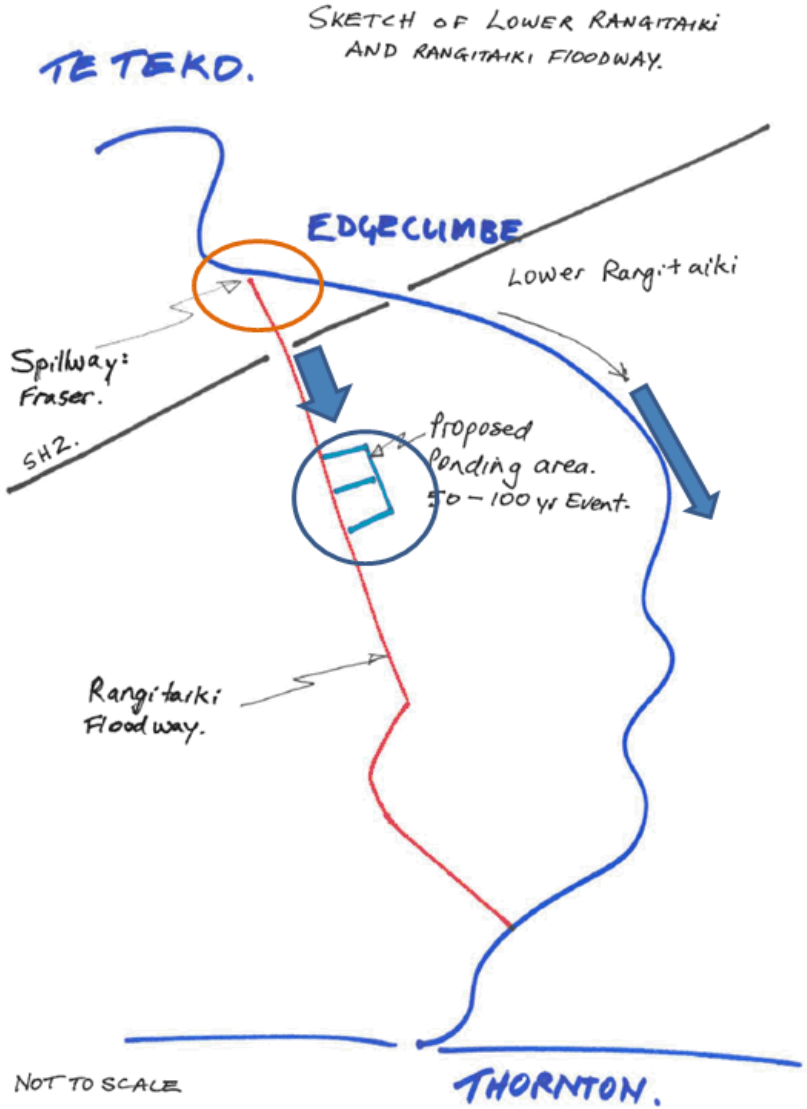
Rangitāiki Floodway Project

Notification of Recommendation

24 November 2018


SKETCH OF LOWER RANGITAIKI AND RANGITAIKI FLOODWAY.
TE TEKO.
EDGECUMBE
Lower Rangitaiki
Spillway: Fraser.
SH2.
Proposed ponding area. 50 – 100 yr Event.
Rangitaiki Floodway.
NOT TO SCALE
THORNTON.

