

Version No: 2.0 Issue Date: 25/05/2022 Portfolio: Discrete Water Quality	Horizons Regional Council	Section No: 15.7 Appendix No: XX Page: 1 of 19
	Hydrology Operations Manual	

Version 2.0 25/05/2022

Invertebrate Monitoring Run Guide

Upper Manawatu

STATE OF ENVIRONMENT (Annual Sampling)

Job Hazard & Task Analysis










Hazard Identification – tick all that apply, write additional hazards identified:

The yellow highlighted hazards are known hazards at the time of compiling this document. This **does not negate** the need to assess for and potentially eliminate or isolate any hazards at *each* sample location at *every* visit

Hazard	Yes	Hazard	Yes	Hazard	Yes
Confined space	<input type="checkbox"/>	Suspended loads	<input type="checkbox"/>	Noise – plant and equipment	<input type="checkbox"/>
Difficult entry/exit	<input checked="" type="checkbox"/>	Falling objects	<input type="checkbox"/>	Communication – means of	<input checked="" type="checkbox"/>
Oxygen deficiency/excess	<input type="checkbox"/>	Working near cranes and crane runways	<input type="checkbox"/>	Remote area	<input checked="" type="checkbox"/>
Poisonous fumes/gas	<input type="checkbox"/>	Live rails-gantry cranes	<input type="checkbox"/>	Temperature extremes	<input checked="" type="checkbox"/>
Explosive gas	<input type="checkbox"/>	Trip hazards	<input checked="" type="checkbox"/>	Reduced visibility	<input checked="" type="checkbox"/>
Flammable materials	<input type="checkbox"/>	Slippery surfaces	<input checked="" type="checkbox"/>	Unauthorized persons	<input type="checkbox"/>
Combustible materials	<input type="checkbox"/>	Manual handling	<input type="checkbox"/>	High pressure water	<input type="checkbox"/>
Hazardous substances	<input type="checkbox"/>	Sharp materials	<input type="checkbox"/>	Vacuum	<input type="checkbox"/>
Drowning	<input checked="" type="checkbox"/>	Line of fire	<input type="checkbox"/>	Air emissions – dust, fumes	<input type="checkbox"/>
Engulfment	<input type="checkbox"/>	Pressurized fluids	<input type="checkbox"/>	General waste	<input type="checkbox"/>
UV Radiation	<input checked="" type="checkbox"/>	Pressurized air/gas	<input type="checkbox"/>	Hazardous waste	<input type="checkbox"/>
Electrical – low /high voltage	<input checked="" type="checkbox"/>	Traffic / vehicle movements	<input checked="" type="checkbox"/>	Hydrocarbon / chemical spill	<input type="checkbox"/>
Multiple electrical feeds	<input type="checkbox"/>	Machinery – mobile plant	<input type="checkbox"/>	Soil disturbance/erosion	<input type="checkbox"/>
Working at height	<input type="checkbox"/>	Moving parts	<input type="checkbox"/>	Habitat disruption	<input type="checkbox"/>
Ladders	<input type="checkbox"/>	Chemical reaction (Pyrophoric iron)	<input type="checkbox"/>	Lighting	<input type="checkbox"/>
Elevated work platforms	<input type="checkbox"/>	Transport of hazardous substances	<input type="checkbox"/>	Weather extremes	<input checked="" type="checkbox"/>
Potential for difficult rescue	<input checked="" type="checkbox"/>	Stock/Farm Animals	<input checked="" type="checkbox"/>		

Required PPE & Safety Equipment– tick all that apply, write additional PPE required:

The yellow highlighted PPE are known required PPE at the time of compiling this document. This **does not negate** the need to assess for the appropriate required PPE measures at each sample location per visit.

SAMPLING GLOVES	EAR PROTECTION	HARD HAT	SAFETY GLASSES / GOGGLES	WORK BOOTS / WADERS	PROTECTIVE GLOVES	PERSONAL FLOATATION DEVICE (PFD)
						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
HI VIZ	SAFETY HARNESS	SUN BLOCK & HAND SANITISER	VHF RADIO	THROW BAG	PERSONAL LOCATOR BEACON	
						
