

Report No.	21-47
Decision Required	

RIVER AND DRAINAGE ENGINEERING REPORT

1. PURPOSE

- 1.1. The purpose of this item is to report on progress with river and drainage activities for the period December 2020 - March 2021.

2. RECOMMENDATION

That the Committee recommends that Council:

- a. receives the information contained in Report No. 21-47.

3. FINANCIAL IMPACT

- 3.1. Funding provision for all activities reported on in this item is either included in the River and Drainage General or River and Drainage Schemes Activity sections of the 2018-28 **Long-term Plan (LTP)**; is covered by an approved carry-forward of unexpended budget from the 2019-20 financial year; or additional approval will be specifically sought by way of recommendation in the item.

4. SIGNIFICANT BUSINESS RISK IMPACT

- 4.1. There are no significant risks relating to the adoption of the recommendations contained in this report.

5. CLIMATE CHANGE IMPACTS

- 5.1. While this item doesn't specifically consider climate change impacts clearly climate change is a significant influence for the activity as a whole, reflected in the fact that the current 30 Year Infrastructure Strategy highlights climate change as a significant issue.

6. DISCUSSION

- 6.1. This period is typically a busy one for river management, with scheme meetings coinciding with the summer construction period. (a large part of the financial year's budget is spent over this period). Layer in the LTP update process, the green light to some key infrastructure projects, (Te Puwaha, the Lake Horowhenua Boat Ramp) and the gearing up to deliver the Climate Resilience Projects and not surprisingly it's proved to be particularly busy.
- 6.2. Scheme meetings commenced in mid-March and a number have already been completed with the remainder scheduled for completion by mid-April. Attendances have been on the low side, not surprising given the relatively benign weather conditions (a general correlation).
- 6.3. Progress in delivering the Climate Resilience projects was summarized in a report to the March **Audit, Risk and Investment (A,R&I)** Committee meeting; without duplicating the full

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content of that report implementation is generally behind the programme outlined in the funding agreement although substantial momentum is building across the Foxton, Palmerston North and Rangitikei projects. As noted to the A,R&I Committee meeting this is not unique to Horizons, part of a wider sector challenge in responding to substantial investment by central government for the first time in 30 years.

- 6.4. The **Lower Manawatu Scheme (LMS)** is intended to receive the biggest slice of Climate Resilience Investment but is lagging behind the other three projects. That's in part attributable to scope – the other three were more fully developed / easily defined as projects at the time the request for shovel ready projects to fund was received. The March workshop, along with some other changes, should see that momentum build through 2021.
- 6.5. Staff have been taking some first steps associated with the **Local Government Act (LGA)** Section 17a review of river management activity. S17a essentially requires Councils to periodically review how services are best delivered (optimal balance between out-sourcing and in-house delivery). An interactive RFT process is currently underway with a view to appointing a consultant later in the month. It is intended to look at both maintenance / construction and technical capability.
- 6.6. Late this month or early next month will see Horizons reach a notable milestone – the completion of the flood protection upgrade work for the Rangitikei Scheme initiated following the 2004 floods. Somewhat in the shadow of the larger investment made in the LMS that has run in parallel, this project has seen flood protection for the communities on either side of the lower reach of the Rangitikei River substantially improved. As noted before to members, the Climate Resilience project dovetails nicely with this project, turning the focus from gross protection standards to resilience and some broader complementary outcomes. Staff are working with the Communications Team to ensure the project completion is suitably celebrated.
- 6.7. Staff have over the period been in discussion with **Horowhenua District Council (HDC)** staff over the condition of the Foxton Boat Ramp, the overall 'fix' and what level of contribution from Horizons would be appropriate (acknowledging the integral issues at that location and the wider community benefit that the boat ramp provides). Horizons is making a relatively small contribution to the construction cost through both the LMS and the regionally rate-funded amenity enhancement fund.
- 6.8. In March I met with the Rangitikei District Mayor and Chief Executive to discuss on-going drainage / flooding issues at Koitiata close to the Turakina River mouth. These issues have been ongoing over many years, related in part to the particular state (at any given time) of the river mouth, issues that climate change induced sea level rise will exacerbate. They are also issues that sit outside the Turakina Scheme.
- 6.9. One of the more unusual non-scheme issues that arose over the period occurred adjacent to the Ohau River in the Kimberley Reserve – the threat the river is posing to a mature Rata tree in the Reserve. Although HDC are providing the bulk of the funding Horizons has agreed to fund the work as an environmental grant and for river management staff to manage the work, arguably a little at the margins of the environmental grant mandate.
- 6.10. From a resourcing perspective a number of new staff have started over the period, in part related to secondments associated with delivering the climate resilience projects but also to cover maternity leave and impending retirements, agility being the order of the day. As noted at the last meeting, substantial investment in plant has occurred over the last 12 months, culminating this month in the delivery of a new truck and transport trailer, replacing very well used pieces of equipment.