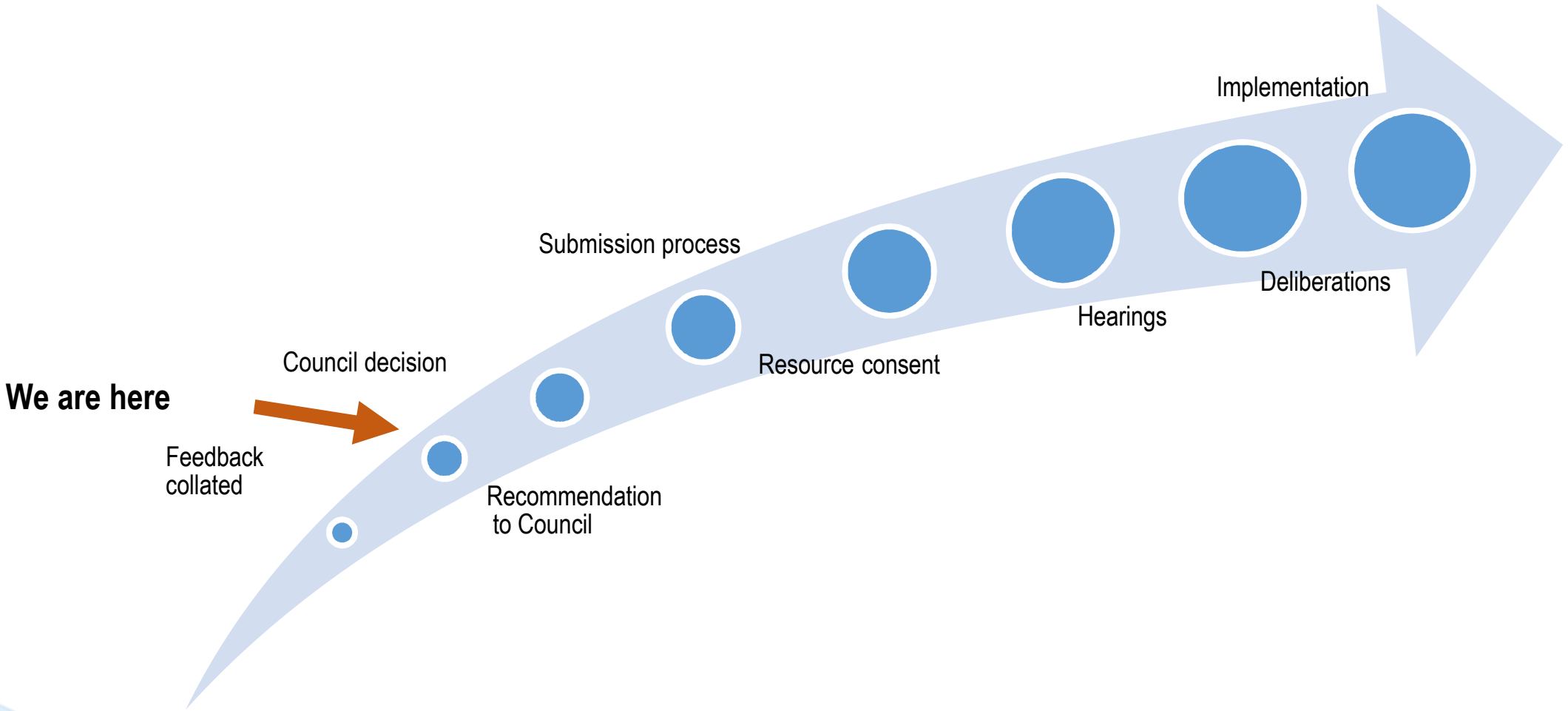
Purpose

1. To provide feedback on the questions that have been asked through the consultation process.
2. To explain the recommendations being made to the Regional Council.

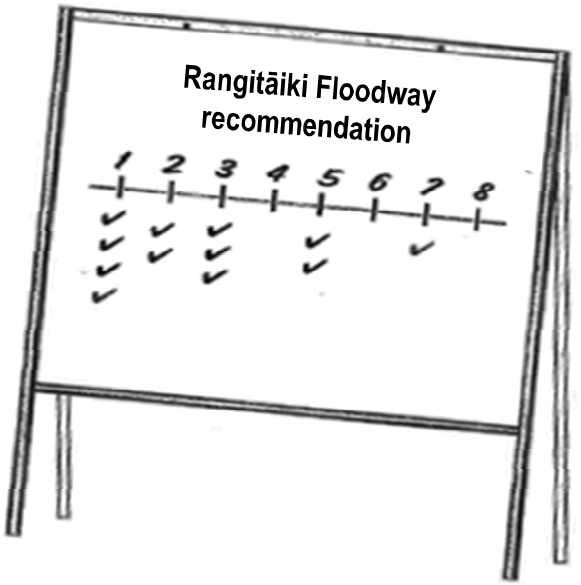
Consultation undertaken

- Meetings with Ngāti Tūwharetoa and Ngāti Awa.
- May 2018 Information Day – specific sessions with affected landowners and a session with representatives of community groups.
- 1:1 meetings with affected landowners.
- Meeting with Federated Farmers representatives.
- Meeting with affected landowners representative (Peter Askey).
- August 2018 Rangitāiki Information Day (Edgecumbe).
- Spillway Options Information Day (3 sessions – iwi and local government committees, landowners, community).

Process forwards



Process today…



Hear the presentation…

Ask questions…

Checking in:

How comfortable are you with the recommendation?

- Put your sticky dot alongside the number that best expresses your level of comfort.
- Then: ***note your reasoning on post-it***
  (please label with the number you 'voted' and/or your name).

Have we got it right?

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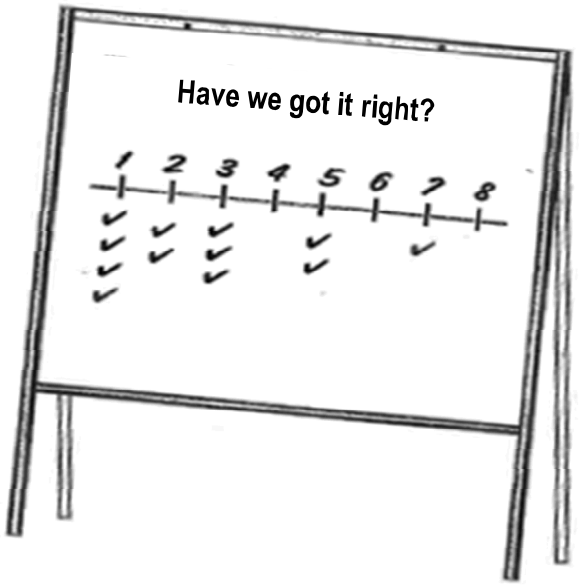
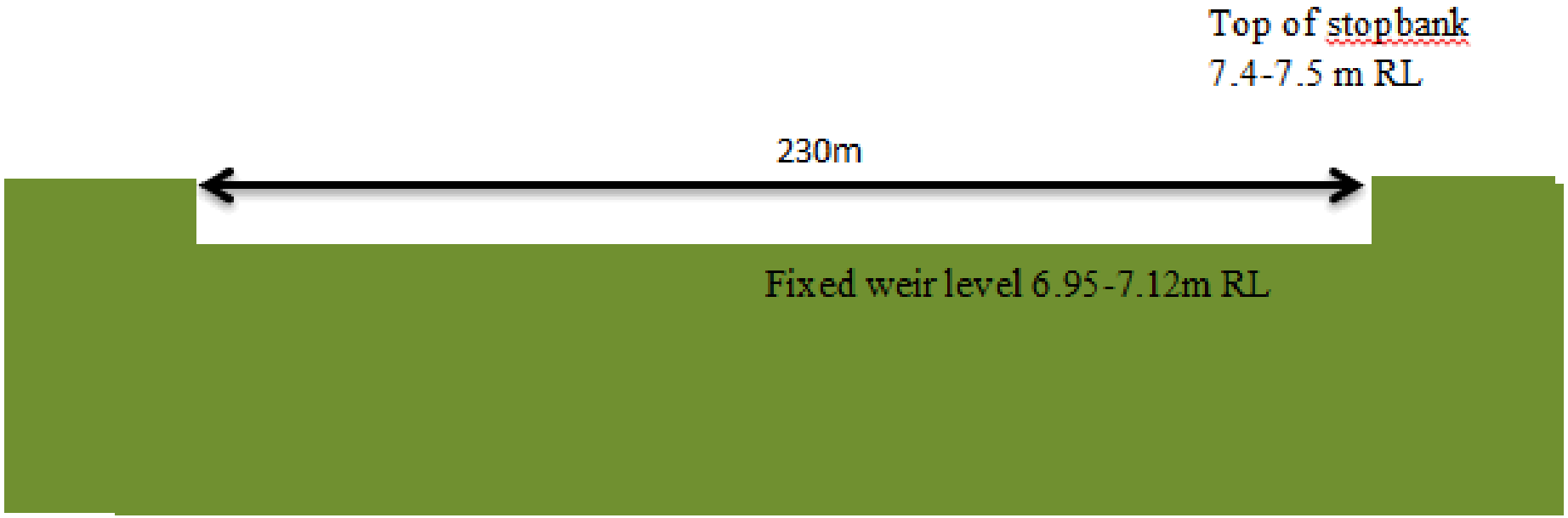


