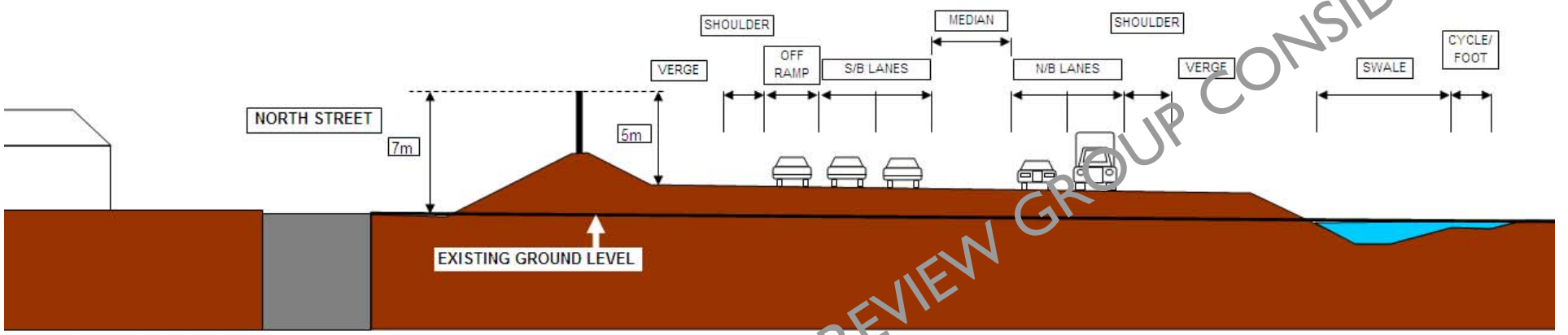

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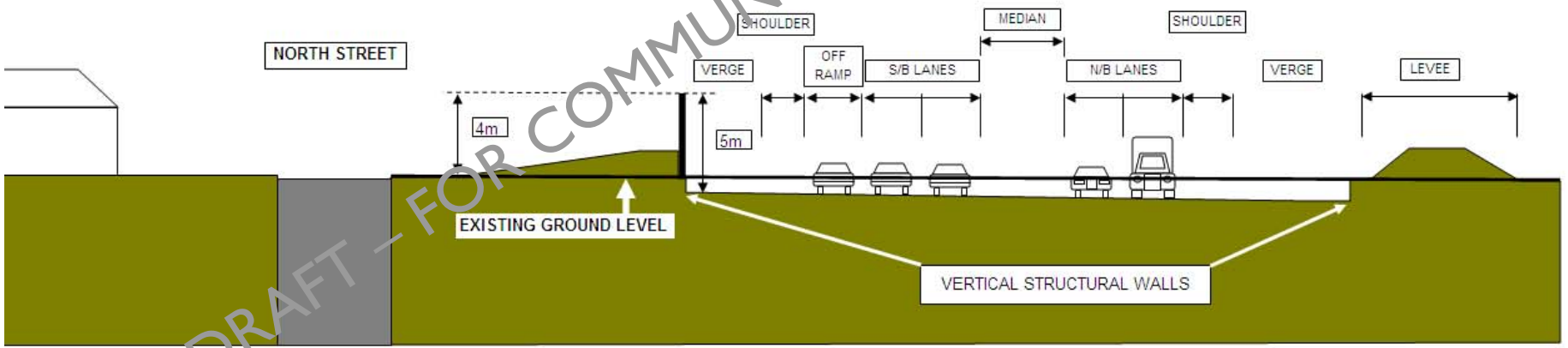

SECTION THROUGH PROPOSED HIGHWAY ALIGNMENT BETWEEN EDWARD & ALBANY STREETS TOWN CREEK DIVERTED ALONG RAWLINGS LANE

Action 2. The amenity of North Street - Examine an alignment further to the north

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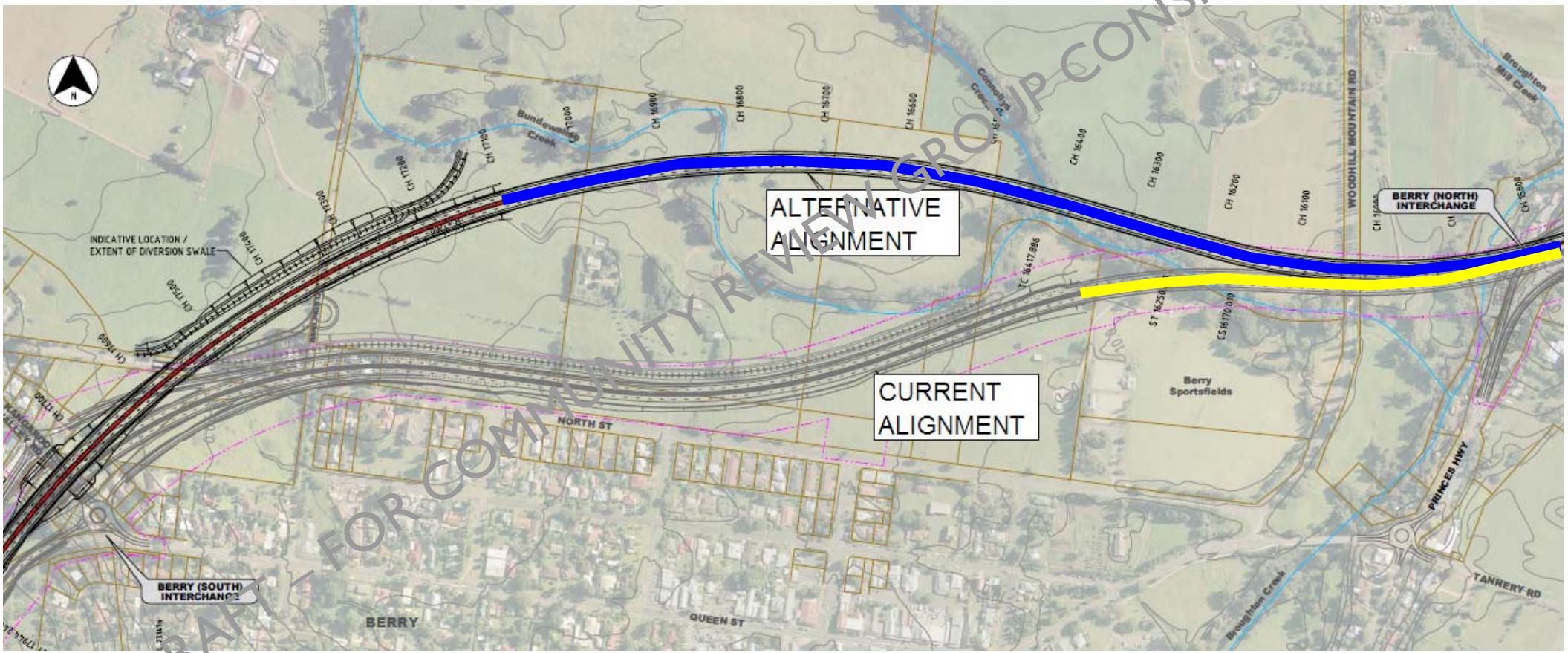

