



Blue-Green
Network
Programme

Artist impression only

Potential A F Thomas Park stormwater detention with integrated recreation outcomes - view looking south towards Takapuna and CBD

Wairau Blue-Green Network Stage 1 - A F Thomas Park Concept Feasibility Report

Revision 1 | 06 August 2025



Source: Newshub

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Source: The Guardian



Source: Stuff



Introduction

This concept feasibility report outlines concept options and a preferred way forward for the Wairau Blue-Green Network Stage 1 works in A F Thomas Park – a critical first step in reducing flood risk to life and property in the Wairau Catchment. It incorporates feasibility assessment findings, benefits, risks, opportunities and maintenance considerations for stormwater detention works proposed for the park.

The concept design options have been developed based on comprehensive catchment wide flood modelling analysis (refer to the Options Report provided as part of Initiate Business Case) and site information available at the time. The A F Thomas Park stormwater detention design will be further refined, developed and optimised as more detailed site information becomes available. Detailed site investigations have been scheduled for July 2025.

This project is jointly funded by Crown and Auckland Council as outlined in the Crown Recommendation Report and the Auckland Council Initiate Business Case approved in March and April 2025 respectively. The mandate for this work includes the primary objectives of:

- 1. Reducing flood risk
- 2. Protecting core infrastructure
- 3. Increasing resilience of stormwater assets

During the Auckland Council Business Case approval process an alternate option was presented to the Transport, Resilience and Infrastructure Committee (TRIC) on the 3rd of April 2025 by the Takapuna Golf Course (TGC). This included maintaining 18 holes of golf alongside the required stormwater detention. The committee moved a resolution that:

Tuhi ā-taipitopito / note: Healthy Waters and Flood Resilience undertake a technical assessment of Takapuna Golf’s proposal and ensure the feasibility and cost benefit ratio of the proposal are included as part of the delivery business case to this committee in 2026.

The TRIC committee's mandate for Healthy Waters and Flood Resilience (Healthy Waters) was to ensure the most effective, timely, and realisable concept proposal progressed into the developed design phase as it relates to improvement of the catchment’s flood resilience and reduction in flood depths, to save lives and protect property and critical infrastructure. This mandate was aimed at meeting stormwater outcomes as detailed in the approved Initiate Business Case on April 3rd, 2025.

Further recreation and open space needs assessments and community engagement is underway and required to support future Local Board decision-making in respect to these outcomes. Due to the urgent nature of the flood mitigation works, these workstreams will necessarily run concurrently to the resolution of stormwater detention in the park.



Public meeting at Eventfinda Stadium held on 21 May 2025
Image: Corey Mason / New Zealand Herald

Following the severe flooding in 2023 and subsequent events that have continued to affect communities, there has been a clear and ongoing call from Local Boards, the Governing Body and Crown partners to urgently progress this work. In response, the requested feasibility assessment has been undertaken alongside the refinement of the Healthy Waters' concept. Both options and the resulting feasibility assessment are detailed in this report.

This report provides confirmation of the feasibility of a proposed flood resilience approach in A F Thomas Park. A feasible concept option is

required before commencing the developed and detailed design for the project. Future project phases will include further refinement and optimisation of the stormwater outcomes alongside urban, social, cultural, open space, recreation and environmental outcomes. This will be undertaken once detailed site information is available and further community engagement and project partnership has been undertaken.

Project Background

During the 2023 Auckland Anniversary floods, the Wairau catchment (including Wairau Valley, Milford, Glenfield and Tōtara Vale) experienced severe flooding and damage, particularly in the residential areas of Tōtara Vale and Nile Road, commercial areas on Wairau Road and upstream of A F Thomas Park. There were two fatalities and stranded residents were rescued in boats.

There are 1,499 properties in the floodplain within this catchment, an estimated 403 of which experienced ‘high danger flood risk’ across the four primary flood risk areas. A total of 163 of these properties have been classified as Category 3 and are eligible for the voluntary buy-out programme.

Figure 1 shows the indicative flooding extent across the Wairau catchment, and the properties at risk in the predicted 1% AEP event, considering maximum probable development and climate change.

