

LOWER MANAWATU SCHEME & ASHHURST STREAM SCHEME

**Responsibilities for the maintenance of
channel management, flood control and river
bank amenity assets within
Palmerston North City**



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LOWER MANAWATU SCHEME & ASHHURST STREAM SCHEME

Responsibilities for the maintenance of channel management, flood control and river bank amenity assets within Palmerston North City

1. Introduction

Extensive channel management and flood protection works have been undertaken within Palmerston North City over the past 50 years, as part of either the Lower Manawatu Scheme (LMS) or Ashhurst Stream Scheme. Following a major flood in the Manawatu River in February 2004, a review of the standard of flood protection provided within the City was undertaken, and a substantial programme of upgrade works was embarked upon. That programme has now been substantially completed and has resulted in some significant new works including a number of recreational access and amenity enhancements along the river frontage. A major programme of flood protection works on the Ashhurst Stream was also undertaken over a three year period concluding in 2011. Those works were completed under the umbrella of the separate Ashhurst Stream Scheme.

The majority of those works are clearly for the purpose of river management and/or flood control and accordingly responsibility for their on-going maintenance rests with the Regional Council through its management of either the Lower Manawatu or Ashhurst Stream Schemes. However, in some instances, improvements to Palmerston North City assets have been incorporated in the upgrade works, and an understanding has been reached around either split or shared maintenance responsibility. The purpose of this document is to set out the various asset classes and to clearly identify the respective maintenance/renewal responsibilities of Horizons Regional Council (HRC) and Palmerston City Council (PNCC).

Respective responsibility of the two Councils were originally agreed and recorded in a document dated June 2003. This document updates and replaces that original document.

2. Document Scope

The maintenance of assets adjoining identified sections of the following rivers, streams and drains is addressed in this document:

- Manawatu River (main stem)
- Mangaone Stream including Jacks Creek and Derby Creek Tributaries
- Kawau Stream
- Little Kawau Stream
- Kawau Diversion
- Pioneer Highway Drain
- Napier Road drain
- Stoney Creek
- Raukawa Road Drain
- Turitea Stream
- Awatea Stream
- Ashhurst Stream.

The assets addressed in the document include:

- Stopbanks and associated ramps and fences
- Culvert structures and associated inlet/outlet drains
- Erosion protection structures including both rock linings and live tree erosion protection works.
- Pathways
- Amenity enhancement elements
- Native tree plantings

3. Manawatu River

3.1 Background

The Lower Manawatu River Scheme (LMS) encompasses that section of the Manawatu River extending from its mouth at Foxton Beach to the downstream end of the Manawatu Gorge – a total distance of 103 km. The 29 km section of river that passes through Palmerston North City, between Ashhurst and the Awapuni landfill, is therefore, included in the scheme.

There are shared responsibilities between HRC and PNCC in certain areas of the scheme particularly in relation to the mowing of stopbanks. Some arrangements were agreed in the early years of the scheme and others have been agreed as the City has developed and as the river scheme upgrade projects have progressed.

3.2 Riverbank Erosion Protection

Responsibility for the maintenance of river channel alignment and the prevention of river bank erosion rests with HRC.

This responsibility will be satisfied by:

- the scheduled regular inspection of all river banks and erosion protection structures;
- the maintenance of edge vegetation including planting, lopping, thinning and mulching, with the objective of developing and maintaining vigorous growth, without large trees;
- the construction and maintenance of tied and anchored live tree structures where necessary;
- riprap (solid material), is also used to stabilise the banks from further erosion particularly where planting or tied tree works cannot be established; and
- the topping up of any slumping of armour rock linings and the extension of existing linings if required.
- removal of debris that may contribute to bank erosion or reduce the flood carry capacity of the channel.

It is noted that concrete rubble sourced from demolition sites shall only be used in riprap linings where the relevant performance conditions, as set out in the Environmental Code of Practice for River Works, are able to be met.

Where erosion occurs on the river channel banks, and it is having a detrimental effect on any asset owned by PNCC, HRC will consult with PNCC to determine appropriate corrective measures and cost responsibility. Responsibility for removal of debris that accumulates against bridge structures shall rest with PNCC.

3.3 Stopbanks and other Flood Protection Structures

Stopbanks run almost continuously on the right bank from the Awapuni landfill to Napier Road Drain. Those stopbanks are only broken in short sections by natural river terrace, for example in isolated areas adjoining Buick Crescent. Stopbanks also extend around the second terrace adjacent to the Turitea Science Centre, on the left bank of the river.

Extensive upgrading of all stopbanks on the right bank has been completed, and those on the left bank will be completed by March 2014, under the LMS City Reach Project. There are shorter sections of stopbank on the left bank – at Staces Road and at the Turitea Science Campus.