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7. INVESTIGATIONS AND DESIGN

- 7.1. Over this reporting period there has been high demand to provide comment on a number of Plan Changes around the Region, in addition to significant infrastructure developments, such the Otaki to North Levin roading project and the KiwiRail freight hub development.
- 7.2. Investigations and Design Staff have also been working alongside the Science and Innovation Team on the risk register associated with swim spots that are monitored as part of the swim in our region campaign, ensuring Health and Safety risks in particular are systematically managed.

ARAWHATA STREAM AND HOKIO DRAINAGE NETWORK STUDY

- 7.3. Consultants Tonkin and Taylor have completed their technical work and the associated report has now been finalised. This work will now be integrated with that being undertaken to develop plans for the Arawhata Sediment Trap as part of the Jobs for Nature package of works.
- 7.4. This next stage will develop an optimal design for the Arawhata Drainage Network and a budget for carrying out the necessary works.

KOPUTAROA SCHEME REVIEW

- 7.5. The review of the Koputaroa Scheme is a significant piece of work as it seeks to understand the multiple issues and drivers that will shape the Scheme's operations and management well into the future. It was intended to present the final document to this meeting but the range / volume of competing demands meant this was not possible.

OHAU-MANAKAU SCHEME REVIEW

- 7.6. This work is being progressed along with a study of the gravel resource in the Ohau River, as gravel management is an integral part of a sustainable / functional scheme. To date meetings have been held with the Southern Area Team to understand key issues. Staff have begun to meet with local Iwi / hapū to ensure both mātauranga Māori and the interests of Tangata Whenua are reflected in the review.
- 7.7. To support staff with some of the technical work required consultants Stantec have been engaged to carry out hydraulic modelling work. As well as helping to inform the review, this modelling work will also provide valuable information for the Hazard Mapping project, important for a rapidly growing part of the region.

ASHURST SCHEME REVIEW

- 7.8. This review is looking at how the Ashhurst Scheme needs to operate into the future considering the pressures associated with climate change, as well as the continuing growth of Ashhurst. Consultants have been engaged to build upon a hydraulic model built for the **Palmerston North City Council (PNCC)** to better understand current levels of service and the investment required to increase that level of service.

8. CENTRAL AREA

- 8.1. This reporting period saw relatively isolated periodic heavy rainfall events followed by prolonged dry spells throughout January and February. River levels dropped quickly after each rain event however they have remained slightly higher than this time last year.
- 8.2. Over the period scheme staff have met with representatives from several Manawatū Iwi (Rangitāne, Kauwhata and Whakatere) with more regular catch up opportunities being planned going forward. These meetings look to strengthen the relationship between Iwi and the Central Team.
- 8.3. Work associated with raising the height of the Burkes gates to the level of the adjoining stopbanks (part of the Rural Upgrade Project) were completed in January. That required

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structural steel plates to be affixed to the top of the existing gates. Reinstatement of fencing and final sign off will be completed within the coming weeks.

- 8.4. Staff have continued to work closely with Horizons Biodiversity Team to respond to the discovery of alligator weed and Sagittaria in the Mangaone Stream and tributaries. Alligator weed, along with root material, was mechanically removed from a site near Highbury Avenue Bridge. Sagittaria was mechanically removed from one location in the Mangaone Stream along with a large stretch of drain alongside Pioneer Highway. Inspections, monitoring and removal efforts for both are ongoing.
- 8.5. Rabbits remain an issue in several locations across the Scheme. A trial using a geogrid material to prevent rabbit damage will be installed in the coming weeks on the right bank of the Mangaone where rabbits have continued to burrow through previous repairs using hard facing material.
- 8.6. Staff have been involved with the Kitchener Park Trust members in relation to a pest plant (Phragmites Karka) that is invasively growing alongside the Makino and into the Park. Staff are committed to working with Trust members on the health of the Park recognising both the value of the remnant forest and the impacts the Scheme has on the Park.
- 8.7. Work has recommenced on the Kara Creek stopbank upgrade, part of the Rural Upgrade Project.

