

Tongariro River Works Plan 2014-2015

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1 Introduction

Waikato Regional Council maintains and operates a flood protection scheme on the Tongariro River to protect the Turangi Community from flooding. The Council holds comprehensive Resource Consents for the maintenance of this flood protection scheme. As part of the consent conditions, an annual work plan for the maintenance of the scheme is required for consultation with affected parties. This document outlines the works proposed for the following year, and follows on from the 'Tongariro River Flood Control Scheme Management plan for floodway maintenance 2012' (Doc # 1972444). This document identifies current issues within the flood scheme and maintenance required for the 2014-15 river works season.

2 Background

Waikato Regional Council has constructed a flood protection scheme on the Tongariro River within Turangi Township to protect people and property from flooding up to a 100-year flow event (1% Annual Exceedance Probability = 1% AEP) in agreement with the community. The standard of protection is provided by the formed floodway that includes stopbanks, river channel, river banks, berms and flood plain.

In 2011, Resource consents were granted to the Waikato Regional Council's River and Catchment Services Group (RCS) for the management of the river floodway and flood protection scheme.

These consents are summarized as follows:

| RC # | Activity authorised |
|--------|---|
| 121305 | Erosion control/flood protection works: gravel extraction up to 150,000cum/year, erosion control works and vegetation removal, temporary diversion bunds and culvert crossings. |
| 121306 | Divert water and temporarily dam and divert water within the Tongariro River. |

These consents require that a Proposed Annual Works Plan be prepared and distributed to;

- a) Department Conservation
- b) Tongariro and Lake Taupo Anglers Club Inc
- c) Advocates for the Tongariro River
- d) Taupo Fishery Advisory Committee
- e) Tuwharetoa Maori Trust Board
- f) Ngati Turangitukua
- g) Genesis Energy
- h) Waipapa and Tokaanu Maori Lands Trust.

3 Assessment of river condition April 2014

The river channel position through the flood scheme has undergone many changes in the past and this can be expected to continue into the future. These changes will depend on the occurrence of future natural events such as floods, eruptions and major erosion events.

This assessment relates primarily to the flood scheme, rather than the entire catchment.

- a) Upstream of the SH1 Bridge in Turangi the bed has remained relatively stable over the last 12 months. Hydrologically, there has been limited activity in the river which would shift materials from this area. The channel has not altered to any significant degree through this area during this last year. The stopbanks and associated flood control assets have been inspected and should not require anything other than routine maintenance during this year. Spraying on Taupehi Island has been effective, with a good kill rate. The dead willow material is scheduled to be mechanically chipped to improve the flow capacity of the channel. The island above the bridge has not altered significantly, however vegetation management is required, particularly small willows.
- b) Downstream of Turangi some changes in the river's position have occurred in recent history.

Through successive flood events and volcanic activity in the region, large amounts of gravels and fine sediments have been transported through the Tongariro catchment and into the main channel.

At present, this gravel and sediment is not posing a risk to the flood protection, therefore no extraction is planned. This is constantly being assessed, and the situation could quickly change after a significant flood event.

Willow removal from the floodway was undertaken over the 2011/2012 year. This maintenance of the flood protection scheme floodway was deemed essential to establishment of a suitable "coefficient of roughness" to pass the design flood flows. This has been largely successful in that flood flows are now able to move through the floodway relatively unhindered compared to before the works. The combination of sediment extraction and willow removal has resulted in the flood scheme now meeting its design specifications according to the latest model.

One result of willow and sediment extraction has been the number of willow stumps remaining in the current river channel and banks below swirl pool. These are likely to slowly break down, however mechanical extraction could be deemed appropriate in some circumstances. Areas of focus have been identified by DOC where it is suggested that if any stump or snag removal were to occur, it would be undertaken in particular locations where it would have the most benefit to fisherfolk, fish, and river stability. This is detailed in section 4.9.

WRC has no plans at present to alter the existing bed not associated with river maintenance works. It is likely that a reasonable flood through this area will alter the existing channels regardless of human intervention. As this happens, the river bed will again be assessed to ensure flood scheme design specifications are being maintained.