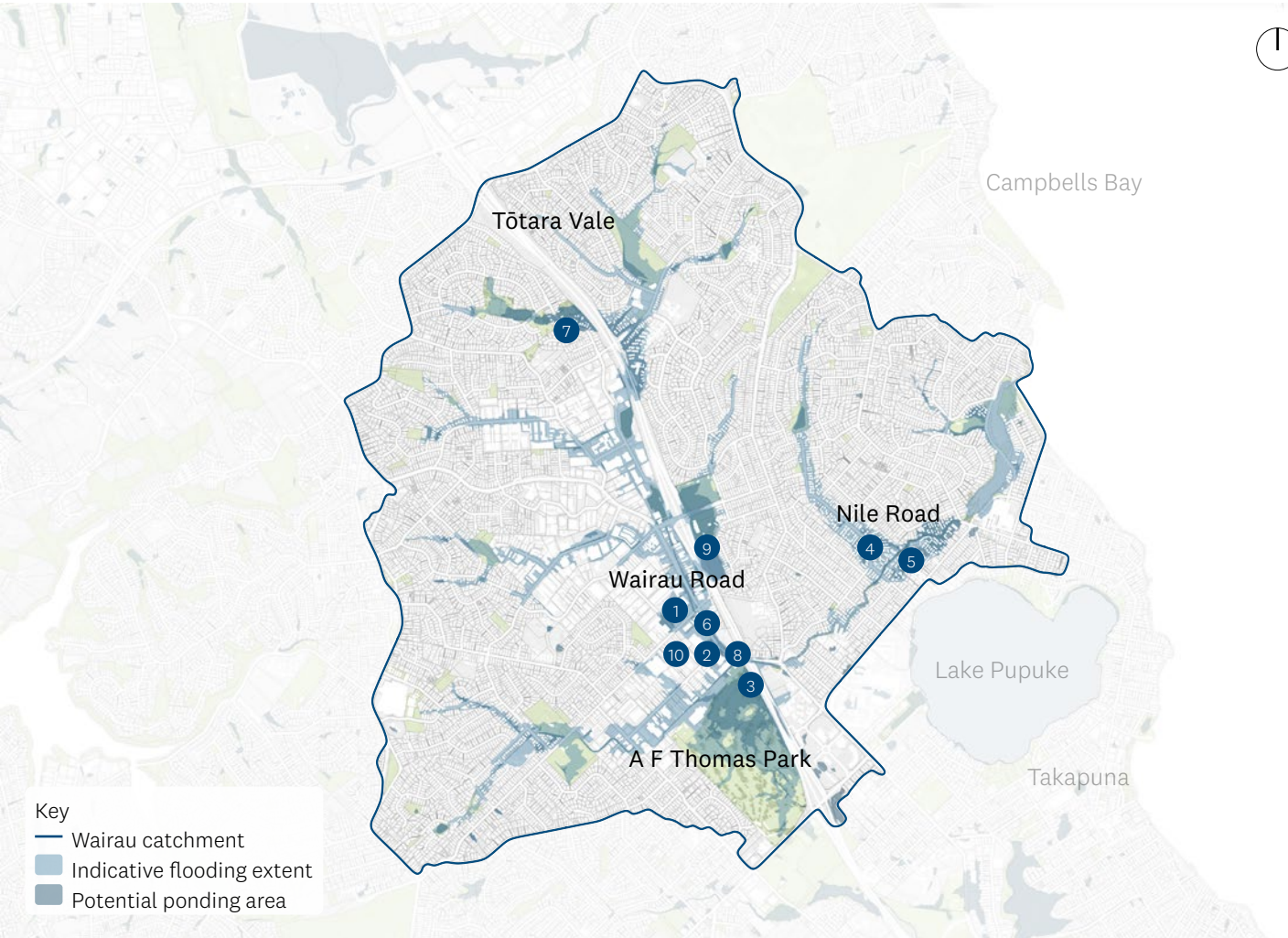


Figure 1: Indicative flooding extent across the Wairau catchment



A comprehensive range of interventions has been evaluated, with the goal of delivering maximum flood reduction benefits in both the short and long-term through a range of infrastructure solutions, funding mechanisms and project partners.

While initial efforts concentrated on the area of greatest impact (Nile Road), modelling indicated broader catchment interventions would benefit both Nile Road and other areas of significant risk. These interventions included upgrading existing stormwater detention schemes, creating new detention schemes, widening the stream, removing obstructions to stream flow such as bridges, and formalising overland flow paths. Each sub-element of flood mitigation was considered both individually and collectively to achieve the greatest benefit.

The assessment concluded that interventions are necessary in all major flood-prone areas to improve flood resilience in the catchment.

Wairau Blue-Green Network Stage 1 works include incorporating stormwater detention at the council owned A F Thomas Park. This will reduce 'high flood risk danger' for 19 residential properties, reduce flood risk over 10 hectares (including over 200 homes and 3 housing for elderly villages) and provide significant flood resilience benefits to power, water, wastewater and transport infrastructure.

The A F Thomas Park detention scheme was selected as the most effective short-term solution for reducing flooding in the Wairau catchment and essential for enabling future flood mitigation in Nile Road and the Wairau Valley commercial/industrial area. Without the A F Thomas Park detention scheme, later stages would not be viable.

Image Source: 1. Resident Submission, 2. Newshub, 3. Twitter @, 4. New Zealand Herald, 5. Newshub, 6. Resident Submission, 7. New Zealand Herald, 8. Twitter @, 9. Newshub, 10. New Zealand Herald

Wairau Catchment Context

A high-level overview of the Wairau catchment is outlined below:

- Urban development across the 1,450ha Wairau catchment over the last 60 years has encroached into the natural wetlands, flow paths, and floodplain of the Wairau Creek and its tributaries (refer Figure 2).
- The catchment is now highly urbanised. Home to 50,000 people, 15 schools, 4 commercial areas, and essential transport and lifeline infrastructure (e.g. Transpower substation). North Shore Hospital is directly adjacent to the catchment and requires safe access through the Wairau area.
- Over time impervious surfaces have continually increased, resulting in higher peak flows when extreme rainfall events occur. Combined with restriction in the conveyance capacity of the stream, this means the flooding beyond the banks of the creek can occur more regularly and have higher consequences when it does occur.
- The Northern Motorway (State Highway 1) bisects the catchment and is a significant impediment to the natural flow of water. Culverts and bridges convey stormwater in both directions across the motorway at different points.
- The Northern Motorway is a barrier to stormwater flow in the Tōtara Vale and Sunnynook areas, with under capacity culverts and a high risk of blockage, creating flood prone areas, as experienced during the 2023 Auckland Anniversary flood event.
- The natural stream has been enclosed in a pipe or engineered with concrete walls along much of its length through the upper (Glenfield, Hillcrest, Forrest Hill) and mid catchment (Wairau Valley) to enable residential and commercial development. This has reduced the capacity of the stream and its floodplain to convey floodwater.
- Through the Wairau Road area the stream has been partially bifurcated so capacity could be accommodated in smaller channels either side of the road. This decision, along with numerous access bridges over these channels to private property, contribute to a restriction in the conveyance capacity, as experienced in January 2023 when the commercial area was inundated.
- A series of detention schemes have been created over time within the catchment to partially control flood effects, these include multi-purpose open space in Sunnynook Park, Becroft Park, Rewi Alley and Knightsbridge Reserves. Detention ponds were created at Link Road and Croftfield Lane when this area was developed in the 1980s.
- Although a larger engineered channel has been maintained in the downstream section of the Wairau Creek, between Wairau Road and the coast, the floodplain has been restricted, and bridges, such as those at Alma Road and Woodbridge Lane, contribute to restricting flow and raising water levels. When water does spill out of the banks it follows overland flow path routes that can take it away from the main channel.