The responsibility for ensuring the long-term integrity of the stopbanks and other flood protection structures rests with HRC. That responsibility will be satisfied by:

- undertaking regular inspections in accordance with the Asset Management Plan (AMP) and assigning an appropriate condition rating in the Asset Management System (AMS);

- undertaking repairs as necessary to maintain the required condition rating;
- investigating and addressing any suspected structural defect; and
- undertaking the regular mowing of stopbanks and adjoining river berms, either in accordance with the AMP or with existing agreements reached with PNCC and the two Golf Clubs.

As regards mowing, there have been a number of agreements reached over the years, and particularly during the recent upgrade project. The basis of those agreements, which relate to cost sharing arrangements, result from a desire on the part of PNCC and the Golf Clubs to maintain the grass growth at a lower height than is required for good stopbank management, thereby requiring more regular mowing.

The following mowing arrangements and/or agreements apply to stopbanks through the City starting from the downstream (Awapuni landfill) end:

- Awapuni landfill, Maxwell's Line; there are four lengths of earth stopbank (combined length 720 m), and one length of concrete floodwall. Responsibility, for mowing, rests with PNCC. HRC is responsible in all respects for the section of concrete floodwall.
- At Panieri Park the stopbank extends for a distance of 250 m from Maxwell's Line to the first Buick Crescent house. HRC will mow this section to its normal standard i.e. not to the higher standard specified for the adjoining sports fields.
- From Paniere Park to the end of Dittmer Drive, flood protection is provided by a series of earth embankments and timber or concrete floodwalls. Most of these works are on private properties although some are on reserve land. In all cases maintenance responsibility rests with HRC, although where mowing is required, that is in the hands of the property owners concerned.
- The 1200 m section of stopbank, together with adjoining river berm area, between Dittmer Drive and the Esplanade Motor Camp is mowed to a higher standard by PNCC in accordance with an agreement originally established by the Manawatu Catchment Board and subsequently confirmed following upgrade works.
- Between the Motor Camp and Fitzherbert Avenue, protection is largely provided by a higher terrace. Where there are some small sections of embankment, mowing is undertaken by PNCC.
- The 670 m section of stopbank extending from Fitzherbert Avenue to the downstream boundary of the Manawatu Golf Club is mown by PNCC in accordance with a long-standing agreement originally established by the Manawatu Catchment Board, and confirmed following the stopbank reconstruction in 2000 and 2012. The presence of timber floodwalls on the crest of this section of stopbank makes mowing close to those structures difficult. HRC agrees to control growth at the stopbank/floodwall interface as part of its herbicide application programme.
- The 920 m section of stopbank that extends up to Albert Street, and is sited on Manawatu Golf Club land, is mown by the club under a cost sharing agreement with HRC. The adjoining area of recently levelled and grassed berm land opposite Anzac Park cliff is mown by PNCC.
- The next section of stopbank extends upstream of Albert Street, through the Waterloo Park area and Higgins Ltd depot to the downstream boundary of the Palmerston North Golf Club (total length 1,950 m). HRC is responsible for

mowing that section. Some open floodplain area from Waterloo Park to Roxborough Crescent is mown by PNCC.

- Palmerston North Golf Club and HRC have a cost sharing agreement for mowing the 1250 m section of stopbank on their property.
- There are some areas of floodplain in the area adjoining the Golf Club that PNCC mow occasionally to keep the walkway fringes tidy.
- The stopbank extends 300 m from the upstream boundary of the Golf Club to a natural terrace at the Napier Road Drain and is mown by HRC.
- A new (2010) section of stopbank that extends from Napier Road Drain and crosses private property to meet State Highway 3 was constructed in 2010. Responsibility for mowing rests with HRC.
- There is 83 m of new concrete floodwall extending from State Highway 3 to the high terrace behind MacPhersons Garden Centre, which is maintained by HRC.
- From the concrete wall to the high terrace, there is 115 m of new stopbank constructed in 2011. HRC is responsible for the maintenance and mowing of this stopbank.

3.4 Secondary Stopbank from the Ruahine Street Carpark to the City Boundary at Napier Road Drain

This stopbank, which provides a second line of defence to flooding, starts at the downstream end of the Palmerston North Golf Club and extends through private properties until it reaches the terrace close to the Napier Road Drain.