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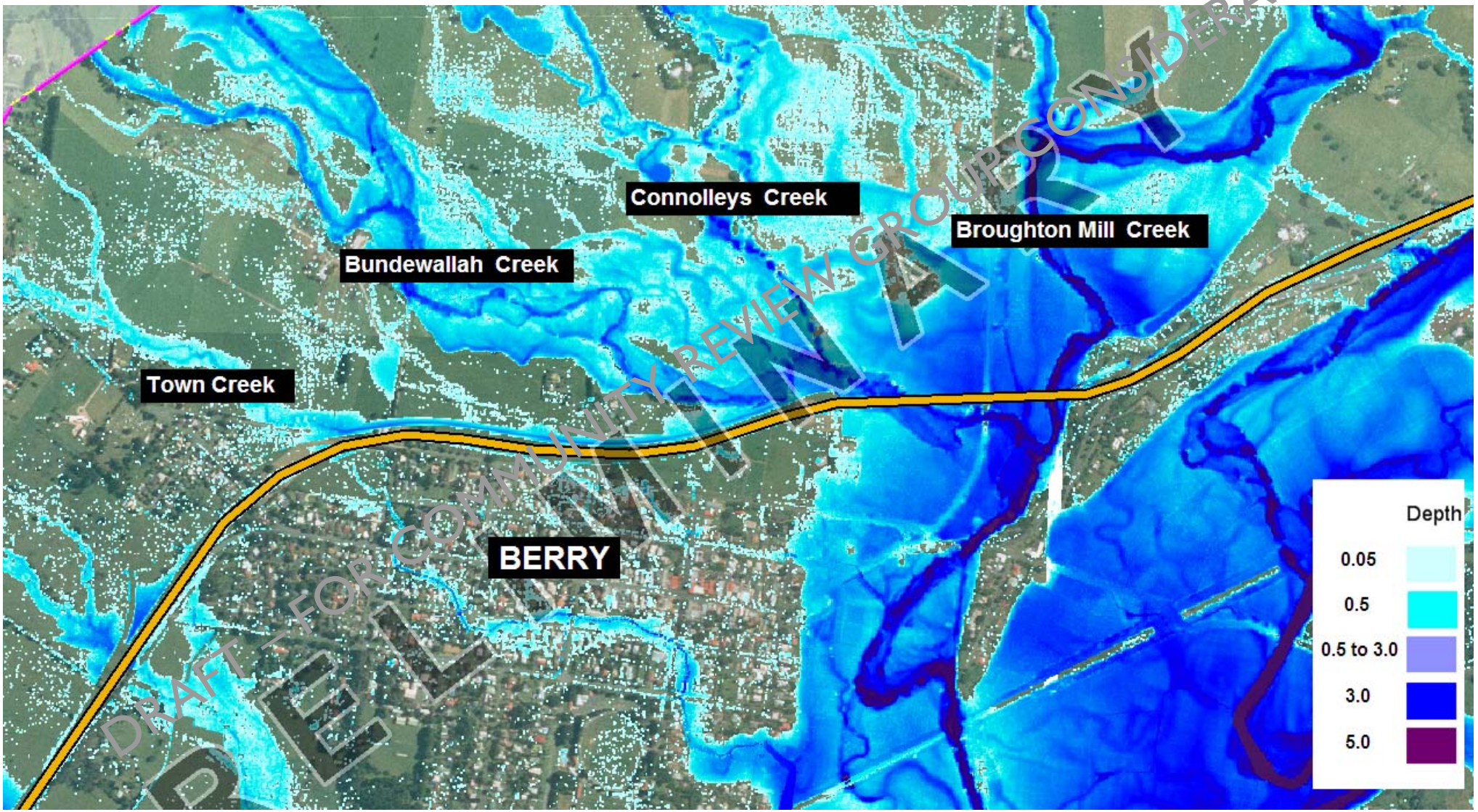

Action 3. The amenity of North Street - Examine an alignment further to the north

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Consequences

- A bridge of approximately 1200 metres length would be required to cross the flood plain
- Increases the amount of land severance and impact on rural properties
- The strategic cost estimate is very roughly $300 million (over current cost of $170 million)

Mitigation

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Problem 2
Flooding

Flooding and management along the alignment north of North Street – Action 1. Rerouting Town Creek

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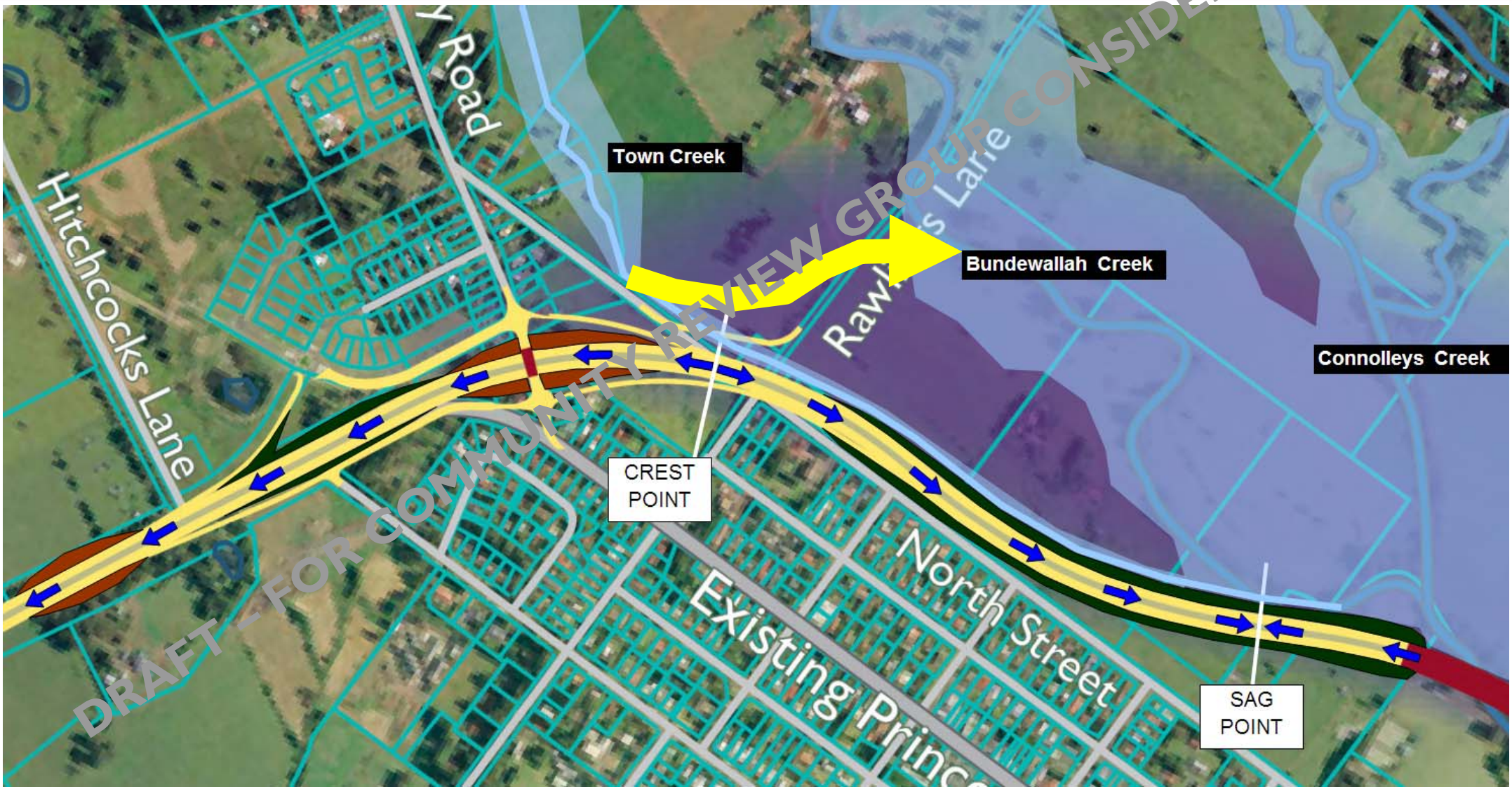

