



**22 FEBRUARY 2018**  
**TANK GROUP**  
**HDC PRESENTATION**

# HDC STORMWATER MANAGEMENT

## AGENDA

1. Global Consent – Key Themes
2. Adaptation - Catchment Management Plans
3. Quantity Management - Attenuation in an Urban Environment
4. Quality Management - Source Controls
5. Then and Now - How far have we come?
6. Upcoming work & expected outcomes

# NETWORK CONSENT

## Network Consent details:

- Issued May 2010, duration 12 years
- Covers 15 urban catchments in the Hastings district
- 40 conditions of consent, some very prescriptive and difficult to achieve in short time frames



## Resource Consent

In accordance with the provisions of the Resource Management Act 1991(RMA), and subject to the attached conditions, the Hawke's Bay Regional Council (the Council) grants a resource consent for a controlled activity to:

Hastings District Council  
Private Bag 9002  
Hastings 4156

To divert and discharge stormwater, excluding runoff that is not a consequence of rain, from any open drain system or piped stormwater drainage system to water, including discharges to land in a manner that subsequently results in the stormwater entering water, within the following catchments as shown in Attachment A:

### LOCATION

- |             |                     |
|-------------|---------------------|
| • DP090355W | Irongate            |
| • DP090356W | Lower Southland     |
| • DP090357W | Awahou              |
| • DP090358W | Ruahapia            |
| • DP090359W | Ruahapia Industrial |
| • DP090360W | Tomoana             |
| • DP090361W | Mallory             |
| • DP090362W | Karamu 2            |
| • DP090363W | Karamu 4            |
| • DP090364W | Clive Urban         |
| • DP090365W | Herehere            |
| • DP090366W | Mangarau            |
| • DP090367W | Havelock            |
| • DP090368W | Havelock Streams    |
| • DP090369W | Mahora              |

### CONSENT DURATION

This consent is granted for a period expiring on 31 May 2022.

### LAPSING OF CONSENT

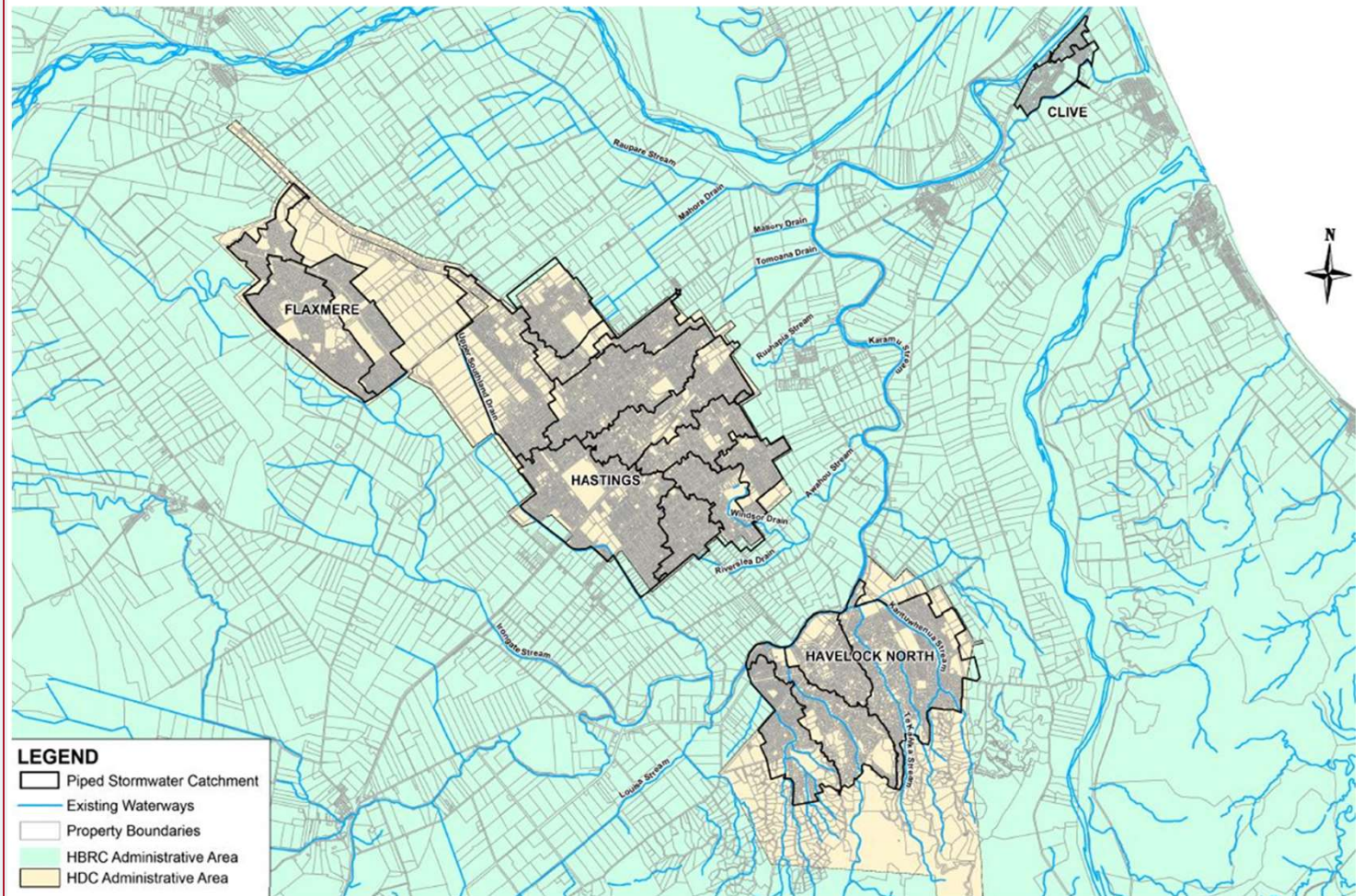
This consent shall lapse in accordance with s.125 on 31 May 2015 if it is not exercised before that date.

A handwritten signature in black ink, appearing to read "H E S Hamilton".

H E S Hamilton  
Commissioner/ Chair of Hearing Panel  
Under authority delegated by Hawke's Bay Regional Council.  
31 May 2010



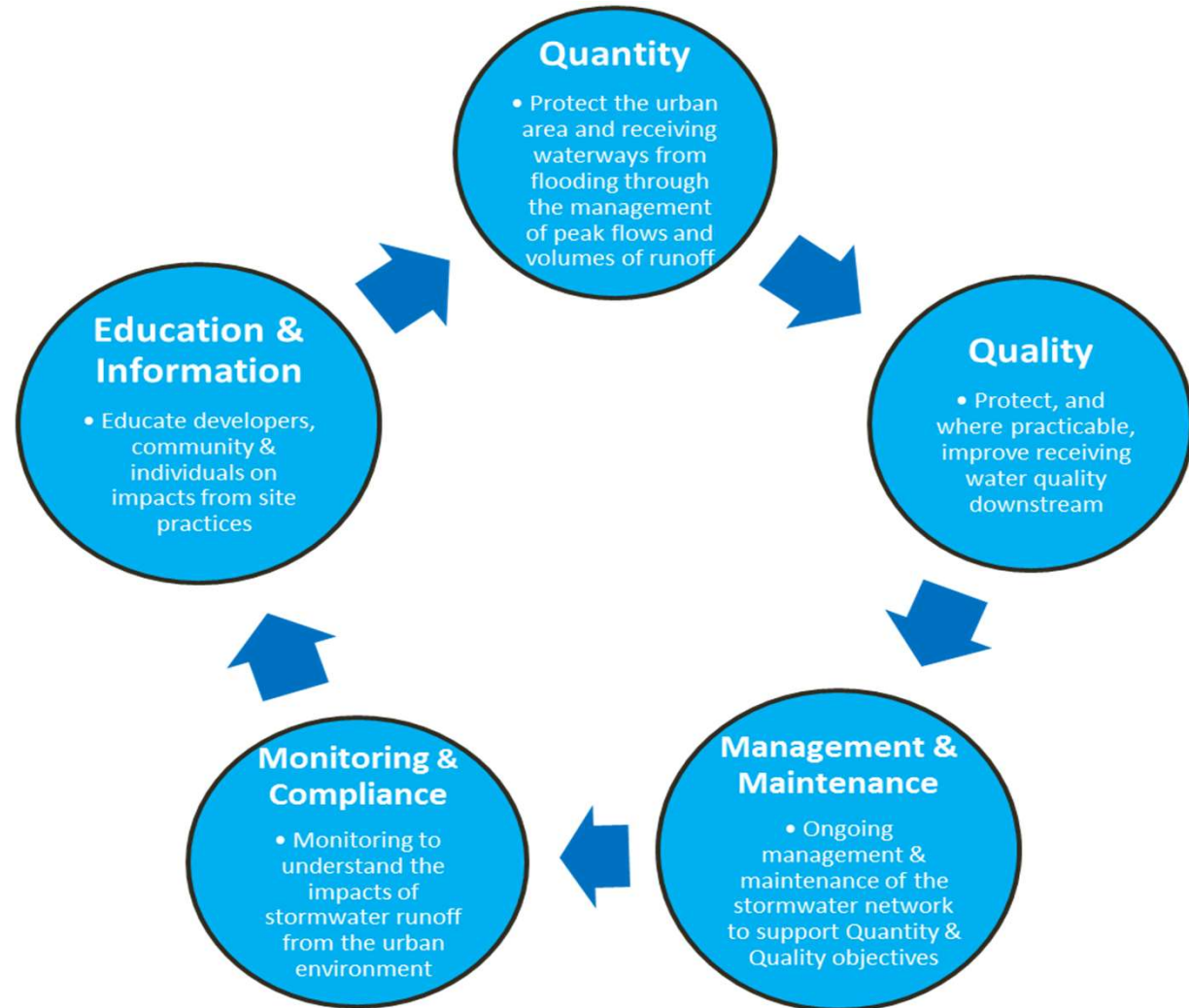
# URBAN STORMWATER CATCHMENT BOUNDARIES



15 individual urban catchments will ultimately discharge into the Karamu Stream.