Following the construction of the new stopbank on the right bank at Fitzroy Bend and through part of the Palmerston North Golf Club, a decision was made to retain the original stopbank in view of its strategic location and value in terms of providing an increased level of protection to the City in the event of a failure of the primary stopbank. Accordingly, the stopbank is specifically referred to in Rules in the One Plan. However, a lower standard of maintenance is accepted. The main requirement is that the crest height and general integrity of the bank are retained. Certain activities such as building of decks over the bank and planting of trees have been permitted, subject to resource consents, but no excavations will be permitted which will compromise the height or general integrity of the stopbank.

Maintenance of the stopbank through the private properties is the responsibility of the individual landowners. HRC staff will undertake annual inspections, from the Golf Club and comprehensive five yearly inspections within individual residential properties. HRC will provide advice in relation to maintenance requirements and permitted activities, and will undertake repairs required as a result of damage not caused by landowners. A separate document entitled Manawatu River Secondary Stopbank at Ruamahanga Crescent – Management and Maintenance Report sets out more fully inspection and maintenance criteria.

3.5 Floodgated Stormwater Outlets

There are a number of storm water outlets discharging into the Manawatu River and Mangaone Stream in particular, within the City. These outlets, which usually

comprise a pipe through the stopbank, some form of inlet and outlet structure and a floodgate or penstock, are designed to discharge runoff from roads, houses and parks and to prevent flooding within the City. The floodgate or penstock, can be manually or automatically closed during periods of elevated river flow, to prevent backflow into the City.

All these outlets with the two exceptions referred to below, are PNCC assets and accordingly, it is the responsibility of PNCC to:

- undertake inspections to ensure that the structures are functioning as designed;
- undertake any maintenance requirements or damage repairs, regardless of the cause; and
- to undertake any renewal, upgrade, realignment, or extension of any structures to meet changed stormwater outlet requirements.

The condition of the outlets could, however, impact on the structural integrity of the stopbank concerned. Furthermore, a missing or malfunctioning floodgate could compromise the flood protection provided by stopbanks. Accordingly, HRC will undertake periodic inspection of the outlets in addition to those required of PNCC, and will inform PNCC of any identified maintenance requirements.

Two large floodgate structures have been installed within stopbanks during upgrade works. They are at the Napier Road Drain outlet (side-hung gate) and at Palmerston North Golf Club outlet (top-hung gate). Responsibility for those two structures, in all respects, rests with HRC.

In the event that stormwater outlets require extension or modification as part of stopbank upgrade works, then the capital cost of those modifications will be the responsibility of HRC. Maintenance responsibility will then revert to PNCC.

3.6 Riverside Pathways

A shared pathway has been established along the full length of the 'City' reach of the Manawatu River that is between the Napier Road Drain and Paniere Park. Much of that pathway has been upgraded in conjunction with the City Reach Flood Protection Upgrade Project. Most of the length is now surfaced with asphaltic concrete, while the balance is surfaced in crushed limestone. The pathway presently extends beyond the urban area from Napier Road Drain to Te Matai Road, and a new section has recently been constructed between the bridge at Ashhurst and Raukawa Roads. Construction of a further section from Raukawa Road to the access to Higgins aggregate plant off Te Matai Road is presently underway. The objective is to ultimately have a continuous pathway between the City and Ashhurst.

Much of the pathway is located on river berm within the floodway and is therefore subject to damage during floods. Some shorter sections are safely located on the stopbank crest.

While HRC has been closely involved, and has assisted with the establishment of pathways during the City Reach Project, essentially all capital costs have been met by PNCC, who are also responsible for all maintenance and flood damage reinstatement work. This responsibility extends to associated barriers, chicanes and signage. Advice and approval is required from HRC's LMS Scheme Manager with

regard to any proposed alterations or improvements to pathways or associated structures, either on stopbanks or on the adjoining river berm. Responsibility for liaison with adjoining property owners, where the pathway may impact on them, rests with PNCC.

There is a potential for erosion of higher riverbanks to the landward side of the pathway in certain locations, for example at Buick Crescent. Horizons Regional Council is responsible for addressing such erosion risk, including where necessary the maintenance of vegetation that compromises bank stability.

3.7 Amenity Enhancements

A number of recreational access and general amenity enhancement elements have been established in conjunction with the flood protection upgrade project. These include the Okatia steps and viewing platform immediately downstream from Fitzherbert Avenue; the steps and canoe launching facility at Dittmer Drive; a viewing platform near the Teachers' College water level recorder; and extensive native shrub plantings on the left bank in the vicinity of the Fitzherbert Bridge and between Ashhurst and Raukawa Road. The construction of further such elements is planned in 2014-15 as a final stage of the City Reach Project. Responsibility for maintenance of these elements, including associated plantings, rests with HRC.

