# Consequential Flood Assessment - Ohiti

Ohiti Stopbank

Prepared for Hawke's Bay Regional Council
Prepared by Beca Limited

**1 September 2025**

# Contents

## Revision History

| Revision Nº | Prepared By | Description | Date |
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| A | Michael Law | Draft for client review | 29 August 2025 |
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## Document Acceptance

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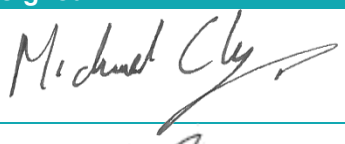
| Prepared by | Michael Law |  | 1 September 2025 |
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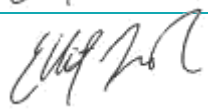
| Approved by | Elliot Tuck |  | 1 September 2025 |
| on behalf of | Beca Limited | | |

# Executive Summary

## Background

Following Cyclone Gabrielle in February 2023, Hawkes Bay Regional Council (HBRC) commenced a series of projects to mitigate future flooding within the region. These projects include a proposal for stopbanks at Omāhu on either side of Okāwa Stream, about 10 km northwest of Hastings. The stopbank alignments are shown in red on the image below, with the Ohiti Road Stopbank on the west side of Okāwa Stream and wrapping around the Ohiti Road subdivision. The Taihape Road Stopbank is on the other side of the stream and protects properties along Taihape Road that would otherwise be adversely affected by the floodwaters displaced by the Ohiti Road Stopbank. The Okāwa Stream discharges into the Ngaruroro River downstream.

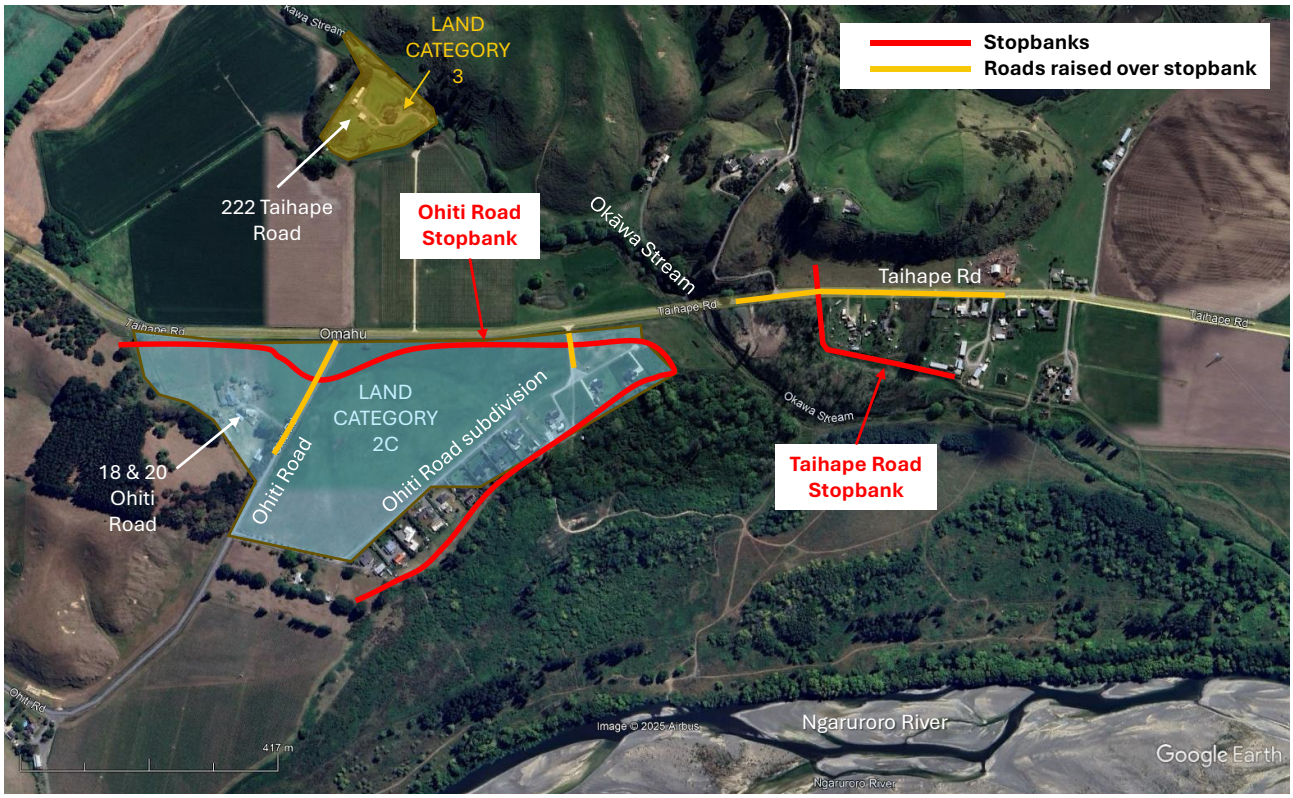



Figure 0-1 Stopbank alignments and property locations

NIWA estimated a peak flow of about 6,000 $m^3/s$ for the Ngaruroro River during Cyclone Gabrielle, compared to a 100-year ARI peak flow of just under 400 $m^3/s$. While there isn't a flow recorder on the Okāwa Stream, the peak flow during Cyclone Gabrielle was estimated as 580 $m^3/s$, compared to the 100-year ARI flow of 336 $m^3/s$ in the T+T Effects Report. Tonkin and Taylor Ltd (T+T) modelled the flood alleviation options and effects, reporting the areas and buildings positively and adversely affected by the stopbanks in the 100-year ARI and Cyclone Gabrielle flood events.

After Cyclone Gabrielle, HBRC and the NZ Government's Cyclone Recovery Taskforce assessed future severe weather risk across the region, establishing three main 'land categories' which have been used to determine the future severe weather risk for specific areas impacted by the cyclone. The area south of Taihape Road on the western side of Okāwa Stream were classed as Category 2C, where *"Local government repairs and enhances flood protection schemes to adequately manage the risk of future flooding events in the face of climate change effects."*

## Conclusions and recommendations

Based on the outcome of the review by WSP, the modelling of the Okāwa Stream and reporting undertaken by T+T is robust. The modelling shows that the proposed stopbank prevents flooding of most of the Category 2C land south of Taihape Road in the design 100-year ARI flood, the exception being at 18 & 20 Ohiti Road where the stopbanks will reduce (but not preclude) flooding. The area protected is less than about 25 ha. The stopbanks would have reduced flooding to the Category 2C land under Cyclone Gabrielle conditions, which were more extreme than the design 100-year ARI flood event. Non-2C land along Taihape Road east of the Okāwa Stream will also be protected by the stopbanks.