Pre-historic



1959 (before the bridge)



Current day (with floodplain)



Figure 2: Past and present of the Wairau Catchment

A F Thomas Park Context

The A F Thomas Park site has a long history of both golf and flooding. Originally a low-lying flood plain and wetland, it was first converted into a golf course in 1912. In the late 1950’s when the motorway was built, the North Shore Golf Club was bought out by the North Shore City Council and relocated to Albany. Since this time the park has remained council owned recreation land with various leases for golf and other recreation facilities.

A fragment of the historic wetland remained in the north-east corner of the site until the 1970’s, when it was incrementally drained and filled over time. There is now a small (2,400m²) constructed wetland in this area, and the historic wetland extent is regularly inundated during rain events.

The site is currently occupied by the Shore Archery Club, Sunnybrae Bowling Club, Fairway Events Centre, Eventfinda Stadium and the Takapuna Golf Club who are operating on a month-by-month lease.

The more comprehensive timeline (Figure 3) outlines the evolution of A F Thomas Park and the associated open space.



View over A F Thomas Park looking towards Takapuna

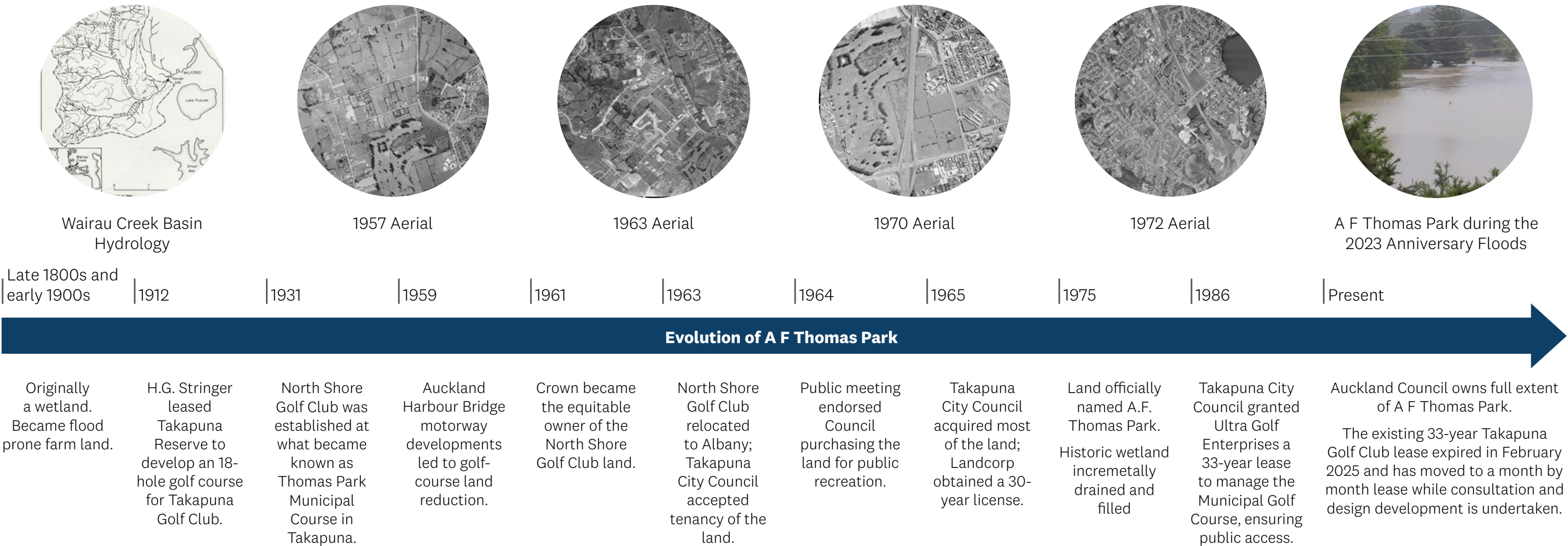


Figure 3: Evolution of A F Thomas Park

Concept Scope and Feasibility Assessment Process

Concept Design

WSP and Boffa Miskell were engaged by Healthy Waters to undertake the concept design for flood detention at A F Thomas Park, including identifying and addressing the risks, issues, opportunities, benefits and associated costs of the option.

The scope for the concept design for Stage 1 works, which incorporates stormwater detention at A F Thomas park, includes:

- Development of concept design option addressing key risks and constraints.
- Initial refinement of the 3D earthworks of the park, overland flow conveyance and infrastructure design to confirm earthwork volumes and benefits and associated potential fill volumes.
- Initial identification and proposed mitigations of key risks identified on site (wastewater trunk main, ecology, groundwater, Vector cables, etc.).
- Consideration of future maintenance opportunities and constraints.
- Identifying broader opportunities.
- Hydraulic modelling to refine the potential flood reduction benefits.

In parallel to the development of the Healthy Waters concept proposal, TGC have undertaken refinement of an alternate proposal.

Feasibility Assessment

The technical assessment for feasibility is an evaluation of the proposed concept options to determine their viability and potential for success. It assesses various factors to determine if the option is technically and financially possible, and if the associated risks are manageable.

The technical assessment includes concept-level feasibility analysis of the following:

- a. Technical feasibility (does it work?)
- b. Constructability (can we build it?)
- c. Consent-ability (can we consent it?)
- d. Cultural values alignment (does it align with our Te Tiriti obligations? Noting this will impact consent-ability)
- e. Operation and Maintenance (can we operate and maintain it into the future?)

An 8-step feasibility assessment process was agreed with TGC following the TRIC committee resolution (on the 10th of April 2025). This included multiple meetings, emails and phone calls. A full summary of engagement and the assessment process is provided in Appendices C and D.