Other 'minor' improvements such as park benches, picnic tables, access barriers, chicanes and planting plots have been established either by PNCC or community organisations, who remain responsible for their maintenance. The approval of HRC's LMS Scheme Manager is required before any additional such improvements are established either on the stopbanks or on the adjoining flood berm. Planting of trees on any part of the stopbanks is not permitted.

4. Mangaone Stream

That section of the Mangaone Stream from its confluence with the Manawatu River to the Feilding/Bunnythorpe Roads at Bunnythorpe, falls within the LMS.

4.1 Mangaone Stream Channel Banks

Responsibility for the maintenance of stream channel alignment and the prevention of stream bank erosion rests with HRC. Erosion protection is primarily provided by rock or rubble riprap and engineered Masbloc walls. Live tree structures and edge planting are not utilised on account of their tendency to restrict channel capacity in such a small watercourse. HRC's responsibility will be satisfied by:

- the scheduled regular inspection and maintenance of all stream banks and erosion protection structures; and
- the topping up or repair of any slumped riprap linings or the extension of those linings if required.

Where stream bank erosion threatens the integrity of any asset owned by PNCC, such as a road or a bridge, consultation between HRC and PNCC will be necessary to determine the nature of corrective measures and responsibility for costs. In

general, costs should be shared in proportion to the benefits that accrue to the respective authorities' assets.

4.2 Stopbanks

The Mangaone Stream is stopbanked through the full length of the City from Pioneer Highway to Flyers Line Bridge. Stopbanking continues upstream of the bridge through the rural area and past Setter's Line. There is a short section of stream downstream of Pioneer Highway Bridge but most of that channel is confined by the natural river terrace with only very short lengths of stopbank.

Responsibility for ensuring the long-term integrity of the stopbanks rests with HRC. That responsibility will be satisfied by:

- undertaking regular inspections in accordance with the AMP and assigning an appropriate condition rating in the AMS;
- undertaking repairs as necessary to achieve the required condition rating;
- investigating and addressing any suspected structural defect; and
- undertaking the regular mowing of stopbanks and adjoining river berms, either in accordance with the AMP or with existing agreements reached with PNCC.

A 50-50 cost sharing agreement regarding the mowing of the stopbanks, and the adjoining flood berms has been in place between HRC and PNCC since 1989. The agreement reflects PNCC's desire for a higher standard of grass management that is required for flood scheme purposes. HRC contracts the mowing to suitable contractors and supervises the work. There is a total length of 9.5 km of mowing between Pioneer Highway and Flyers Line.

4.3 Floodgated Stormwater Outlets

There are a number of stormwater outlets discharging into the Mangaone Stream within the City boundary. These outlets are designed to discharge runoff from roads, houses etc and prevent flooding within the City. Most of these outlets have either a floodgate or penstock to prevent backflow into the City stormwater system during times of river flooding.

All these outlets are PNCC assets and accordingly, it is the responsibility of PNCC to:

- undertake inspections to ensure that the structures are functioning as designed;
- undertake any maintenance requirements or damage repairs, regardless of the cause;
- to undertake any renewal, upgrade, realignment, or extension of any structures to meet changed stormwater outlet requirements; and
- to inform the LMS manager in that any identified defect has the potential to compromise stopbank integrity.
- to notify the LMS Scheme Manager and then repair any stream erosion that is attributable to stormwater outlet flows.

In the event that stormwater outlets require extension or modification as part of stopbank upgrade works, then the capital cost of those modifications will be the responsibility of HRC. Maintenance responsibility will then revert to PNCC.

4.4 Pathways

There is a pathway situated on top of the Mangaone Stream stopbanks. This pathway is well signposted and is surfaced in crushed limestone. Responsibility for any new construction, maintenance or restoration for any reason of that walkway is the responsibility of PNCC. Advice and approval should be obtained from HRC's LMS Manager prior to any additional pathway construction being undertaken either on the stopbank or on the adjoining floodplain.

Generally, where the Mangaone Stream crosses streets, public access is restricted, for safety purposes, by fencing and gates. However, because of the large number of public access paths to the pathway, and therefore to the stream channel, it is not practicable to ensure that gates remain in place and operate effectively at all times. HRC will endeavour to respond to reasonable requests for the erection of fencing and gates, but do not accept responsibility in that regard.

4.5 Public Access at Pinfold Road

An area of land that provides river access at the end of Pinfold Road is owned by HRC. PNCC has erected fencing and is responsible for mowing grass and maintaining the various amenity features.

5. Kawau Stream

The Kawau Stream flows through the City from catchments to the north east, picks up City stormwater on the way and discharges into the Mangaone Stream approximately 100 m upstream of Pioneer Highway at the Manawatu Trotting Club.