48 buildings will be at lower risk of flooding in the current 100-year ARI flood than currently, while two (non-habitable buildings) will be at greater risk. The net benefit is slightly less in a Cyclone Gabrielle sized flood event, but increases in flood risk are generally small at those properties adversely affected.

The Ohiti Road Stopbank runs along the south side of Taihape Road, resulting in higher flood depths along Taihape Road. While the flood hazard category along the road doesn't increase as a result of the increased flood depth, any increase in the duration of flooding is not reported.

Therefore, the greatest benefit of the proposed stopbank is experienced in the 100-year ARI flood rather than larger events such as another Cyclone Gabrielle sized event, but there is still benefit in the larger events.

The scope of this report has been to weigh up the benefits of protecting the Category 2C land (and other areas) against the adverse effects on other areas. These consequences have been evaluated by considering the effects against five criteria:

- **Magnitude of Effect:** Changes in flood depths, water velocities, and flood hazard category.
- **Event Scale:** Differences in flood effects in different design/historic events.
- **Property Sensitivity:** Consider how the change in flood effects will affect properties; removing flood risk, still flood prone but increased/decreased risk, introducing flood risk
- **Land use:** Evaluate the vulnerability/resilience of the affected land to flooding.
- **Scale of the proposal:** Considering the scale of proposed works against the accrued benefits.

Based on the flood consequences evaluation shown in Table 3-2, the proposed stopbanks pass four of the five criteria. The exception is the 'Scale of the proposal' test, where the numbers of properties and areas protected are small when compared with other projects. Overall, this would indicate that **the consequences of the proposed stopbank are acceptable.**

# 1 Introduction

## 1.1 Scope

Following Cyclone Gabrielle in February 2023, Hawkes Bay Regional Council (HBRC) commenced a series of projects to mitigate future flooding within the region. These projects included stopbanks to protect vulnerable communities. One such project is at Omāhu/Ohiti along the lower reaches of the Okāwa Stream and its confluence with the Ngaruroro River, about 10 km northwest of Hastings.

HBRC appointed Tonkin & Taylor Ltd (T+T) to undertake the flood modelling and design of the stop bank. Subsequently, HBRC appointed Beca to:

- Review and provide comment on T+T's report letter titled ***"Consequential Flood Effects of the Omāhu Stopbank"***. (T+T Effects Report).
- Report on the consequences of the proposed works on the local community. This includes the areas and numbers of properties where the risk of flooding will change due to the works, with the information drawn from the T+T report.

This report is the second of those; the 'Consequences Report'.

## 1.2 Key locations

Figure 1-1 shows the alignment of the two stopbanks proposed to protect either side of Okāwa Stream.