Site and project information that was available at the time and relevant to the TGC proposal was provided to TGC. This included preliminary contamination and geotechnical reports, and draft flood and ground models. Where material provided was subject to ongoing design refinement as part of concept development and might differ to the final proposal presented by Healthy Waters, this was noted.

Following initial project cost analysis, feedback was provided to TGC at the workshop on the 7th of May 2025 that their proposal (TGC-R0 as presented to the TRIC committee) was significantly over budget, and contained maintenance and other risks. Subsequently TGC confirmed that they were revising their design and requested significant additional engagement, collaboration and information regarding the Healthy Waters concept design.

Healthy Waters was unable to provide the level of partnership or information requested by TGC as they do not have the mandate to enter a design partnership with a commercial entity, and much of the information requested was still under development. A decision on project partnership has implications for the future use of the park that are outside Healthy Waters’ mandate and would require additional decision-making from the Kaipātiki Local Board.

As the Kaipātiki Local Board is subject to decision-making obligations in relation to the future use of the park (including consideration of community views and preferences) it was not considered feasible to delay concept design development until decisions about land use following the stormwater works were made.

As noted above, a final design (TGC-R1) was provided on the 12th of June 2025 by TGC (1-month after the agreed due date). This design, as it relates to stormwater and landform, has significantly converged with that proposed by the Healthy Waters option. This was reiterated in a clarification workshop on 18th of June 2025, and subsequent letter to Healthy Waters:

‘Overall, we consider the TGC and Healthy Waters (HW) proposals are comparable in all but a few minor aspects. As the design process has progressed, the two solutions have converged significantly.’

Information Provided

The feasibility assessment of the options has been based on the following material provided to Healthy Waters and the technical assessors:

- Healthy Waters’ Concept Design Option Rev 0.0 dated 12th June 2025.
- TGC’s alternative option (TGC-R1) dated 12th June 2025 including covering letter and associated sketches.
- Clarification meeting of the Healthy Waters design on stormwater matters (e.g. hydrology, hydraulics and spillway) on 18th June 2025
- Clarification meeting of TGC’s submission held on 18th June 2025 and subsequent additional information on assumptions, wetland and construction methodology provided on 18th June 2025.
- Clarifications and Comparative notes from TGC ‘Engagement Summary’ (includes Healthy Waters notes)
- Wairau Creek Geotechnical Desktop Study dated 14th March 2025 by WSP
- Contaminated land desktop study (PSI) dated 14th April 2025 by WSP
- Publicly available geotechnical information in the New Zealand Geotechnical Database (NZGD)
- All levels for both proposals are as Auckland Vertical Datum (AVD1946)

Relevant concept design information and clarifications are included in Appendices A, B and C.

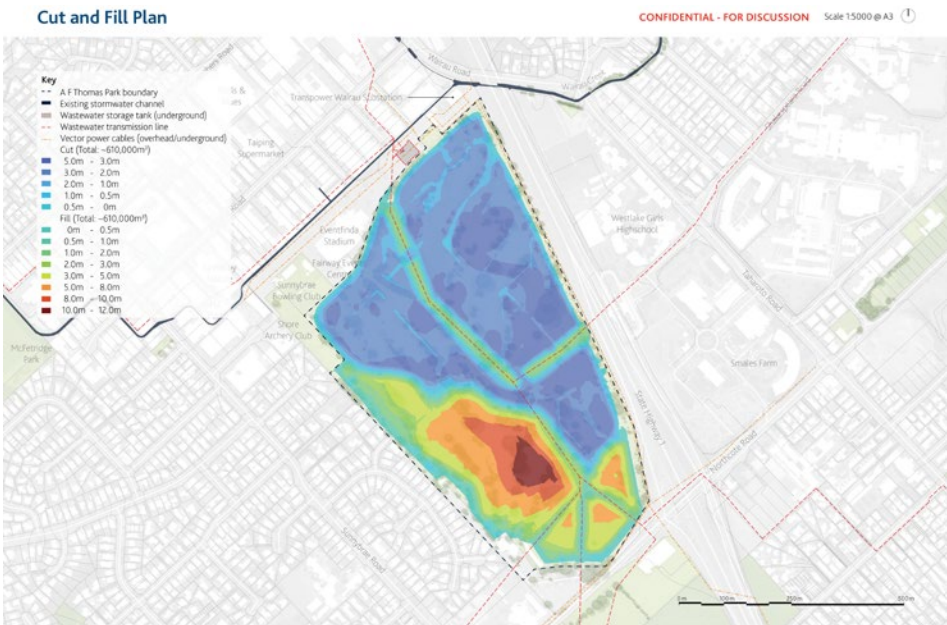
Summary of Options

Healthy Waters Concept Design Option

The Healthy Waters concept option provides the 550,000m³ flood storage through a 11.1ha wetland in the north-east and dry detention areas through the centre of the reserve. Both areas offer recreation opportunities. The resulting excavated material (fill) will be repurposed in the south-west of the site with dedicated recreation areas incorporated following future community input, needs assessment and Local Board decision-making.

The proposed landform has considered existing overland flow paths, intermittent streams, existing stormwater pipes and critical wastewater services.

Further detail on the Healthy Waters concept design option is contained in Appendix A.