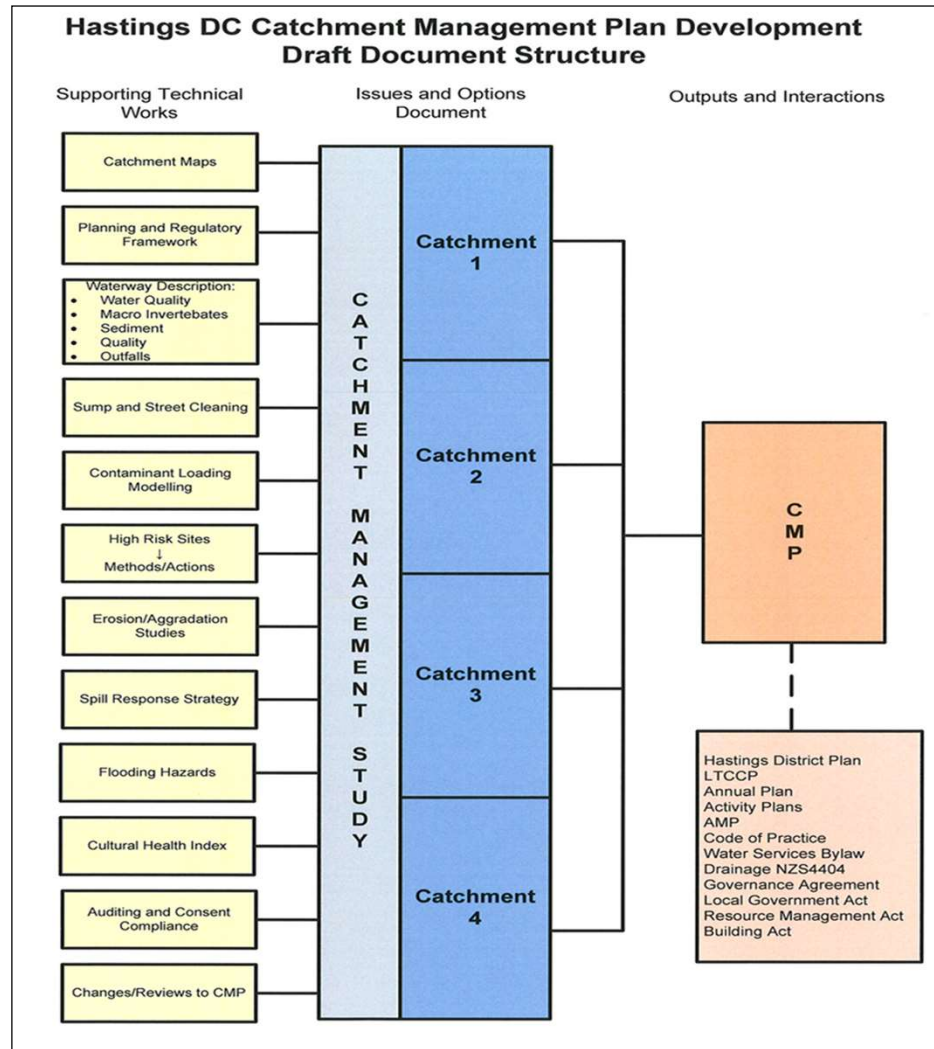


## STORMWATER MANAGEMENT ACTIVITY AREAS



The 40 network consent conditions are broadly defined by these five focus areas.

# FRAMEWORK TO DEVELOP CATCHMENT MANAGEMENT PLAN



# ROADMAP TO CONSENT COMPLIANCE

Develop the CMP and implement the actions associated with each of the five themes/activity areas.

## First 5 year period: (2010 – 2015)

- Information gathering, monitoring programme, prepare CMS & rank catchments

## Second 5 year period: (2015 – 2020)

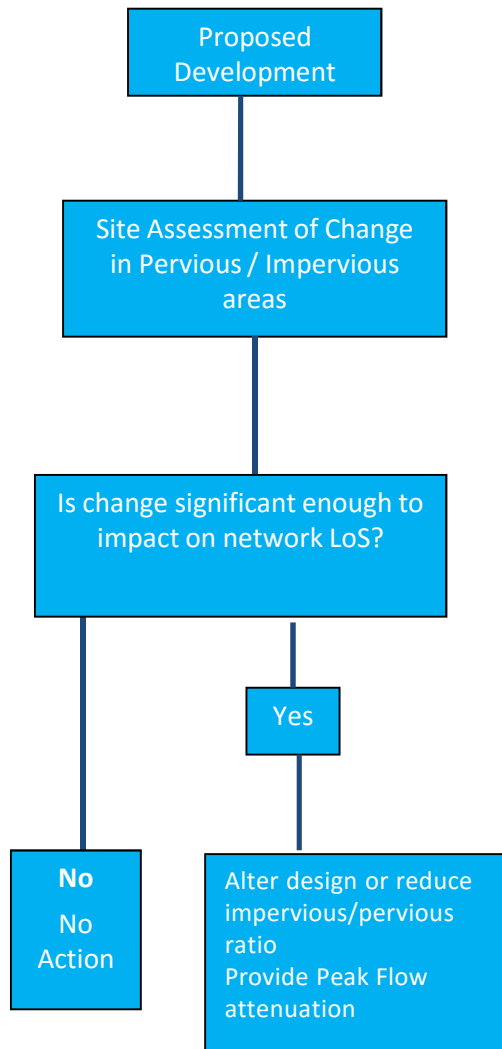
- Implement CMP, targeted monitoring, treatment options
- Address point source problems

## Final 2 year period: (2020 – 2022)

- further consultation with iwi (via cultural health index consent condition) updates of CMP, assess nature of new consent in 2022
- Continue targeted monitoring of individual catchments



## QUANTITY – SELF HELP TOOL FOR SITE ASSESSMENT



A. Site Details	
Site Name	Test 1
Development Type	Central Business District
Total Property Area	500 (m <sup>2</sup> )
Proposed Building Roof Area	360 (m <sup>2</sup> )
Garage Roof Area (Residential)	Nil or in Building Roof Area (m <sup>2</sup> )
Driveway Area (Residential)	0 to 15 (m <sup>2</sup> )
Other Paved or Hardstand Areas	100 (m <sup>2</sup> )
Impervious %	95%
Equivalent C Value (5 year)	0.85
Equivalent C Value (50 year)	0.87
<b>Storage Required - See below</b>	

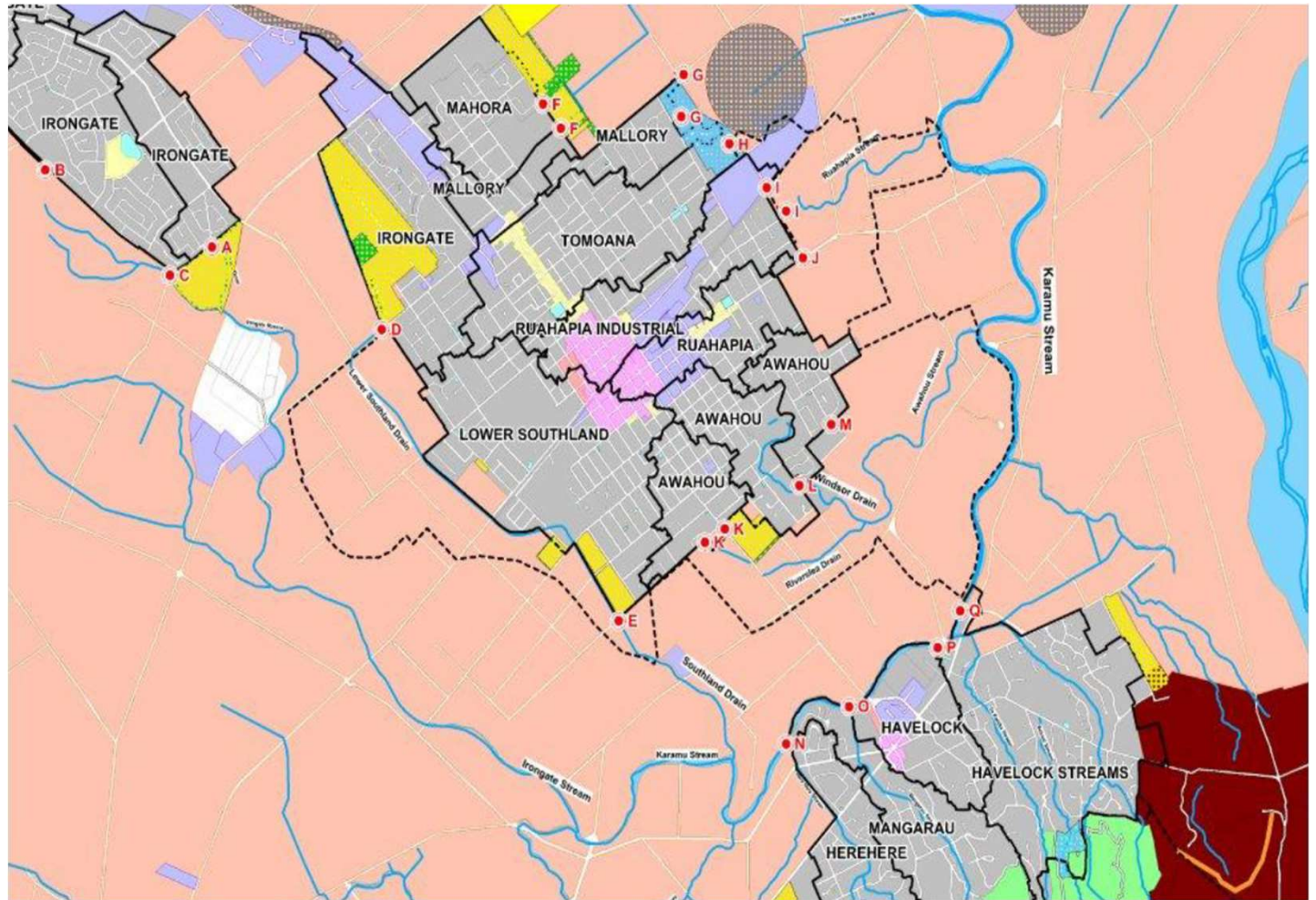
B. Detention Storage Required	
Minimum Storage Required	1000 litres
Minimum Roof Area Connected to Storage	70 (m <sup>2</sup> )
Proposed Roof Area to be Connected to Storage	150 (m <sup>2</sup> )