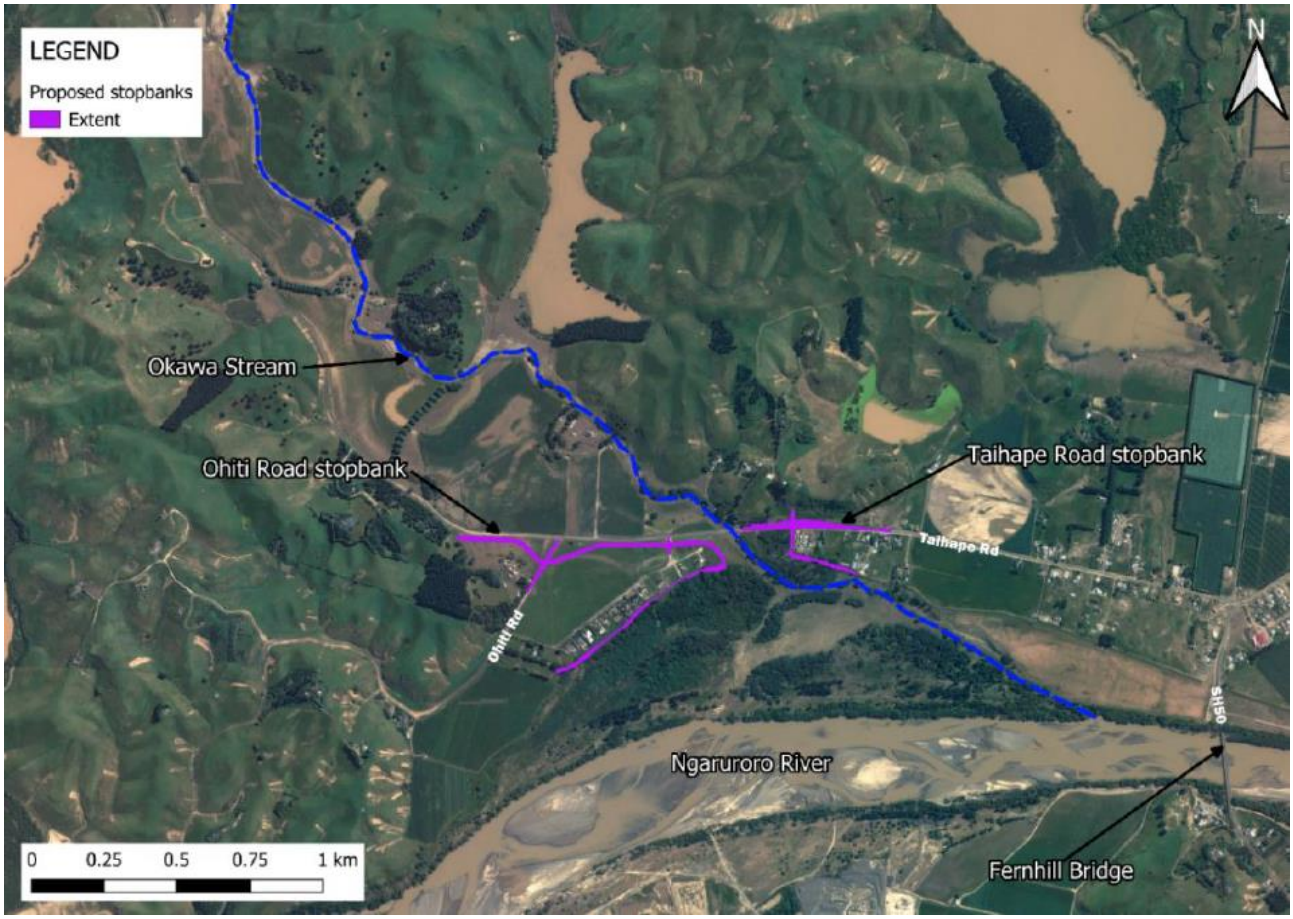



Figure 1-1 Proposed stopbank alignments *(Figure 1., T+T Effects Report)*

The Ohiti Road Stopbank runs west to east along the south side of Taihape Road for about 900 m. At its western end, it ties into high ground before crossing Ohiti Road, with a slight diversion to facilitate the road crossing over the stopbank and an 'at grade' junction of Ohiti Road and Taihape Road. About 120 m west of Okāwa Stream, the stopbank alignment turns south and runs west southwest along the top of the river terrace at the back of the properties at 203-209 Taihape Road and 23-39 Ohiti Road (Ohiti Road subdivision).

The Taihape Road Stopbank runs north to south, crossing Taihape Road 180 m East of Okāwa Stream. The stopbank ties in with the higher ground at its northern end while the other end ties in with the river terrace. Taihape Road rises to cross the stopbank.

Figure 1-2 shows properties in the area that are currently subject to flooding and that will be protected/ affected by the proposed stopbank.

The Ohiti Road stopbank wraps around:

- 23-39 Ohiti Road and 203-209 Taihape Road, which are set on the river terrace 1-2 m above the Ngaruroro River's contemporary braidplain.
- 20 Ohiti Road, towards the western end of the stopbank.

The Taihape Road stopbank separates Okāwa Stream from numbers 123 to 157 on the south side of Taihape Road, and numbers 120 and 124 on the north side.

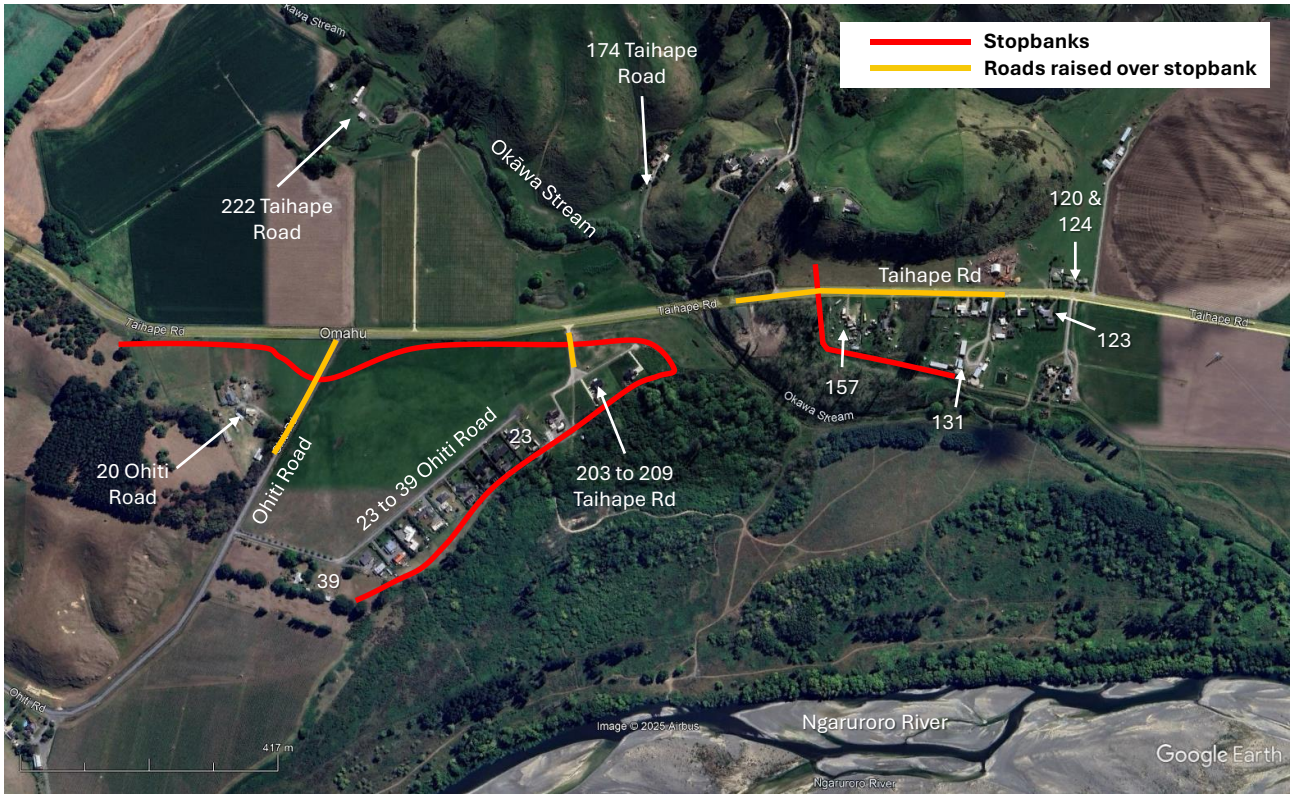



Figure 1-2 Property locations

## 1.3 Cyclone Gabrielle

The extent and damage inflicted on the Hawkes Bay region is well documented, and it's not the purpose of this report to restate or expand on the details of the event. However, it is pertinent to consider the local severity of the event, which occurred in mid-February 2023.

Following the cyclone, HBRC appointed NIWA to undertake extreme flood flow analysis of the event. This allowed HBRC and other parties to understand the severity of the river floods with reference to previous storms and design flood events. The results were presented in a report (NIWA, 2024) dated 31 May 2024.

NIWA recorded a peak flow of 5,398 $m^3/s$ for the Ngaruroro River at Fernhill (Site No. 23102), just downstream of the Okāwa Stream confluence, but note that there was a breach upstream and estimate that the flow would have been about 6,000 $m^3/s$ at Fernhill if the breach hadn't occurred. This compares to an estimated 100-year average recurrence interval (ARI) flow of just under 4,000 $m^3/s$ (Figure 2.10, T+T Model Report). Based on the 70-year flow record, the Cyclone Gabrielle peak flow of 5,398 $m^3/s$ has (ARI) of over 400 years (Table 4.3, NIWA 2024).