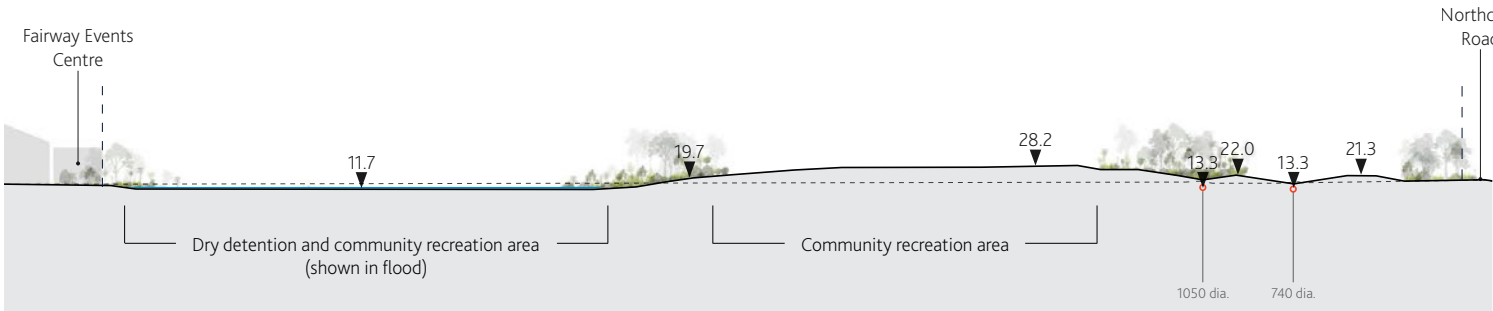
Layout Plan

Scale 1:5000 @ A3



Figure 4 (left top): Healthy Waters Concept Design Option Park Zone Plan
Figure 5 (left bottom): Healthy Waters Concept Design Option Cut and Fill Plan

Figure 6 (above): Healthy Waters Concept Design Option Layout Plan
Figure 7 (below): Healthy Waters Concept Design Option Long Section through A F Thomas Park



TGC Concept Design Option R0

TGC presented TGC-R0 to the TRIC committee on the 3rd April 2025 and subsequently to Healthy Waters on the 24th of April 2025. The option provided the required 550,000m³ of flood storage with an integrated 18-hole golf course. However, there were significant technical and maintenance concerns, and it was estimated to cost >\$100mil, approximately twice that of the available project budget. Further detail on the TGC-R0 concept design option is contained in Appendix B.



Figure 7 (left top): TGC Concept Design Option R0 Proposed Layout Plan
Figure 8 (left bottom): TGC Concept Design Option R0 Depth Contours
Figure 9 (Above): TGC Concept Design Option R0 Finished Contour Plan

TGC Concept Design Option R1

Based on feedback from Healthy Waters, TGC revised their design and developed TGC-R1. The TGC revised concept option provides the 550,000m³ storage through a 6.6ha wetland in the north-east and dry detention areas incorporating golf holes. Both areas have recreation opportunities associated. The resulting fill will be incorporated in the southern area of the site with additional holes and a driving range.

TGC-R1 has been designed to be delivered in stages with the intention of keeping some golf operations open throughout construction, and with the end goal of maintaining an 18-hole golf course.

Further detail on the TGC-R1 concept design option is contained in Appendix B.