- c) The Herekieke St stopbank will require further maintenance in the next year. This engineered structure has suffered minor degradation through successive flood events and was been identified for upgrade works last year. In the 2013/2014 works season approximately 75m of erosion protection was bolstered. In the coming season, this work will continue, as part of a 3 year maintenance programme. This is discussed in more detail in section 4.5 below.
- d) After the recent willow clearance, rapid re-growth of willow seedlings has been observed. During the summer of 2013-14, a spray programme was implemented which saw much of this re-growth killed. Although largely successful, follow up spraying will be required in the upcoming summer, as well as every year in the future. This area will not be allowed to re-infest with willow species. Desirable native species such as carex sp. and toi toi have become established and these will be allowed to continue to thrive. As identified in the management plan for the river, any woody plant over 1.5m within the main channel through the flood scheme will be targeted for removal or chemical control.
- e) A change to the river channel was witnessed at Delatours Bend during the September and October 2013 floods. The river breached its banks at the sharp corner leading into Delatours bend and proceeded to erode the height of the peninsula in one section. Although the first flood did not permanently break through, a second flood two weeks later succeeded in permanently changing the course of the river by cutting off Delatours bend. Works have been undertaken in the 2013/14 works season to keep the old channel open, however no attempt has been made to block the new channel. After engineering assessments, it has been deemed that any attempt to block the new channel would likely be unsuccessful, owing to the channel shape in this location.
- f) A river stability issue has been developing over many years in the area of Deep Creek. This has been identified previously and is being monitored. The concern is that during a major flood the river could potentially break out through deep creek and follow its new path to the lake. This is discussed further in section 5.1.
- g) Erosion of river banks through the lower reaches continues to be observed, particularly after high flow events. This is a natural process in the soft, highly erodible sediments that the delta is composed of. This is likely to continue as the river stabilises over time.
- h) Turangitukua funded through the Ngati Tuwharetoa – Genesis Energy Fund have undertaken a river bank willow removal programme over the last five years downstream of Delatours pool. This work has opened the river up creating greater channel capacity. Some localised riverbank erosion has occurred and it may take some years for this new river regime to stabilise. Turangitukua will continue with the management of this area of the river in partnership with Waikato Regional Council.
- i) This work plan relates to the issues in the river that impact on the flood control scheme. The annual monitoring program identifies loss of floodway capacity and erosion that may place river assets at risk. Assessment of the risk and the response in the first instance is managed by the Works Supervisor in consultation with the Zone Manager. Waikato Regional Council's Technical team may be called upon, dependent on the severity or complexity of the issue.

4 Annual works programme

4.1 Works site meeting

In accordance with consent conditions, a pre-works meeting will be scheduled with Works Supervisors, WRC staff, affected parties as listed in section 2, and contractors (if known). The purpose of this meeting is to advise interested parties of the works to be undertaken, the methodologies involved and any mitigation measures, and allow interested parties to raise any concerns with the scope of work so as they can be addressed before work plan is finalised.

4.2 Description and nature of works

Scheduled works during the 2014-2015 year primarily will involve maintenance of existing structures and vegetation control through the flood scheme. The main work will be the continuation of maintenance of the Herekieke stopbank and erosion protection structure. This is detailed in section 4.5. Other work will be vegetation management (generally a permitted activity). The scale of this is detailed in section 4.6.

Emergency works, such as after flood events, may be undertaken on occasion. In this case every effort will be taken to notify representatives from the parties listed in section 2 above.

4.3 Primary consideration of timing of works

The Tongariro River is a nationally significant Trout fishery. As such the timing of consented in stream works are limited to the months outside of May to October inclusive. This ensures work falls outside of the main trout spawning season.

The river is an internationally renowned trout fishing location. Although Trout fishing is popular all year, the least fishing activity on the river generally falls over the warmer summer months. For this reason most of the works will be scheduled for mid to late summer. This will also coincide with seasonal low river levels. Representatives from DOC will be consulted at various stages prior to the works commencing to ensure the best possible outcomes in the event of late spawning runs or other such natural events.

Other recreational activities on the river include whitewater rafting and kayaking. The works planned for this year will have no impact on these activities.

4.4 Monitoring and mitigation

All works will be carried out in accordance with the conditions of these consents. Monitoring and mitigation measures are outlined in the detailed work plan in section 4.5.

4.4.1 Best practice guidelines

All works will be carried out in accordance with Waikato Regional Council's Best Practice Environmental Guidelines – Vegetation Management & Instream Works.

4.4.2 Other mitigation measures

4.4.2.1 Fishing and recreational access

Access to fishing and recreational activities will be retained wherever possible. Access will only be restricted to work sites during hours of operation, and only to the small area where work is being carried out to ensure public safety.

4.4.2.2 Hazardous substance spillages

All machinery will be refuelled, serviced and maintained in manner to ensure spillages of contaminants are prevented; and in a location that should a spill occur it will not enter a water way.

Spill prevention and response activities will be undertaken in accordance with the Waikato Regional Council's Oil Spill Contingency Guidelines – River and Catchment Services Operations.

Detailed spill prevention and response plans for each contract will be made available as part of the contract process. This plan will include lists of hazardous materials such as fuels, measures undertaken to prevent spills, work site map showing refuelling locations and fuel storage areas.

4.4.2.3 Dust

It is expected that dust emissions from these works will be minimal. However, should dust become an issue which may result in an objectionable or offensive effect beyond the work site boundary, works shall cease until appropriate dust suppression measures are put in place. These measures may include the use of water carts or irrigation on the exposed areas; and slowing or minimising vehicle movement.

4.4.3 Consent compliance monitoring

A resource consent compliance monitoring regime has been developed in consultation with the Resource Use Group (RUG). The RCS Environmental team will be implementing this process.

All relevant resource consent conditions will be monitored and assessed. A Compliance Audit Report will be drafted, and reviewed by RUG prior to approval. This report will identify any areas of non-compliance and identify any remedial actions undertaken to rectify this non-compliance.