While there isn't a flow recorder on the Okāwa Stream, the peak flow during Cyclone Gabrielle was estimated as 580 $m^3/s$, compared to the 100-year ARI flow of 336 $m^3/s$ (Table 2.2, T+T Model Report).

The aerial photo used by T+T in Figure 1-1 was taken on 10 March 2023 in the aftermath of Cyclone Gabrielle. The areas of brown on Figure 1-1 indicate sediment deposited by Cyclone Gabrielle flooding, and these tie-in well with T+T's modelled flood extent of Cyclone Gabrielle (Figure 1-3, with the proposed stopbank alignments shown for reference. The cyclone deposited sediment in Okāwa Stream through Broughton (Taihape Road) Bridge, reducing its conveyance capacity.

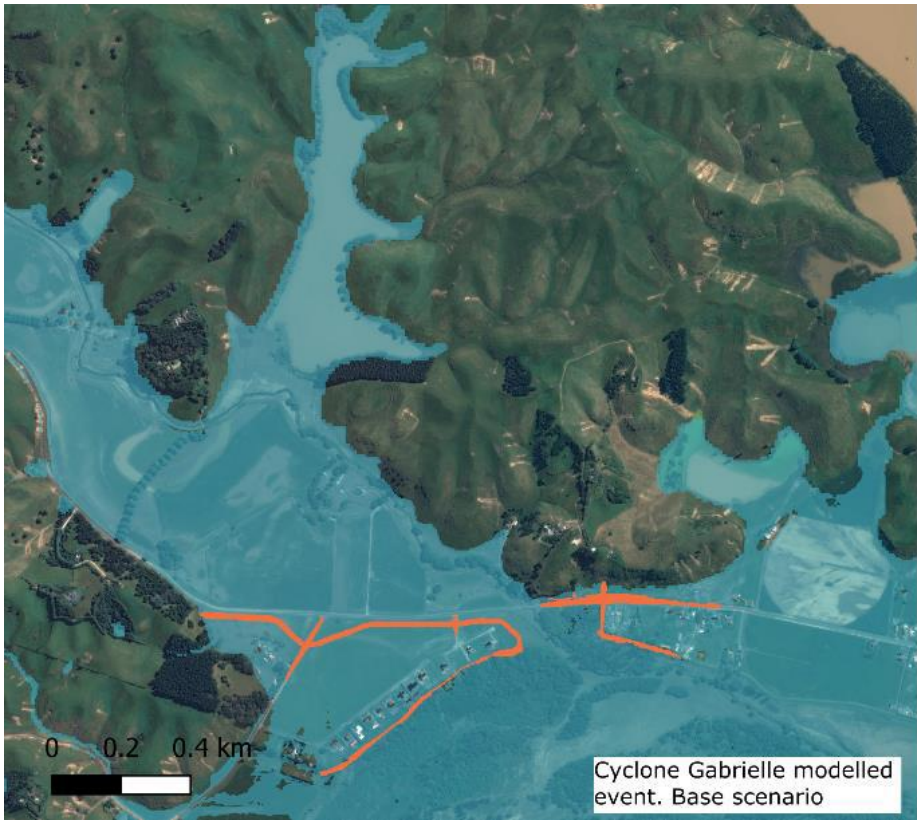



Figure 1-3 Modelled Cyclone Gabrielle flood extent *(Figure 2.2, T+T Effects Report)*

## 1.4 Land categorisation

As a result of Cyclone Gabrielle, HBRC and the NZ Government's Cyclone Recovery Taskforce assessed future severe weather risk across the region. They established three main 'land categories' which have been used to determine the future severe weather risk for specific areas impacted by the cyclone. Areas in Land Category 1 can be repaired to its previous state to manage future risk, whereas future risk cannot be sufficiently mitigated in Land Category 3 areas. Land Category 2 (divided into four sub-categories) areas fall between the two with interventions needed to mitigate future risk.

Figure 1-4 shows the land categorisation for the Omāhu/Ohiti area. The buildings at 222 Taihape Road lie adjacent to Okāwa Stream and are enclosed by an old meander of the stream. This area is classed as Land Category 3. All of land south of Taihape Road is provisionally Land Category 2C. Table 1-1 provides definitions of the two categories. The proposed Ohiti Road stopbank is designed to protect that 2C land and mitigate future risk from severe weather events, while the Taihape Road stopbank is designed to prevent floodwater displaced by the Ohiti Road stopbank from increasing flooding along Taihape Road on the eastern (true left) side of Okāwa Stream.

Table 1-1 HBRC Land Categorisation Categories[1]

| Category | Definitions | Examples |
|---|---|---|
| 2C | Community level interventions are effective in managing future severe weather risk event. | Local government repairs and enhances flood protection schemes to adequately manage the risk of future flooding events in the face of climate change effects. |
| 3 | Future severe weather event risk cannot be sufficiently mitigated. In some cases some current land uses may remain acceptable, while for others there is intolerable risk of injury or death. | In the face of enhanced climate risks the property may face unacceptable risk of future flooding. Other property could be subject to unstable land that poses an ongoing risk. |


Figure 1-4 Omāhu Land Categorisation Map (HBRC 2023)

[1] https://www.hastingsdc.govt.nz/land-categorisation-hb/information/

### 1.5 Information received

As noted above, HBRC appointed Tonkin and Taylor Ltd (T+T) to undertake the flood modelling and design of the stop bank. T+T provided copies of their reports:

- ***Okawa Stream Hydraulic Model Build*** (T+T Model Report). Provided for reference to inform this consequences report. The T+T Model Report describes the modelling undertaken to inform the preferred alignments and design heights of the two proposed stopbank and assess the effects of flooding pre- and post-construction. The modelling was undertaken using Tuflow software (2023 HPC solver) package, which is widely used for flood modelling in New Zealand and overseas.
- ***Consequential Flood Effects of the Omāhu Stopbanks*** (T+T Effects Report). This report is presented in extended letter format. It takes the results of the modelling covered in the T+T Model Report and describes how flooding depths, velocities and extents will change because of the proposed stopbanks. One version of the report (dated 22 July 2025) has been viewed and used in the preparation of this consequences report. Comments on the 22 July version of the report were provided by Beca to T+T and HBRC on 30 July 2025.
- ***Okāwa Stream – Summary of Peer Review and Scour Assessment*** (WSP letter report). This report:
  - Summarised the outcome of the peer review of T+T's Okawa Stream TUFLOW flood model
  - Included an assessment of scour at Broughton Bridge over Okāwa Stream.