Flooding and management along the alignment north of North Street – Action 1. Rerouting Town Creek

Flooding and management along the alignment north of North Street – Action 1. Rerouting Town Creek

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Rerouting

Discussions with Council ongoing.

Consequences

Environmental impacts – effects on riparian landscape

Impacts on 2 farms

Improved flood management for the town of Berry.

Mitigation

discussions with Council needed.

Flooding and management along the alignment north of North Street – Action 3. Examine pumps

3. Consider using pumps in the lowered highway area.

RTA advice to date as to this practice was that it is preferable we do not use these. Pacific Highway use at Pugan – see comment.

Consequences

If the pump fails due to blockages or power failures (experience in the Airport Tunnel and Parramatta Road at Granville under the railway, shows they do) the road will flood, rendering it impassable and dangerous.

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Problem 3.

The visual impact and amenity of the highway at Woodhill Mountain Road

3.1. Action: Examine Council's and Cardno's estimate of heights for 1:20 and 1:100.

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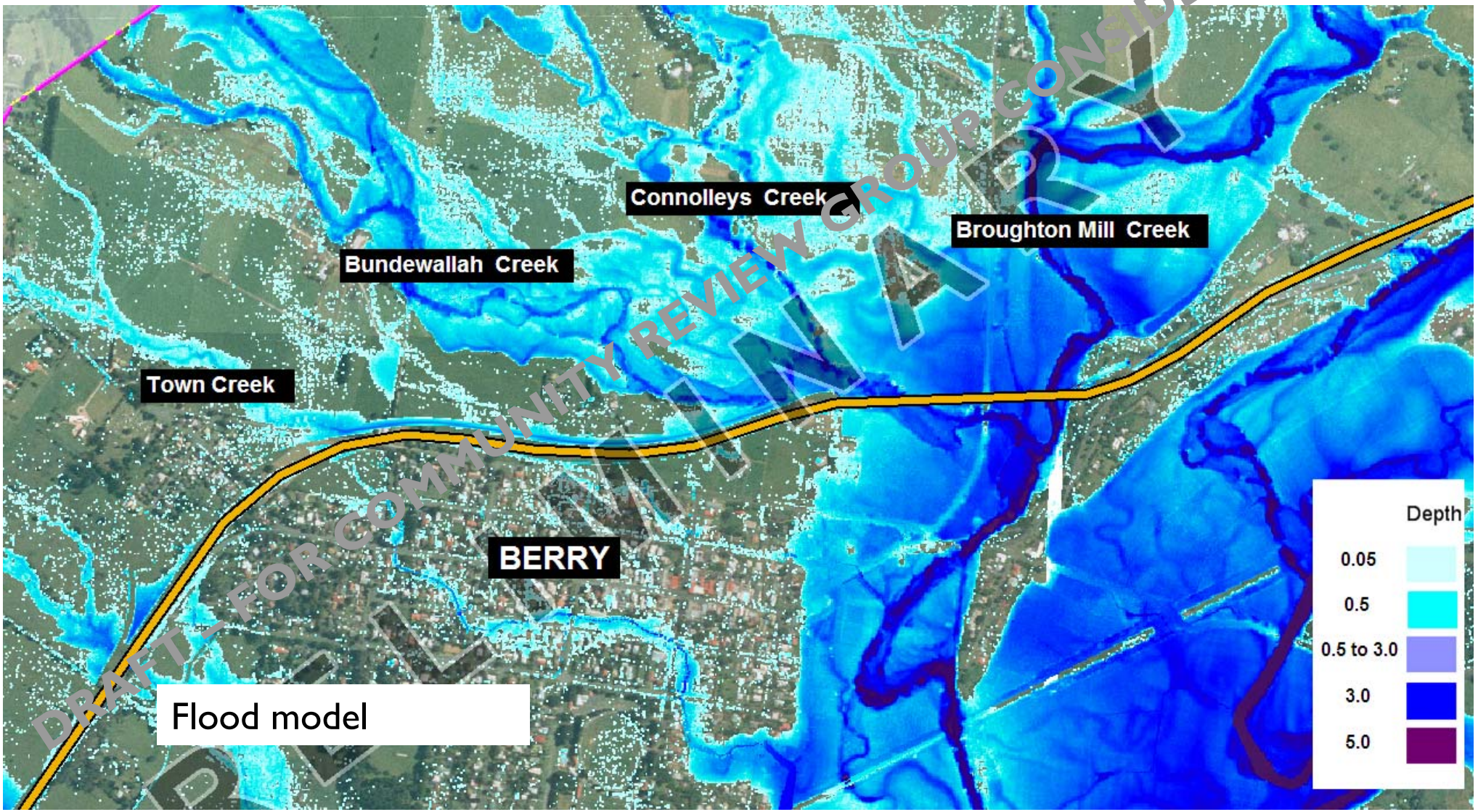