A representative number of sites will be selected for monitoring, based on the scale, location and sensitivity of the proposed sites.

4.5 Work plan: Herekieke stopbank maintenance

The riprap erosion control structure on the stopbank adjacent to Herekieke St has been identified previously as requiring some localized top up. A three year maintenance program was started in the 2013/14 works season, with approximately 75m of rock face being bolstered with imported rock. This year we aim to continue this work, with the upper and lower section being topped up. The plan will be the same as the last year, as follows;

To undertake this work the river channel on the right will be diverted away from the right bank by shifting deposited river material from the centre island to form a bund upstream. This will separate the work site from the main flow of the river and allow machinery to work without impacting on the main channel.

Rock will then be placed as required onto the face of the structure from the Herekieke St reserve. It is predicted that this work will take approximately 2 weeks.

Due to the highly visible and potentially sensitive location here the works will be undertaken with a high level of consultation, particularly with Turangatukua, DoC and fishery advocates. The bridge pool itself is a renowned fishing location and will need to

be retained as far as possible. It is not anticipated that this work will disturb the main pool itself, however the tail end of the run below may be re directed away from the right bank.

As this structure is quite large, it is anticipated that a 3 year work programme be undertaken, in which the worst parts of the structure will be addressed first, and follow up maintenance will be completed in successive years.

| Tongariro River, Turangi. Herekieke stopbank and erosion structure Map Ref NZMS260 | |
|---|--|
| Nature of works | <ul style="list-style-type: none"> • Repair of erosion control structure. Placement of rip rap rocks along face of stopbank. |
| Scale, timing & duration | <ul style="list-style-type: none"> • 100 lineal metres of bank erosion protection. • Scheduled Late January- February 2015 • 3 weeks to complete |
| Receiving environment | <ul style="list-style-type: none"> • Stony bottomed channel. • Residential and recreational land use surrounding the river downstream. • No recorded archaeological sites. • No legal water takes recorded within 500m downstream of the works (including permitted activities). |
| Significant species/habitat | <ul style="list-style-type: none"> • Tongariro River is classified Trout Fisheries and Trout Habitat, and Significant Indigenous Fisheries and Fish Habitat water classification. |
| Mitigation measures | <ul style="list-style-type: none"> • Minimise disturbance of main channel by undertaking bunding with local material. • Undertake works during period of low flow. • Sedimentation of main flow to be minimised through bunding. • Use modern and well maintained machines to avoid leaking of engine oil • Time work outside of main fishing season. • Minimise restriction of fishing access. • Follow Best Practice Guidelines. |
| RC Condition assessment | <ul style="list-style-type: none"> • c.8- Public access will not be unduly restricted. • c.9– Works are scheduled for outside the fishery timing restrictions • c.11- Limited hours of operation (Mon-Sat, 8am-6pm max) • c.14- Machinery will be cleaned prior to entering work site. • c.15-16- Minimise time in flowing water. • c.17- Machinery operated in accordance with best practice. • c.18-20- Spill prevention plan to be identified and addressed. • c.22-28, 29-30- Best practice for sediment will be applied. • c.36- Dust emissions to be monitored and managed. |

- c.37-39- Notification and work plan to be circulated.