### 1.6 Site visit

Mike Law (Beca), the author of this report, visited the site on 30 January 2025 with Dugan Weitz and Mel Anderson (both HBRC), including inspecting sediment deposits in Okāwa Stream at the Taihape Road bridge.

# 2 Stopbank Level of Service

Section 1.1 of the T+T Effects Report describes the different levels of service that have been adopted for each section of the proposed stopbanks.

- **Ohiti Road Stopbank**
  - Section along the south side of Taihape Road: The design level for this section of the proposed stopbank is the 100-year ARI (1% AEP [Annual Exceedance Probability]) flood level with an allowance for climate change (using RCP 8.5 to 2050), plus freeboard of 700 mm.
  - Southern side of 23-39 Ohiti Road along the edge of the Ngaruroro River terrace: The design level for this section of the proposed stopbank is the current climate 100-year ARI flood level plus freeboard of 700 mm.
- **Taihape Road Stopbank.** The level of service for this stopbank is not explicitly mentioned in the T+T Effects Report. As this section of stopbank is required to mitigate adverse effects caused by the Ohiti Road Stopbank, it is assumed to have the same level of service; 100-year ARI flood level with an allowance for climate change (using RCP 8.5 to 2050), plus freeboard of 700 mm.

# 3 Consequential Flood Risk

### 3.1 Flood hazard classification

It is a consequence of stopbanks that while they will protect some areas, floodwater is diverted or ponded elsewhere. This can increase the risk of flooding to properties and infrastructure in those areas on the 'upstream' side of the stopbank.

The T+T Effects Report outlines the areas and properties that will be positively or adversely affected by proposed stopbanks. *"To assess flood hazard effects, we have adopted the* ***"Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (AIDR 2017)"****. This provides an overview of various risk categories based on flood depth and velocity,"* (Section 2.3, T+T Effects Report). The flood classification curves are shown in Figure 3-1.

The flood hazard classification is based on a combination of the flood depth and water velocity at the site of interest, with the different hazard classes defined on the potential danger/damage to people, vehicles and property. It can be quite 'broad brush' with large variations in flood depth or velocity falling within the hazard class. To provide more nuance to the results, the T+T Effects Report includes tables detailing the post-stopbank changes in flood hazard for buildings in the area. The locations of properties near the stopbanks are shown on Figure 3-2, with the alignment of the proposed stopbanks represented by the red lines. However, further east in Omāhu village there are also properties affected by the stopbanks. The location of these reported by T+T are shown in Figure 3-3.

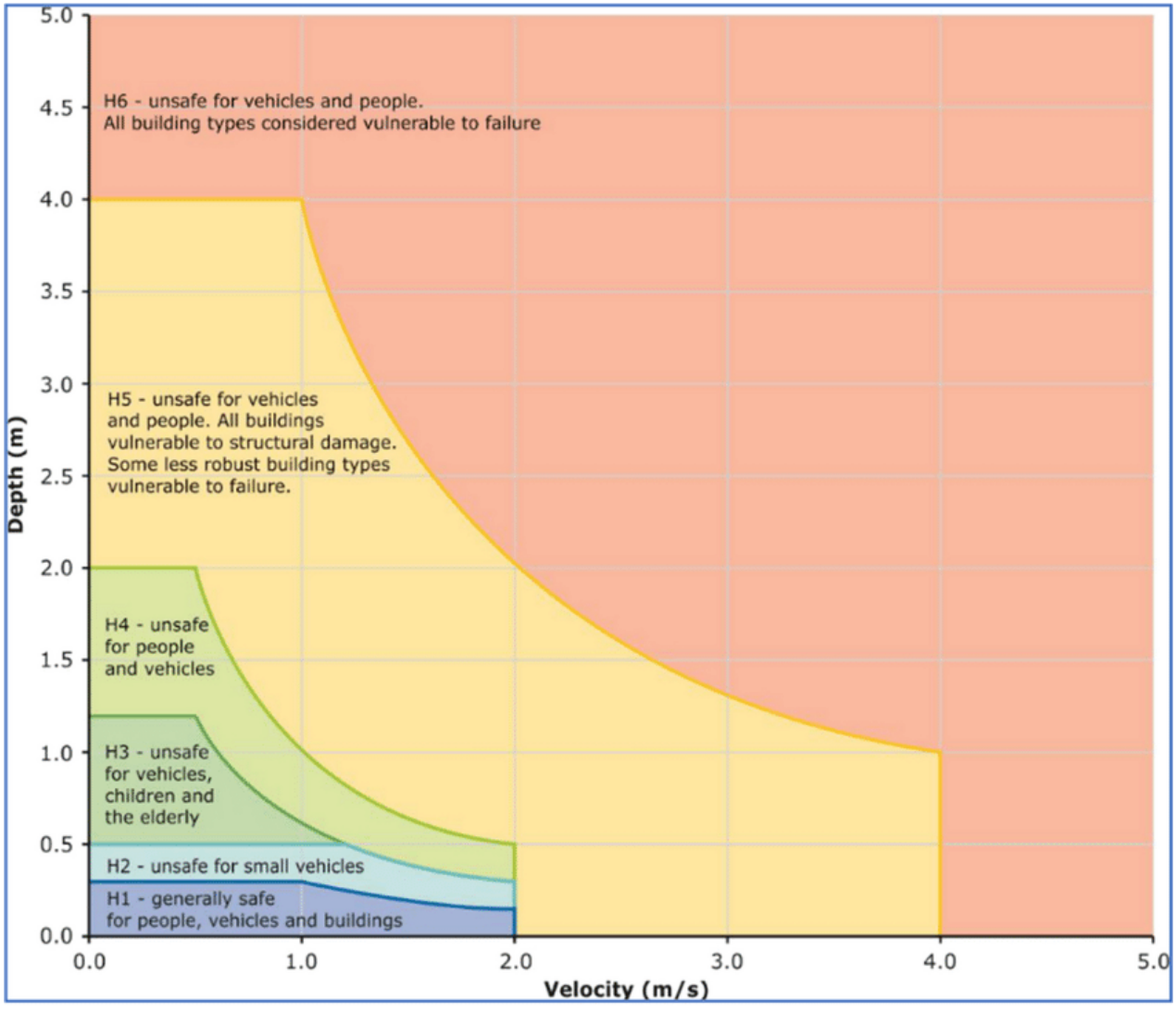



Figure 3-1 Flood hazard curves (Smith et al 2014)