LOWER MANAWATŪ SCHEME

- 8.8. Works undertaken on the various rivers within the Scheme this period include the following:

MANAWATŪ RIVER

- 8.9. Survey of the gravel beaches is being undertaken to see what the impacts of gravel build-up / beach development are on the alignment of the Manawatū River between Palmerston North City and Ashhurst and to define a management approach. This matter is intended to be workshopped with Council.
- 8.10. Debris has built up on both the Pohangina Rail Bridge and SH 3 Napier Road Bridge across the Manawatū. Staff have been working with KiwiRail and a common contractor to have this removed before winter and are hoping to have consent from KiwiRail within the coming weeks to undertake these works on their behalf.
- 8.11. Staff are working with PNCC around the timing for burning the debris at The Fitzroy Groynes. PNCC are hoping to hold another Matariki celebration at the site in June which will incorporate the burning of the debris piles.
- 8.12. Staff have continued to monitor, meet and work with PNCC across various projects this reporting period. These included the continuation of the river entranceway works within the Esplanade; appropriate areas for wild flowers; assisting with the Summer Shakespeare event (location / flood hazard advice and additional vegetation maintenance); progressing the river pathway extension upstream of Riverside Drive; willow clearing and channel maintenance advice within tributaries; installation of the Proverb Pathway at the Steps of Tane; assistance and advice around future events within the river corridor.
- 8.13. Staff are continuing to assist PNCC around the development of the Marae Tarata area, previously used as a gravel extraction site near the transfer station on Tip Road in Awapuni.
- 8.14. Staff have also been involved in a workshop run by the Rangitāne and PNCC partnership for Te Motu o Poutoa (ANZAC Park). This is around development of this historical site and potential significant as a cultural and welcoming site for Palmerston North.
- 8.15. The mowing contract for the City that was put out for tender at the end of the last reporting period has been awarded. This is a combined term maintenance contract with the City (that has the larger share of the work) as the Contract Principal. This has some savings (albeit relatively modest) for the LMS.

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- 8.16. The removal of the Whirokino Trestle Bridge was completed early this reporting period with no word as yet to the decision from **New Zealand Transport Agency (NZTA)** around whether or not the old Manawatū River Bridge will be removed or left for pedestrian and cyclist use.
- 8.17. The Manawatū River User Advisory Group met on 6 December with good attendance. General items were discussed in addition to highlighting the discovery of alligator weed in the catchment and an update on the drill pipe navigational hazards above Aokautere.

9. NORTHERN AREA

RANGITIKEI RIVER CONTROL SCHEME

- 9.1. The settled weather conditions over summer have allowed staff to complete a large amount of proactive maintenance work on the river. Even now with the commencement of autumn we are experiencing continued low flows and excellent working conditions.
- 9.2. During this period work commenced on the \$5.2M Rangitikei Climate Resilience Project which is 75% funded from central government (\$3.9M). Senior Engineering Officer Dougal Ross has been appointed Project Engineer for the project, the river management component of the Te Puwaha / Whanganui Port Revitalisation Project as well as the final stage of the Parewanui stopbank upgrade currently under construction.
- 9.3. When the current stage of the Parewanui work is complete this will see the end for the sixteen year-long project that began in Tangimoana back in 2005. This project is expected to be completed on time and within the original budget brief.
- 9.4. The development of a management strategy for the Rangitikei River reached another milestone with the recent scheme meeting, the staff outline provided generating constructive discussion around the current situation and the best way forward. Further development / refinement will take place during the year with drop-in sessions for adjoining / impacted landowners planned for late winter / early spring this year.