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

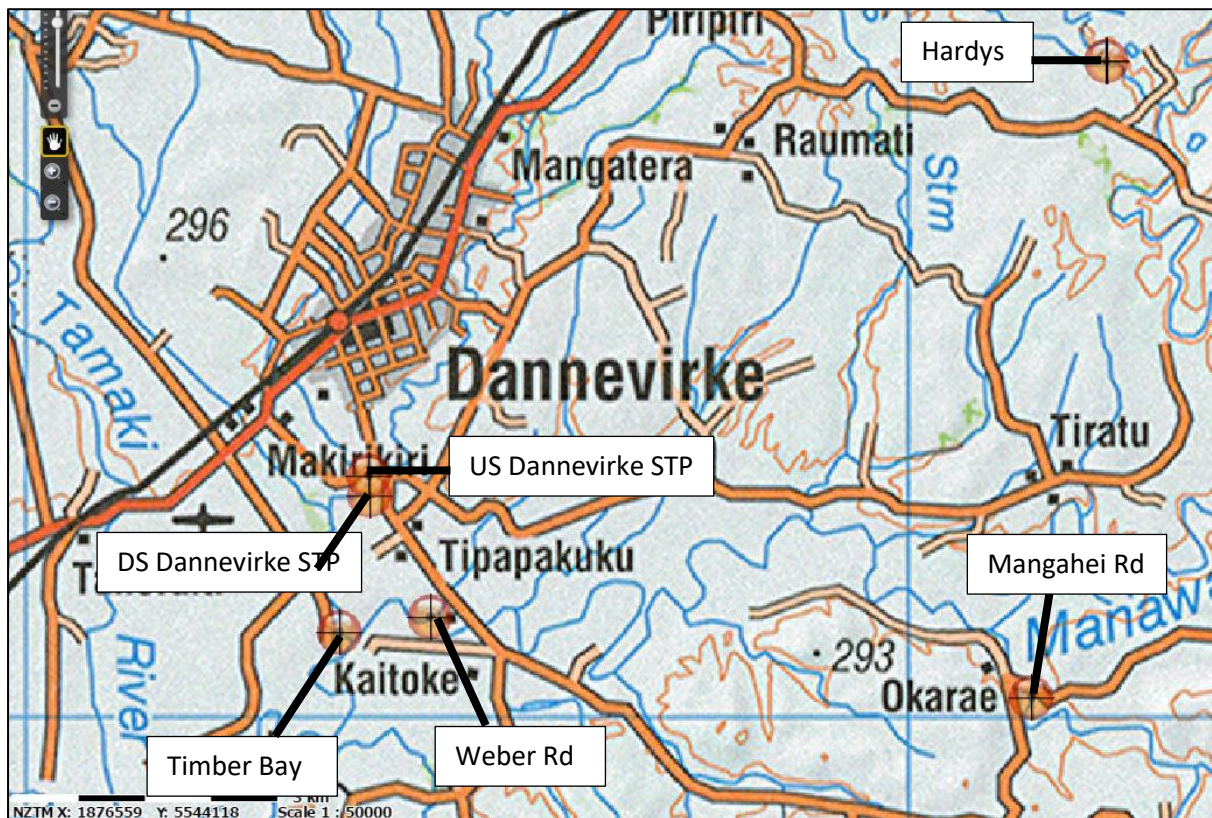
Known Hazard	Significant		Can it be Eliminated		Can it be Isolated		Method of control
	Yes	No	Yes	No	Yes	No	
Drowning	✓			✓		✓	Staff should use a sample pole if access into the river/stream is unsafe. PFD's must be worn by staff. Always carry a throw bag when working around water and have a personal locator beacon on hand. It is always preferable to have someone else with you at all times when working around water [HMP 18]
UV Radiation	✓			✓	✓		Horizons provide sunscreen and hats. Staff are encouraged to make use of these. [HMP 17]
Difficult Entry/Exit	✓			✓	✓		Entry and exit into waterways poses many risks and should be treated with caution. Sampling must be done from stable level ground. Staff should use a sample pole if access into the river/stream is unsafe. PFD's must be worn by staff and staff must be trained for working around water. [HMP18]
Electrical-Low/High Voltage	✓			✓	✓		Many of the rural sampling sites require traversing across farm paddocks equipped with electric fences that contain stock. If unknown, treat every farm fence as electric and avoid direct contact. Contact the landowner for advice on whether or not the fence is live and discuss alternative routes or options for avoiding the fence if possible.
Potential for Difficult Rescue	✓			✓		✓	Sampling must always be done from stable level ground. Staff should use a sample pole if access into the river/stream is unsafe. PFD's must be worn by staff and staff must be trained for working around water. Vehicles must be driven a sensible distance from any river or pond edges. Always carry a throw bag when working around water and have a personal locator beacon on hand. It is always preferable to have someone else with you at all times when working around water [HMP18]
Trip Hazards	✓			✓	✓		Prior to sampling, staff must check area is clear of items that pose a risk. Trip Hazards should only be moved if safe to do so. Sampling only to commence if the sampler is satisfied that any slip, trip or fall hazards are isolated.
Slippery Surfaces	✓			✓	✓		Sampling must be done from stable level. Vehicles must be driven a sensible distance from any river or pond edges. [HMP 18]. Staff driving four wheel drive vehicles must have adequate training [HMP 9]
Traffic Vehicle Movements	✓			✓		✓	The designated driver of a vehicle is responsible for ensuring the safety and operational requirements and recommendations are met. All staff working within the road reserve must wear high visibility clothing to AS/NZS 1906.4:2010. This clothing must be fluorescent red orange in colour unless the individual is the site STMS then the garment must be fluorescent lime yellow. [HMP 9] [HMP 16] [HMP 20].
Communications-Means of	✓			✓		✓	Cell phone coverage is not available at all sites. Staff must be capable of communicating via VHF radio in an equipped vehicle. [HMP 24]

Known Hazard	Significant		Can it be Eliminated		Can it be Isolated		Method of control
	Yes	No	Yes	No	Yes	No	
Remote Area	✓			✓		✓	Most council vehicles are fitted with the E-Road vehicle locator system. Many vehicles are also fitted with a radio operating on the Horizons digital radio network providing communication and tracking coverages across a majority of the region. [HMP 24]
Stock/Farm Animals	✓			✓	✓		Although generally docile, farm animals can still be hazardous. The risk should be isolated by finding alternative access routes to the sample location or contacting the owner for assistance. [HMP26]
Temperature/ Weather Extremes	✓			✓		✓	During the duration of a sampling run varying types and degrees of weather may be experienced. All sampling staff are to have access within their HRC vehicle to additional and appropriate clothing. Staff must have access to suitable PPE and spare clothing within their vehicle. [HMP 18]
Reduced Visibility	✓			✓		✓	If you find you are driving in limited visibility slow your driving speed and turn your fog lights on and watch out for vehicles that aren't using their lights. When working in limited visibility if you cease to be able to make out your surrounding environment stop work immediately. If working at night it is advisable to traverse the property in daylight first to map out an action plan outlining walking tracks, vehicle tracks, fence lines, stock positions, ponds, waterways, houses, and sheds as well as other significant items of interest. [HMP12]

Site Information

Hilltop Site Name	Easting/Long (NZTM)	Northing/Lat (NZTM)
Mangatera at Timber Bay	1863573	5540943
Mangatera at u/s Dannevirke STP	1863903	5542705
Mangatera at d/s Dannevirke STP	1863803	5542504
Manawatu at Weber Road	1864903	5540904
Mangatoro at Mangahei Road	1864903	5540904
Mangatewainui at Hardys	1872267	5547419