Spillway options

Rangitāiki floodway spillway

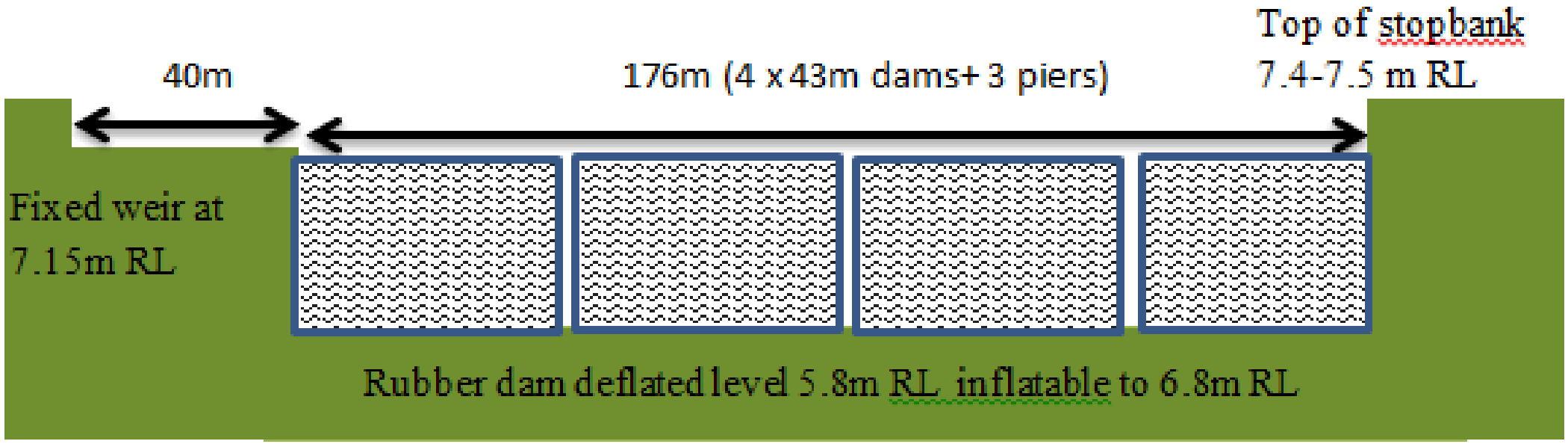


Existing Spillway at 7m RL

Maximum discharge 85m^3/s

Threshold for operation 680m^3/s (approx. 1 in 48 year event), design intention was 1 in 40

Widened inflatable rubber dam



Rubber Dam spillway

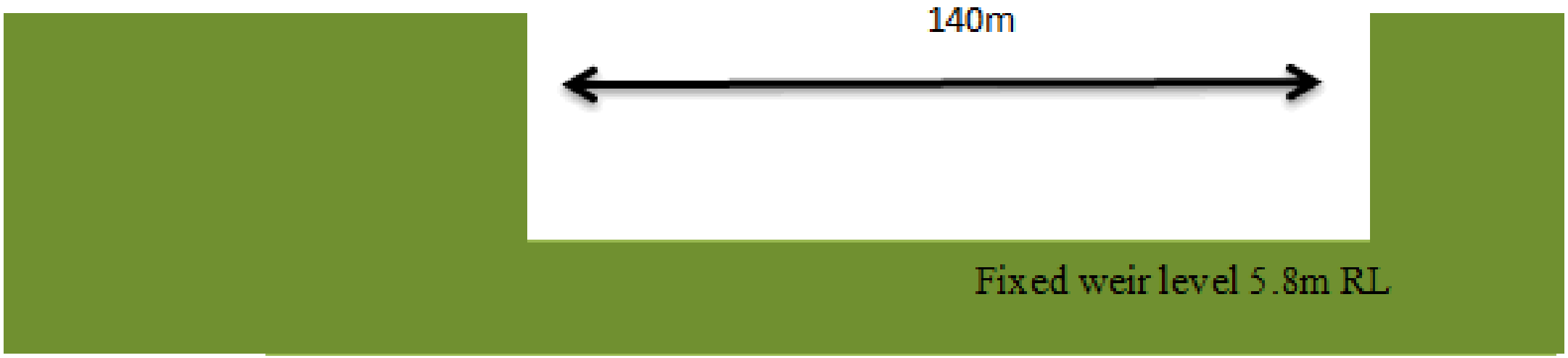
Maximum discharge 190m³/s

Threshold for operation 510-650m³/s (approx. 1 in 17 to 1 in 40 year event)

Floodway spillway design 2008

International examples of inflatable dams.