Rangitikei Maintenance Works

- 9.5. The Bulls Bridge River Access Track has been graded and re graveled. What appeared to be a log jam upstream of the Bulls Bridge at the local swimming spot was removed for public safety reasons. The logs turned out to be a mass of native Totara, suggesting bed degradation through this reach. The native logs were removed from the channel and provided to the local Parewahawaha (Ōhinepuhiawe) Marae.
- 9.6. A great deal of time has been spent preparing for the annual aerial spray of the Rangitikei River under the new resource consent. The spraying activity is likely to commence on 22 March. Notification of the spray was via letters, newspaper, website and signage at public access points.

RANGITIKEI STOPBANK UPGRADE & CONSTRUCTION OF CONCRETE FLOODWALL

- 9.7. The construction works will see the upgrade of 1,800m of Rangitikei River right bank stopbank from Walmac Farm through to Scotts Ferry on Parewanui Road. In addition to this, the contract also includes the construction of a 22m section of concrete floodwall where the stopbank intersects the Kapuni Gas Line. A wall was required over concerns that a larger compacted earth embankment would place too much load on the gas line. The contract awarded for the stopbank work will see 25,000 cubic metres of earth moved.
- 9.8. The completion of the works will finalise the Parewanui stopbank upgrade that commenced 10km upstream in 2006. The length of stopbank will provide 1 % AEP (100 year) flood protection with an allowance for 25 years of forecast river bed aggradation and 600mm freeboard. The contractor carrying out the work is Cashmore Contracting Ltd. As of the end of March 60% of the stopbank work had been completed.

RANGITĪKEI RIVER ENHANCEMENT / CLIMATE RESILIENCE PROJECT

- 9.9. Horizons Regional Council has recently secured \$5.2 million in funding from central government for the Rangitīkei Enhancement / Climate Resilience project.
- 9.10. The key outcomes / criteria for the project align with the recently created strategy and are as follows:
 - Making the lower section of the scheme more resilient particularly in the face of climate change;
 - Increased recreational access and use of the river corridor;
 - Enhanced biodiversity / environmental values of the river corridor.
- 9.11. The project will focus on the reach of the Rangitīkei River that is downstream of the Bulls SH1 Bridge and is expected to be completed in 2024. The work components involve returning areas of leased pastoral farmland to vegetation to protect the stopbank in conjunction with widening the active channel and managing river alignment through targeted gravel management and vegetation removal.
- 9.12. In addition to the idea of a mobility corridor, a recreational multi use track / route is proposed from Bulls to Scotts Ferry that includes cultural and historical sites along the way. There is also potential to develop wetlands around some of Horizons larger drains. The proposed plans are conceptual only and will be developed over the next three months with input from key stakeholders such as, landowners, Iwi and public. An information kiosk is planned for the Bulls Community Centre.

TE PUWAHA / WHANGANUI PORT REVITALISATION PROJECT

- 9.13. The Horizons component of this project involves strengthening / addressing deferred maintenance of the moles and other river training infrastructure that keeps the lower reach of the river in its present position, enabling navigable access to the port and protection for parts of the City.
- 9.14. A Hui was held with key members of the community and representatives of Te Mata Puau to discuss the Morgan Street rock stockpile site - the impacts and opportunities consistent with the underlying focus on abundance and mauri that underpin the project. Work to form the stockpile area has begun and staff are expecting to begin an RFT process for rock supply shortly.
- 9.15. A series of workshops is currently underway with Te Mata Puau, a core component of the co-design process intended to give effect to the Tupua Te Kawa values contained in the Te Awa Tupua statute.

ENGINEERING ADVICE

- 9.16. In the Ruapehu District a joint council (Horizons and Ruapehu District Council) information day was held at Ohura on 19 January 2021. Over recent years new landowners have settled in Ohura who are unaware of the flooding risk to the community.

10. EASTERN AREA

GENERAL

- 10.1. Due to changes in health and safety policy and the general shortage of contractors available for river works, new contractors have been engaged to work within the Tararua district. These contractors are usually engaged in works for other regional councils and large infrastructure concerns (i.e. Transpower), so bring additional resourcing and skills / expertise to the Eastern Area.