There is no floodgated outlet at the confluence with the Mangaone Stream. There is a length of return stopbanking on the stream, extending upstream from the confluence with the Mangaone Stream. Responsibility for maintenance, erosion protection, channel clearance or improvement of this stopbank and adjoining stream channel rests with PNCC. For convenience however, mowing of the short section of stopbank involved is incorporated in the 50-50 Mangaone Stream cost sharing arrangement. It is likely that PNCC will require resource consents for any improvement works.

6. Little Kawau Stream

The Little Kawau Stream is an old diversion of the main stream and has an open discharge into the left bank of Mangaone Stream approximately 250 m upstream of the Rangitikei Line Bridge. There is some return stopbanking on this channel upstream of its confluence with the Mangaone. As with the Kawau Stream, responsibility for all channel and stopbank maintenance rests with PNCC.

7. Kawau Diversion

Another old diversion of the Kawau Stream discharges into the left bank of the Mangaone Stream approximately 300 m upstream from Milson Line. The diversion channel has return stopbanks for a distance of approximately 800 m up to the point where it crosses Richardson's Line. Again, as with the Kawau Stream, responsibility for all channel and stopbank maintenance rests with PNCC.

8. Jacks Creek

Jacks Creek is an open channel that joins the left bank of Mangaone Stream just upstream of Te Ngaio Road. It is maintained as part of the LMS for a distance of approximately 900 m up, to Kairanga-Bunnythorpe Road.

9. Derby Creek

Derby Creek joins the right bank of the Mangaone Stream approximately 300 m upstream of Roberts Line. The creek is returned stopbanked for a distance of 600 m up as far as the Kairanga-Bunnythorpe Road.

10. Pioneer Highway Drain

This major drain, which runs parallel to Pioneer Highway and is increasingly being piped, discharges City stormwater into the Mangaone Stream immediately upstream of the Pioneer Highway bridge. The outlet is floodgated. All maintenance is the responsibility of PNCC.

11. Napier Road Drain (Kelvin Grove Outfall Channel)

The Napier Road Drain, also known as the Kelvin Grove outfall channel, is sited at the north-eastern boundary of the old City boundary and discharges into the Manawatu River. The channel is return stopbanked up to State Highway 3 and beyond to the high terrace on its true right bank. The section of stopbank below State Highway 3 was upgraded by HRC in the mid 1990's and the section above the highway was subsequently constructed by PNCC. A major floodgate structure close to the drain's confluence with the Manawatu River was installed in 2010, as part of the City Reach Upgrade Project.

Maintenance of the full length of the channel and stopbank upstream of the floodgate is the responsibility of PNCC. The floodgate, and the open channel below the floodgate, is an LMS asset and accordingly is the responsibility of HRC.

12. Stoney Creek

This watercourse is located approximately 3 km northeast of the old City boundary at Whakaronga. It crosses SH3 and Te Matai Road and has an open discharge into the Manawatu River.

Between SH 3 and its confluence with the Manawatu River, the creek is part of the LMS and is the responsibility of HRC. Responsibility rests with the owners of those properties it passes through upstream of SH3.

13. Raukawa Road Drain

This drain connects at Hackett Road, where it collects the Ashhurst Stream discharge, and discharges via a floodgated outlet into the Manawatu River. The drain is maintained by HRC as part of the LMS.

14. Minor Drains

There are two unnamed drains – one at Whakaronga and one at Te Matai Road North, which are maintained as part of the LMS. Both are open drains, the former discharges to Stoney Creek, the latter discharges directly to the Manawatu River..

15. Awatea Stream

The Awatea Stream has its origins from various open channels in the Hokowhitu area that have been progressively diverted and piped over the years, as that part of the City developed. The Awatea Stream now commences in the lower Victoria Avenue area near Lincoln Terrace and flows in mainly open channels through private properties, via Te Awe Awe Street, Collingwood Street and ultimately into the Manawatu River through a 525 mm diameter discharge pipe. When the river level rises and cuts off the outlet, or when local stormwater reaches levels that cannot be handled by the 525 mm outlet pipe, excess flows discharge into the Centennial Lagoon via a 1350 mm pipe.

PNCC inspect the channel and will undertake some periodic maintenance to ensure the channel remains clear. PNCC also responds to property owners' enquiries and requests regarding the stream. HRC has no responsibility regarding the Awatea Stream or the Centennial Lagoon.

16. Turitea Stream

The Turitea Stream flows through part of Massey University, crosses Tennant Drive and continues through the Turitea Science Campus to discharge into the Manawatu River. Substantial flood protection works, comprising stopbanks and floodwalls, designed to provide a 0.5% AEP protection standard, will be completed by March 2014. Downstream of Tennant Drive, the stream is included in the LMS and accordingly, responsibility for all improvements and maintenance of the channel and flood protection assets rests with HRC

That section of the stream above Tennant Drive is not within any scheme and maintenance responsibility rests with the landowners concerned.