Lower fixed crest weir



Fixed crest weir at 5.8m RL

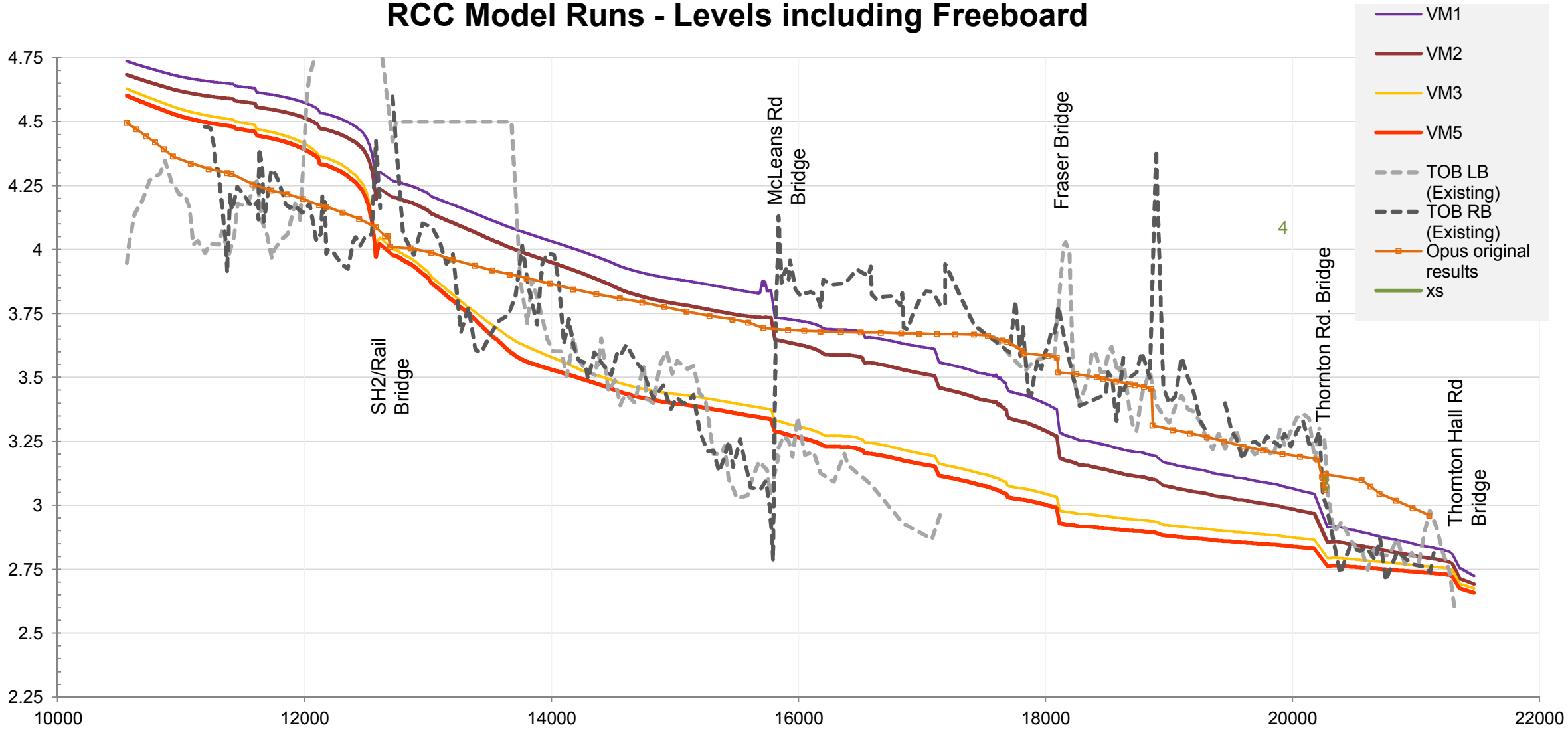
Maximum discharge 190m^3/s

Threshold for operation 500m^3/s (approx. 1 in 16 year event)

Modified spillway

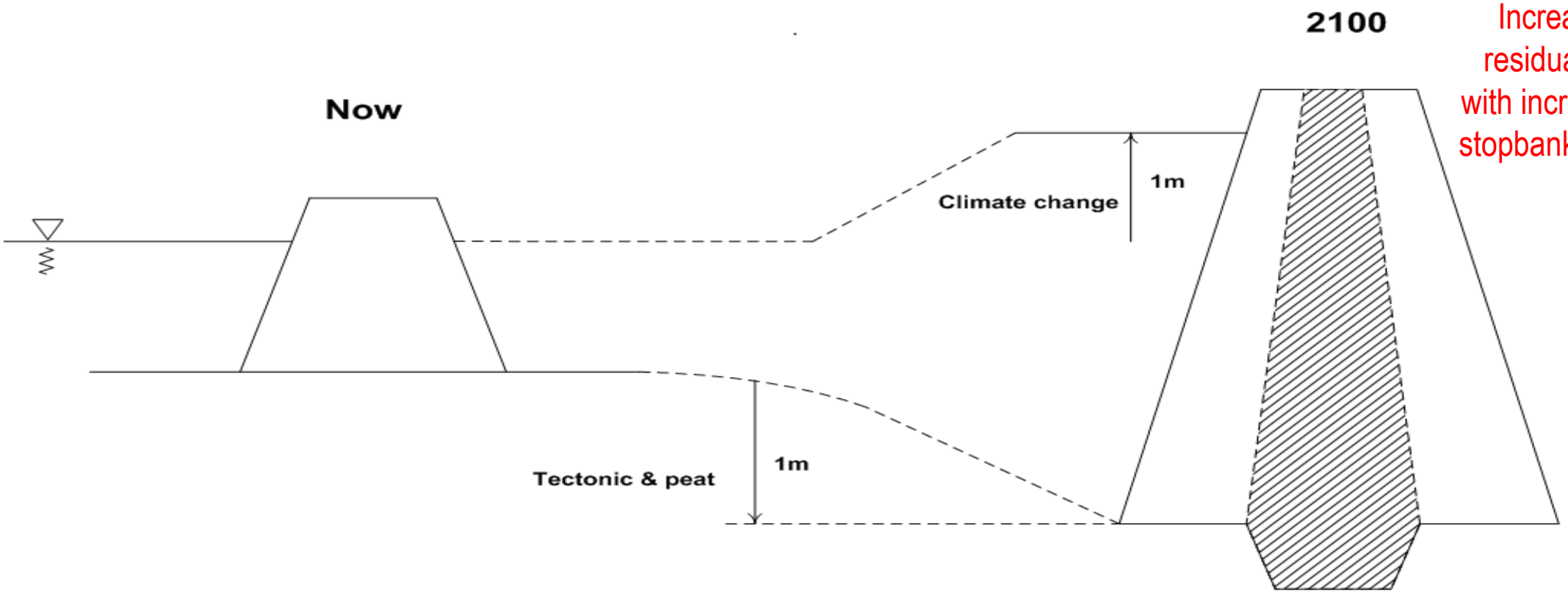
Ponding areas vs stopbank raising

RCC Model Runs - Levels including Freeboard




VM3 Ponding Option
Floodway
Concrete Wall
Stopbank
Roads
West Bank Road
Edgecumbe Soldiers Road
McLean Road
Orini Road
East Bank Road
College Road
State Highway 2
Matata Road
Tawhiata Place
Kaka Avenue
Bridge Street
Tawa Street
Kowhai Avenue
Main Street
Hydro Road
Awaiti Road
Putiki Road
Western Drain Road
Orchard Road