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TARARUA DISTRICT RIVER MANAGEMENT SCHEME

- 10.2. Two large sections of vegetation clearance work have been undertaken in the quarter
- 10.3. The first was completed in the headwaters of the Tiraumea River, at Tiraumea and involved a new contractor utilising large forestry equipment. Over 3 km of willow congestion was removed in a very quick period of time by a single operator. This now expands the possibilities of vegetation clearance methods for the scheme and gives opportunities for large scale remote vegetation clearance to be completed cost-effectively.
- 10.4. The second piece of work involved vegetation clearance on a very congested tributary of the Mangaramarama Stream which was causing flooding issues. A specialist forest contractor was engaged to fell and remove the very old trees. This has very effectively opened the channel and has resulted in an even flow through the awa.

SOUTH EASTERN SCHEME

- 10.5. Channel shaping and clearance was started and completed on the Otomarahu near SH 2. Due to channel congestion the stream was becoming overly sinuous and affecting fences and some farm crossings. The landowner wants to fence and plant the stream in collaboration with the Freshwater Team – stabilising the stream will help achieve this as well as improving water quality by decreasing bank erosion. The only challenge will be agreeing to the offsets required of Schedule B of the One Plan - Streams Valued for Flood Control and Drainage.

UPPER MANAWATŪ – LOWER MANGAHAO SCHEME

- 10.6. Commercial extraction of two large gravel beaches close to the confluence of the Manawatū and Mangahao Rivers has been begun, linked to the Te Ahu a Turanga project. A large amount of metal will be removed from the inside bends adjacent to some significant erosion at Elliot's. This will then be shaped to allow a better conveyance of flow and bank protection work will follow later in the year.
- 10.7. Work is still underway to renew the Gravel Extraction consent, which is held by Horizons and is an integral part of the management of the scheme. This is awaiting signatures from all affected parties.

11. SOUTHERN AREA**GENERAL**

- 11.1. Staff have been working on preparing presentations for the up and coming scheme meeting which started on 22 March 2021.
- 11.2. Staff continue to be heavily involved with the development and testing of the new Asset Management System.
- 11.3. This period has seen the arrival of the replacement truck and trailer unit which will be used (amongst other things) to transport the new excavator.
- 11.4. Shanay Mercer has joined the Southern River Management Team taking up a fixed term contract as a skilled labourer.

MAKERUA DRAINAGE SCHEME

- 11.5. Boundary pump No. 2 has been pulled for servicing and renewal and the replacement of the impeller to improve operational effectiveness at this site. At the same time a new sleeve has been fitted inside the discharge pipe into the pump chamber as the old pipe was badly rusted out.
- 11.6. Okuku Pumpstation the No. 4 pump is being pulled as part of its routine maintenance cycle for servicing and renewal.

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KOPUTAROA DRAINAGE SCHEME

- 11.7. This period saw the pump at station No. 2 pulled out for servicing and renewal.
- 11.8. While the pump was out being serviced a ramp has been installed in drain M2 so a tractor pump can be used to relief pumping to the No.2 area.
- 11.9. An enhancement project related to a part of the Koputaroa scheme - the Koputaroa No.4 pumpstation catchment – continued over the period. The project involves mapping the current network, identifying all the scheme drains and non-scheme drains that feed to the Koputaroa No. 4 station along with identifying which drains have been fence and planted. At the same time all culverts were mapped and a preliminary assessment done on fish passage.
- 11.10. The project is a collaborative one with both Freshwater and Science Staff, a key component being assessing fish mortality rates associated with station operation. Staff installed a net on the outlet of the pumpstation, in place for approximately 6 months. Staff have been regularly monitoring the site and to date have found no signs of fish mortality.
- 11.11. Staff have also been working on an assessment of the aquatic values within the network. During a week long period in February River Management and Science Staff carried out the following assessments:
- Fish surveys - 6 sites throughout the scheme where 2 fyke nets were set and 4 minnow traps installed per site. This will provide information about the fish species present in the network and give an indication of fish passage.
 - Diurnal fluctuations in temperature and dissolved oxygen will be recorded by oxygen / temperature loggers which will be installed at these four sites for a minimum of 7 days during the fishing period.
 - EDNA testing - samples taken and sent to lab to identify the presence of low abundance or difficult to capture fish species.
 - Water quality monitoring-total of four water quality sites will be sampled once a month for 12 months beginning in January 2021. At the time of each sample a SmarTroll reading will be taken to determine dissolved oxygen levels, temperature, pH and conductivity at each site. Habitat assessments (e.g. percent macrophyte coverage and shade) will also be recorded upon each site visit.
- 11.12. Results so Far:
- EDNA sample results: Three samples were collected throughout the drainage network and provided strong indications for shortfin eels and mosquito fish, and weak indications for inanga and goldfish. Brown mudfish were not detected despite being caught at one of the sites.
 - Shortfin and longfin eels, inanga (primary whitebait species), common bully, and, brown mudfish were present throughout the system. Non-indigenous goldfish and mosquito fish were also present, the latter present in high densities throughout the system. This suggests that the fish friendly flood gate is allowing fish to pass through during high flows, particularly due to the presence of inanga which are poor swimmers compared to eels.
 - Nutrients results were adequate in terms of toxicity.
 - One perched culvert – all others were sufficient (they had water in them and not too much sediment so should not hinder fish passage)
 - Water temperature and depth changes random results likely due to water entering system from Manawatū and gravity feeding pump activating.
 - Dissolved Oxygen is extremely low in parts of the system and should be addressed because macrophyte growth is excessive throughout the network.