17. Staces Road

On the left bank of the Manawatu River immediately upstream of Staces Road, approximately 1.5 km of stopbank was either constructed or upgraded in 2010-11 to

provide the rural 1% AEP protection standard to the lower terrace lands at Aokautere. Two further isolated sections of stopbank provide protection to houses close to the river immediately downstream of Staces Road. Each of those stopbanks is an LMS asset and accordingly responsibility for maintenance rests with HRC.

18. Whakaronga

Between Napier Road Drain and Ashhurst, 1% AEP rural standard flood protection is provided by stopbanks of approximate total length 11.5 km, together with two sections of natural terrace of approximate total length 2.4 km. Again, these stopbanks are LMS assets and accordingly responsibility for their maintenance rests with HRC.

19. Ashhurst Stream Scheme

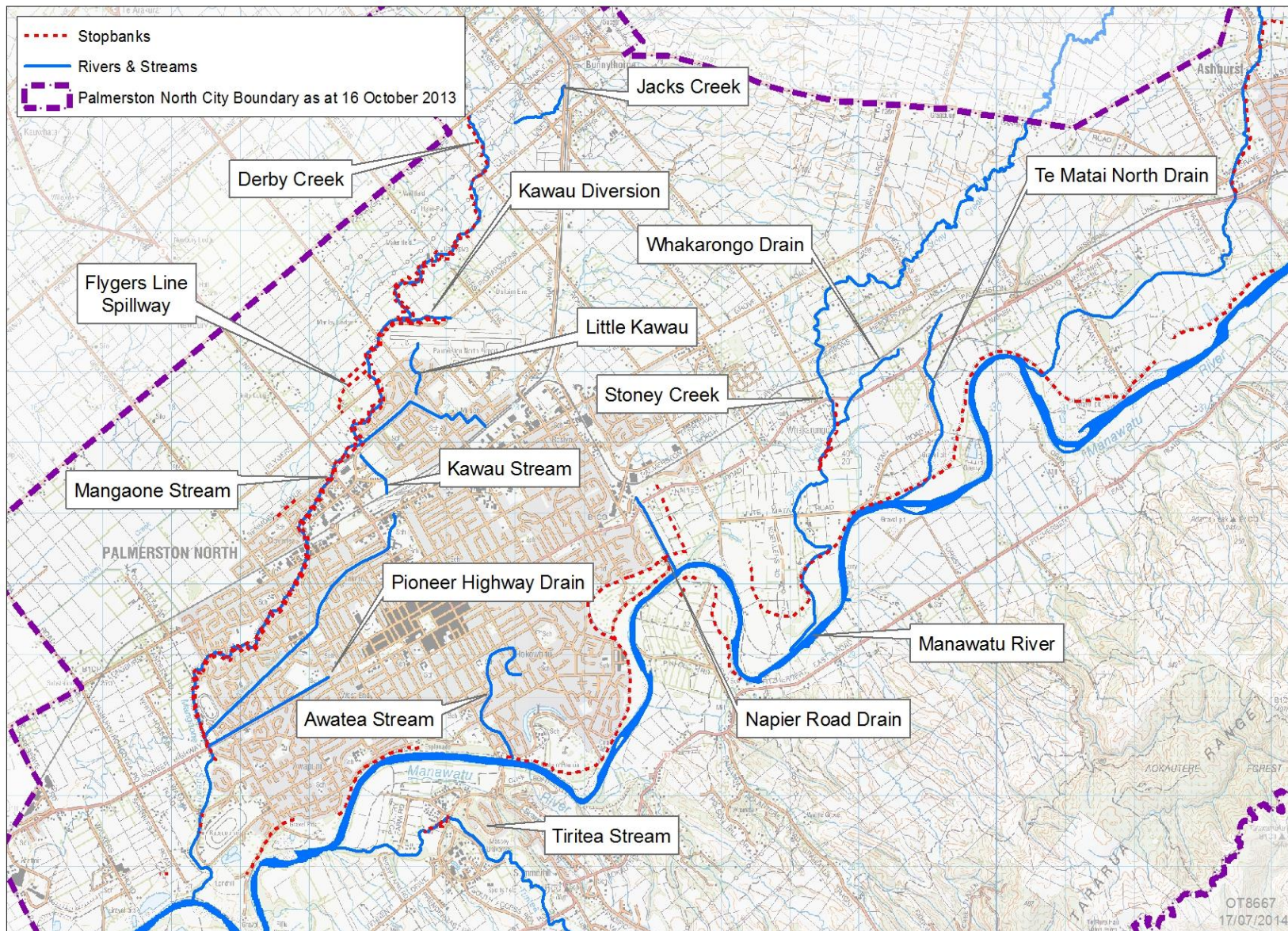
This previously small drainage scheme was upgraded between 2010 and 2012 to include flood protection benefits (1% AEP standard) to the Ashhurst Township. Flood protection assets, including stopbanks and floodwalls extend along the Ashhurst Stream for a distance of approximately 3 km from Ulysses Road, on the northern side of Ashhurst Hacketts Road. Those assets, together with the stream channel from Ulysses Road to its confluence with Raukawa Road Drain, are maintained by HRC under the Ashhurst Stream Scheme.