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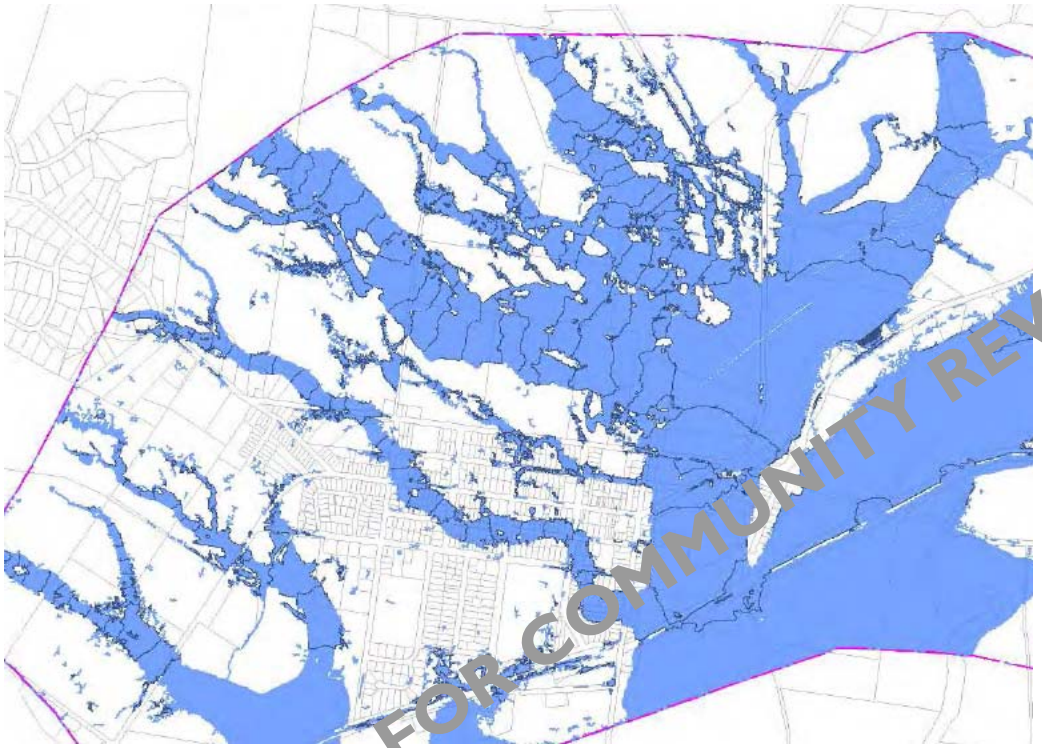
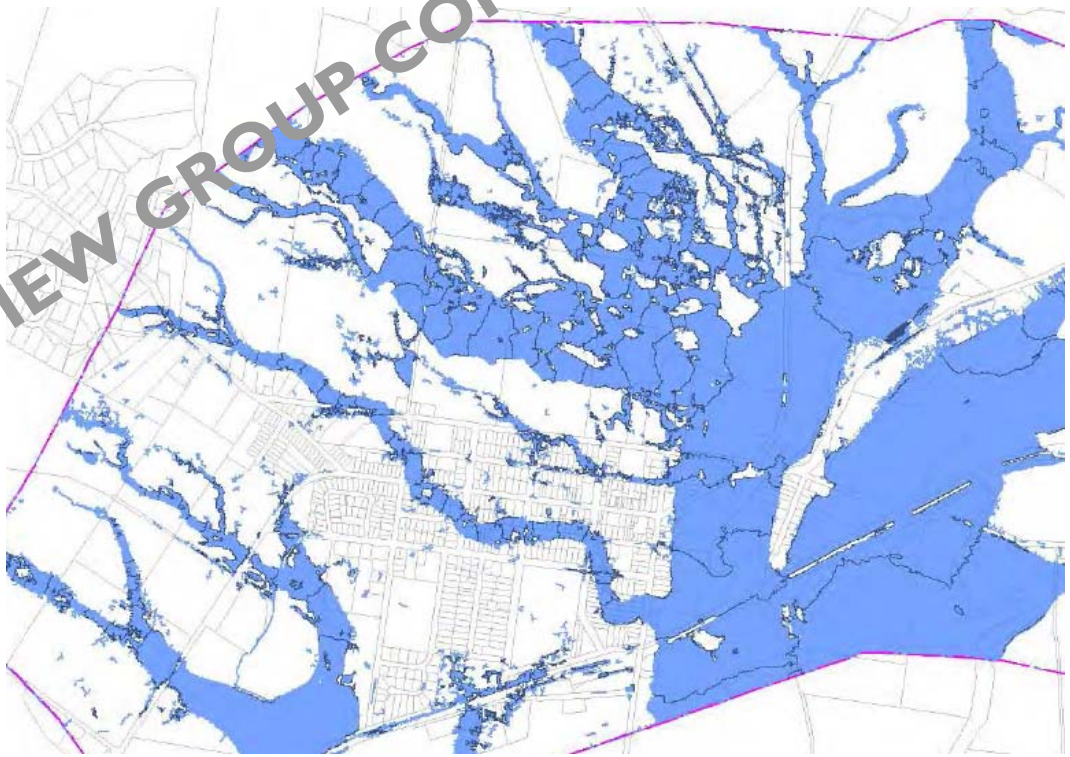
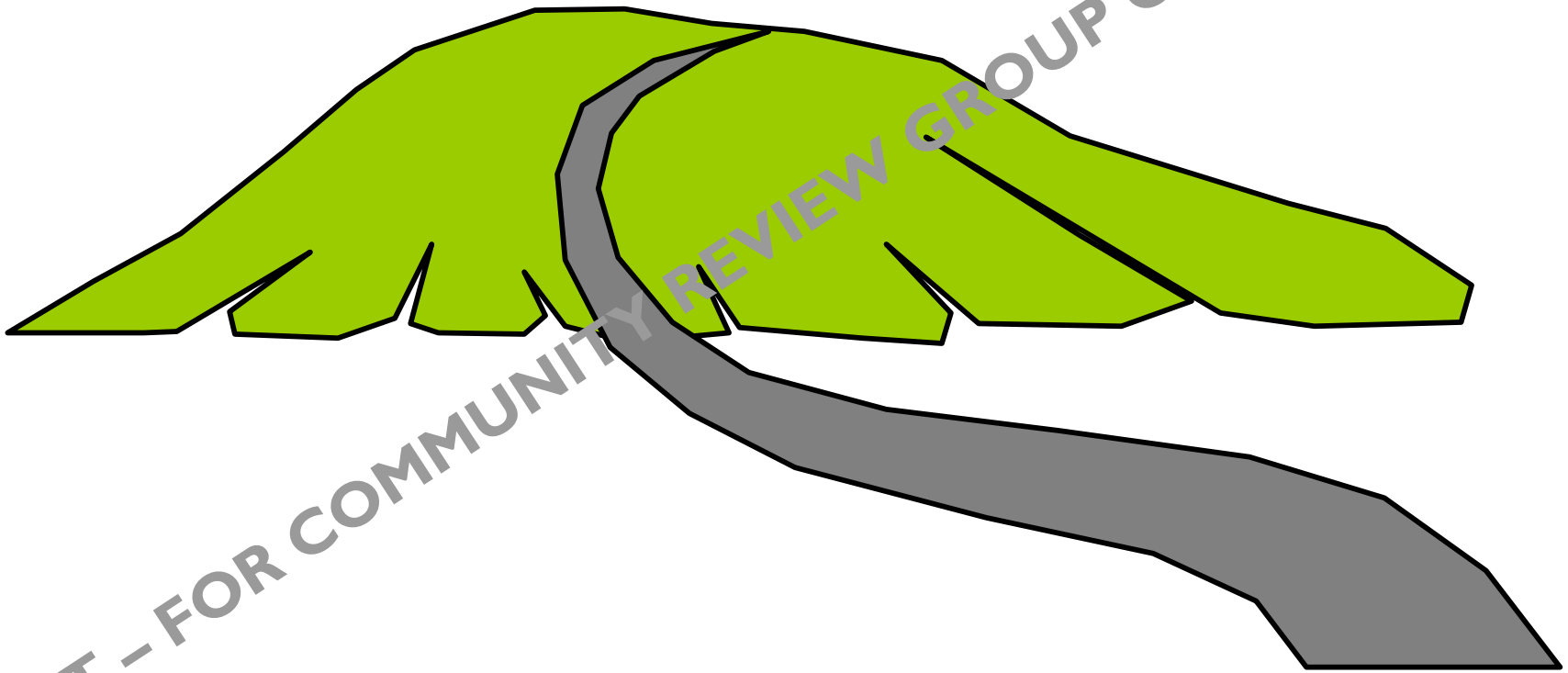