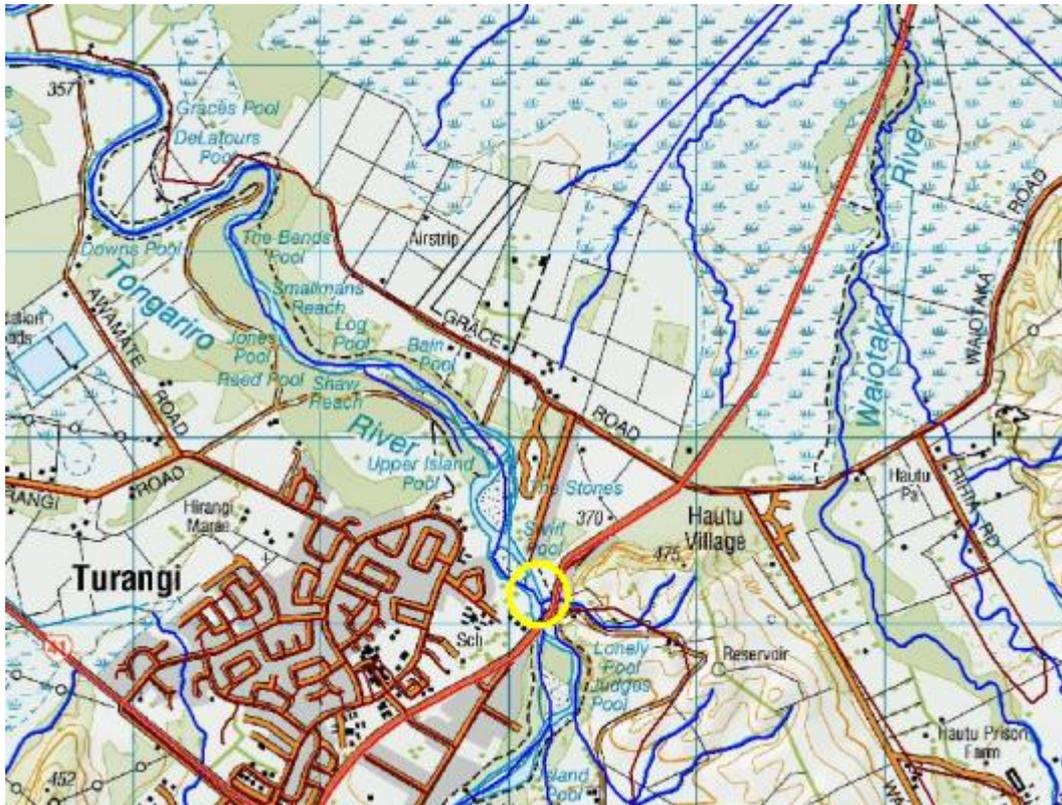


Figure 1 Location of works



Figure 2 Location of works



Figure 3 Works during 2013/14 rip rap top-up.



Figure 4 Herekieke St erosion protection after Rip Rap top up.

4.6 Tongariro River vegetation management

River flood modeling of the outcome of the 2011/12 removal of scrub and willow infestation from the floodway shows that the 100 yr modeled flood level adjacent to Tongariro Lodge have been lowered due to this vegetation management.

The bulk of this area has mostly been mechanically cleared with some of the smaller vegetation established in the last few years sprayed. For the continued elimination of willow and other larger woody species within the floodway further work will be required

on an ongoing basis to keep these areas free of dense vegetation that impede flood flows (Figure 3).

Low growing vegetation or grass varieties are the preferred species for ground cover within the floodway. This vegetation cover should be fully achieved in the next 3-4 years but as stated this will require continued vegetation management.

Similarly above the bridge some vegetation clearing is required. This will be carried out in the main using chemical means. The areas identified in figures 4 and 5 have been identified due to the vegetation at these sites restricting the floodway such that there is additional pressure on existing structures or the floodway itself. The existing stop-bank freeboard in this reach of floodway above the bridge exceeds the design and currently does not require any gravel extraction.

As stipulated by permitted activity rules, notification for the spray works will be via advertisements placed in local papers advising of the spray programme for Tongariro for the 2013-14 season. In addition, appropriate signage will be in place in the days leading up to spray programme as well as while the spraying is being undertaken.

Chemicals used for each spray programme will be assessed to be appropriate for the site and purpose. All spraying will be undertaken by Growsafe accredited contractors.

The maps below provide a general overview of where plant pest control will be focused. Other areas may be targeted as and when they are identified.