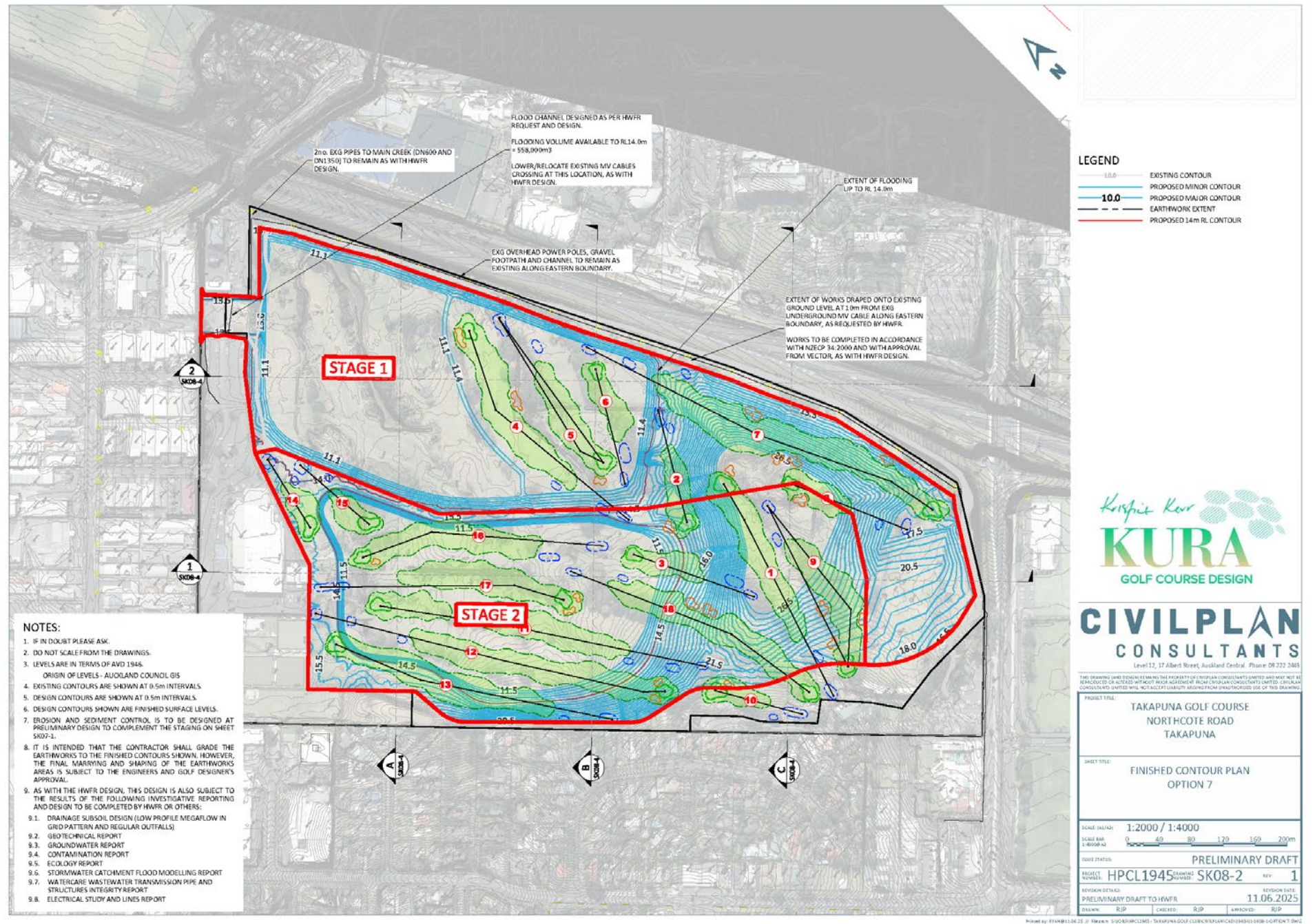
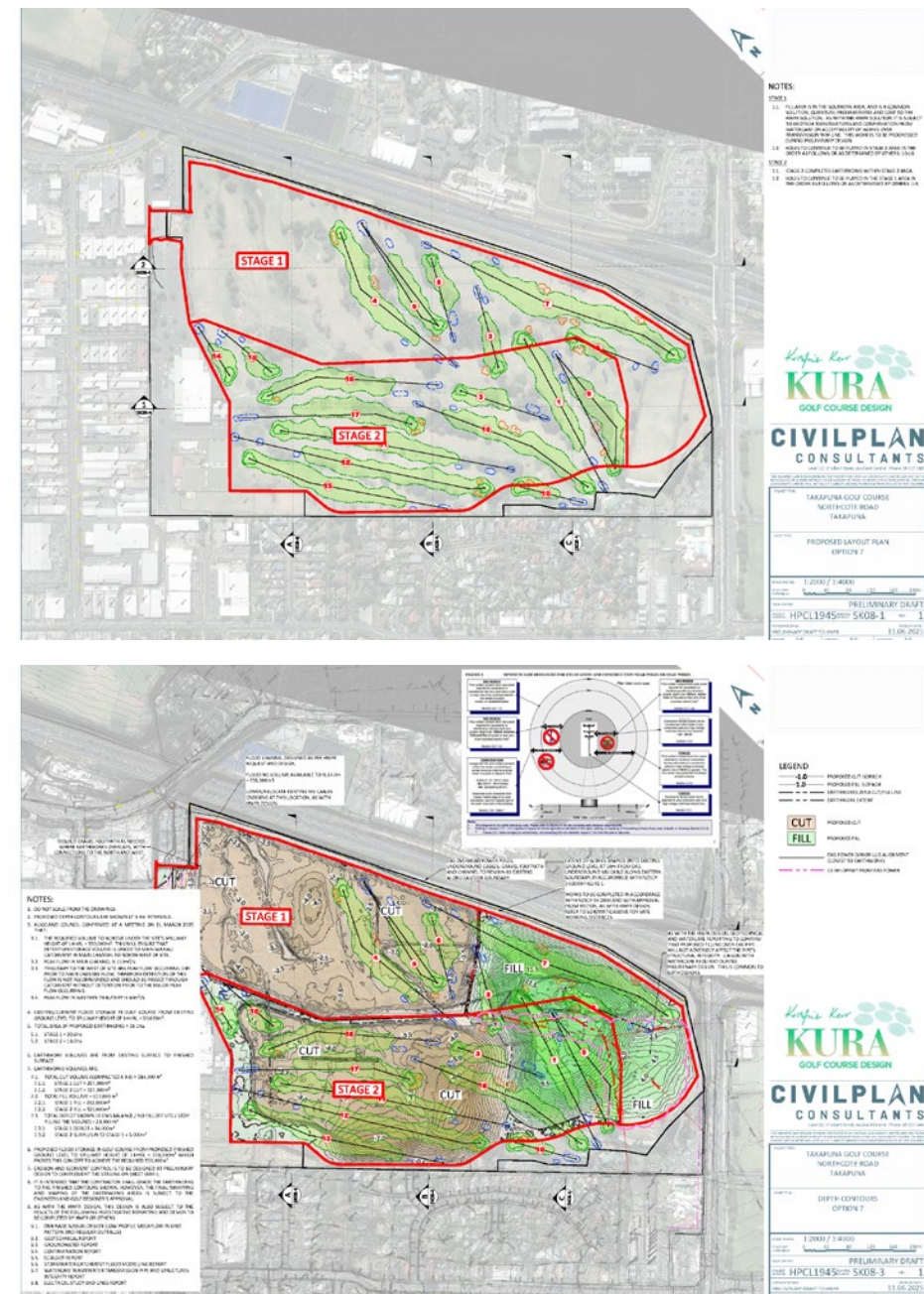
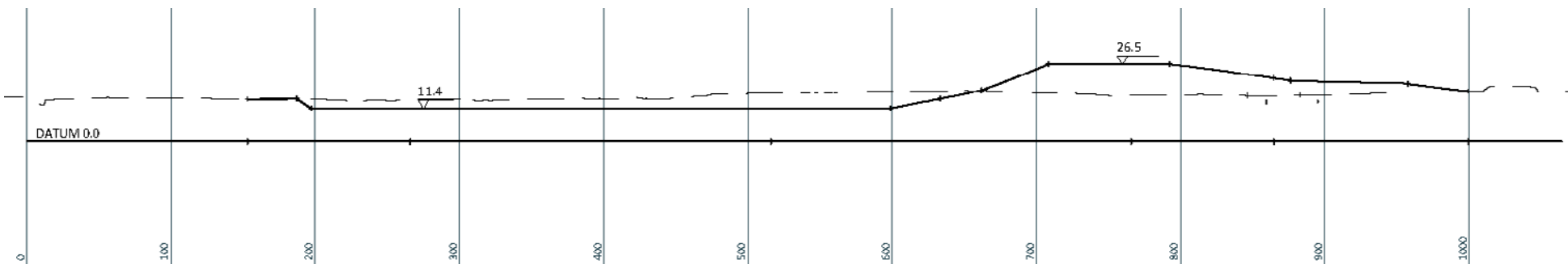


Figure 10 (left top): TGC Concept Design Option R1 Proposed Layout Plan
Figure 11 (left bottom): TGC Concept Design Option R1 Depth Contours

Figure 12 (above): TGC Concept Design Option R1 Finished Contour Plan
Figure 13 (below): TGC Concept Design Option R1 Long Section through A F Thomas Park



Comparison of Options

Both A F Thomas Park options now include:

- A combination of wetland recreation areas, dry detention recreation areas and dedicated recreation areas
- Storage capacity of a minimum of 550,000m³ (up to 14.0m RL) of flood waters
- Fill retained in the southern area of the site
- An assumption that maintenance responsibilities and costs will be shared between Healthy Waters for stormwater components, and Parks and Community Facilities or the future tenant, responsible for open space and recreational assets.