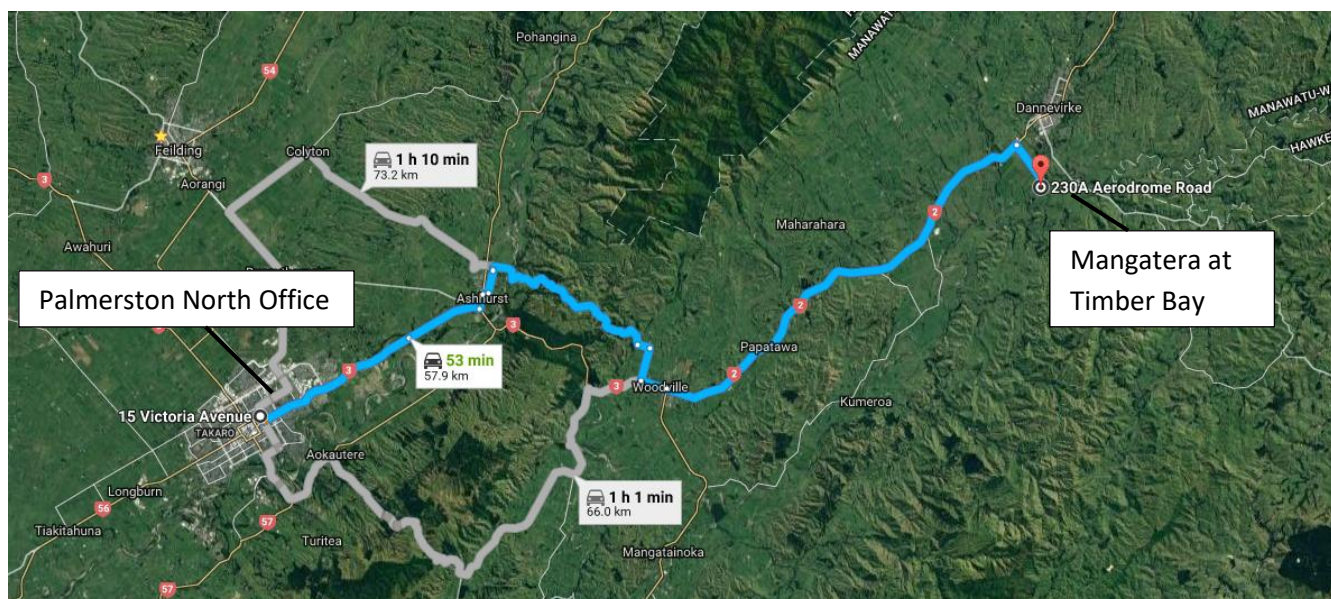
Site Locations



Equipment Required

Equipment	<ul style="list-style-type: none"> • Camera and GPS • Kick net • Invertebrate Pottles and Propan-2-ol • White plastic tray • Metal ruler • Gravelometer • Sampling Worksheet and Pencil • Bathoscope / Viewer • Scrubbing brush, tooth brush, washer bottle, yellow sample bottle lid and ice cream container • Pottles (Approx 10), chilly bins and ice-packs • Personal Locator Beacon • 4WD Vehicle equipped with VHF Radio • Throw Bag
Additional Comments	<p>Mangatewainui at Hardys:</p> <p>CONTACT ANDREW HARDIE BEFORE VISITING: 06 374 9095 OR 029 439 2542</p>

SITE LOCATION MAP – Mangatera at Timber Bay



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning	UV Radiation	Slippery surfaces	Trip hazards
Difficult entry/exit	Potential for difficult rescue	Weather/Temperature Extremes	Traffic / Vehicle Movements
Stock / Farm Animals	Communication- means of	Remote Area	Reduced Visibility

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS / WADERS	PFD	SUNSCREEN & HAND SANITISER	PERSONAL LOCATOR BEACON	THROW BAG	VHF RADIO	HI-VIS	
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DIRECTIONS:

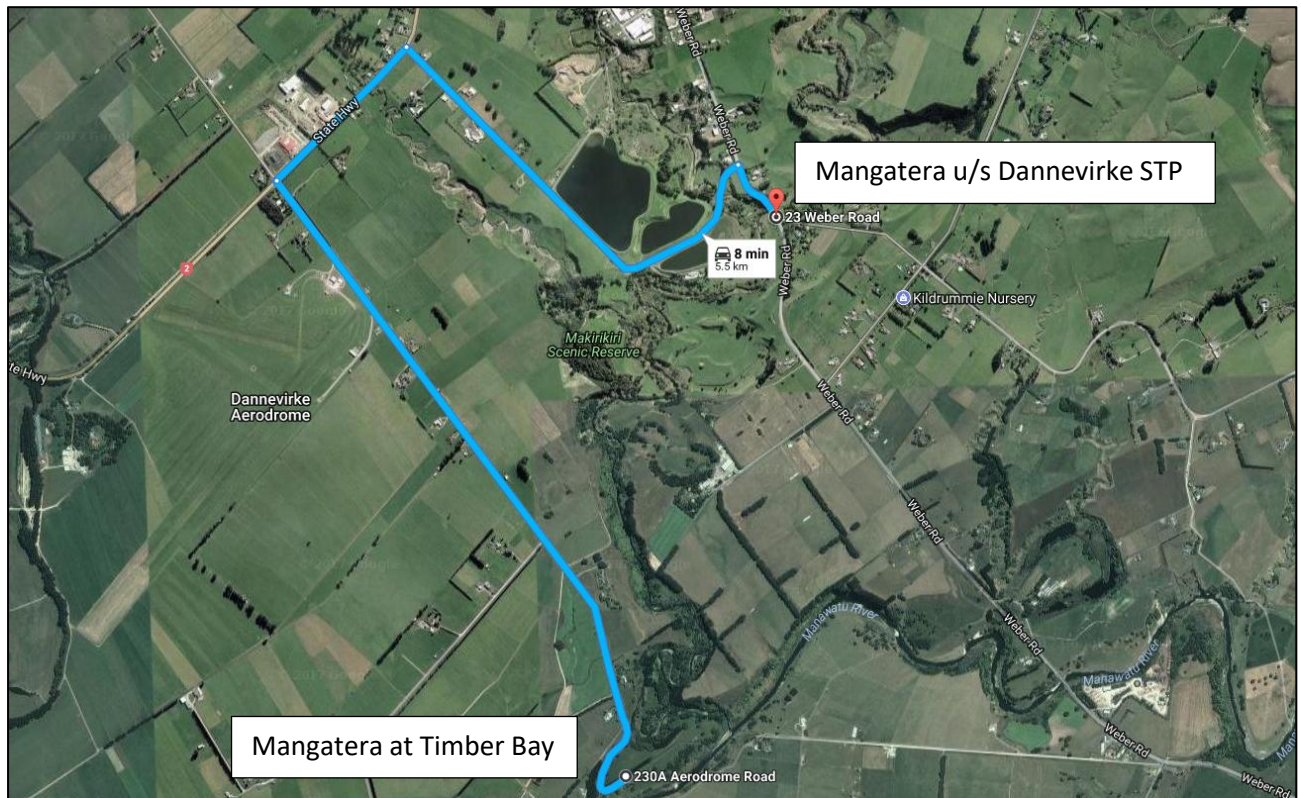
- Head out from the Palmerston North office via Napier Road to Ashhurst.
- Once in Ashhurst turn left at the main intersection onto Cambridge Ave, travel approximately 750m and then take the third exit onto Mulgrave Street at the roundabout.
- Follow Mulgrave Street for approximately 300m, then turn left onto Salisbury Street.
- Follow Salisbury Street, the road will then change names to Saddle Road. Follow Saddle Road up and over the Ruahine Ranges for about 11km and then turn left onto Oxford Road and follow for approximately 3km to the end of the road.
- At the end of Oxford Road turn right onto Pinfold Road, follow this until you reach SH2 (Napier Road). Turn left onto Napier Road and head towards Dannevirke.
- Just before you reach Dannevirke you there will be a road on your right called Aerodrome Road. Turn right onto Aerodrome Road and follow until you reach the end.
- At the end of Aerodrome Road there will be a driveway to your right that heads to a house and a farm track which heads straight to the left of this. Drive down the farm track – be sure to have the vehicle in 4WD before you proceed.
- The farm track splits, go down the left track. The farm track will go down a steep hill, and then bend back around to the left. It will then head in a straight direction following alongside the Manawatu River. Drive as far down this farm track as you can go heading in the same direction and then park up.