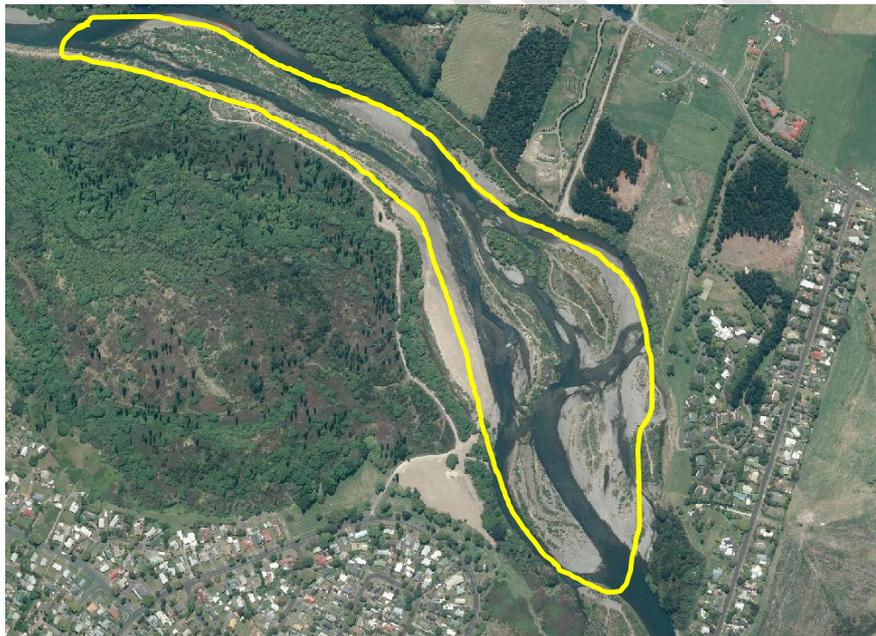


Figure 5 Vegetation management through lower flood scheme



Figure 6 Vegetation management through centre of flood scheme

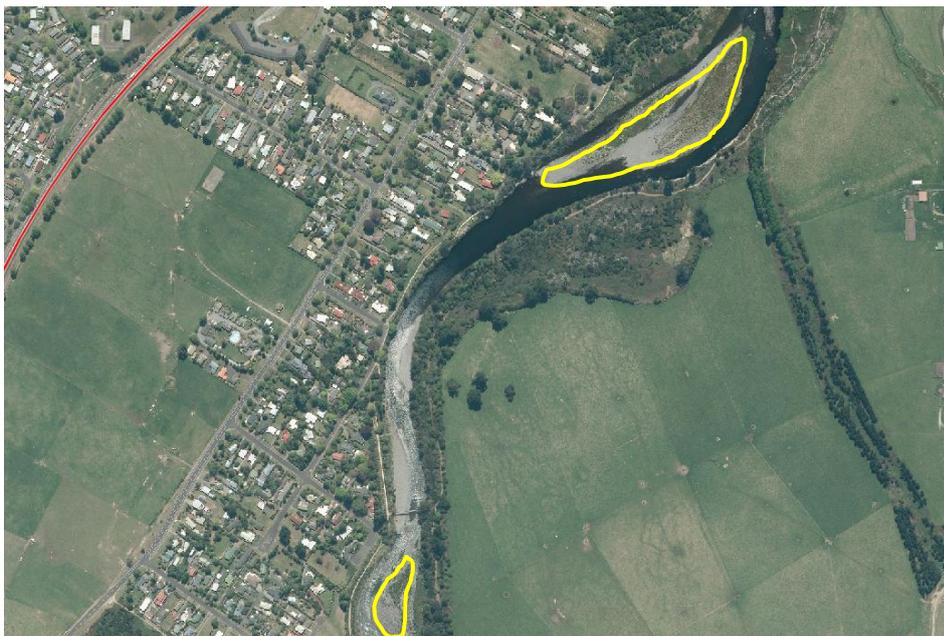


Figure 7 Vegetation management through upper flood scheme.

4.7 River cross section surveys

Cross sections throughout the flood scheme are scheduled for the 2014/15 season. The purpose of these cross sections is to monitor gravel build up through the scheme to ensure there is adequate flow capacity in order to meet the schemes 1 in 100 yr flood design level of service.

These cross sections are undertaken at least on a 5 yearly basis, or when required after significant flood events.

In order for the cross sections to be undertaken, some vegetation control will be required to open up survey lines across each of the 21 cross sections.

4.8 Delatours bend maintenance

The short term options for the river break through at Delatours are to undertake some minor ongoing work to encourage a stable river channel.

The work required will involve removal of a small amount of debris in the channel as and when it arrives, generally after flood events. This will be assessed after each event to determine its effect on the river channel. The purpose of this is to encourage the old river channel to stay open, and encourage a good percentage of flow to stay flowing through this channel. This will keep the old channel operating to ensure fish habitat and angler opportunities. The new channel will not at this stage be attempted to be closed, and will be allowed to develop as the river dictates. However, by shaping the inside of the bend to prevent as much as possible any erosion on the right bank, we will hopefully relieve pressure to the far side. This work is shown in figure 6.

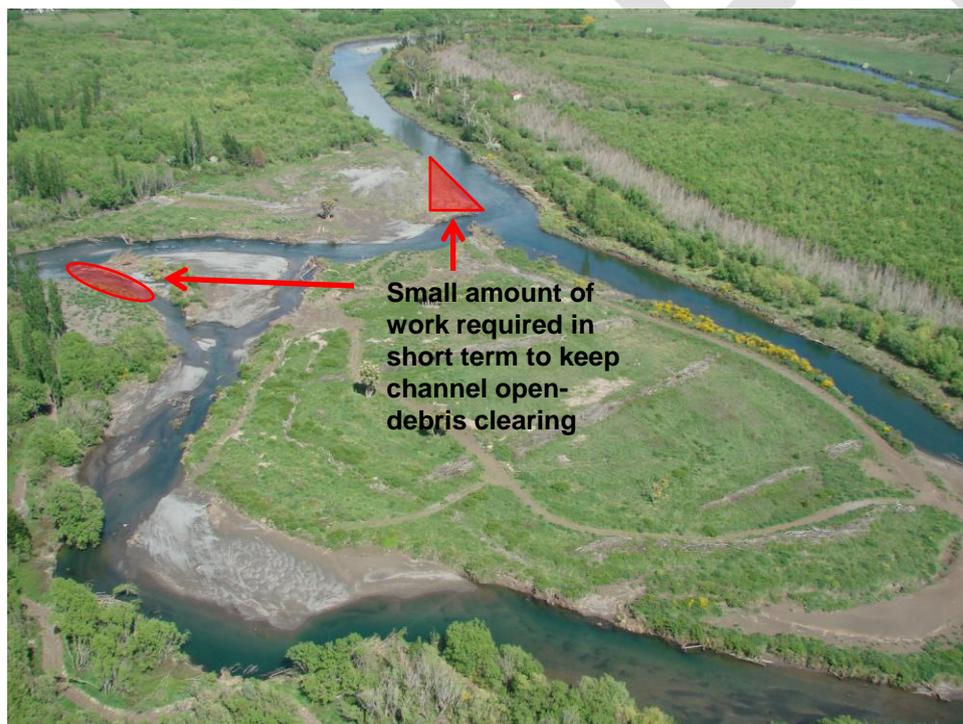


Figure 8 Delatours bend works

4.9 Improved angler opportunities

After recent discussions with DoC fishery staff and various angler interests, an attempt will also be made to improve angler opportunity in the braids area. While WRC has a machine in the area, it will attempt to drag a small amount of debris out of select small areas of the river channel in this area. This will be done under DoC supervision in an attempt to get best bang for buck as far as angler opportunity is concerned. This area has been identified as it is relatively stable, and has good access for vehicles for those who have less mobility.