…or stopbank raising



Increased residual risk with increase in stopbank height

Questions asked during consultation

Questions asked during consultation

Spillway:

1. Why don't you buy the land the spillway is on?
2. Is a contingency flow capacity to be provided to allow for variations in bed level?
3. Is the recommendation on the spillway option being made on reliability not cost?
4. If the lower fixed crest weir option is being recommended how will farmers be compensated for increased flow frequency?
5. How are the effects of climate change being allowed for?

Questions asked during consultation

Ponding area:

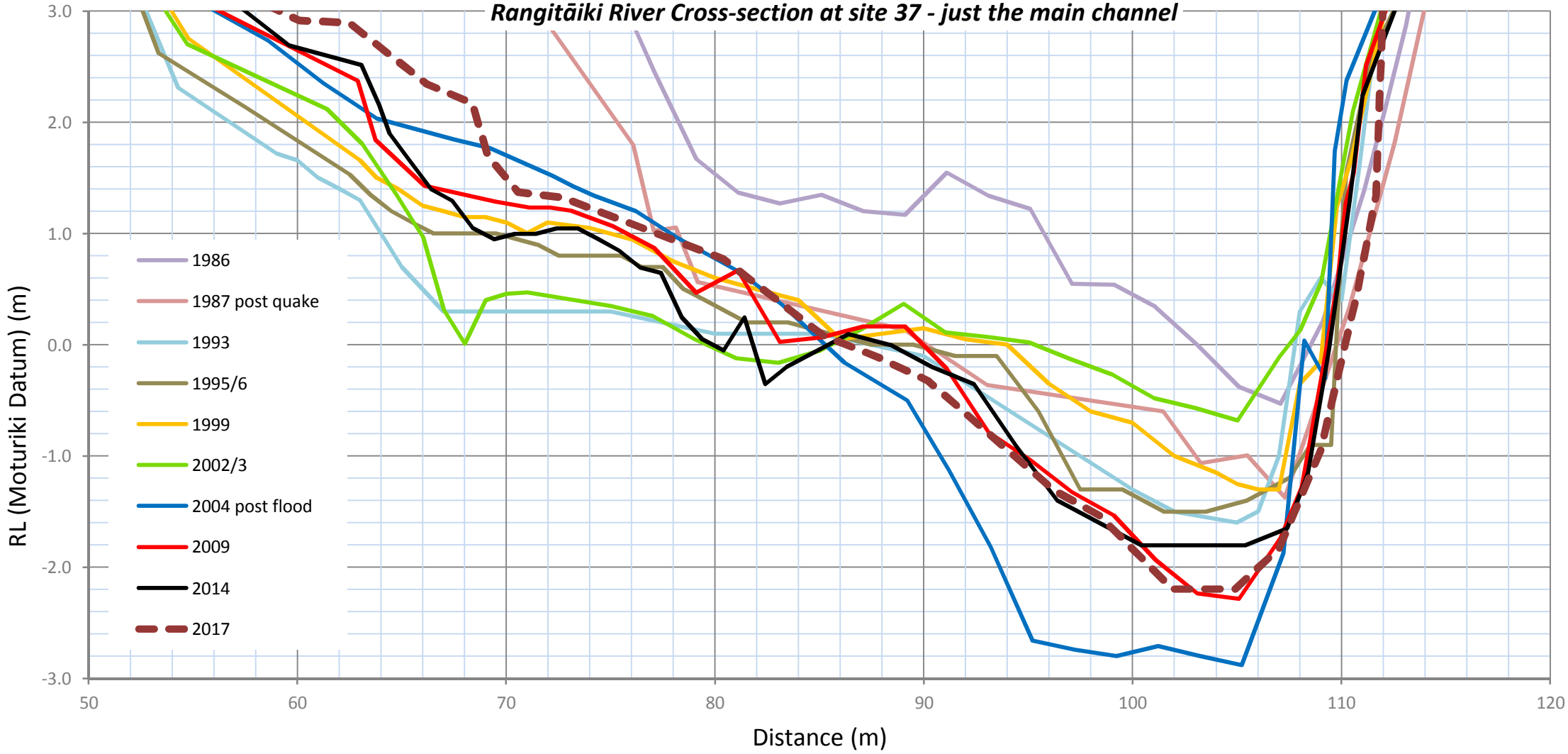
1. How long will water sit on the land before draining away?
2. What will we do with our stock?
3. Will Council buy the land?
4. Will Council compensate us for the loss of land value?
5. How will Council compensate us following a flood event?
6. What level of assurance can Council give that it will operate as designed?

Q1: Why don’t you buy the land the spillway is on?

- The spillway land is a very important piece of land. The recommendation to Council will be to purchase the land, undertake the proposed work and then lease it with use conditions.

Q2: Is a contingency flow capacity to be provided to allow for variations in bed level?

- Yes, the investigation into this revealed that a contingency flow (extra controllable flow) of 15% (extra 30 m^3/s) would be appropriate.
- Options to provide this have been investigated and cost estimates produced. These are explained later in this presentation.