- Walk as far down the farm track as possible until you come to an open paddock on your left. Walk into this paddock and head left perpendicular to the farm track until you come to the Mangatera Stream. Find a riffle to sample.



Mangatera at Timber Bay looking upstream.

SITE LOCATION MAP – Mangatera at u/s Dannevirke STP



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning	UV Radiation	Slippery surfaces	Trip hazards
Difficult entry/exit	Potential for difficult rescue	Weather/Temperature Extremes	Traffic / Vehicle Movements
Communication- means of	Remote Area	Reduced Visibility	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS / WADERS	PFD	SUNSCREEN & HAND SANITISER	PERSONAL LOCATOR BEACON	THROW BAG	VHF RADIO	HI-VIS	
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DIRECTIONS:

- From Mangatera at Timber Bay drive back down Aerodrome Road to SH2. Turn right onto SH2 and head towards Dannevirke.
- As you enter the 70 km/hr area just before Dannevirke there is a bright green Farm Source building on the corner of Makirikiri Road to your right, turn right here.
- Follow this road around, past the sewage treatment ponds until it reaches the intersection with Weber road. Turn right onto Weber road.
- Follow Weber road down the hill and across the bridge. The first driveway on your right hand side leads into a yard. Turn in here. On your right there is a track that heads to the river. Follow this track to the Mangatera Stream.
- Sample upstream of where the Tapuata stream converges with the Mangatera in a riffle. This is a very obvious confluence on the true right of the Mangatera stream.



Mangatera Stream u/s Dannevirke STP looking upstream

SITE LOCATION MAP – Mangatera at d/s Dannevirke STP



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning	UV Radiation	Slippery surfaces	Trip hazards
Difficult entry/exit	Potential for difficult rescue	Weather/Temperature Extremes	Traffic / Vehicle Movements
Remote Area	Communication- means of	Reduced Visibility	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS / WADERS	PFD	SUNSCREEN & HAND SANITISER	PERSONAL LOCATOR BEACON	THROW BAG	VHF RADIO	HI-VIS	
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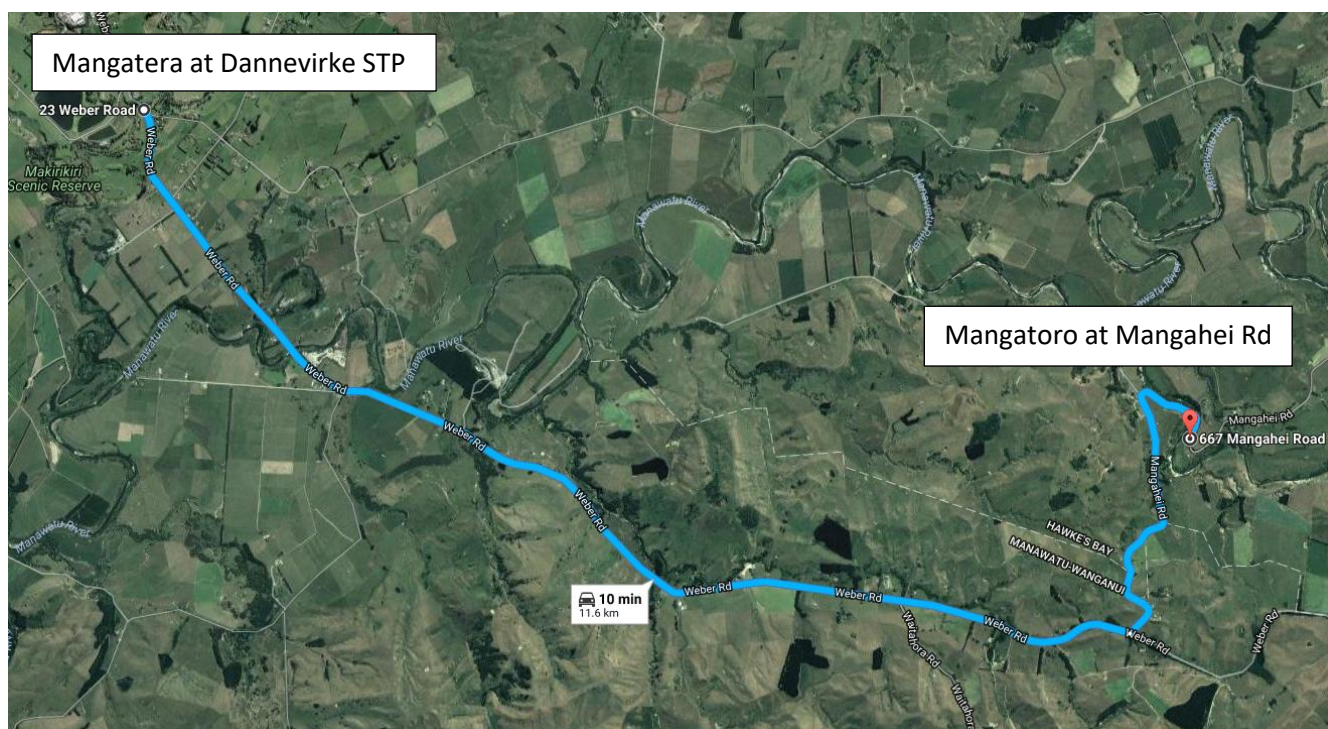
DIRECTIONS:

- From the upstream site walk back towards the shed and follow the driveway to the end.
- At the end of the driveway you will see a track leading back towards the stream- follow this.
- On the true right of the river is the discharge from the Dannevirke STP which takes the form as a small tributary coming into the Mangatera Stream. Continue down from the discharge for approximately another 100 metres. You will come to a sharp right hand turn. You may need to cross the stream a few times when making your way down.
- On the true left of the river there is a Totara tree and a Macracarpa that has been heavily weathered. There are also a set of power lines that pass directly overhead of this point. Find a riffle and take a sample here.



Mangatera Stream d/s Dannevirke STP looking upstream.

SITE LOCATION MAP – Mangatoro at Mangahei Road



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning	UV Radiation	Slippery surfaces	Trip hazards
Difficult entry/exit	Potential for difficult rescue	Weather/Temperature Extremes	Traffic / Vehicle Movements
Reduced Visibility	Communication- means of	Remote Area	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS / WADERS	PFD	SUNSCREEN & HAND SANITISER	PERSONAL LOCATOR BEACON	THROW BAG	VHF RADIO	HI-VIS	
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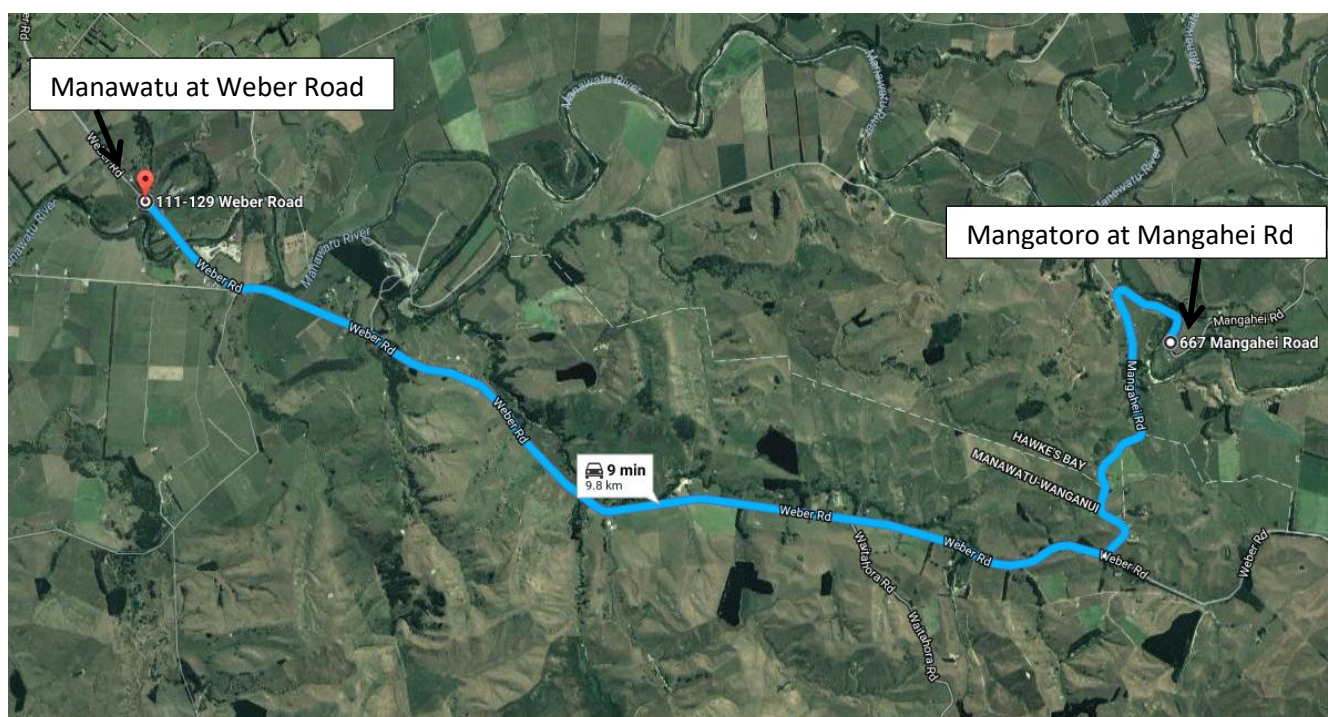
DIRECTIONS:

- From the Mangatera sites drive out of the yard and turn right onto Weber Road.
- Follow Weber Road for approximately 9km, then turn left onto Mangahei Road.
- Follow Mangahei Road for approximately 2.6km, you will go over a bridge immediately after the bridge there will be a green hydrosite on the right hand side of the road. Keep driving past this to the next house driveway on the right with the red mail box. Keep an eye out for bulls.
- Park up off the road and head down to the river. The banks here are steep and finding a suitable riffle may be difficult. Do your best to find a suitable spot to sample. You may have to walk about 200m upstream along the bank to find a suitable place to sample. Be careful as it can be very deep and there is lots of slippery bedrock.



Mangatoro at Mangahei Road looking downstream.