1:100 year flood model



1: 20 year flood model

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - Bruce's ideas: Examine lowering the highway cutting in the ridge



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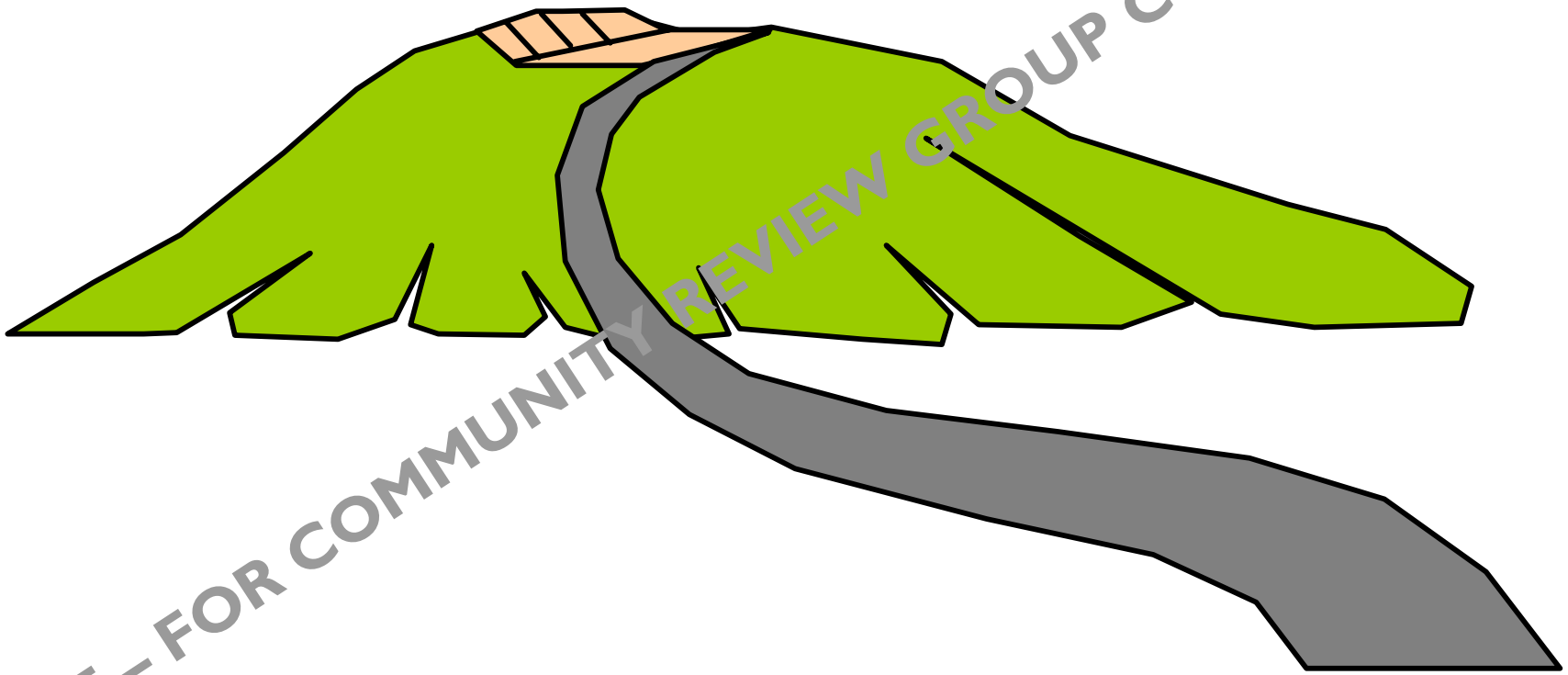

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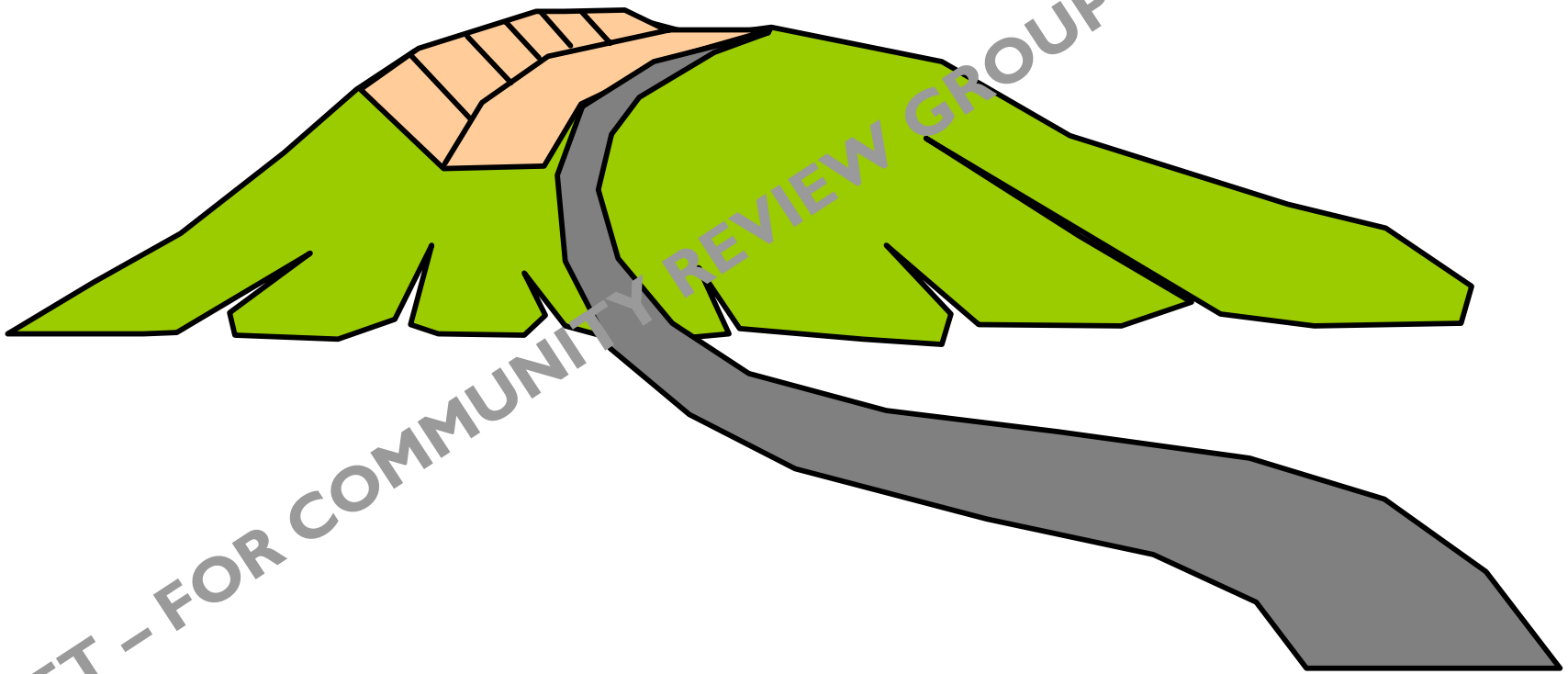