C. Storage Outlet	
Restricted Flow Rate	1.4 l/s
Storage Depth	1500 (mm)
Outlet Orifice Size	25 (mm)
<b>Refer to Guidance for Storage Details</b>	

On line detention calculator to determine volume of detention storage, outlet size and roof area to be directed to tank



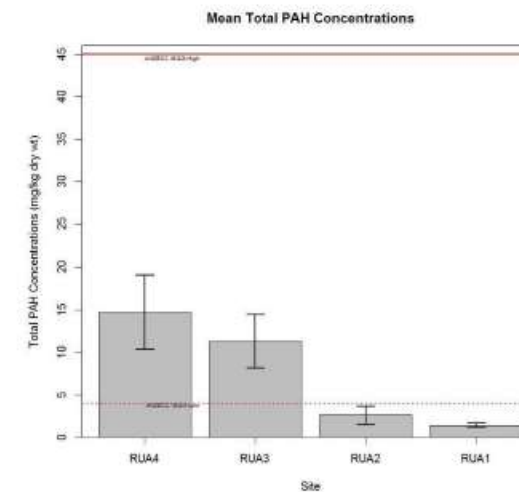
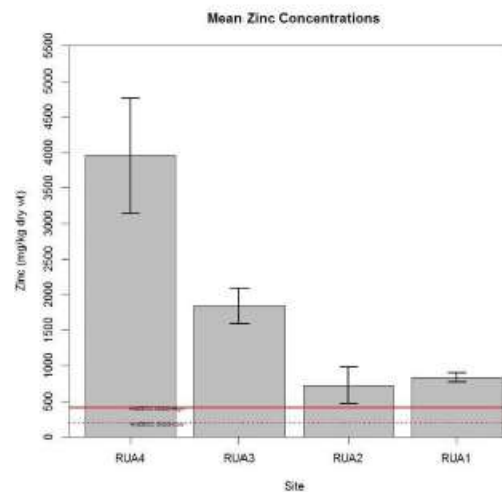
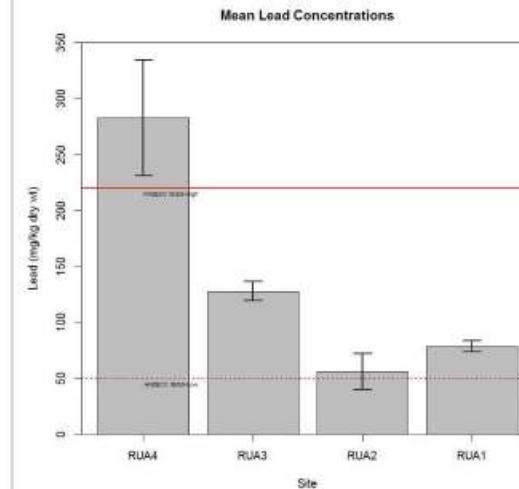
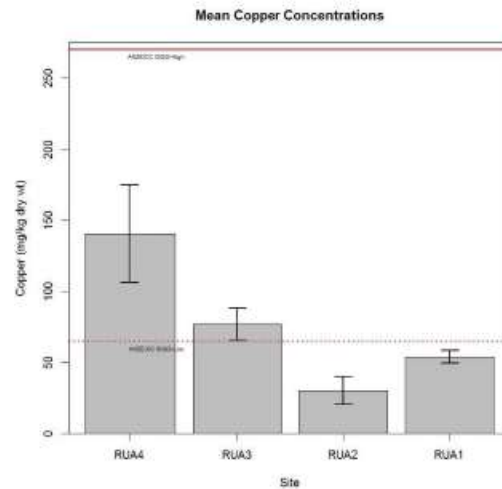
## HASTINGS URBAN AREA - LAND USE



Grey shaded area – urban residential zone.  
Purple shaded area – industrial zone.



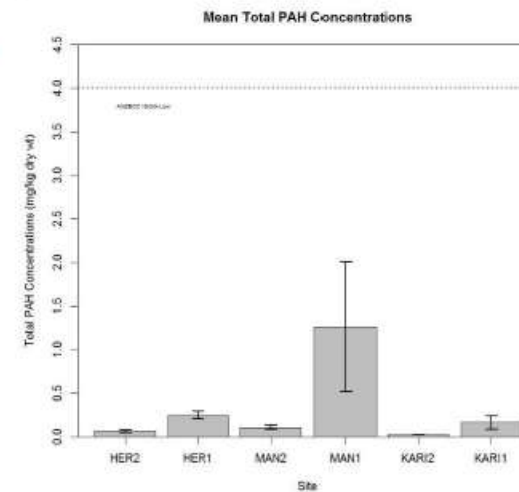
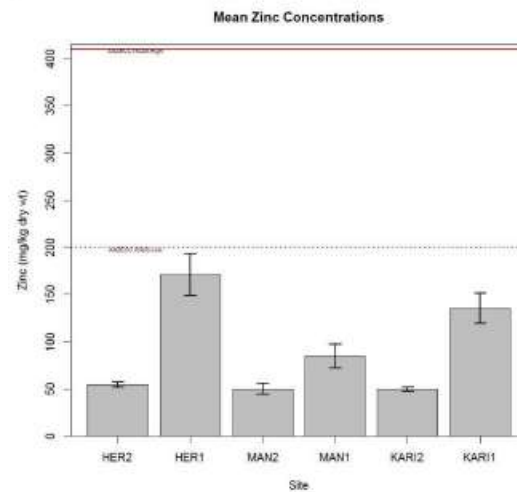
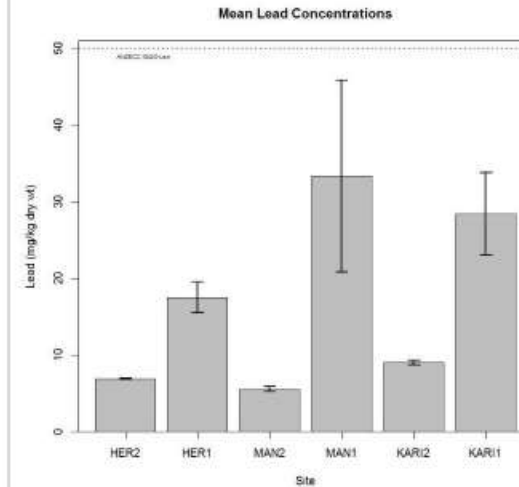
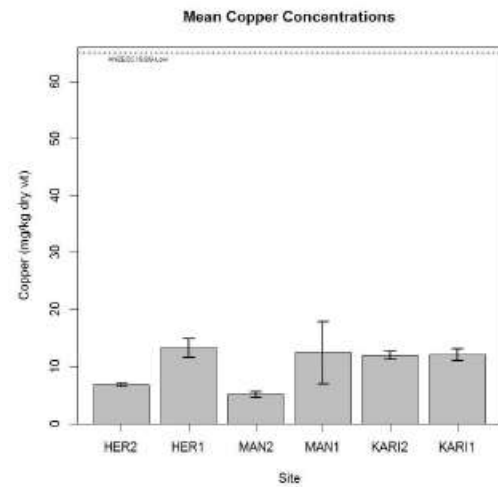
# RUAHAPIA STREAM SEDIMENT RESULTS



Ruahapia Stream sediment results – Copper, Lead, Zinc, PAH.  
Red dashed line ANZECC ISQG - Low.  
Red solid line ANZECC ISQG – High.