SITE LOCATION MAP – Manawatu at Weber Road



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

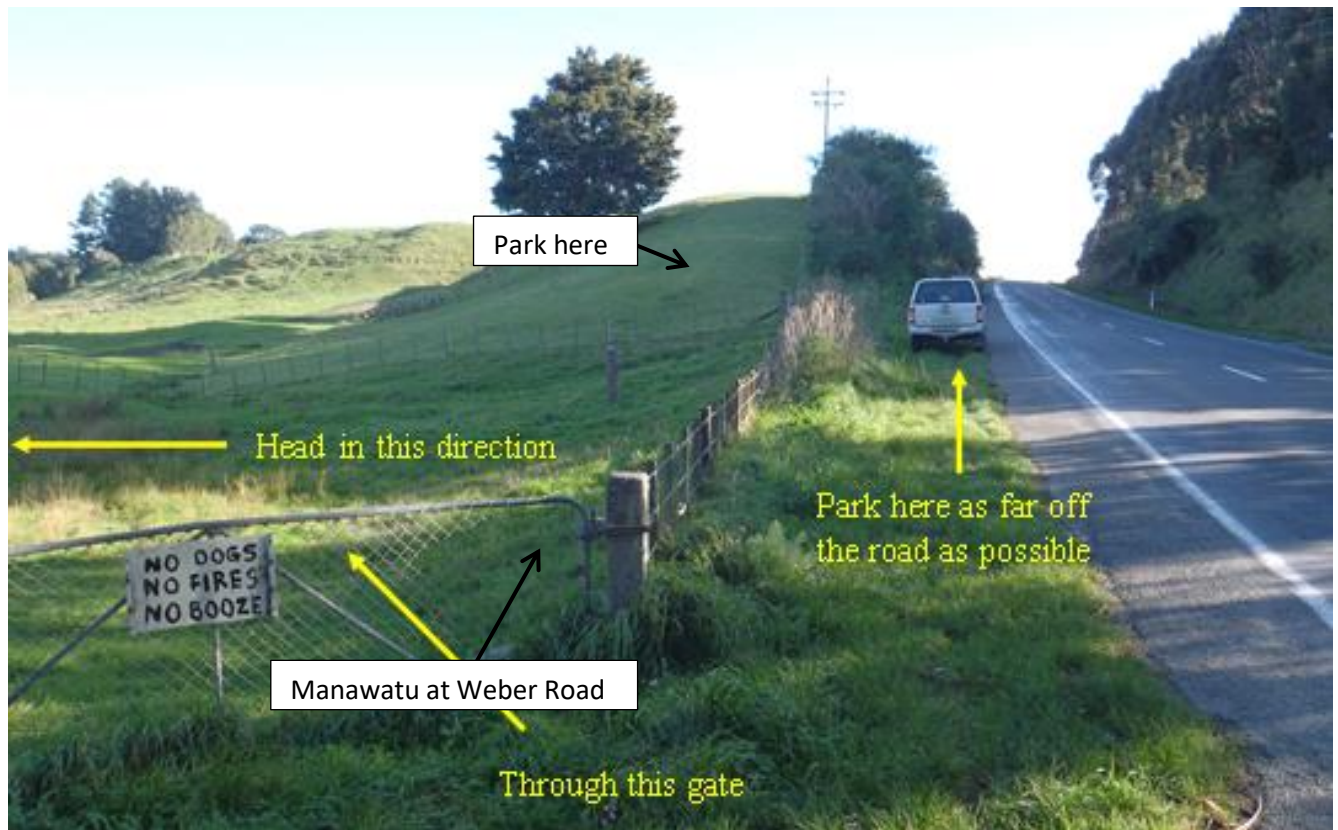
Drowning	UV Radiation	Slippery surfaces	Trip hazards
Difficult entry/exit	Potential for difficult rescue	Weather/Temperature Extremes	Traffic / Vehicle Movements
Reduced Visibility	Communication- means of	Remote Area	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

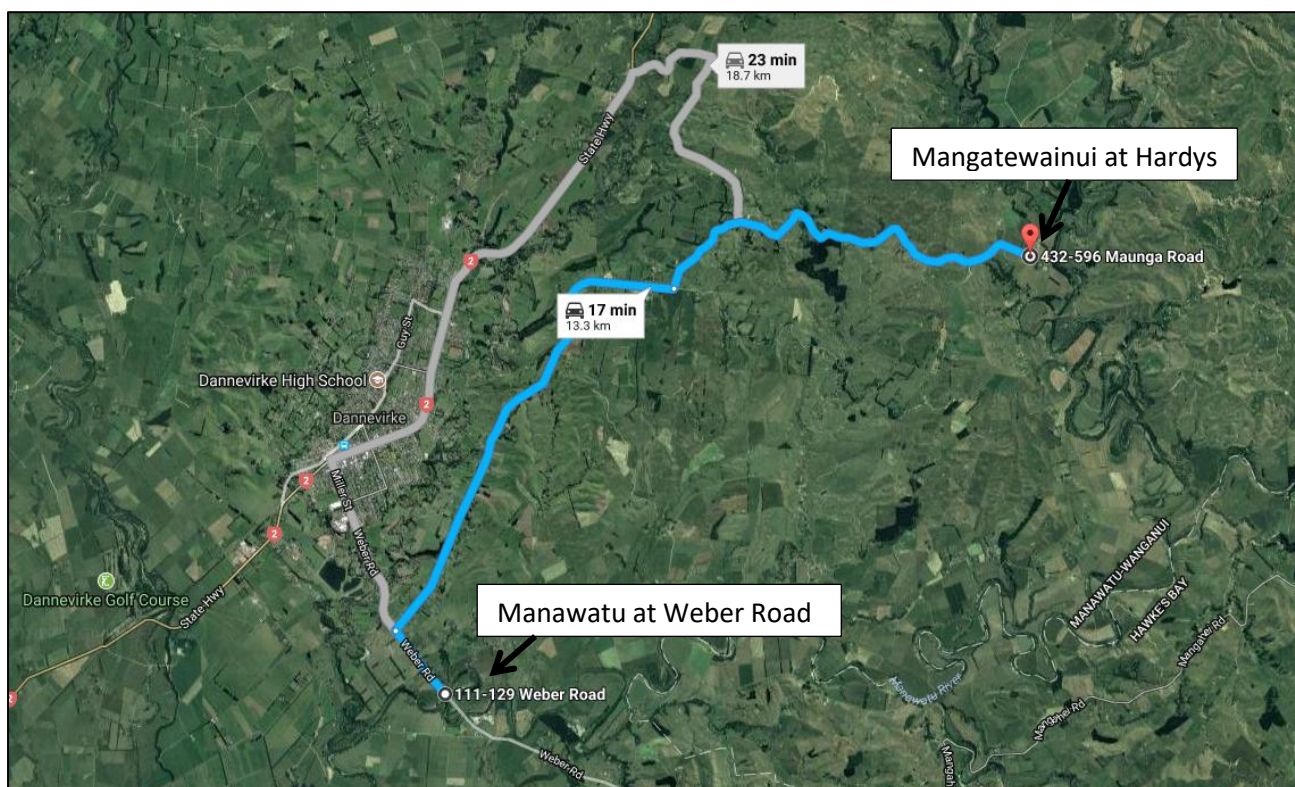
WORK BOOTS / WADERS	PFD	SUNSCREEN & HAND SANITISER	PERSONAL LOCATOR BEACON	THROW BAG	VHF RADIO	HI-VIS	
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DIRECTIONS:

- From Mangatoro at Mangahei Rd head back the way you came to Weber Road.
- Turn right onto Weber Road heading back the way you came.
- You will cross a bridge over the Manawatu River. This is quite large and is a very obvious bridge. Approximately 50m down the road from the bridge you will pass a driveway on the left hand side and start up the hill. On the left hand side of the road there is a line of trees. Approximately halfway up the hill the trees come to a stop and there is a gate. You can pull over here on the side of the road next to the gate.
- Climb over the gate and start walking along the fence line. The fence drops away to the left towards the river but stay on the track for approximately 200 meters. The track will lead down towards the river at a point where there is a small curve. This should be reasonably obvious once you get here.
- Find a riffle to sample.



SITE LOCATION MAP – Mangatewainui at Hardys



POSSIBLE SITE HAZARDS (this does not negate undertaking a hazard review prior to sampling on the day):

Drowning	UV Radiation	Slippery surfaces	Trip hazards
Difficult entry/exit	Potential for difficult rescue	Weather/Temperature Extremes	Traffic / Vehicle Movements
Reduced Visibility	Communication- means of	Remote Area	

REQUIRED PPE (in accordance with above hazards – this does not negate undertaking a hazard review prior to sampling on the day and/or using additional PPE if deemed necessary):

WORK BOOTS / WADERS	PFD	SUNSCREEN & HAND SANITISER	PERSONAL LOCATOR BEACON	THROW BAG	VHF RADIO	HI-VIS	
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DIRECTIONS:

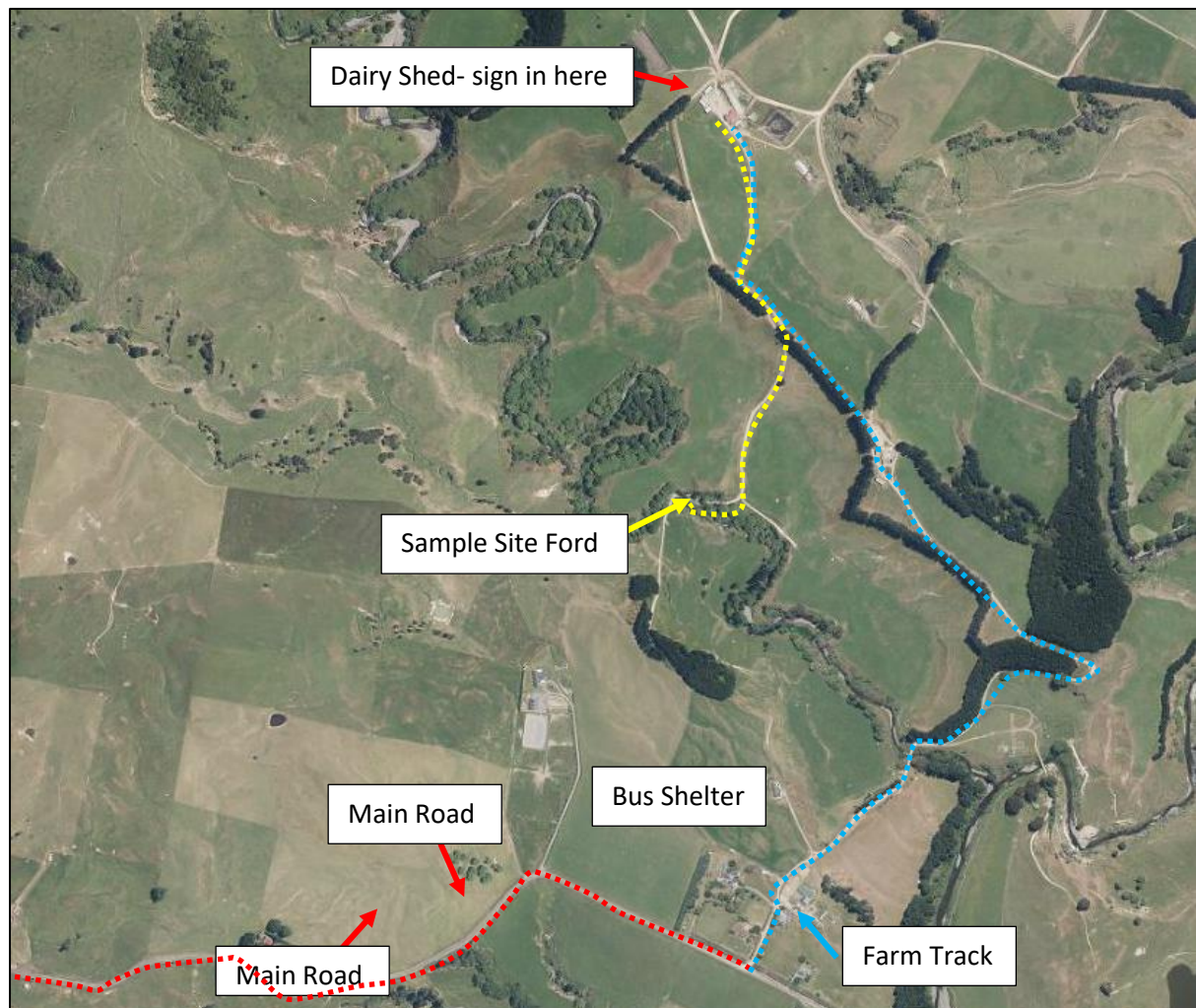
CONTACT ANDREW HARDIE BEFORE VISITING: 06 374 9095 OR 029 439 2542.