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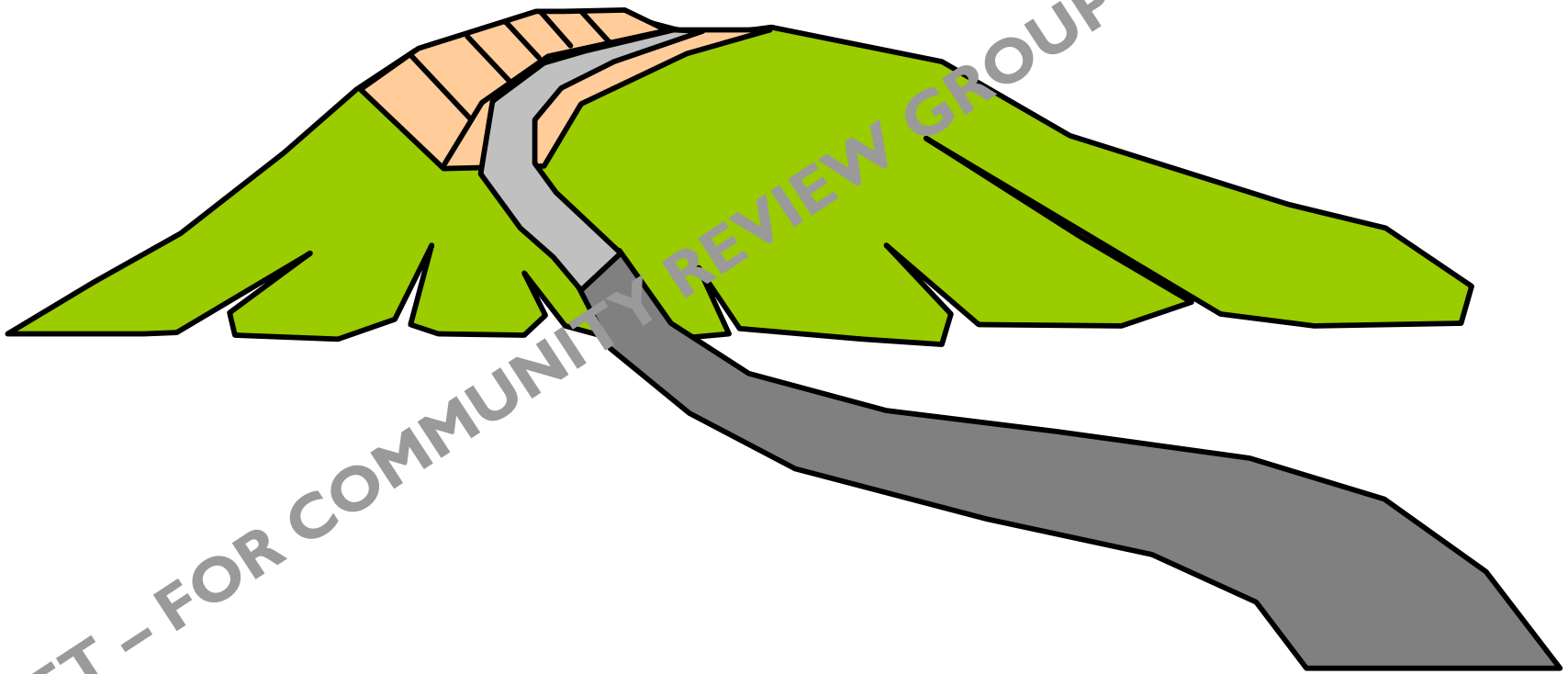

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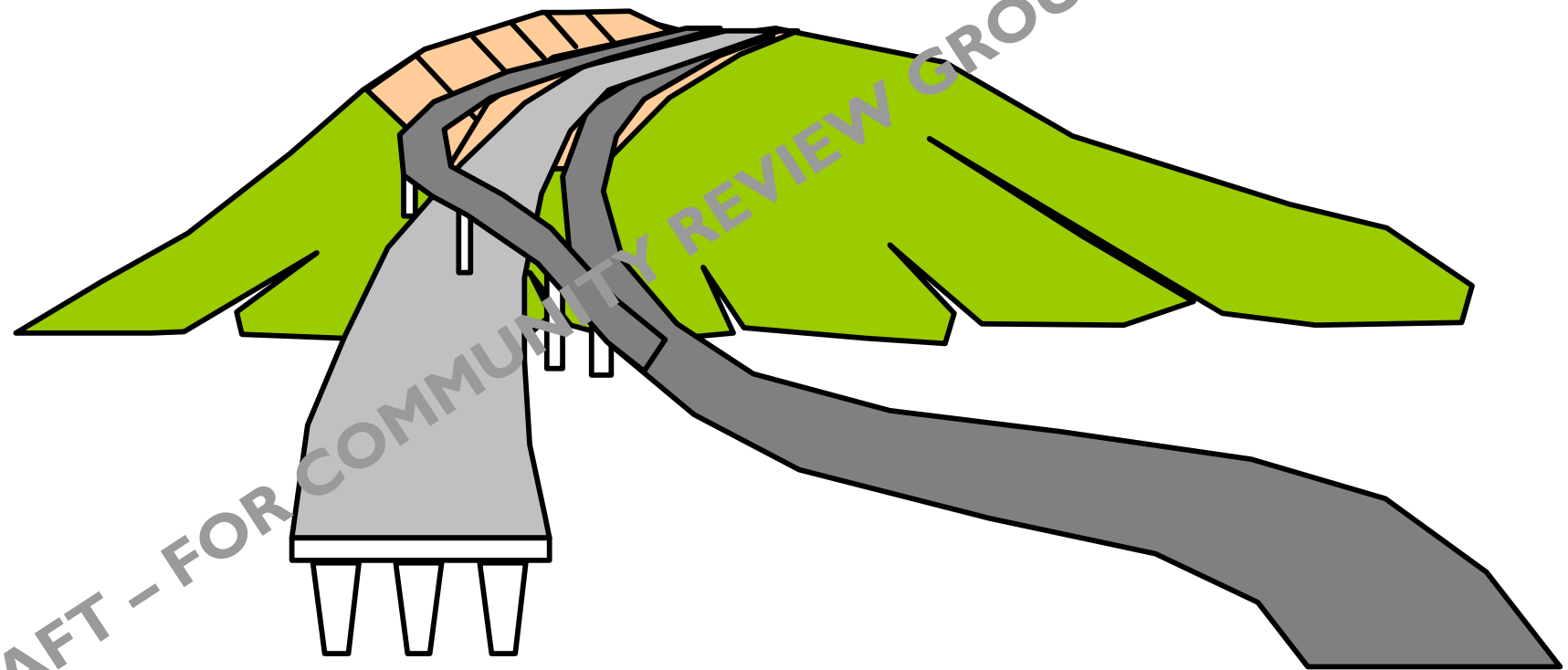

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - Bruce's ideas: Examine lowering the highway cutting in the ridge