As noted in the table following, there are some minor differences between the two schemes, however, the critical difference is the assertion from TGC that:

- 18-holes of golf can be accommodated within the future recreation areas
- It is reasonably practicable to maintain golf operations throughout construction

As such, the feasibility assessment has considered whether there is sufficient evidence to support the two statements above, and whether there are any resulting differences in risk, cost or programme between the two stormwater detention proposals as a result.

A high-level summary of the features of the final concept options are outlined in Table 1.

Table 1: Comparison of Options

Consideration	Healthy Waters’ Design	TGC’s Revised Design (TGC-R1)
Flood storage	Meets the >550,000m³ storage requirement	Currently meets the >550,000m³ storage requirement but there is a lack of information about any additional contouring required for the golf course which may impact storage volumes.
Wetland	11.1ha wetland area (at 11.1m RL), with a 3.2ha permanent pool at 10.6m RL (0.5m deep).	6.6ha wetland area (at 11.1m RL), with a 0.5ha permanent pool at 10.6m RL (0.5m deep).
Dry detention area	7.7ha dry detention area and community recreation zone at 11.6-11.9m RL.	12.0ha dry detention area and golf recreation at 11.4m RL.
Earthworks	610,000m³ of cut 610,000m³ of fill (one stage)	732,100m³ of cut 613,200m³ of fill* (two stages) Stage 1 cut = 322,000m³ Stage 1 fill = 333,000m³ Stage 2 cut = 410,100m³ Stage 2 fill = 280,200m³ *assuming the compaction factor of 0.8 is valid – otherwise another 118,900m³ of fill will need to be incorporated onsite or disposed of offsite.

Fill (spoil)	Fill (610,000m³) proposed in the southern area of the reserve up to ≈12m in height and 28.4m RL at highest point. Note no compaction factor has been assumed. Filling of up to 2.2m high over the trunk wastewater pipes and overland flow paths integrated through fill area.	Fill (613,000m³) proposed in the southern area of the reserve up to ≈12m in height and 26.5m RL at highest point. TGC assumed a compaction factor of 0.8, if not valid (and the material is kept onsite) the fill height is predicted to be 5-10m higher. Filling of up to 11.5m high over the trunk wastewater pipes.
Vegetation	Any works in the reserve will likely result in significant vegetation removal. Retainment of existing vegetation and trees where feasible. Net increase in vegetation and trees to existing site.	Any works in the reserve will likely result in significant vegetation removal. Retainment of existing vegetation and trees where feasible. Similar vegetation and trees to existing site.
Frequency of inundation – Dry detention areas	The dry detention areas are predicted to be inundated a few times a year.	The dry detention areas are predicted to be inundated many times a year (anticipated to be twice as frequent as the Healthy Waters scheme due to the lower ground levels).
Frequency of inundation – Wetland	The wetland for both schemes will have a permanent pool and will be frequently inundated (once or twice a month) from flows backing up from the main Wairau Creek.	
Contamination	Vast majority of soil assumed to be able to be retained onsite. An allowance has been made in the cost estimate for 500m³ of contaminated material to be disposed of offsite.	
Connection of cells	Same connections between storage areas/cells provided through wastewater pipe bridges.	
Spillway and culverts (inlet/outlet)	Same 40m wide weir/channel at 13.5m RL and culverts.	
Existing infrastructure - Vector	Same 10m setback provided on eastern boundary for Vector cables.	
Pathways	Same pathways, footbridges and boardwalks (as shown on the Healthy Waters concept design plans).	

Detail on the identified considerations and risks are outlined in the respective technical review memorandums and are contained in Appendix E.

Further detail on the commonalities and differences are outlined in Appendix C.

Feasibility Outcomes

Due to the significant convergence of the schemes, both options are deemed feasible to achieve the required stormwater detention outcomes.

There are several risks and issues noted for both options which will require ongoing design refinement and mitigation. These include:

- Maintenance approach for both recreation and stormwater areas (including wetland/s)
- Protection of existing services onsite, notably existing wastewater, stormwater and Vector assets
- Construction logistics associated with working on a site with a high likelihood of groundwater and flooding
- Proposed recreation use of dry detention areas considering inundation frequency and groundwater levels (noting lower dry detention levels and higher risk associated with the TGC option)
- Ground conditions and resulting slope stability
- Level of contamination and associated management
- Consideration of existing ecological features including vegetation and streams
- Inlet / outlet and spillway design
- Wetland function, including final dimensions and groundwater interaction (including permanent pool)
- Consent considerations relating to existing hydrological features, construction, ecological impacts and Te Tiriti responsibilities.

In addition to the risks stated above, there appears to be insufficient evidence and site information available to support the assertion that 18-holes or continuous golf operations are feasible without additional risk to the construction programme, cost or functionality. This potential additional risk is noted in both the constructability and technical feasibility memorandums. Following completion of ground investigations, these risks can be re-evaluated as required as part of future decision-making in respect to recreation outcomes.