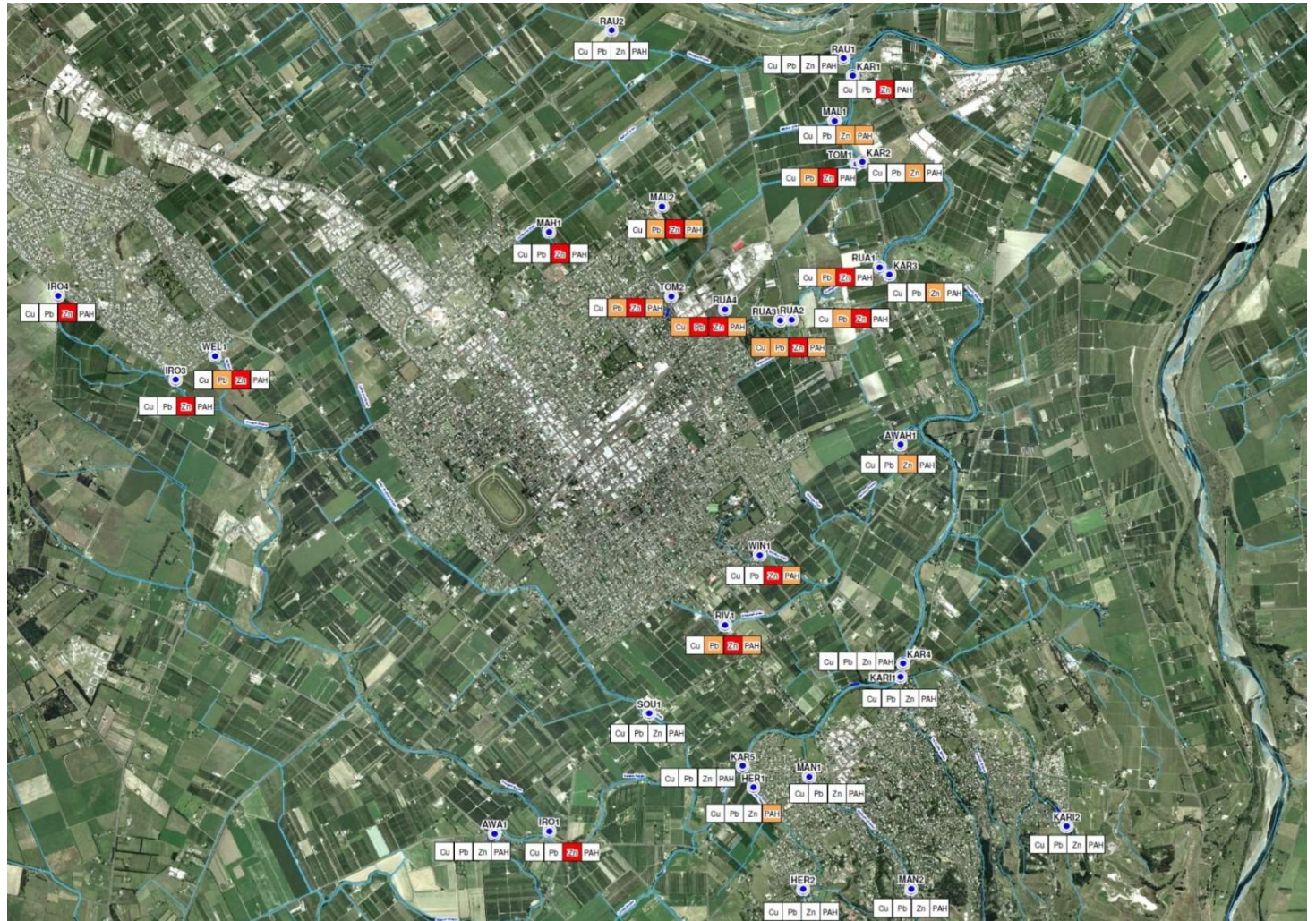
# HAVELOCK NORTH SEDIMENT RESULTS



Havelock North sediment results – Copper, Lead, Zinc, PAH.  
 Red dashed line ANZECC ISQG – Low.  
 Red solid line ANZECC ISQG – High.



## SEDIMENT QUALITY RESULTS



Spatial plan of four contaminant indicators: Copper, Lead, Zinc, Hydrocarbons.

## LYNDHURST RESIDENTIAL DEVELOPMENT

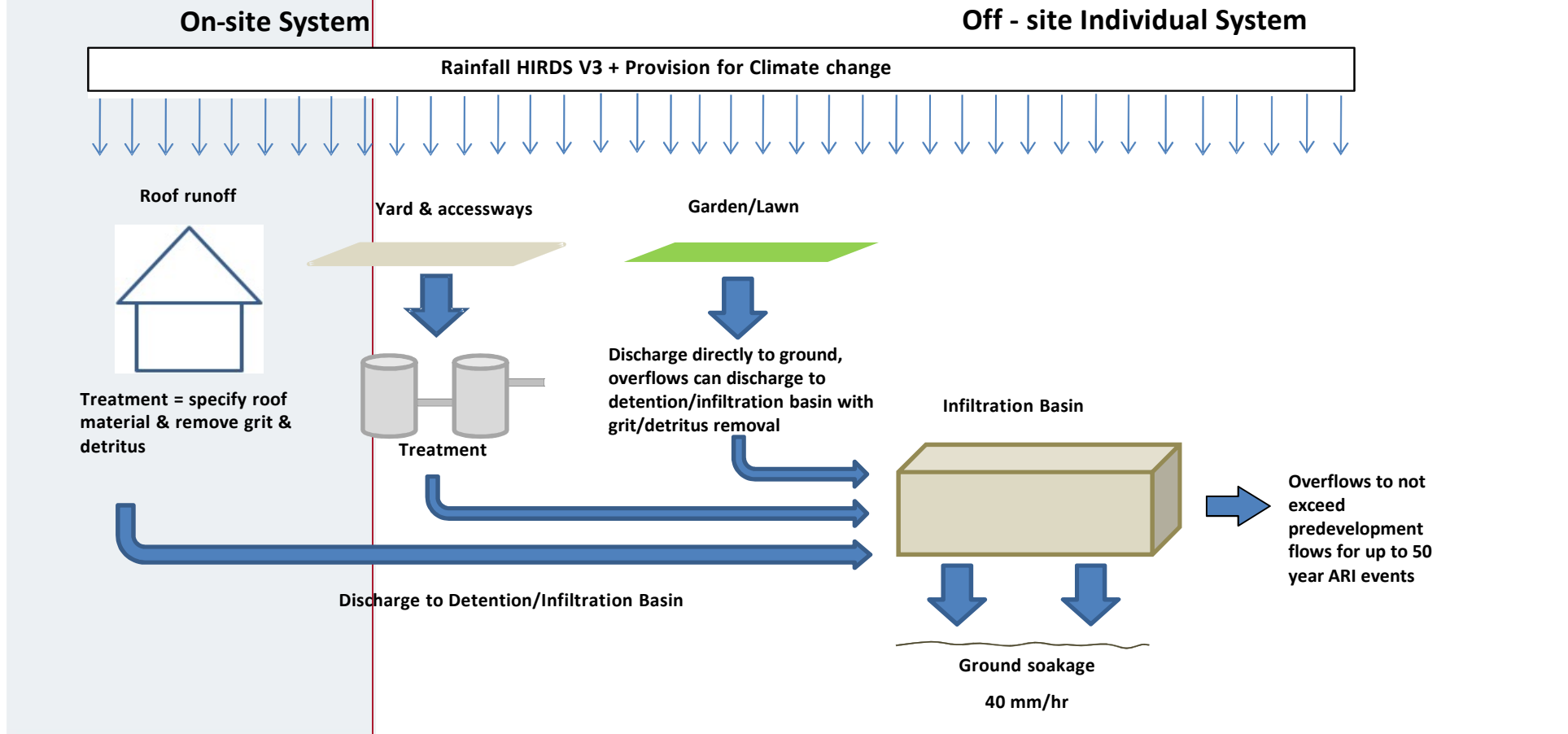


Stormwater detention ponds incorporated into residential development



# STORMWATER DISPOSAL METHOD FOR NEW INDUSTRIAL SITES

## OMAHU INDUSTRIAL STORMWATER SYSTEM DIAGRAM

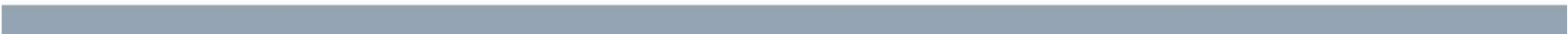
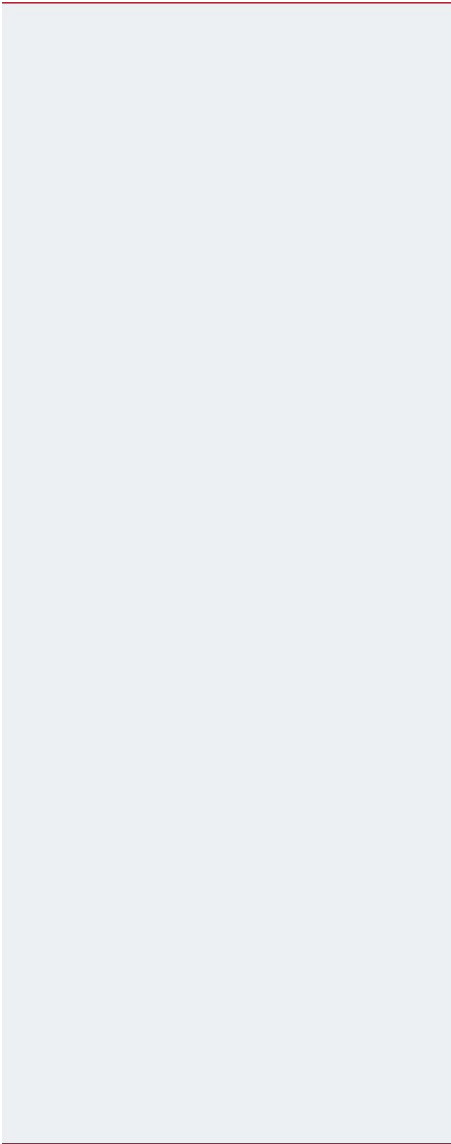


Quality - On site pre-treatment of stormwater prior to disposal to land  
Quantity - individual on site infiltration basins sized for 24 hour, 1:50 ARI event



## UPCOMING WORK & EXPECTED OUTCOMES

- Source pollution tracking - Move from 'routine' monitoring to 'targeted' catchment monitoring
- Network treatment - Develop treatment options for road runoff
- Lowes Pit – In conjunction with source pollution tracking, develop options to convert Lowes Pit into treatment/wetland area
- Improvement in stormwater quality by reducing contaminants entering the network
- Our success requires a regional approach to stormwater management (alignment of objectives, policies and rules)