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- 11.13. Over the next couple of months we will be working with Science Staff to put a report together on the results along with mitigation options. That will be taken back to landowners and tabled to future scheme meetings, as well as presented to Council. We will also be correcting the perched culvert and continuing to monitor the network.

MOUTOA-WHIROKINO DRAINAGE SCHEME

- 11.14. Ongoing issues with both of the Pleuger pumps at the end of the floodway have kept staff busy and at times both pumps have been out of action and localised flooding in the lower reaches of the floodway. Over this period both pumps have been pulled and sent away for servicing. Damage to the seals of the small pump caused by silt / sand in the water meant that all of the seals needed replacing before the pump could be reinstalled.
- 11.15. The large Pleuger pump issues were much more difficult to diagnose and the parts for replacement more difficult to be supplied. This pump is still out and is waiting on parts with it to be reinstalled during the next period.
- 11.16. Ongoing leakage through the wet gates at the end of the floodway continues to be an issue and is resulting in the scheme doing additional pumping to maintain water levels in the spillway. This period saw staff try and fix sheets of timber onto the outside of the northern end gate to block any holes, however, the extent of existing gaps in the timber gates and deformations of the timber boards made it too difficult to get a good seal.
- 11.17. The age and condition of these gates at this site does require that these gates be replaced in the near future to ensure they efficiently hold water out. There is significant cost involved in the replacement of these gates and with the uncertainty around the future use of the lower spillway land and potential abandonment of this structure it does not make sense to undertake such work at until the review of the floodway use is completed.

12. ENVIRONMENTAL GRANT WORKS AND ENGINEERING ADVICE

- 12.1. There are a number of Environmental Grant jobs that are on hold while the applicants confirm funding for their 70% contribution to the work.

2020 – 2021 Environmental Grant work

Name	River or Stream	Job No.	Type of work	Work status	Estimated work cost (\$)	Value of grant (\$)
Cvitanovech	Makiriki	IN	Geo fabric	Approved	\$14,000	\$4,200
Te Rongaroa Marae	Ongarue	IN1511	Rock Lining, Layering Planting & Earth works	Approved – On Hold Awaiting client funding	\$35,354	\$10,606
Palmer	Okahukura Saddle Rd	IN	Vege clearance	Application being prepared	\$23,250	\$6,975
Blue Mountain Adventure Centre	Piopiotea Stream	IN	Rock Lining	On Hold Awaiting client funding		
Friends of Taihape	Hautapu River	IN	Willow Clearance	On Hold Awaiting client funding	\$7,148	\$2,144
Segura – Tuatahi Property	Pungapunga	IN	Bank Protection, Gravel Mgmt	Cancelled	\$18,885	\$5,665
McKay & Larsen	Kiwitea	IN1516	Bank Protection	Approved	\$3196.66	\$958.99
Randall	Tutaenui	IN	Bank Protection	Application being prepared	\$11,878	\$3,563
Hilton Shane	Tapuata Stream	IN1513	Rock Lining	Complete	\$4600	\$1380

13. SIGNIFICANCE

13.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Ramon Strong

GROUP MANAGER RIVER MANAGEMENT

ANNEXES

There are no attachments to this report.