Rangitāiki River Cross-section at site 37 - just the main channel
RL (Moturiki Datum) (m)
Distance (m)
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
50
60
70
80
90
100
110
120
1986
1987 post quake
1993
1995/6
1999
2002/3
2004 post flood
2009
2014
2017

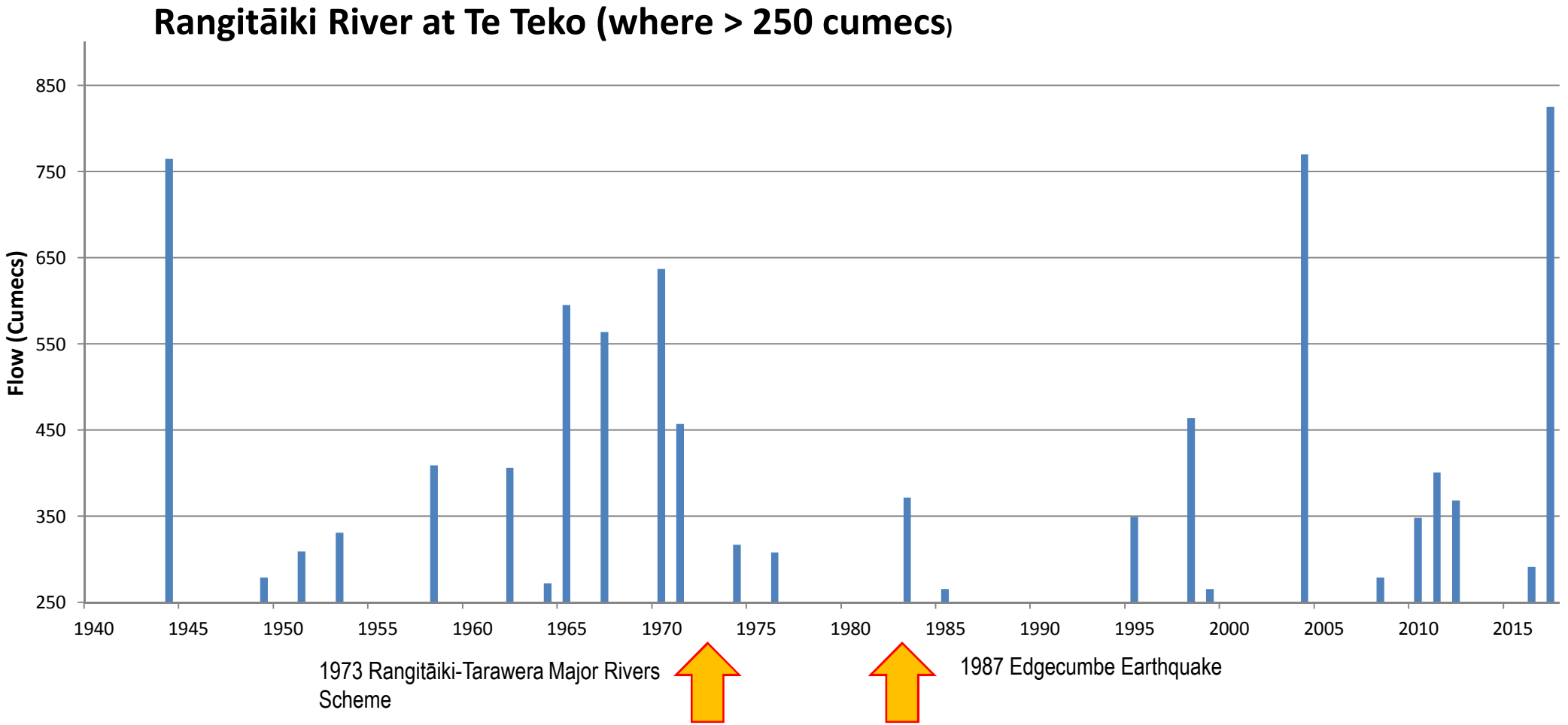
Q3: Is the recommendation on the spillway option being made on reliability not cost?

- Yes, details follow later in this presentation.
- It should be noted that risk of Rangitāiki River stopbank breach is also a significant factor to be considered.

Q4: If the lower fixed crest weir option is being recommended how will farmers be compensated for increased flow frequency?

- Very difficult to determine how farmers will be impacted due to:
  - Nature of storm event,
  - Whether the farm drainage system is already overwhelmed,
  - Difficulties in determining the effect water being in the floodway will have on farm drainage.
- The frequency of floodway use can be altered by the Matahina Dam operation, thereby:
  - A 20 year flow at the dam, 520 m^3/s can be reduced to a 370 m^3/s flow below.
  - A 30 year flow at the dam, 611 m^3/s can be reduced to a 461 m^3/s flow below.
  - A 40 year flow at the dam, 680 m^3/s can be reduced to a 530 m^3/s flow below.

Flood history

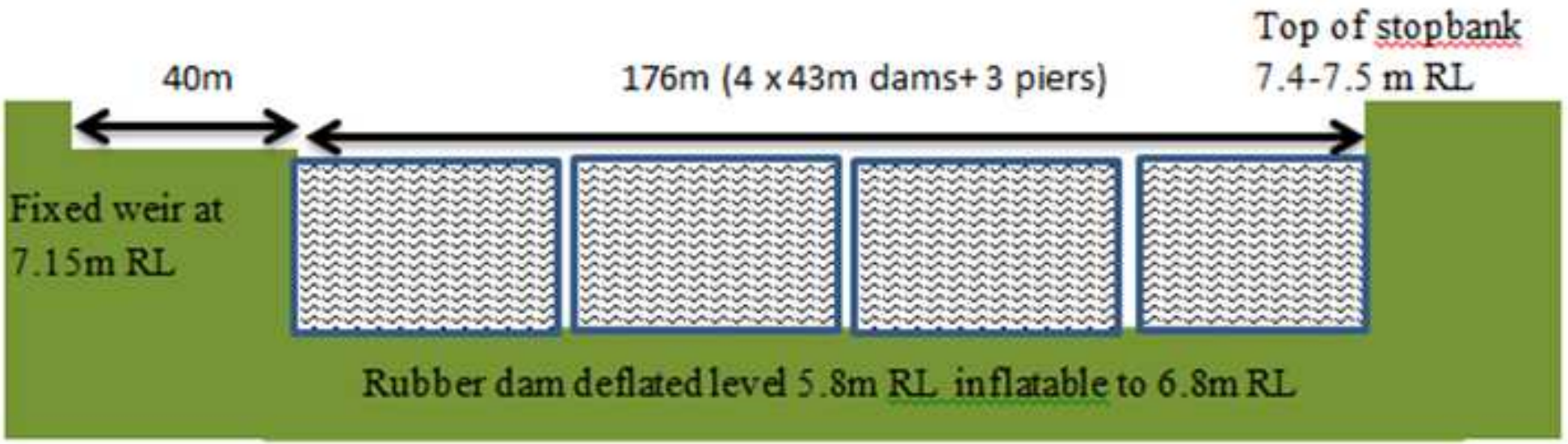


Q5: How are the effects of climate change being allowed for?