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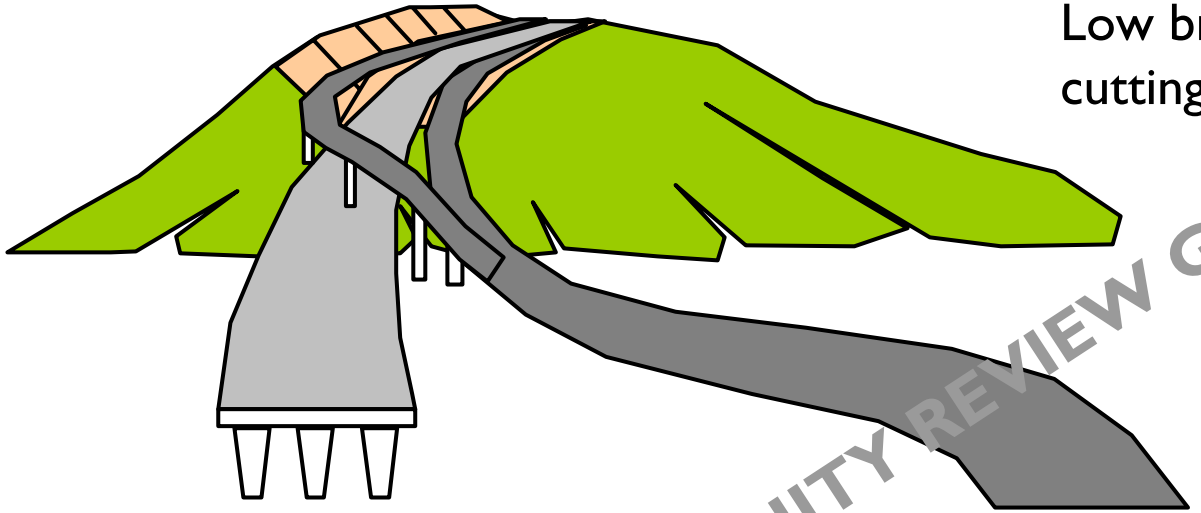
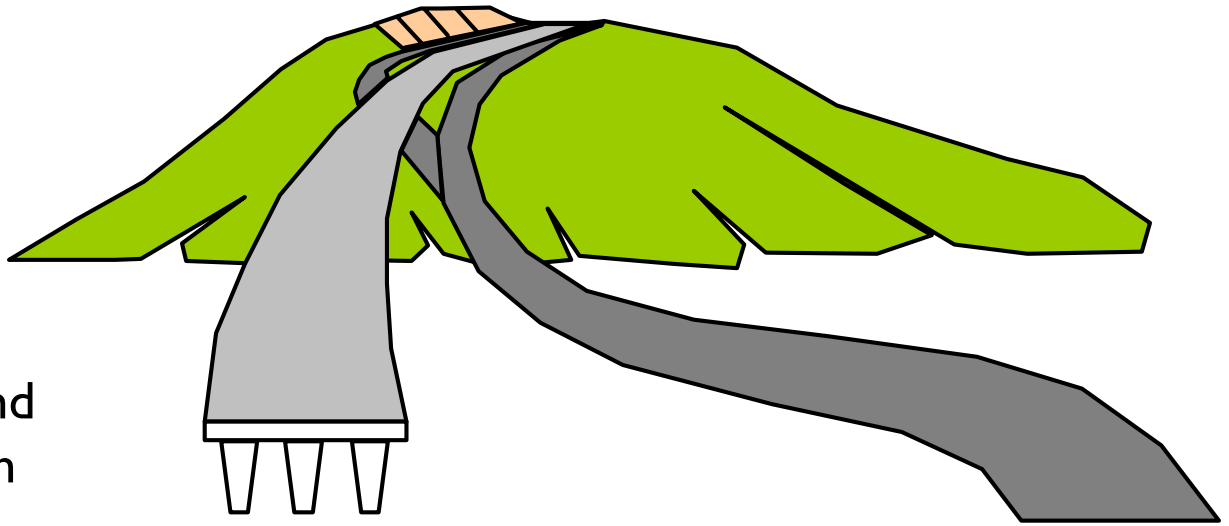
Low bridge and deep cutting eastern approach





Original high bridge and shallow cutting eastern approach

Comparing the original proposal with new ideas

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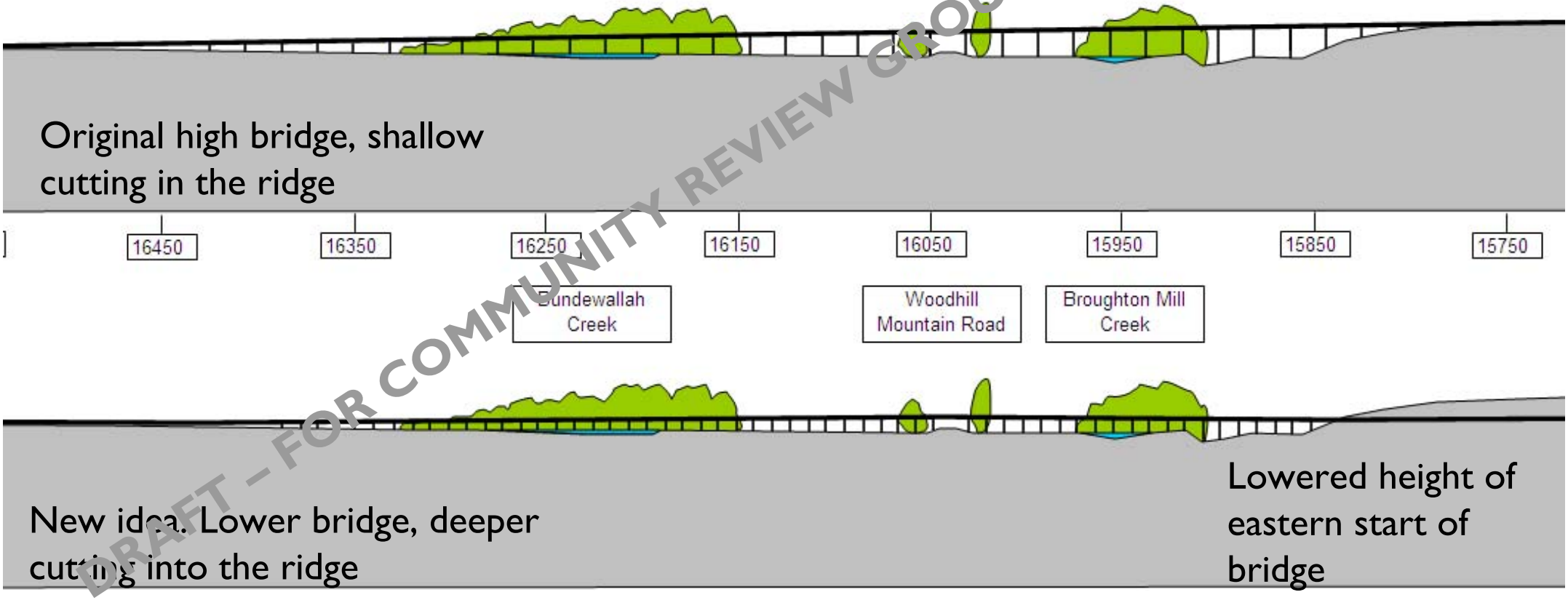

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - community ideas: Examine lowering the highway cutting in the ridge

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Consequences of a deeper cutting:

- The height of the bridge would be lowered.
- Improved visuals at Mountain Hill Road.
- Large environmental impact of mountain removal.
- This cutting would excavate 540,000m3 of surplus excavated material.
- This would require approx. 36,000 extra loaded truck trips to transport the soil somewhere.
- Assuming a typical 15m3 capacity truck this would mean 270 truck loads per day for about 7 months.
- Removing soil: hydraulic rock breakers and bursters would be needed as the rock strength increases lower down.
- The strategic cost estimate at this stage is $250 million (original higher bridge option is $170 million).