Figure 9 Area for improved angler opportunity

4.10 Wilding pines

The Advocates of the Tongariro River and DoC have highlighted the wilding pines in the river channel as an issue. The Advocates have received funding for wilding pine control; and have contracted out some of the works to have some of the pines poisoned. WRC have indicated to investigate the removal of some of the larger trees using professional services, particularly any trees which could pose a threat to the flood scheme lower down the river.

WRC will also be targeting any wilding pine appearing within the flood control scheme. These will be poisoned or felled, and in some cases mechanically chipped.

5 Other river issues not within flood scheme

5.1 Potential flood avulsion through Deep Creek

The Tongariro River main channel has undergone many changes in its history. The mouth where it enters Lake Taupo has relocated many times in the past, swinging through various sections of Southern Lake Taupo. This is a natural pattern of river geomorphology, and occurs primarily over successive flood events.

At present a headward eroding arm is forming from Lake Taupo and heading towards the main river. This arm is known as Deep Creek. This has been forming for many years, and its slow creep upstream continues today.

It is thought that there is a very real possibility that the river could break out through this arm during a significant flood event. This would likely form into a permanent channel and would change the river landscape significantly.

WRC is monitoring this arm, particularly after flood events. WRC will be working with stakeholders to determine what should be done to assist with stabilising the area to prevent the river from working its way into this channel.



Figure 10 Location of Deep Creek



Figure 11 Potential future channel through Deep Creek

Appendix 1 Resource consent conditions

General conditions for Resource consent numbers 121305 and 121306

1. The activities authorised by this consent shall be undertaken in general accordance with the documents titled “*Land Use & Water Resource Consent Application and Assessment of Environmental Effects for the Tongariro River Gravel Management - Revised October 2010*”, Sherie McHardy, Taupo Planning Consultant & Design Services except as otherwise identified in the following resource consent conditions.
2. A copy of this resource consent shall be kept onsite at all times that physical works authorised by this consent are being undertaken, and shall be produced without unreasonable delay upon request from a servant or agent of the Waikato Regional Council.
3. The Consent Holder shall notify the Waikato Regional Council in writing of the commencement of activities authorised by this consent, at least 5 days prior to discrete sections of work authorised by this consent commencing.
4. The Consent Holder shall appoint a representative(s) prior to the exercise of this resource consent, who shall be the Waikato Regional Council’s principal contact person(s) in regard to matters relating to this resource consent. The Consent Holder shall inform the Waikato Regional Council of the representative’s name and how they can be contacted at least 1 working day prior to the commencement of the works authorised by this resource consent. Should the representative(s) change during the term of this resource consent, the Consent Holder shall immediately inform the Waikato Regional Council and shall also give written notice to the Waikato Regional Council of the new representative’s name and contact details.
5. The Consent Holder shall arrange and conduct a pre-works site meeting each year that works are proposed and invite, with a minimum of 10 working days notice, the parties listed in condition 38, the Waikato Regional Council Resource Use Group, the site representative(s) appointed under condition 4 of this consent, the contractor if known, and any other party representing the consent holder, prior to commencing the consultative phase of each Proposed Annual Works Programme detailed in condition 37 below.

Advice Note: *In the case that any of the invited parties, other than the site representative does not attend this meeting, the consent holder will have complied with this condition, provided the invitation requirement is met.*

6. The Consent Holder shall be responsible for all contracted operations related to the exercise of this resource consent, and shall ensure contractors are made aware of the conditions of this resource consent relevant to their work area, and comply with those conditions.

Notices

7. The Consent Holder shall erect and maintain notices upstream and downstream of each section of the works not less than 5 working days prior to the commencement of the works. These notices shall provide appropriate warning of:

- a) the proposed works;
- b) any relevant safety advice;
- c) the period over which these works will be occurring.

Access to Tongariro River

8. The Consent Holder shall, in respect of the works authorised by this resource consent, maintain any existing public access at any location where works authorised by this consent are carried out except where the public are required to be excluded for safety purposes. In the latter situation, every effort must be made to ensure that through or by-pass access to up or down river locations is either available or provided.