Floodgated stormwater culverts discharging into the Ashhurst Stream, along with the outlet from the Ashhurst treatment works discharging into the Manawatu River, are PNCC assets, and as such, are maintained by PNCC in all respects.

It is noted that wastewater collected in Ashhurst is now being pumped to the City for treatment at Totara Road, as such there is no longer a permanent discharge to the Manawatu River at the Ashhurst ponds site. The discharge pipe is however being maintained as an emergency backup and the floodgate will remain in place and be maintained by PNCC.

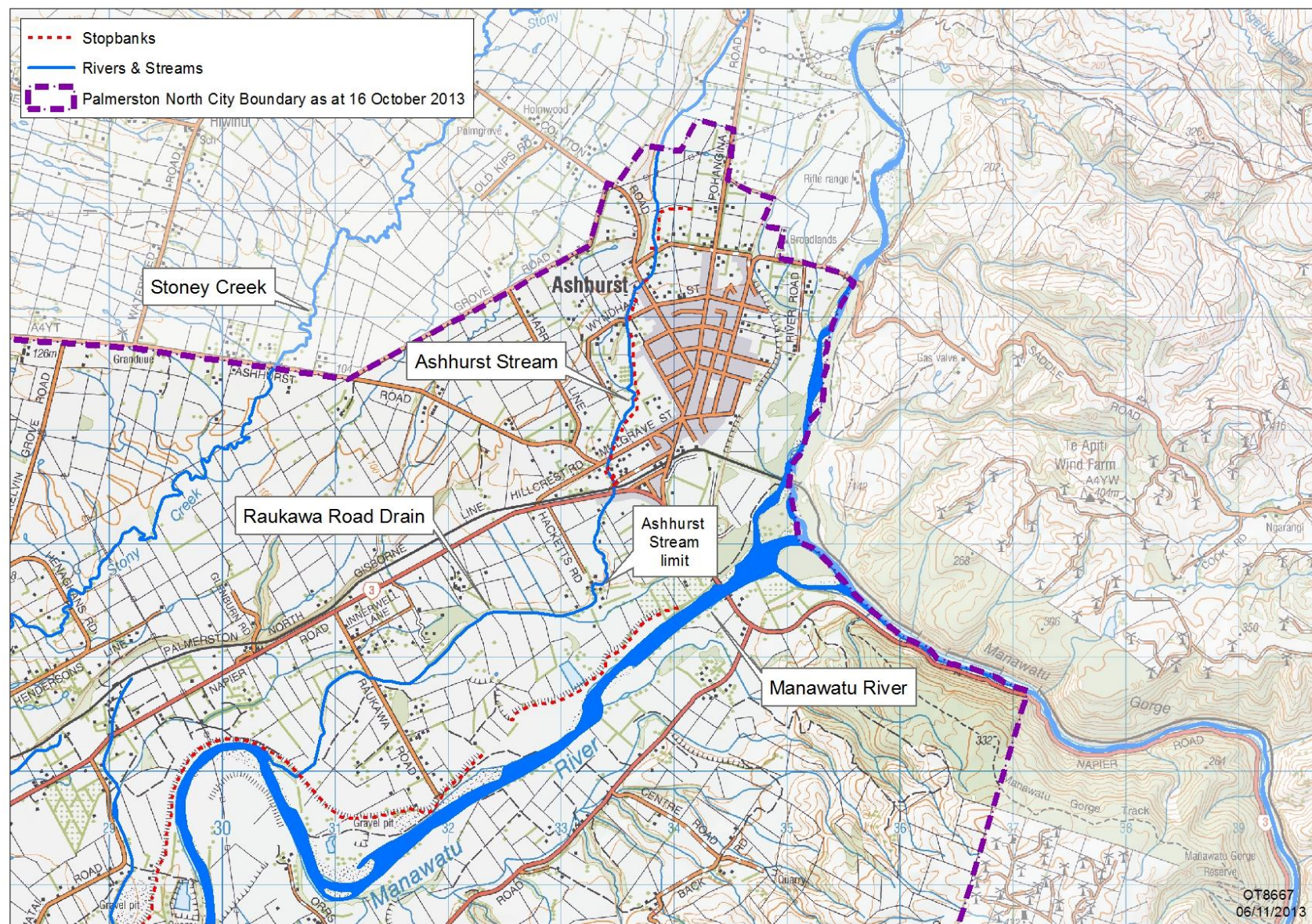
ANNEX A

Palmerston North Rivers and Streams Map




ANNEX B

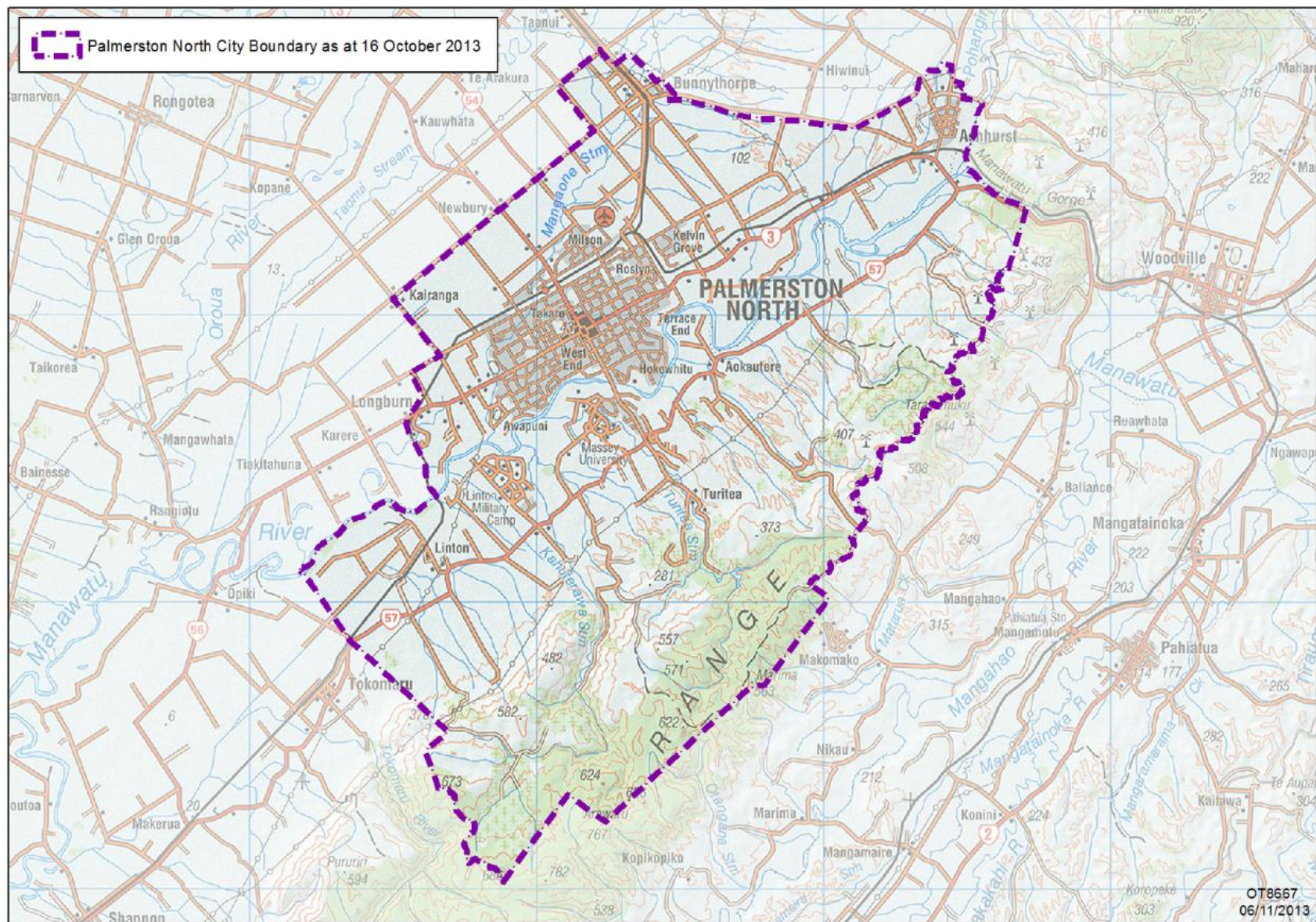
Ashhurst Rivers and Streams Map



ANNEX C

Palmerston North Territorial Local Authority Boundary Map

 Palmerston North City Boundary as at 16 October 2013



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