Sign in at the cow shed when you get to the farm (is included in the directions) and text when you leave the property.

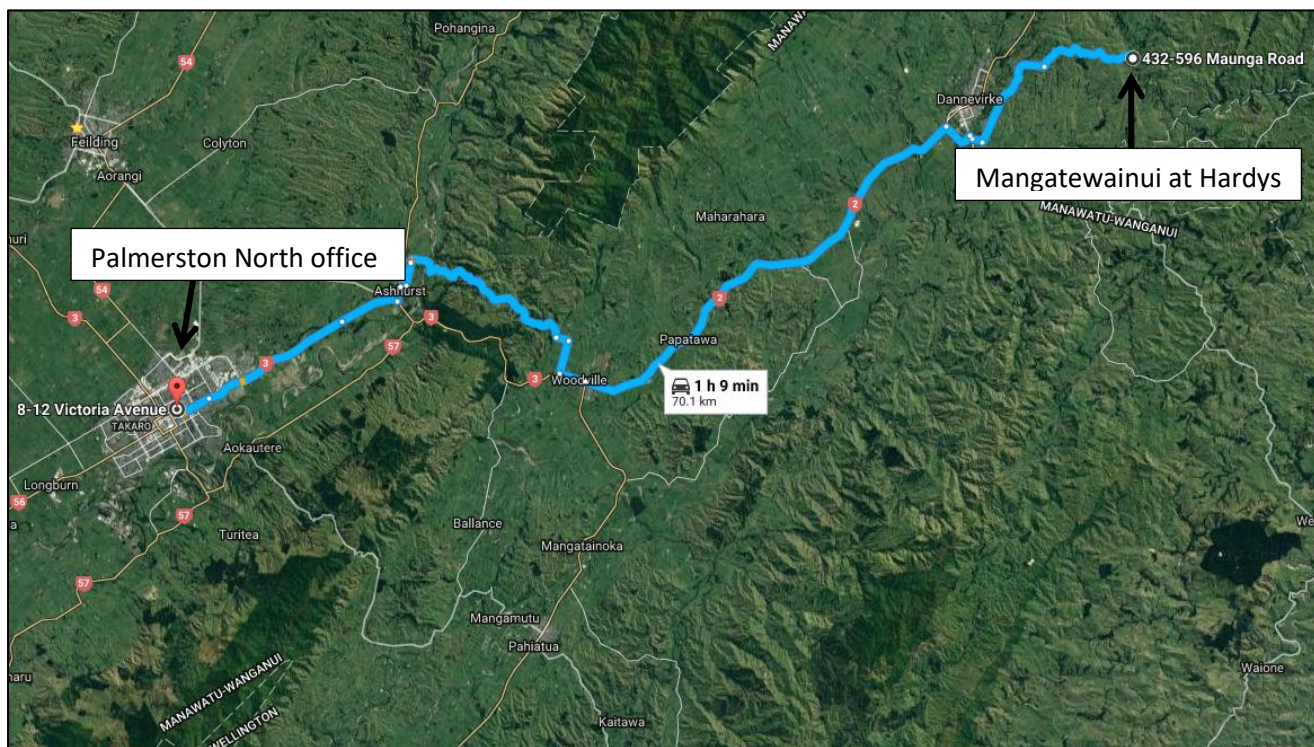
- From the Weber Road site head back down Weber Road towards Dannevirke. After approximately 1km turn right onto Tipapakuku Road.
- Follow Tipapakuku Rd for approximately 6.4km then turn left onto Maunga Road.
- Follow Maunga Road for approximately 5.8km, on your left you will come to a gravel drive way with a green bus shelter and a sign saying 'Ben Nevis Station', turn in here.
- Follow the gravel road for approximately 2.3km past the houses, down the hill, over a bridge, up another hill, and along until you reach a dairy milking shed. At the dairy shed you will see a red metal box, inside will be a book for you to sign into. Sign in here then head back the way you came.
- There is a gate on your right about 400m from the milking shed. This leads to a race that runs parallel to the tanker track, turn left down the race and follow it down the steep hill

until you get to a gate on your right by some willows. Park here and walk down to the river. This is your sample location. Find a suitable riffle

- Head back to the dairy shed once finished to sign out.



Heading back to the office



DIRECTIONS:

- From the Mangatewainui at Hardys site turn right and head back the way you came along Maunga Road until you get to the intersection with Tipapakuku Road.
- Turn right onto Tipapakuku Road and follow for approximately 6km, then turn right onto Cowper Road.
- At the end of Cowper Road turn right onto Weber Road. Follow Weber Road for about 250m and then turn left onto Makirikiri Road.
- Follow Makirikiri Road until you get to the intersection with SH2, turn left onto SH2 towards Palmerston North.
- Follow SH2 into Woodville, this road will then change to SH3 once you are through Woodville. Keep following out of Woodville for about 1km then turn right down Woodlands Road.
- When you come to the intersection with Oxford Road turn left onto Oxford Road and follow this up and over the Ruahine Ranges. The road will change names to Saddle Road.
- Eventually you will come into Ashhurst, follow the road to the end and then turn right onto Mulgrave Street.
- At the roundabout turn left onto Cambridge Ave and follow until you get to the intersection with SH3 then turn right and head to Palmerston North.
- Follow SH3, this will bring you into Palmerston North and then turn right onto Victoria Ave and drive back to the Horizons office.