Greenslade Reserve, Northcote in flood during the 2023 Auckland Anniversary Weekend floods



Greenslade Reserve, Northcote on the day following the 2023 Auckland Anniversary Weekend floods

Cost Benefit Analysis

The TRIC resolution requests the inclusion of a benefit-cost ratio (BCR) of the TGC proposal. This was initially to be undertaken by WSP, however due to the risk of perceived conflict of interest it was agreed to externally procure these services from a supplier approved by the Auckland Council Chief Economist. This work was commissioned, however due to the change in proposal and approach from TGC, has been rescoped. As a result of the designs converging, an external peer review and augmentation of the existing Cost Benefit Analysis (CBA) was deemed sufficient and has been provided for both proposals as part of this Concept Report. Refer to Appendix G for the Cost Benefits Analysis report.

A comprehensive CBA will be prepared in partnership with the Chief Economist as part of the detailed business case due in 2027. This comprehensive analysis will include wider social, environmental and recreation benefits once known (including any golf course redevelopment allowed for in the final project).

MartinJenkins Analysis

MartinJenkins was asked to compare the costs and benefits of the current A F Thomas Park (the counterfactual) to a future scenario involving flood storage wetland, dry detention and associated amenity. The analysis did not consider any future use arising from development of the park beyond the Stage 1 works (for example, a redeveloped golf course). This type of future development would be subject to separate decision making and funding decisions.

The analysis produced a benefit-cost ratio (BCR) between 0.5 and 1.4. The BCR was presented using a range because the design is at concept stage and there is uncertainty about the underlying assumptions and inputs. The range was produced by calculating the BCR for different cost and benefit scenarios. This range is slightly higher than the benefit-cost ratio outlined in the business case approval paper of 0.5 – 1.36, presented to TRIC on 3 April 2025.

The modelling done so far indicates that, due to the convergence of the two options, the benefit-cost range is appropriate for both proposals.

It is important to note the limitations of the benefit cost ratio. It does not include all benefits, only those that have been able to be monetised at this stage. There are qualitative benefits that should be considered as part of the investment decision, for example community resilience and environmental benefits in addition to water quality. This investment also unlocks further flood protection benefits (in subsequent stages of work) and options to use the park for different types of recreation activities in the future.

MartinJenkins noted there is not an ‘ideal’ BCR for pluvial flood protection, it will depend on the characteristics of each investment. The BCR for pluvial flooding protection can be lower compared to river or coastal flood protection because it is usually more localised with lower per-event damages (even if more frequent).

MartinJenkins’ approach to the analysis was informed by the relatively short amount of time available to do the review, and the convergence of the two design options. They examined supporting documents and reviewed the methodology that WSP used to do the earlier cost benefit analysis. MartinJenkins relied on the cost estimates produced by Alta Consulting, property damage cost modelling produced by Auckland Council, and flood modelling data produced by WSP.

The majority of the costs (approximately 62%-80% of the total costs) were associated with the development of the wetlands, dry detention basin and associated earthworks. The remaining costs are associated with the deadweight cost of taxation, and ongoing maintenance of the flood resilience elements.

The most significant monetised benefit was the avoided damage to property (approximately 27%-87% of the total benefits). The value of this benefit is likely to be conservatively estimated. For example, the method used to calculate it does not account for any future increases in property value resulting from improvements or new housing on subdivided land. Nor does it include any avoided damage to public infrastructure, or other flood-related land impacts.

MartinJenkins considered whether any other benefits (beyond what was already identified in the business case and WSP cost benefit analysis) could be included in the benefit-cost ratio, within the timeframe available to do the analysis. They added in health benefits common to both options associated with additional walking and cycling around the wetlands, and carbon sequestration.

MartinJenkins considered the impact on benefits and costs if the Takapuna Golf Course stopped operating. Although not yet confirmed as a feasible option, they also considered the potential impact if the golf course continued to operate at a reduced 9-hole capacity (but without any further investment in the golf course).

The benefit-cost ratio is most sensitive to changes in assumptions about:

- The increase in property-related costs over the timeframe of the investment (which determines the value of the avoided property damage benefit)
- The costs to develop the flood resilience elements
- The discount rate used to calculate the present value of the costs and benefits
- The proportion of existing Takapuna Golf Club players that move to nearby golf courses if the golf course stops operating (or operates fewer holes), versus the number of golfers that stop playing altogether (in other words, the level of expected displacement of golf activity).



Figure 14: Artist Impression of the Healthy Waters Concept Design in Normal Conditions

Outcome and Next Steps

Due to the significant similarities and convergence between the two proposals, and urgency to progress these works, Healthy Waters will progress developed design based on the converged proposals. Through the developed design phase, Healthy Waters will seek to address the stated risks and opportunities presented in this report and refine the project design to create the best outcome for the stormwater detention objectives, whilst optimising future recreation opportunities. As seen in both options, this will include a combination of wetland/s, dry detention and open space with recreation outcomes provided throughout.

This is the most effective, timely, and practical way to improve flood resilience and reduce flood depths, to save lives, and protect property and critical infrastructure. It will also enable further research, a needs assessment, engagement and partnership negotiations in respect to recreation outcomes (including golf) to occur in parallel, with the respective decision-makers.

Healthy Waters note that reinstating a high-quality, publicly accessible open recreation space is a key long-term outcome for the park. Healthy Waters believe it is feasible to accommodate a significant golf offering within the project design, however, it is not within their mandate to make this decision. They will continue to work closely with the Local Board, Parks and Community Facilities, Mana Whenua and the local community to optimise the design to accommodate future recreation outcomes in the park.

Detailed site investigations have been commissioned and are scheduled to be undertaken from mid-July 2025. These will include site surveys, contamination sampling, ecological reporting, geotechnical ground conditions and groundwater levels (to be monitored over the next 12-months). In addition to this, meetings have been scheduled with critical asset owners to ensure coordination with Vector and Watercare assets, and further community and partner engagement is planned to inform the developed design phase.



Figure 15: Artist Impression of the Healthy Waters Concept Design in Flooded Conditions