# HDC URBAN WATER SUPPLY

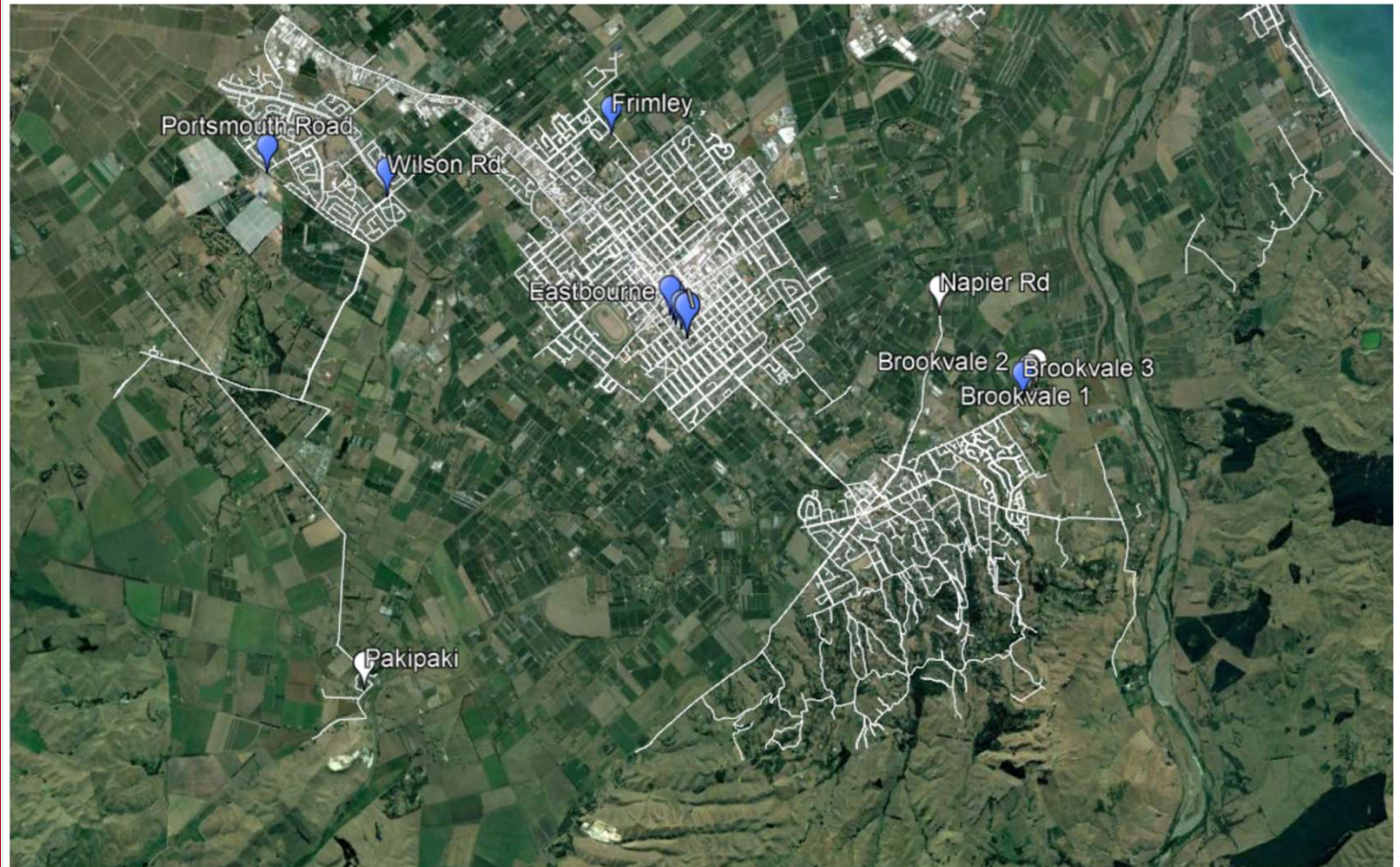
## AGENDA

1. Water Supply Overview
2. Consent & Allocation
3. Source Protection Zones / Sustainable abstraction management
4. Our Water Conservation & Demand Management Programme

# URBAN WATER SUPPLY OVERVIEW

## OUR SUPPLIES

HASTINGS  
HAVELOCK NTH  
FLAXMERE  
BRIDGE PA  
PAKI PAKI  
OMAHU  
WAIPATU  
WHAKATU  
CLIVE  
HAUMOANA  
TE AWANGA  
WAIMARAMA  
WHIRINAKI/ESK  
WAIPATIKI



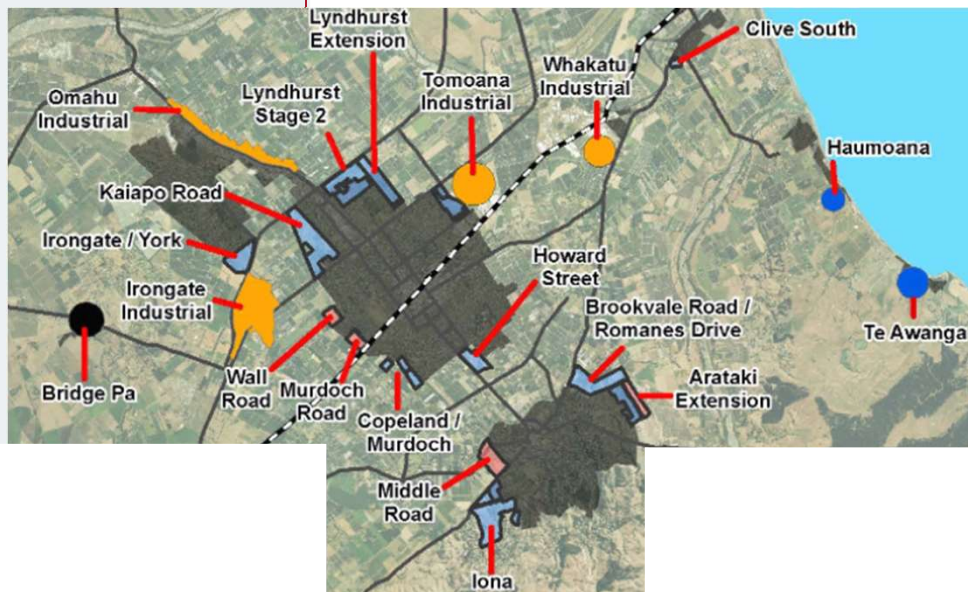
## HASTINGS WATER SUPPLY OVERVIEW

- Supplies 57,000 people via 23,000 connections (Domestic & Industrial)
- Expanded in recent years to include Bridge Pa & Paki Paki
- Major industry users; potable supply only, not for processing

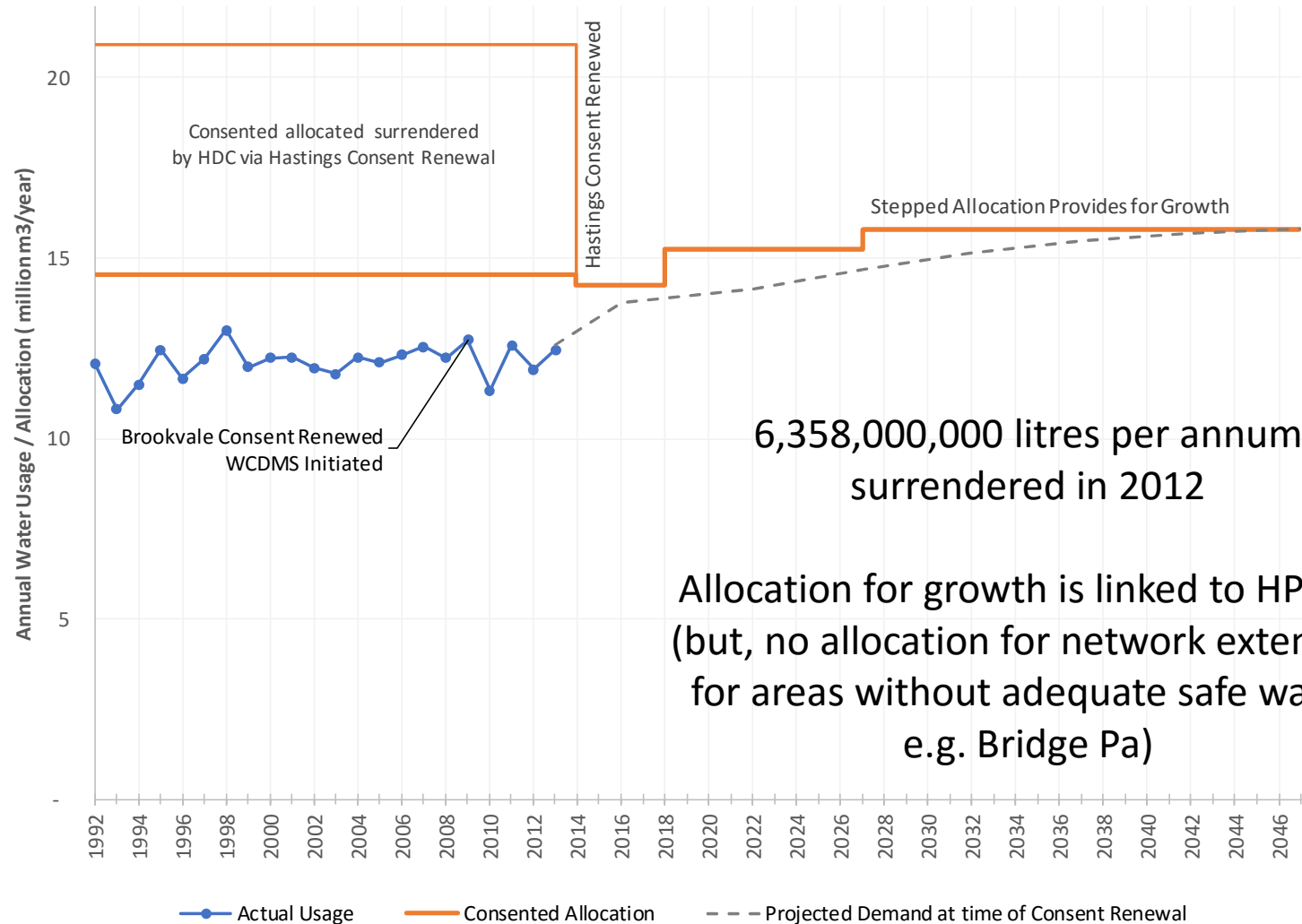
Borefield	
Eastbourne	Main supply borefield in centre of Hastings
Frimley	2 <sup>nd</sup> largest supply borefield
Wilson Road	Single bore located in Flaxmere Park; Rate of take limited to minimise effects on Irongate Stream
Portsmouth Rd	No use in low flow periods. Will become emergency only in 2020.
Brookvale	Bores 1 & 2 have been decommissioned. Bore 3 operated at reduced rates. To be decommissioned after new pipeline to avoid effects on Mangateretere Stream
Napier Road	Decommissioned.
Paki Paki	No longer used.