Timing of works

9. Works authorised by this consent shall not be undertaken in the wet river channel during the months May to October inclusive each year, except where:
- a) flood flows have resulted in stopbank freeboard loss and the remaining freeboard in the reach upstream of the bridge being less than 150mm and/or the remaining freeboard in the reach downstream of the bridge being less than 400mm; or,
 - b) there is a reduction in a cross sectional area which is more than the product of 0.30 times the design width at the design flood level, or
 - c) erosion control works to maintain the integrity of the Tongariro River Flood Control Scheme are required.
10. The Consent Holder shall provide survey information to the Waikato Regional Council confirming the trigger levels set in 9a or 9b above have been met prior to undertaking works provided by condition 9.
11. Works may be undertaken up to a maximum of 10 hours per day during the period 8am to 6pm; and, up to six days per week Monday to Saturday. No works shall be undertaken on a Sunday or a Public Holiday.
12. The Department of Conservation shall be notified prior to any works occurring during the months of May to October.
13. The Consent Holder shall check daily and weekly weather forecasts. In the event of a rain forecast which could result in flood flows which may, in conjunction with undertaking the works authorised by this consent, adversely affect the Tongariro River environment, the works shall be postponed, or be suspended if already commenced, and all machinery shall be removed from the river bed and flood plain until the identified flood risk has passed.

Machinery maintenance and hazardous substances spill prevention and response plan

14. The Consent Holder shall ensure that all machinery used in the exercising of this consent is cleaned prior to being transported to the construction site to ensure that all seed and/or plant matter has been removed.
15. All machinery, including bulldozers, loaders, diggers and trucks, shall be operated in a manner so as to minimise time spent in flowing water.
16. No river-bed material extraction shall be undertaken in flowing water.
17. The Consent Holder shall ensure that all machinery shall be maintained and operated in a manner which ensures that spillages of fuel, oil and similar

contaminants are prevented. Particular care shall be taken during refuelling and machinery servicing and maintenance. Such activities shall be carried out away from any water body and in such a manner that any spillage can be contained so it does not enter the Tongariro River.

18. The Consent Holder shall provide the Waikato Regional Council with a “Spill Prevention and Response Plan” at least 20 working days prior to the commencement of activities authorised by this consent. This Plan shall be submitted to the Waikato Regional Council for their written approval, acting in a technical certification capacity. The aim of the Plan shall be to minimise the possibility of contamination of water. This Plan shall address, but not necessarily be limited to, the following matters:
 - a) a list of the hazardous materials and their quantities kept on site and their storage details;
 - b) the prevention measures that will be undertaken on site in order to avoid a spill of hazardous materials;
 - c) the equipment available to contain and/or remove spills of hazardous materials;
 - d) specific procedures and measures that will be undertaken when machinery is operating within close proximity to water bodies that are designed to minimise the risk of any spillages or significant leakages of hazardous materials entering the water body;
 - e) the training staff will receive in the use of hazardous materials spill prevention, containment and clean up measures and associated equipment;
 - f) how the disposal of any contaminated materials arising from spills or leakages of hazardous materials will be undertaken; and,
 - g) the procedures involved in reporting of any such incidents to the Waikato Regional Council.
19. The Consent Holder shall in exercising this consent comply with the approved “Spill Prevention and Response Plan”. Any subsequent changes to the “Spill Prevention and Response Plan” shall only be made with the prior written approval of the Waikato Regional Council, acting in a technical certification capacity.
20. The Consent Holder shall notify the Waikato Regional Council and the Department of Conservation as soon as is practicable, and as a minimum requirement within 12 hours, of the Consent Holder becoming aware of a spill of hazardous materials, fuel, oil, hydraulic fluid or other similar contaminants. The Consent Holder shall, within 7 days of the incident occurring, provide a written report to the Waikato Regional Council, identifying the following:
 - a) the possible causes;
 - b) steps undertaken to remedy the effects of the incident; and,
 - c) any additional measures that will be undertaken to avoid future spills.

Responsibility for erosion control works

21. The Consent Holder shall be responsible for the provision and maintenance of any erosion control works that may be necessary as a result of the exercise of this resource consent.

Sediment control and debris removal

22. The Consent Holder shall ensure that sediment losses to natural water arising from the exercise of this resource consent are minimised for the duration of the works and during the term of this consent.

23. Stormwater runoff from the river-bed material extraction area access road shall be controlled to such an extent that it is discharged into the ground and not discharged directly into the Tongariro River.
24. River-bed material shall only be removed below the adjacent River water level when the excavation site is bunded from direct surface connection with the River.
25. Excavations below water level shall be backfilled to a level not deeper than 1m below the adjacent river channel water level using river bed material from within the site. Inlet and outlet channels shall be provided to a depth similar to that of the completed backfilled area to maximise continuous river flows through the site. A minimum buffer of 10m from the undisturbed river channels shall be left intact.
26. Debris collected during river-bed material extraction shall be removed from the river bed and the floodplain of the river.
27. Should the works authorised by this consent cause a conspicuous change in the visual clarity of the river after a mixing distance of 100 metres downstream from the activity, then the consent holder or its delegate shall measure the concentration of suspended solids in the river at this location and upstream from the activity and provide those measurements to the Waikato Regional Council within 10 working days.
28. The activities authorised by this consent shall not result in any of the following standards in the Tongariro River being breached after reasonable mixing and at a point 100m downstream of the works:
 - a) black disc horizontal visibility less than 1.6 metres;
 - b) a conspicuous change in the visual clarity of the river;
 - c) An increase in the concentration of suspended solids above 25g/m^3 after a mixing distance of 100 metres downstream from the activity except when the concentration of suspended solids in the Tongariro River above the work site is greater than 25g/m^3 . Then there shall not be any increase in the Tongariro River suspended solids concentration as a result of the activity.