- The lower Rangitāiki River system, incorporating the floodway, upgrade has been designed for a flow of 804 m^3/s. This is the current 1% AEP or 100 year flow.
- Sea level rise until 2030 has been allowed for.
- It is proposed that any increase in the 1% AEP or 100 year flow would be taken up by moderating the flow using the Matahina and Aniwhenua dams.

Updated spillway options

Widened inflatable rubber dam



Rubber Dam spillway

Maximum discharge 190m³/s

Increased width to allow for 20% extra contingency flow.

Widened inflatable rubber dam - advantages

- Ability to deflate and divert more flow into the floodway.
- In emergency situations can deflate and let water into the floodway earlier.
- Ability to inflate and reduce flow into the floodway.

Extra widened inflatable rubber dam - disadvantages

- Requires regular condition assessments, testing and maintenance.
- Susceptible to vandalism or damage.
- Susceptible to vibration under flood flow.
- Power requirement.
- Finite service life.
- Lengthy concrete structure adjacent to an earthquake fault line.
- Requires activation.
- Flow into floodway could become more progressively more frequent due to climate change effects.

Cost estimate and proposed construction period

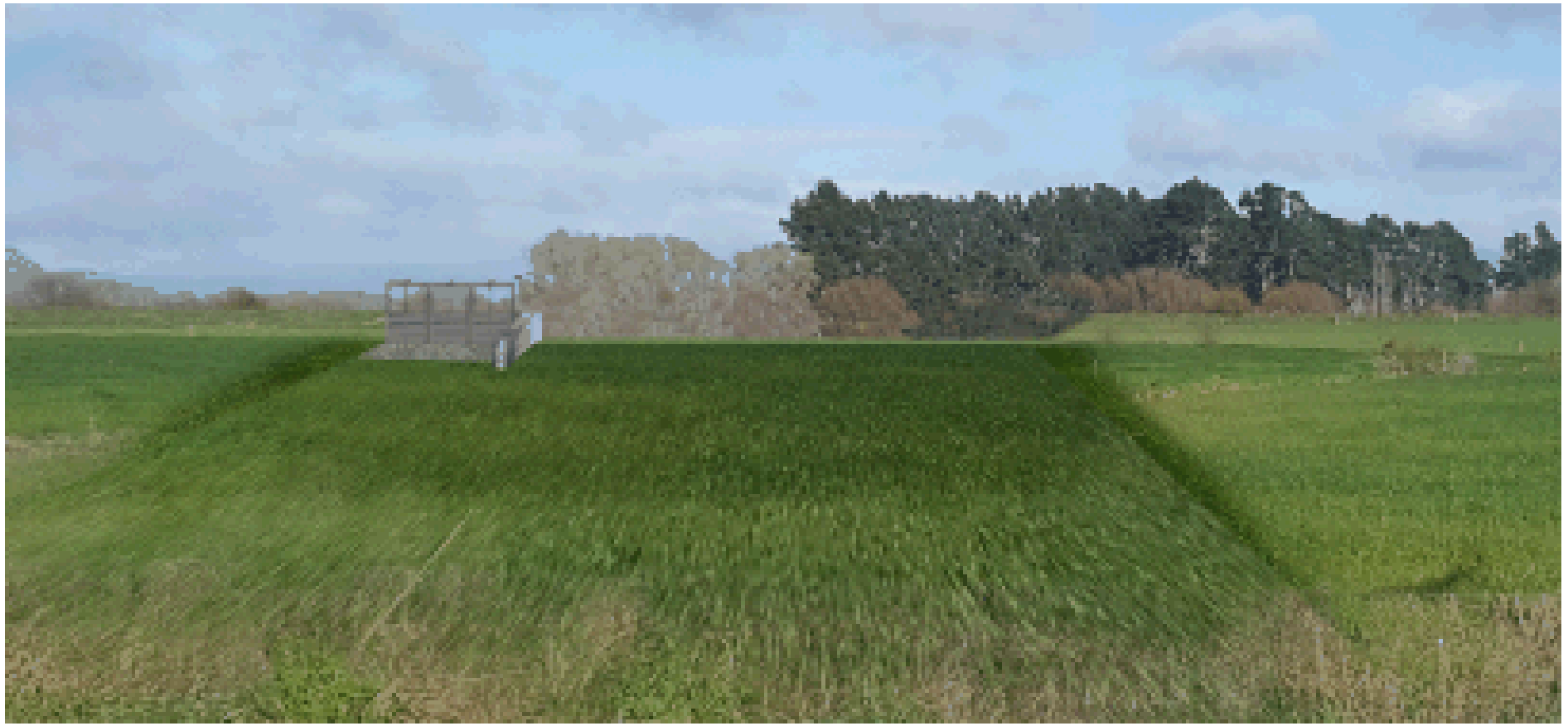
Widened inflatable rubber dam

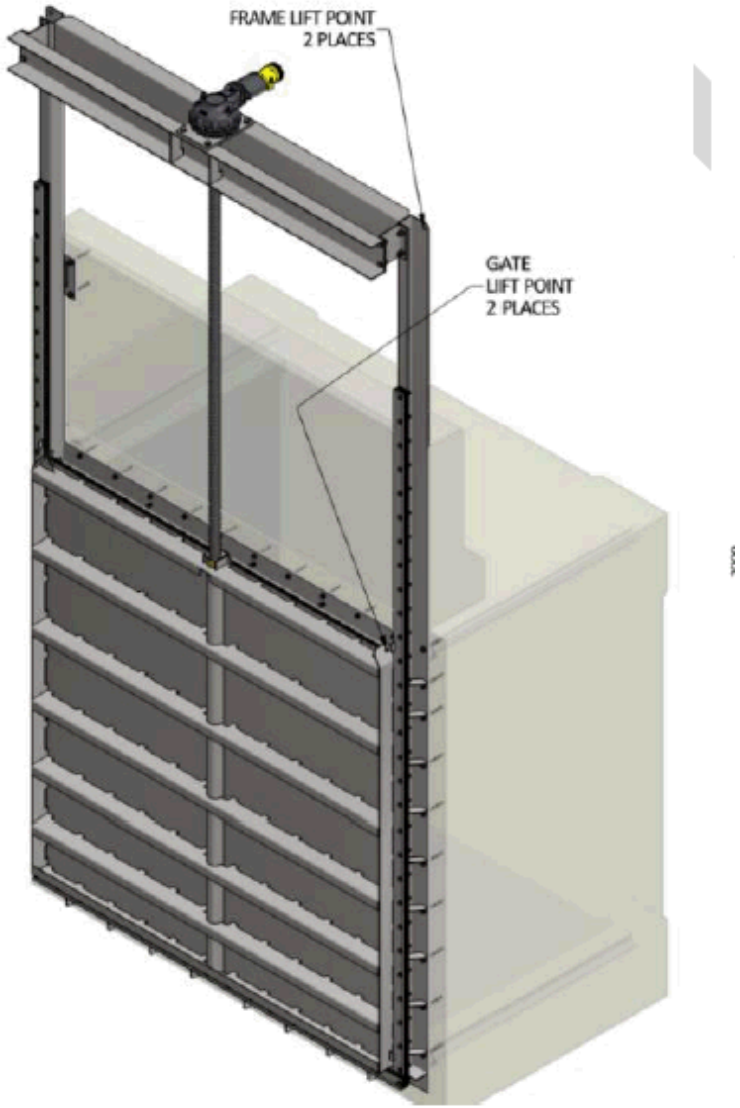
Cost estimate (including contingencies) = $4.9M.

Construction period – November 2020 to May 2021.

Lower fixed crest weir with contingency radial gates

Lower fixed crest weir with contingency vertical slide gates




FRAME LIFT POINT
2 PLACES
GATE
LIFT POINT
2 PLACES

Lower fixed crest weir with contingency - advantages

- Simple design with little to no maintenance required.
- Allows flow into the floodway early in the flood event.