## WATER SUPPLY - CONSENTED ALLOCATION

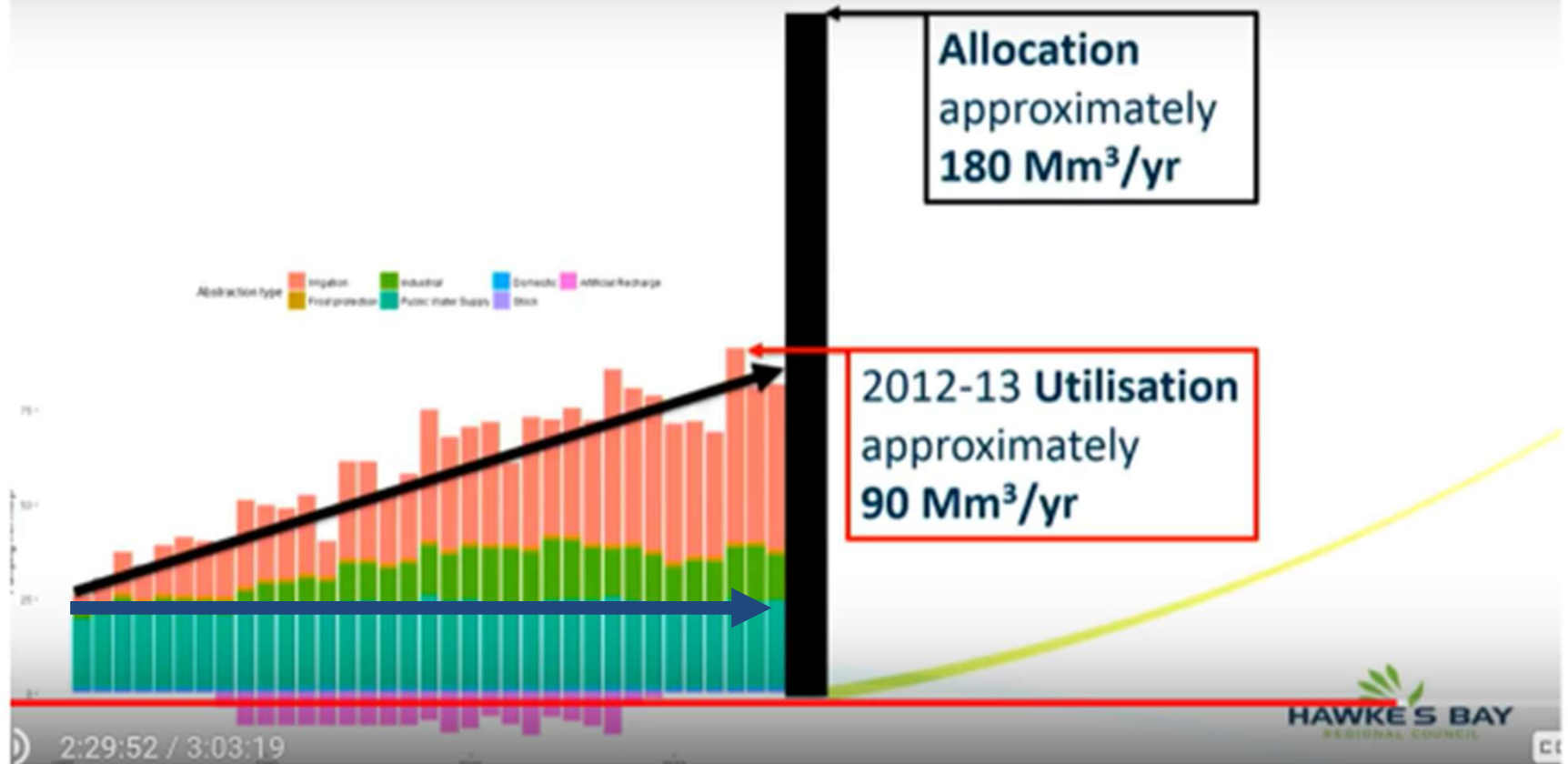
- Hastings Consent Renewal 2012
- Capped Annual Allocation for whole system
  - including abstraction under other consents ( Brookvale )
- Water demand projected based on HPUDS growth
- “Stepped” annual allocation limit in line with growth



# WATER SUPPLY – CONSENTED ALLOCATION



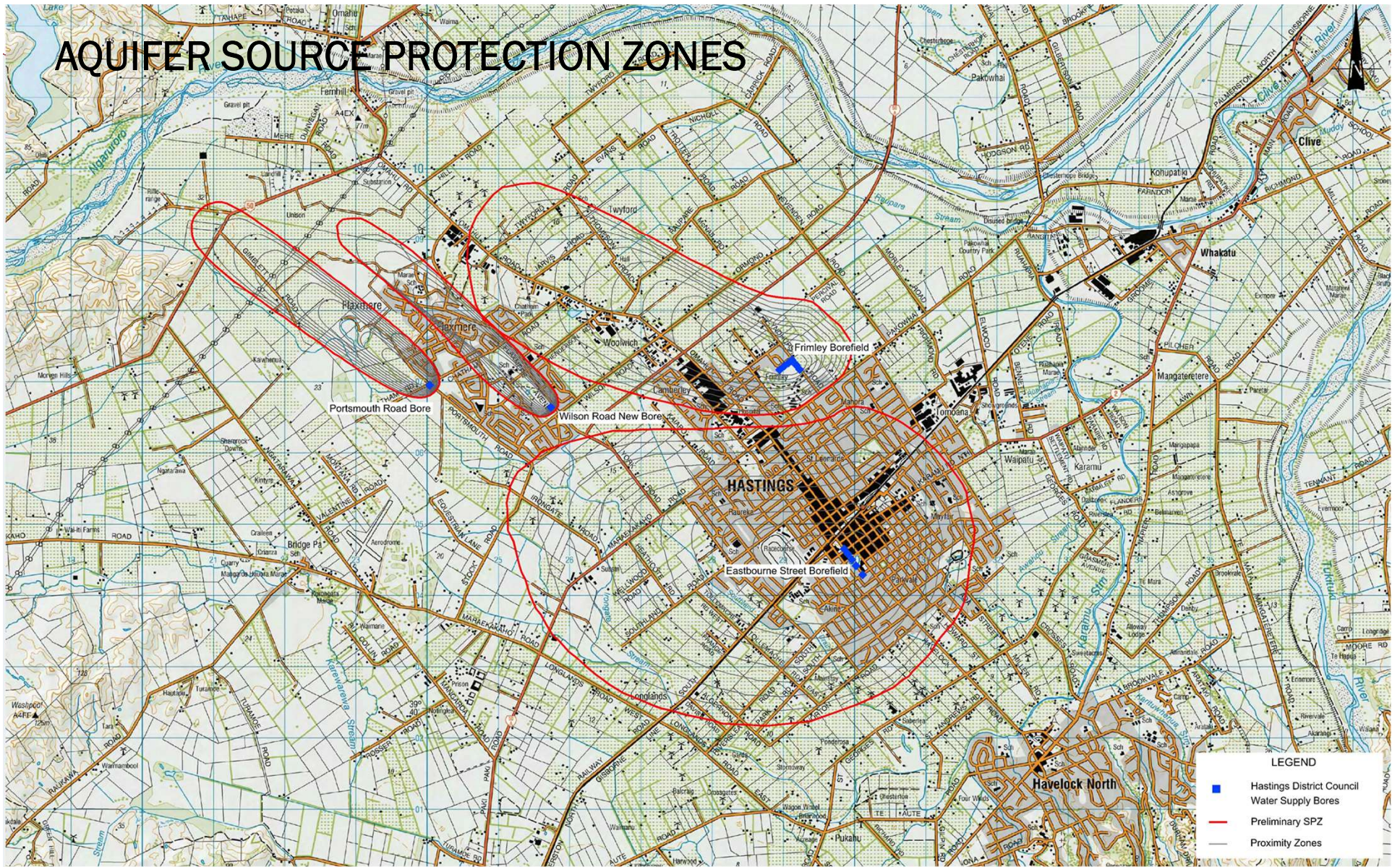
# Heretaunga Plains groundwater allocation