Mitigation

- Currently designs estimates are we need soil in Bomaderry, but not this much.
- If the surplus were used on the next section to Bomaderry it would increase the average height of the road by [illegible] metre.
- More thought needed.

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - community ideas: Examine lowering the highway cutting in the ridge

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Cut and cover tunnel – includes:

- Would require a lighting system.
- Would require a jet fan based ventilation system and likely require a portal exhaust system. An air outlet may also be needed to disperse the air - depending on proximity to residences and NSW government environmental approvals.
- Would require a dual redundant high voltage electrical system with one or two substations.
- Would require a deluge system, probably with large water storage tanks.

Consequences of cut and cover tunnel (600 metre tunnel):

- The height of the bridge would be lowered.
- Improved visuals at Mountain Hill Road.
- Large environmental impact
- Some soil could be replaced back on the tunnel cover.
- Estimated the strategic cost for a cut and cover tunnel would be over $300 million (original higher bridge option is $170 million).

Mitigation

- More needed

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - community ideas: Examine lowering the highway cutting in the ridge

Deep cut, low bridge idea

View of Berry Bridge looking east

Original proposal, shallow cut, high bridge

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - community ideas: Examine lowering the highway cutting in the ridge

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Deep cut, low bridge idea

View of Berry Bridge looking east

Original proposal, shallow cut, high bridge

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - community ideas: Examine lowering the highway cutting in the ridge

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Deep cut, low bridge idea

View looking west from eastern approach to Berry Bridge

Original proposal, shallow cut, high bridge

3.2. Action: Consider how to reduce the height of the bridge at the eastern end - community ideas: Examine lowering the highway cutting in the ridge

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Deep cut, low bridge idea

View looking south from Woodhill Mountain Road

Original proposal, shallow cut, high bridge

3.4. Action: Examine other construction types (more piers) to reduce the costs

Type of bridge investigated is called planked bridge, using 15 metre spans.

Changing the Berry bridge to 15metre long plank beams from 35 metre long super tee beams increases the number of spans from approximately 16 to 38.

Comparing the original proposal with new ideas

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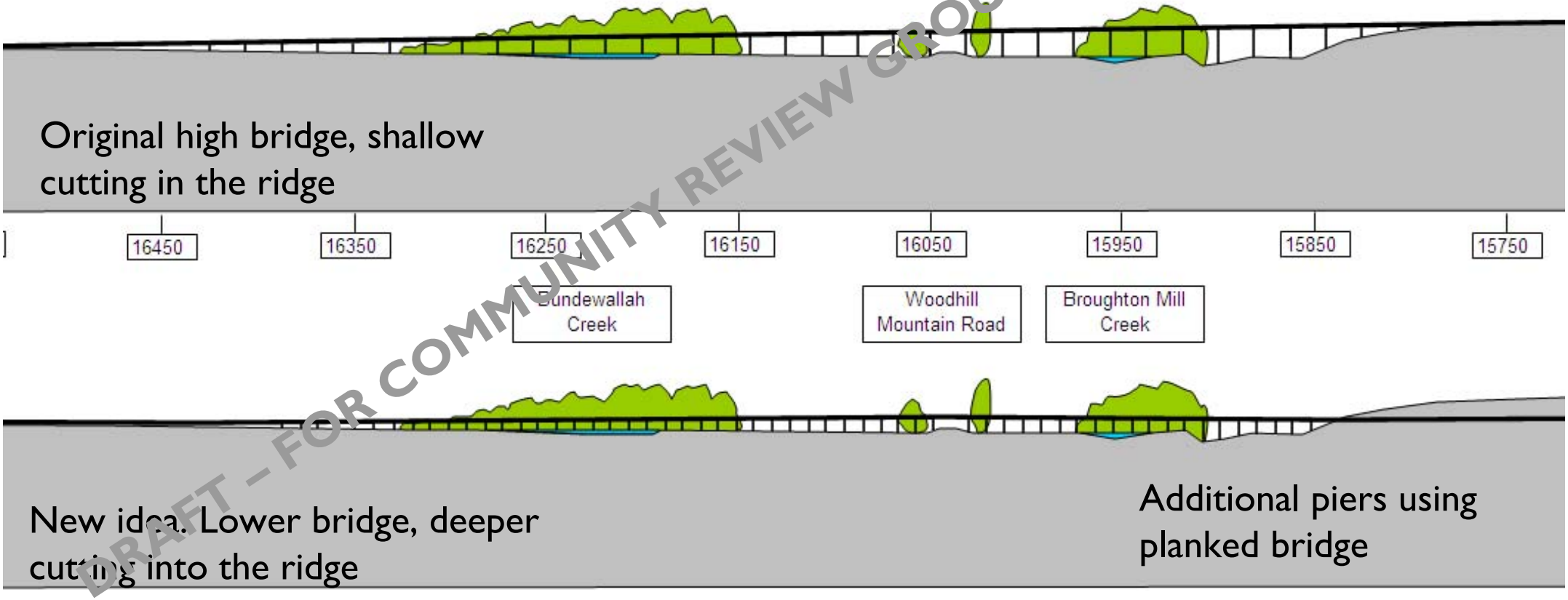

3.4. Action: Examine other construction types (more piers) to reduce the costs

Consequences of planked bridge

- Cheaper to construct
- More spans, more piers (16 to 38)
- More piers in floodwater, greater impact in flood
- More impact on riparian areas

Mitigation

- Difficult
- Estimates to date or deeper cutting into the ridge INCLUDE planked bridge.

Our problems

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Our problems

4. The design and aesthetics of the Berry bridge

Actions:

4.1. Give special attention to the bridge's proportions and aesthetic befitting of its vicinity to Berry. Get urban designers on board. NEXT PRESENTER

5. Noise – noise management and resident impacts

Actions:

5.1. Examine the appearance of a lowered highway and what that entails VR NEXT ANIMATION

5.2. Examine the noise wall options with the lowering of the highway in the vicinity of North Street NEXT ANIMATION

6. (subset of noise) Shadow impact for residents

6.1. Action: virtual reality to show potential shadowing issues at various locations. NEXT ANIMATION

Our problems

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Our problems

7. The noise generated from the design of joints on the bridge

Actions: RTA to examine

- different types of bridge expansion joints: modula, fingerplate

<u>Options to improve design</u>

- Bridge design impacts joint number and types
- Tender for design and construct could include environmental performance as a key criteria
- Can be a different design to Minamurra

HYPERLINKS TO ANIMATIONS

- Winter solstice North Street shadowing
- Walk through from Queen Street to North Street
- Fly-pass current option
- Fly-pass low bridge deep cutting option