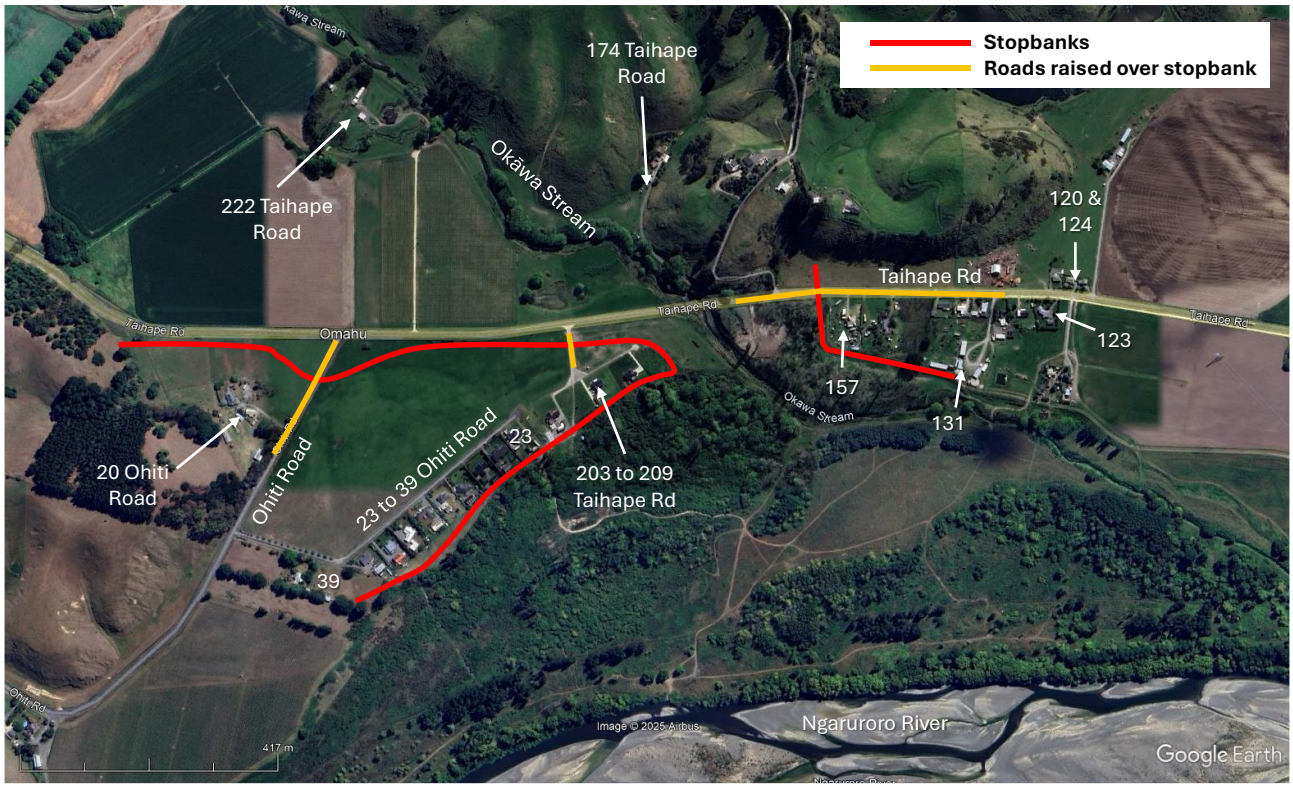



Figure 3-2 Properties referenced by T+T Effects Report near the stopbanks

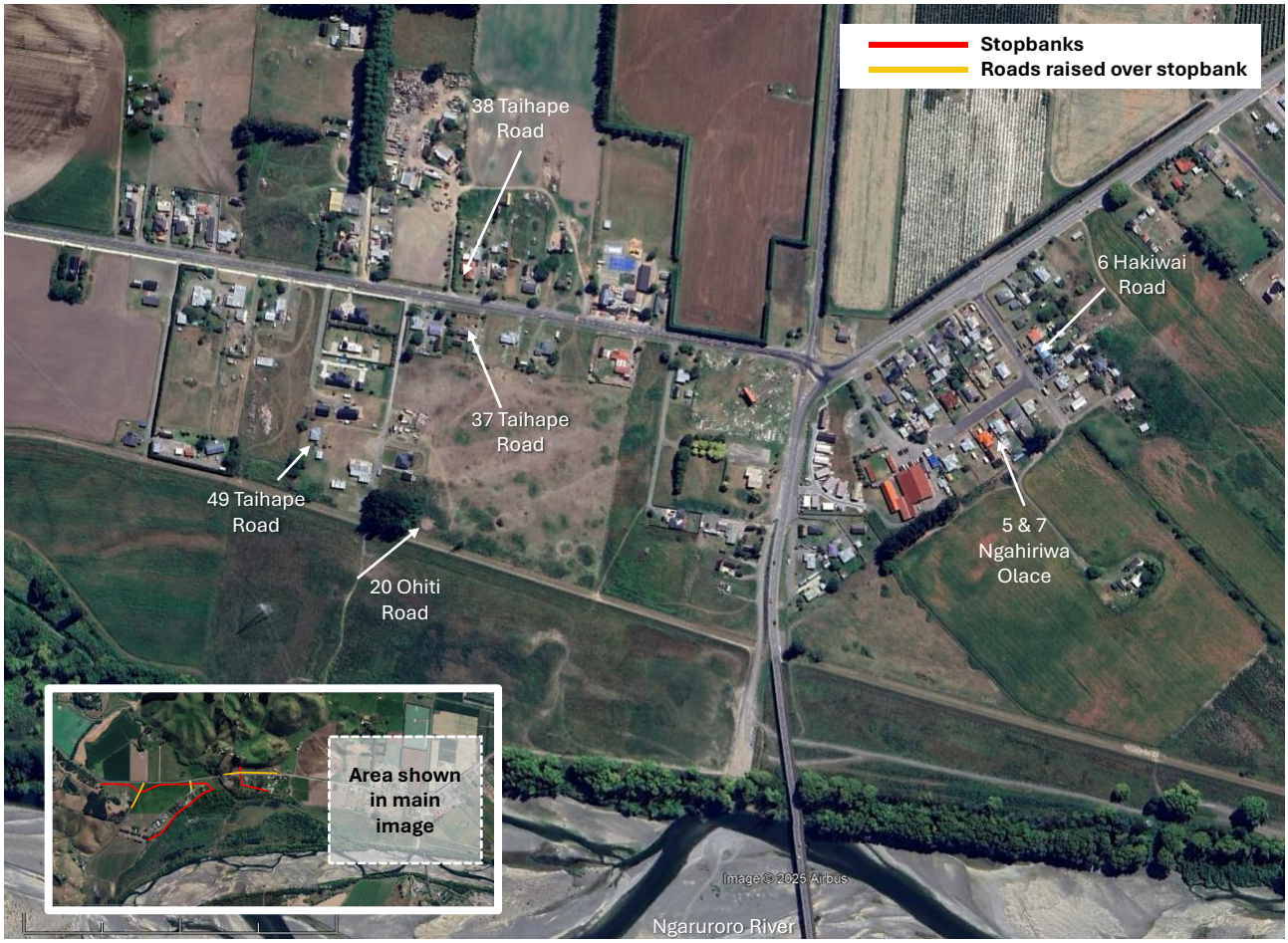



Figure 3-3 Omāhu village properties referenced by T+T Effects Report

## 3.2 Flood extents

The images below from the T+T Effects Report show the effect of the proposed stopbanks (orange line) on 100-year ARI (Figure 3-4) and Cyclone Gabrielle (Figure 3-5) flood extents.


Figure 3-4 Modelled 100-year ARI flood extents with, and without, the proposed stopbank (Snip from Figure 2.1 T+T Effects Report)


Figure 3-5 Modelled Cyclone Gabrielle flood extents with, and without, the proposed stopbank (Snip from Figure 2.2 T+T Effects Report)

Figure 3-4 shows that the proposed stopbanks remove the risk of flooding to the Ohiti Road subdivision and properties east of Broughton Bridge in the modelled 100-year ARI flood event. In the larger modelled Cyclone Gabrielle event these areas would still flood, but the depth of flooding is decreased compared to the pre-stopbank condition. Local runoff means 18 and 20 Ohiti Road are still subject to flooding in the 100-year ARI event when the stopbanks are in place, but that the depth of flooding is less.

T+T provide plots showing water level differences resulting from the stopbanks. For more information refer to Figures 2.10 and 2.11 of the T+T Effects Report.

## 3.3 Changes in flood hazard

Table 3-1 shows the number of buildings where the flood hazard would change in the 100-year ARI and modelled Cyclone Gabrielle flood events due to the proposed stopbanks. This confirms that 48 buildings would be at less risk of flooding in the 100-year ARI design flood event, but that two non-habitable sheds as at 174 Taihape Road would be at increased risk of flooding. The benefit of the stopbanks is reduced in the 'over-design' modelled Cyclone Gabrielle event but still results in a net reduction in flood risk.

Table 3-1 Changes in flood hazard category (based on Table 2.1 T+T Effects Report)

| Event | Number of buildings affected | |
|---|---|---|
| | Increased flood hazard | Decreased Flood Hazard |
| 100-year ARI with future climate | **2**<br>• 174 Taihape Road | **48**<br>• Behind the stopbank at the Ohiti Road subdivision and east along Taihape Road. |
| Cyclone Gabrielle | **12**<br>• 174 Taihape Road<br>• 27 Ohiti Road subdivision<br>• 131 Taihape Road<br>• Seven in Omāhu village. | **28**<br>• Behind the stopbank at the Ohiti Road subdivision and east along Taihape Road. |

### 3.3.1 Increased flood hazard

Details of the changes in flood hazard category for each building are documented in Table 2.2 of the T+T Effects Report. Generally, the changes are small with water depth increases of less than 100 mm and less than 0.1 m/s increases in water velocity. These changes increase the flood risk by hazard category; e.g. H1 to H2 or H2 to H3. Key things to note include:

- At one of the sheds at 174 Taihape Road there is a 400 mm increase in flood depth in the 100-year ARI event and 600 mm increase in the modelled Cyclone Gabrielle flood event. This building is nestled in the bottom of a small side valley of Okāwa Stream. Water constrained by the stopbanks and conveyed through Broughton Bridge encroaches on this building more than in the no-stopbank scenario.
- 131 Taihape Road is at the eastern end of the Taihape Road Stopbank on the edge of the terrace above the Ngaruroro River. T+T's modelling indicates that the flood hazard category increases from H2 to H4 in the modelled Cyclone Gabrielle event. This more due to increases of water velocity than water depth and probably the result of water conveyed around the end of the stopbank, though the flood maps in the T+T Effects Report are at too small a scale to see velocity details are the property scale.
- Further East in Omāhu village, flood risk at seven properties increase by one hazard category. These are due to small increases of velocity (0.02 m/s or less) and flood depth (10 mm or less) in the modelled Cyclone Gabrielle event. These changes are negligible and the reason is unclear, unless more water is being conveyed through Broughton Bridge into the Ngaruroro River, thereby increasing flood risk from the Ngaruroro River in Omāhu village.

### 3.3.2 Risk of structural damage or failure

Based on the AR&R flood hazard categories, buildings are at danger of structural damage in hazard category 5 (H5) or failure in hazard category 6 (H6).

T+T note that the flood hazard category at 37 and 38 Taihape Road increases from H4 to H5 in the modelled Cyclone Gabrielle event, but the change in category is due to minor increases in velocity and flood depth and so the material effects on flood hazard is negligible. As these properties are about 1km east of the stopbanks, it is unclear that the stopbanks are the cause of the changes in flood hazard and could be due to minor modelling anomalies.

The dwellings at 203 and 205 Taihape Road are at reported to have a *"substantial reduction in flood depths and velocities due to the proposed stopbanks, indicating a meaningful decrease in flood hazard at these properties"* (Section 2.3.2, T+T Effects Report). Though the hazard categories are not reported, T+T report that they are less prone to structural damage with the stopbanks in place. Given their location close to Brought Bridge, these properties are shown to be in an area of high water velocity on Figures 2.15 and 2.16 in the T+T Effects Report in the modelled no-stopbank scenarios.