## SOURCE PROTECTION ZONES / SUSTAINABLE ABSTRACTION

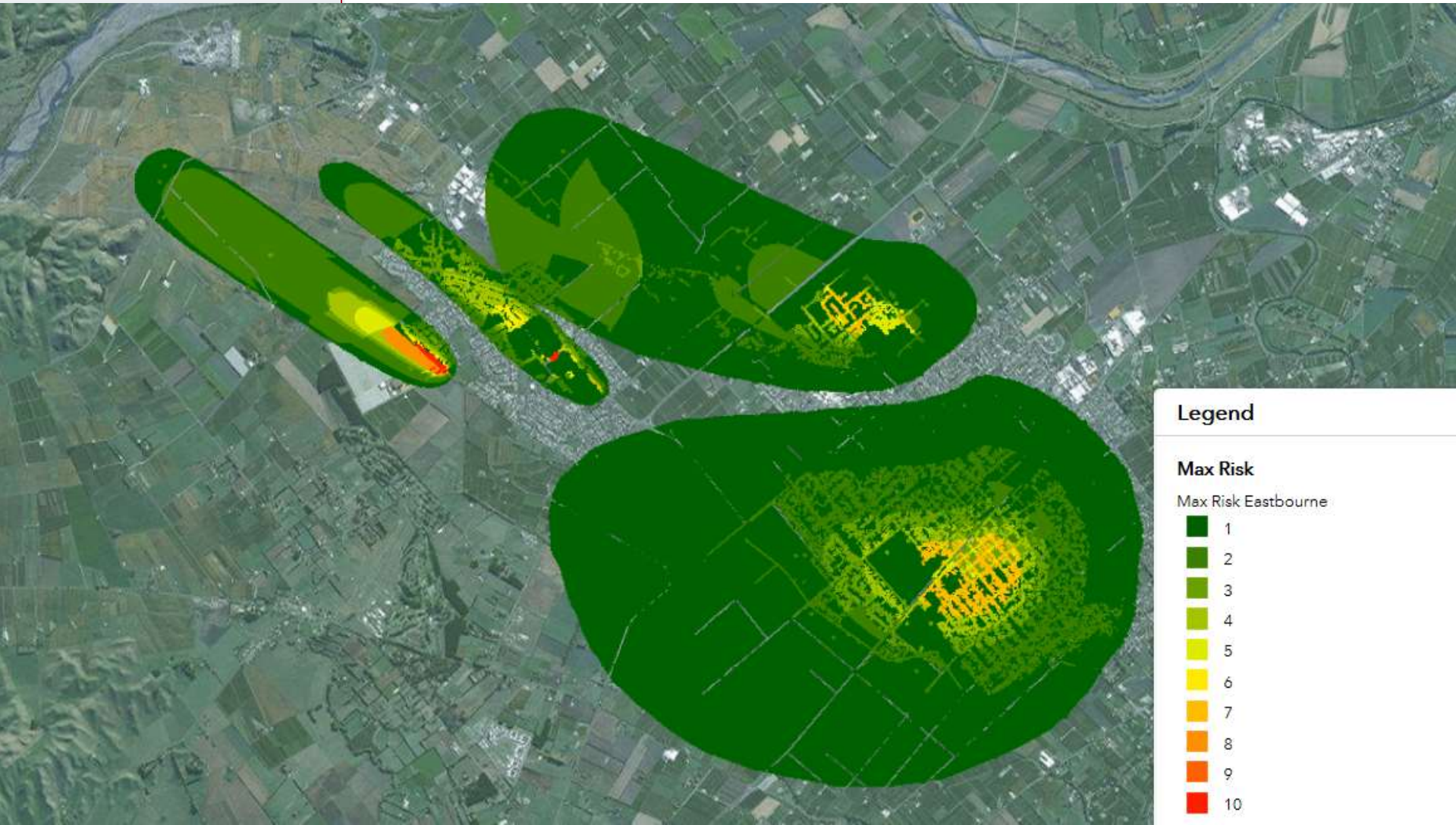
1. Source & Aquifer Investigations, Risks and Issues
  - HDC Source Protection Zones
  - SPZ best practice
  - Health Act S69U requirement (duty to protect source water)
  - Multi-barrier protection - GNS age dating of source water
  
2. Sustainable groundwater source management
  - Eastbourne reconfiguration, storage and treatment
  - Abstraction management, storage buffer – managed stream depletion effects
  - New groundwater source(s) – feasibility assessments: Tomoana, Whakatu

# AQUIFER SOURCE PROTECTION ZONES





# SPZ RISK MATRICES



# RISK PROFILE – WILSON ROAD BORE



## GROUNDWATER AGING – IMPLICATIONS FOR WATER SUPPLY

- 1 Compliance with DWSNZ 2005 (2008)
- 2 Secure groundwater confirmed by age-tracer analysis (GNS) in 2011
- 3 2016 minimum and mean residence time – significantly lower than 2011 results (which confirmed GW was not secure by definition with proportion of young fraction (< 1 year) to be greater than 0.005%)
- 4 Chemical data in the aquifer suggesting the influence of surface water in the aquifer
- 5 Treatment systems installed (UV, chlorination)

Table 4.1 Groundwater mean residence time (MRT) and young fraction (i.e., water less than one year old).

Well name	Exponential mixed flow %	MRT [years]	Minimum residence time [years] <sup>2</sup>	Young Fraction <0.005%
Waipatiki	50	115	58	Yes
Whirinaki	72	10	2.8	Yes
Omahu	50	0.2	0.1	No
Portsmouth Road	19	2.1	1.7	Yes
Wilson Road	56	2.1	0.9	No
Pakipaki	71	149	43	Yes
Parkhill	BMM <sup>1</sup>	20.8	3.3	Yes
Beach Rd, Haumoana	53	73	34	Yes
Tucker Lane, Clive	BMM <sup>1</sup>	26.6	5.4	Yes
Ferry Road, Clive	BMM <sup>1</sup>	34.1	5.0	Yes
Whakatu	BMM <sup>1</sup>	29.9	2.0	Yes
Waipatu	BMM <sup>1</sup>	29.9	2.0	Yes
Brookvale No.1	BMM <sup>1</sup>	4.3	0.1	No
Lyndhurst No.5	50 BMM <sup>1</sup>	5 9.0	2.5 1.0	Yes No
Eastbourne No.5	BMM <sup>1</sup>	25.0	2.4	Yes

<sup>1</sup> BMM denotes a binary mixing model.

<sup>2</sup> Minimum residence time is the age of the youngest water present in the well outflow. Values in red indicate non-compliance with the DWSNZ:2005 residence time criterion.

# WATER CONSERVATION & DEMAND MANAGEMENT

- Initiated in 2008: One of first for municipal supplies in NZ
- Three key components:



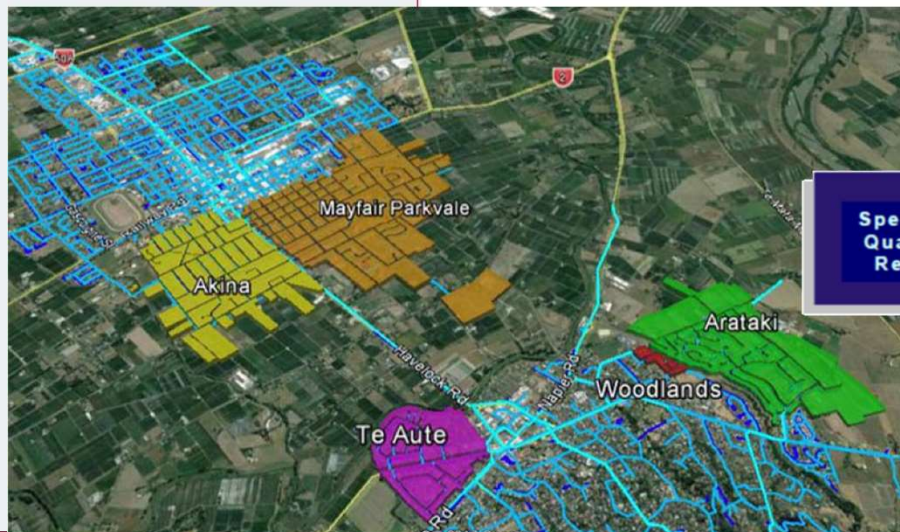
Encouraging Wise Use



Restricting Use in Low Flow Conditions

# NETWORK MANAGEMENT

- Pressure Management Zones
- Water Supply Bylaw
- Metering & Charging Extra-ordinary Users
- Tanker Filling Stations
- Response Times



## COUNCIL'S WATER USE

### Sportsground & Parks Irrigation

- Soil Moisture Metering
- Night Time watering
- Efficient Irrigation Infrastructure (4 parks to date)



### Community Gardens

- Automated Sprinklers for night time watering
- Adoption of drought tolerant species
- Mulching to retain soil moisture





### IN THE GARDEN

- Use a timer for garden sprinklers so you don't forget to turn them off.
- Water at cool times of the day; early in the morning is ideal.
- Avoid watering in windy weather, to reduce evaporation.
- Soak rather than spray, every fourth day.



### IN THE KITCHEN

- Scrape dirty dishes rather than rinsing them, and make sure the dishwasher is full before you run it.
- Put the plug in before you wash dishes or vegetables (and don't forget to put vegetable scraps on the garden).



### IN THE LAUNDRY

- Your washing machine can use up to a bath-full of water per load, so either wait till you have a full load, or if your washing machine has an adjustable water level setting, use it.
- Ask about water efficiency next time you buy a new washing machine



### IN THE BATHROOM

- Don't leave the water running while shaving or brushing your teeth.
- Take shorter showers.
- Installing a low flow showerhead can save up to 50 litres per shower.
- Run shallow baths rather than filling the tub right up.
- Check for leaks in your toilet cistern by putting a few drops of food colouring in.
- If you don't have a dual flush toilet, put a brick in the cistern to reduce the amount of water used with each flush.
- Don't use the toilet just to flush away rubbish such as facial tissues - if you can, put it in the bin.

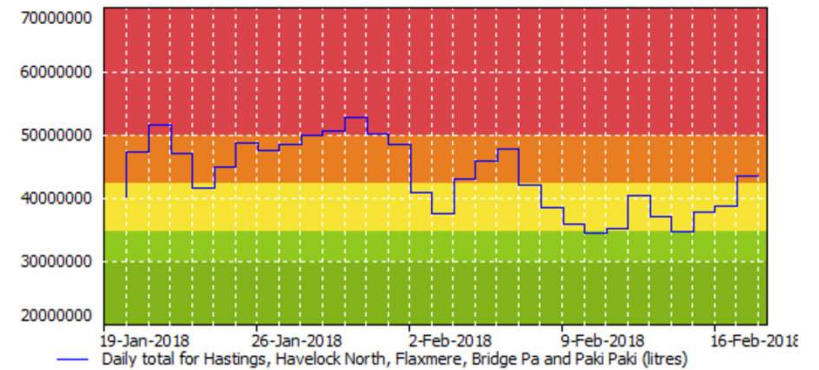


### AROUND THE HOME

- Install covers on pools and spas to lessen water evaporation.
- Park the car on the lawn when washing it.
- Fix leaky taps with new washers - if it still leaks, call a plumber.