Flow diversion and re-contouring

29. The Consent Holder shall, immediately after the construction of each temporary diversion bund either maintain fish passage past the bund or, in conjunction with the Department of Conservation, salvage any fish stranded in pools in the diverted section of river channel and return them to the main channel of the Tongariro River.
30. Except as provided for by conditions 24-25, on completion of river-bed material extraction at any one location, the Consent Holder shall re-contour the surface of the extraction area back to its original form, to the satisfaction of an officer of the Waikato Regional Council's Resource Use Group.

Erosion control structures

31. Structures and floodways in the immediate vicinity of structures shall be maintained clear of debris.
32. Structures shall not decrease the cross sectional area of the river.
33. All construction materials and equipment shall be removed from the river upon completion of the activity.

34. Where the weight of the structure is insufficient to keep it in place it shall be permanently anchored to the bed of the river.

35. All structures shall be maintained in a structurally sound condition at all times.

Dust emissions

36. All activities undertaken on site shall be conducted and managed in a manner that ensures that all dust emissions are kept to a practicable minimum. To this end there shall be no discharge of dust as a result of the activities authorised by this consent that causes an objectionable or offensive effect beyond the boundary of the property on which works are authorised by this consent.

Proposed annual works programme

37. The Consent Holder shall prepare a Proposed Annual Works Programme including (but not limited to) the following:

- a) details of scheduled works and maintenance requirements authorised by this consent that are to be carried out for the 12 months commencing 1 November including a description of the nature, scale and location of the works; and
- b) the proposed timing of the works; and
- c) any contingency procedures that may be required for specific activities; and
- d) any specific mitigation measures that will be undertaken; and
- e) riparian planting proposed using eco-sourced indigenous plants;

Any changes to the Proposed Annual Works Programme (with the exception of works required to be undertaken without delay, for example, unscheduled works in response to flood events) shall be advised in writing by the Consent Holder to the Waikato Regional Council within 10 working days of the work commencing.

38. The Consent Holder shall distribute the Proposed Annual Works Programme required by condition 37, to the following parties on or before 30 June each year requesting comment(s) on the proposed works (if any) to be provided in writing within 20 working days of receipt:

- a) Department of Conservation;
- b) Tongariro and Lake Taupo Anglers Club Inc.;
- c) Advocates for the Tongariro River;
- d) Taupo Fishery Advisory Committee via DOC;
- e) Tuwharetoa Maori Trust Board; and
- f) Ngati Turangitukua,
- g) Genesis Energy; and,
- h) Waipapa and Tokaanu Maori Lands Trust.

Comments received by the Consent Holder from the above parties regarding the proposed works shall be copied to the Waikato Regional Council.

Any changes to the Proposed Annual Works Programme (with the exception of works required to be undertaken without delay, for example, unscheduled works in response to flood events) shall be advised in writing to the groups listed in this condition.

39. The Consent Holder shall address any comments from the parties listed in condition 38, and upon completion of any related changes to the Proposed Annual Works Programme, advise these parties in writing of any changes. The Consent Holder shall submit the Proposed Annual Works Programme to the Waikato Regional Council prior to 1 October annually. The Consent Holder shall not commence these works until the Proposed Annual Works Programme has been approved by the Waikato Regional Council acting in a technical certification capacity.

Tangata whenua values

38. In the event that any archaeological remains are discovered, the works shall cease immediately in the vicinity of the discovery, and Tangata Whenua, the Historic Places Trust and the Waikato Regional Council shall be notified as soon as practicable and within 48 hours of a discovery. Works may recommence with the written approval of the Waikato Regional Council. Such approval shall only be given after the Waikato Regional Council has considered:

- a) Tangata Whenua interests and values,
- b) the Consent Holder's interests,
- c) Historic Places Trust advice, and
- d) any archaeological or scientific evidence.

Review

39. During the April to June period each year for the term of this consent Waikato Regional Council Resource Use Group may, following service of notice on the Consent Holder, commence a review of this consent under section 128(1) of the Resource Management Act 1991, for the following purposes:

- a) To review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or
- b) To review the adequacy of and the necessity for monitoring undertaken by the Consent Holder and specifically to review the method and frequency of record collection for the purposes of determining the most appropriate method and frequency; or
- c) If necessary and appropriate, to require the holder of this resource consent to adopt the best practicable option to remove or reduce adverse effects on the environment.

Administration

40. The Consent Holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.