- No activation required.
- Able to adjust flow if required (-5%, +15%) remotely.
- Radial gates close if power lost.

Lower fixed crest weir with contingency - disadvantages

- Require power to open and close.
- Flow into floodway could become more progressively more frequent due to climate change effects.

Cost estimate and proposed construction period

Lower fixed crest weir with contingency radial gates

Cost estimate (including contingencies) = $2.3M.

Construction period – November 2020 to May 2021.

Cost estimate and proposed construction period

Lower fixed crest weir with contingency vertical slide gates

Cost estimate (including contingencies) = $2.2M.

Construction period – November 2020 to May 2021.

Rangitāiki River Scheme review – April 2017 flood event

Recommendation aa

The work the Regional Council is currently undertaking to examine the feasibility of spill compartments and an additional outlet from Reid's floodway as well as a lower fixed crest for Reid's spillway should be pursued using all of the tools available including designations (s166-186, Resource Management Act, 1991), and if necessary, the Public Works Act 1981.

Recommendation to Council

- Purchase spillway land – 266 Hydro Road.
- Lower fixed crest weir with contingency radial gates
  - Cost estimate (including contingencies) = $2.3M.
  - Construction period – November 2020 to May 2021.

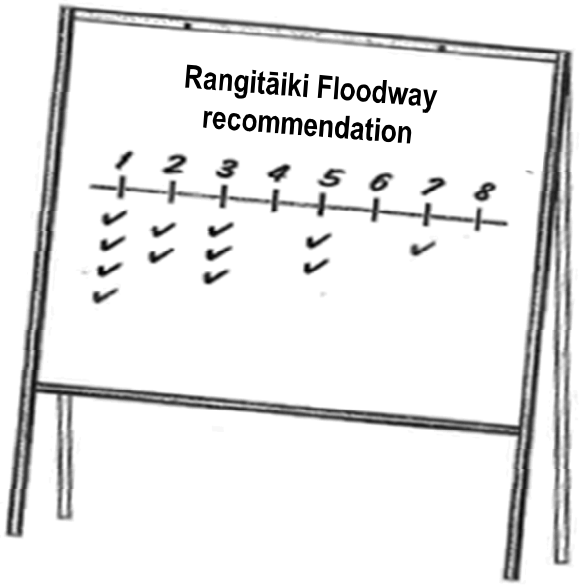
Ponding areas vs stopbank raising

Discussions with affected landowners continue

Recommendation to Council

- Continue to negotiate with affected landowners.
- Bring recommendation back to Council in April 2019.

So now…



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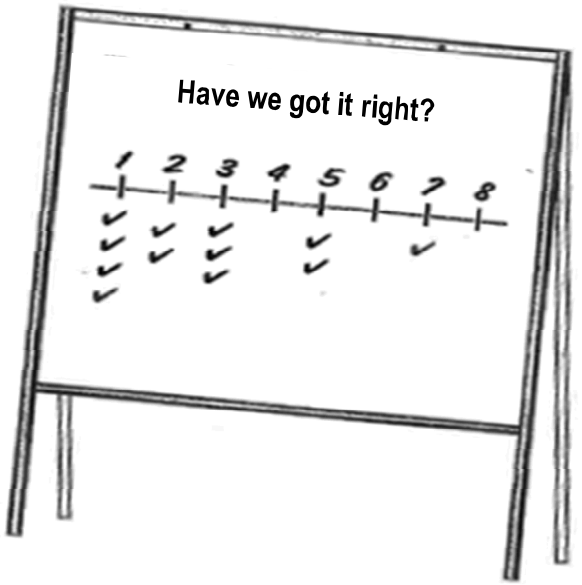

Process forwards