## ENCOURAGING WISE USE

- Promotion of water conservation message
- Water Use Monitor



## SUMMER / LOW FLOW RESTRICTIONS

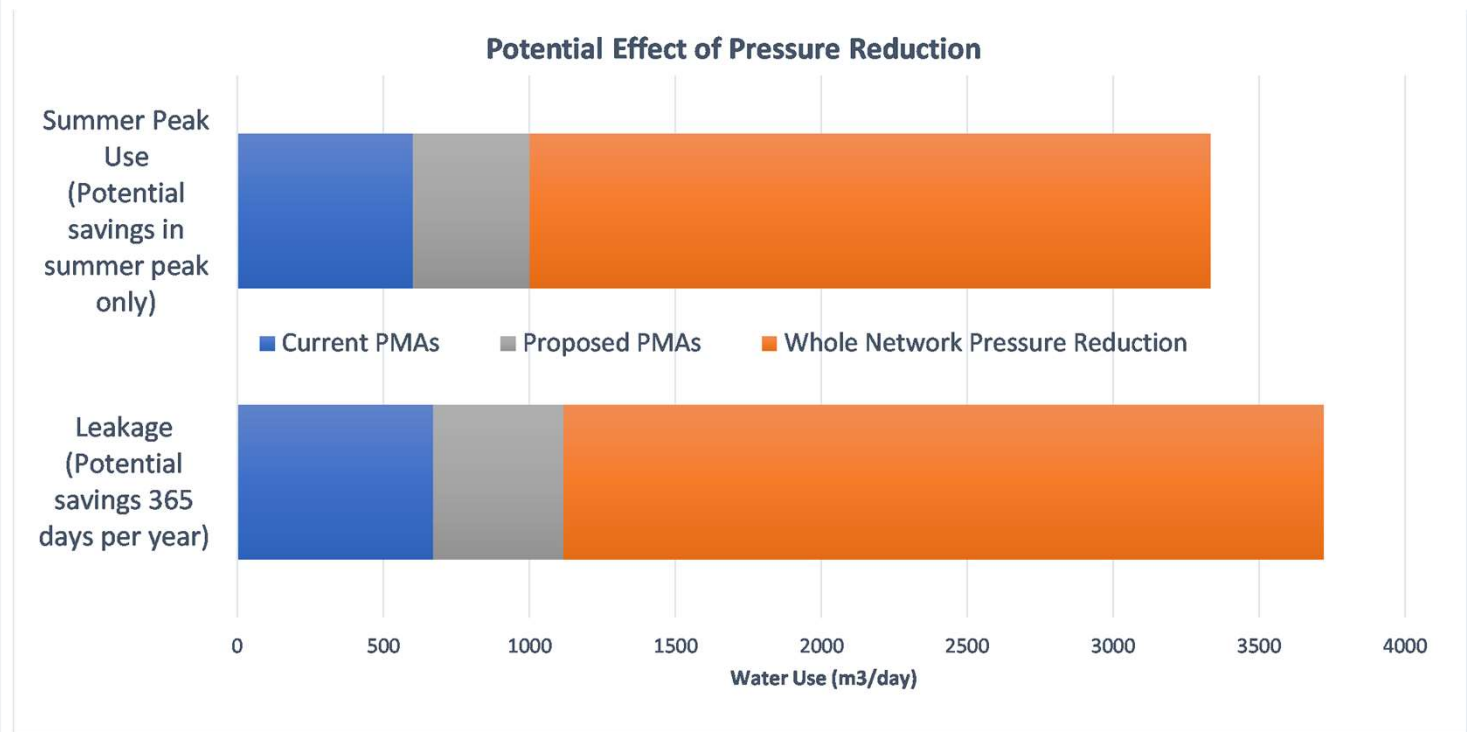
- Consent conditions limit our abstraction on bores that may affect stream flows
- Decision matrix for implementing restrictions
  - Stream flows
  - Community demand
  - Weather forecast
- 4 Levels of Restrictions



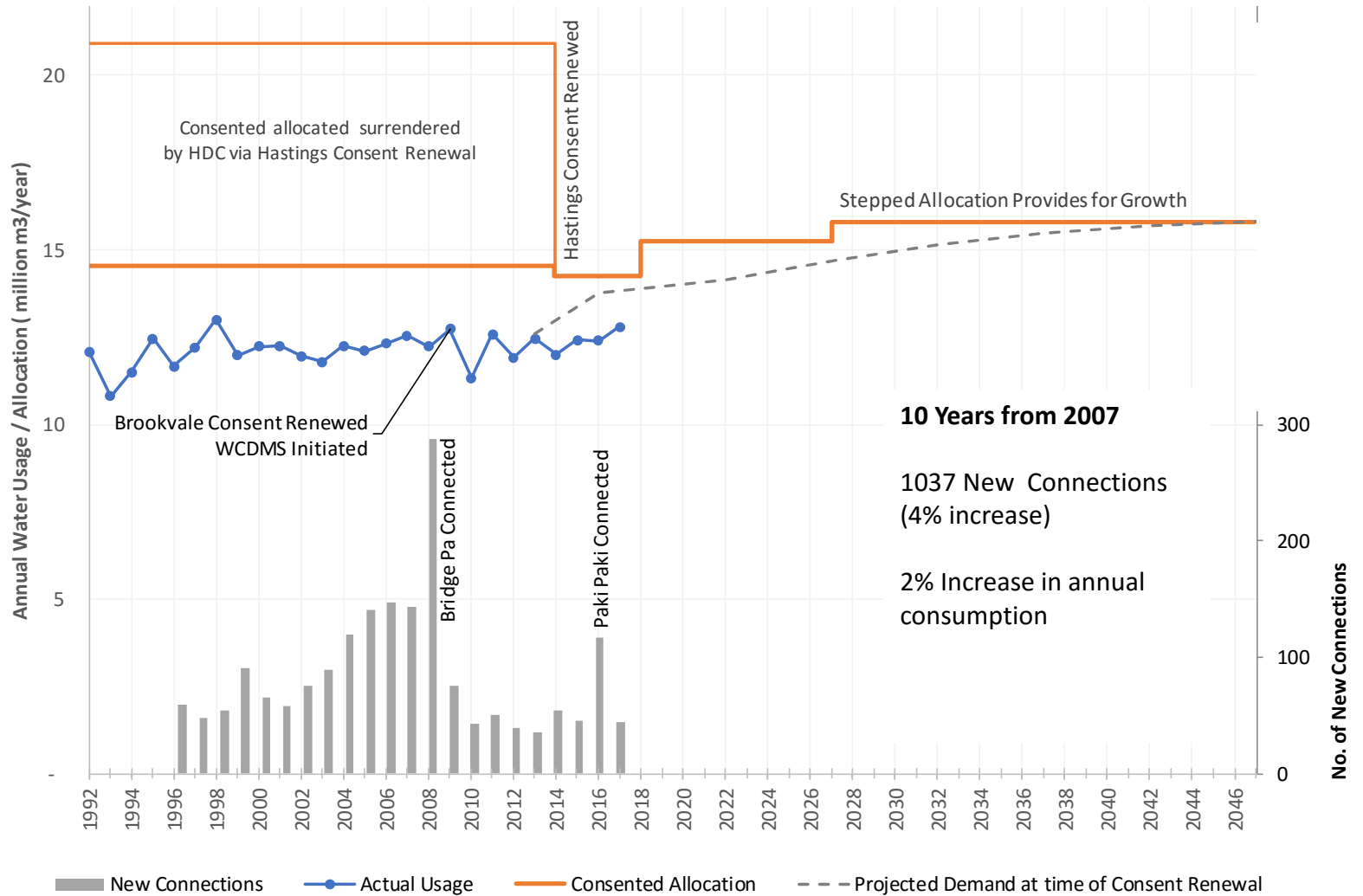


## OUTCOMES TO DATE

- Pressure Management Areas:
  - 18% of network is in PMA
  - Reduced pressure has saved 670 m<sup>3</sup>/day in leakage
  - PLUS, reduces peak summer use by approx. 600 m<sup>3</sup>/day



# OUTCOMES TO DATE – ANNUAL CONSUMPTION



## E.G. HORIZONS POLICY – REASONABLE USE

- |   |                                                                                  |                              |
|---|----------------------------------------------------------------------------------|------------------------------|
| 1 | Domestic Needs                                                                   | 300 L/p/day                  |
| 2 | PLUS Commercial Allowance                                                        | 20%                          |
| 3 | PLUS Industrial Allowance                                                        | Best practice                |
| 4 | PLUS Hospitals, Medical, Marae, Education, Correction Facilities.                |                              |
| 5 | PLUS Amenity & Recreation<br>e.g. community pools, gardens, sports fields, parks |                              |
| 6 | PLUS Animals & Agricultural Uses                                                 |                              |
| 7 | PLUS Growth where planned                                                        |                              |
| 8 | PLUS leakage                                                                     | 15% of total of all of above |

## UPCOMING WC&DMS PROGRAMME

- Expansion of education programme jointly with NCC
- Full network pressure reduction 5 year implementation (supersedes the PMA programme planned over 15 years)
- Sportsground irrigation system – remainder of Council's parks within next 6 years.
- Enhanced network modelling
- Leak detection programme
- Annual water restrictions and surveillance

# CONCLUSION

## 1 Stormwater

- Adaptive consent to 2022
- Targeting catchments of concern (CMP)
  - Specific work plan for Lowes Pit
- Source controls (e.g. Bylaw & District Plan)
- Managing urban stormwater impacts, but, as part of a whole-of-catchment approach

## 2 Municipal Water Supply

- 1<sup>st</sup> priority is Providing Adequate Safe Water
  - Source Protection Zones
- Consent to 2047;
  - 6,358,000 m<sup>3</sup>/yr surrendered
  - Allocation for growth is linked to HPUDS (but, no allocation for network extension for areas without adequate safe water e.g. Bridge Pa)
- Mature WC&DMS: getting our house in order; & changing community behaviour
- Measurable improvements achieved to date demonstrate strategy is driving efficiency