### 3.3.3 Summary

From the information provided in the T+T Effects Report, the positive effects of the proposed stopbank will be most noticeable in the 100-year ARI flood event with 48 fewer buildings subject to flooding due to the stopbanks, but with two non-habitable sheds at greater flood risk. In the modelled Cyclone Gabrielle flood event, there would still be a net reduction in the flood risk to buildings, though the benefit would be less than that observed in the 100-year ARI event.

The modelling indicates that some of the buildings that could expect a slight increase in flood hazard are 1-2 km east of the stopbanks in Omāhu village, but changes there would be expected to be small and could even be due to minor modelling anomalies as much as the effects of the stopbanks channelling more water to the Ngaruroro River.

## 3.4 Lifelines

Taihape Road and Ohiti Road are the two transport links that are affected by the proposed stopbanks.

Without the stopbanks in place, Taihape Road floods to a depth of about 500-800 mm. With the proposed Ohiti Road Stopbank in place and running along the south side of Taihape Road, flood levels along Taihape Road increase by 600-700 mm, but with a small decrease in water velocity. According to the T+T Effects Report, the Flood Hazard category remains unchanged at H3, which is unsafe for vehicles. What is not reported is the duration of flooding along the road, which will affect the length of time that the road is impassable during a flood event. The proposed stopbanks will increase flood levels on Broughton Bridge that carries Taihape Road over Okāwa Stream by 500-600 mm with water velocities of more than 1 m/s. The flood hazard category at the bridge would be H3, which is unsafe for vehicles.

While the stopbank reduces flooding along Ohiti Road, the junction with Taihape Road will be flooded and the flood extents shown in Figure 3-4 and Figure 3-5 indicate that the road will be flooded further south around 85 Ohiti Road.

## 3.5 Indicators

Pattle, Delamore Partners Ltd (PDP) have done similar modelling and reporting for a proposed stopbank along Whirinaki Drain in the lower Esk Valley. In their report (PDP Whirinaki Effects Report), PDP note that "There is no formal guidance available nationally or locally which can be applied as a framework for assessing effects on flooding and flood hazard." (pp 6&7, PDP Whirinaki Effect Report), and so propose a framework of five criteria against which to evaluate the effects of proposed works. The five 'PDP criteria' are listed and described below in Table 3-2. This also includes a summary of the effects/consequences of the proposed Waiohiki stopbank against each of the criteria, and an evaluation as to whether it passes the criteria. Both of these are based on the information described and summarised in this Consequences Report.

Table 3-2 Flood consequences evaluation

| Criteria | Effect and consequences of the Whirinaki Stopbank | Evaluation |
|---|---|---|
| **Magnitude of Effect:**<br>Changes to the flood depth/level and changes to the flood hazard classification. | Land and buildings in the 2C area behind the Ohiti Road Stopbank would be protected from flooding in the 100-year ARI flood event and with reduced flood risk in larger events. There are also reductions in flood risk to areas outside of the 2C area. The stopbanks will increases in flood hazard in some locations, but these are generally minor increases in flood level or water velocity or areas with no buildings (The difference map show increase of 600 mm+ in places. | **Pass** |
| **Event Scale:**<br>An effect for a smaller, more frequent, event is considered worse than the same effect for a larger, less frequent event. | Flood model results are only available for the 100-year ARI and 'over-design' modelled Cyclone Gabrielle event. These show significant benefits in reducing net flood risk, especially in the 100-year ARI event where a large number of buildings will no longer flood. | **Pass** |
| **Property Sensitivity:**<br>Properties with existing flood vulnerabilities have a lower tolerance for additional flooding compared to those with low or no flood hazards. | Generally, there are only minor increases in the flood hazard associated with properties that will experience additional flooding as a result of the proposed stopbanks, and these increases are generally only in the modelled Cyclone Gabrielle event. No material increase in flood risk is expected in smaller flood event. | **Pass** |
| **Land use:**<br>The land use of the affected property is also a consideration. Rural land used for grazing/cropping/horticulture is considered to have a greater tolerance to flood effects when compared to residential dwellings. | The Category 2C area (and other areas) protected by the proposed stopbanks is primarily semi-rural residential land. In contrast, land not protected by the stopbanks is predominantly rural land used for pasture and cropping, and so would be considered more tolerant to flooding.<br>However, there are increases in flood depths of 250-500 mm on the Category 3 land at 222 Taihape Road, which does also include vulnerable land uses, such as the dwellings. | **Pass** |
| **Scale of the proposal:**<br>While less critical than the factors above, the size of the proposal generating the effect should be considered. A significant proposal which will protect regionally significant infrastructure and 100's of residential properties, generating an effect is more acceptable than a smaller proposal (for example a stopbank protecting ten houses) generating the same effect. | The 1.5 km long Ohiti Road Stopbank will protect about 25 ha and less than 20 properties from flooding. The Taihape Road Stopbank is about 250 m long and will protect about 3 ha and about ten properties.<br>Compared to other HBRC post-cyclone stopbank projects, the areas and numbers of properties protected are low for the Omāhu/Ohiti stopbanks, and so doesn't meet this criteria. | **Fail** |

# 4 Conclusions and recommendations

Based on the outcome of the review by WSP, the modelling of the Okāwa Stream and reporting undertaken by T+T is robust.

The modelling shows that the proposed stopbank prevents flooding of most of the Category 2C land south of Taihape Road in the design 100-year ARI flood, the exception being at 18 & 20 Ohiti Road where the stopbanks will reduce (but not preclude) flooding. The area protected is less than about 25 ha.

The stopbanks would have reduced flooding to the Category 2C land under Cyclone Gabrielle conditions, which were more extreme than the design 100-year ARI flood event.

Non-2C land along Taihape Road east of the Okāwa Stream will also be protected by the stopbanks.

The scope of this report has been to weigh up the benefits of protecting the Category 2C land against the adverse effects on the Category 3 areas. Based on the flood consequences evaluation shown in Table 3-2, the proposed stopbanks pass four of the five criteria. The exception is the 'Scale of the proposal' test, where the numbers of properties and areas protected are small when compared with other projects. Overall, this would indicate that **the consequences of the proposed stopbank are acceptable.**

# 5 References


- ***Okāwa Stream Model Build Report***. T+T report for HBRC. July 2024 (T+T Model Report)
- ***Consequential Flood Effects of the Omāhu Stopbanks***. T+T letter report for HBRC. 22 July 2025. (T+T Effects Report)
- ***Flood frequency in the Hawke's Bay Region following Cyclone Gabrielle***, NIWA client report 2024090CH. 31 May 2024
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