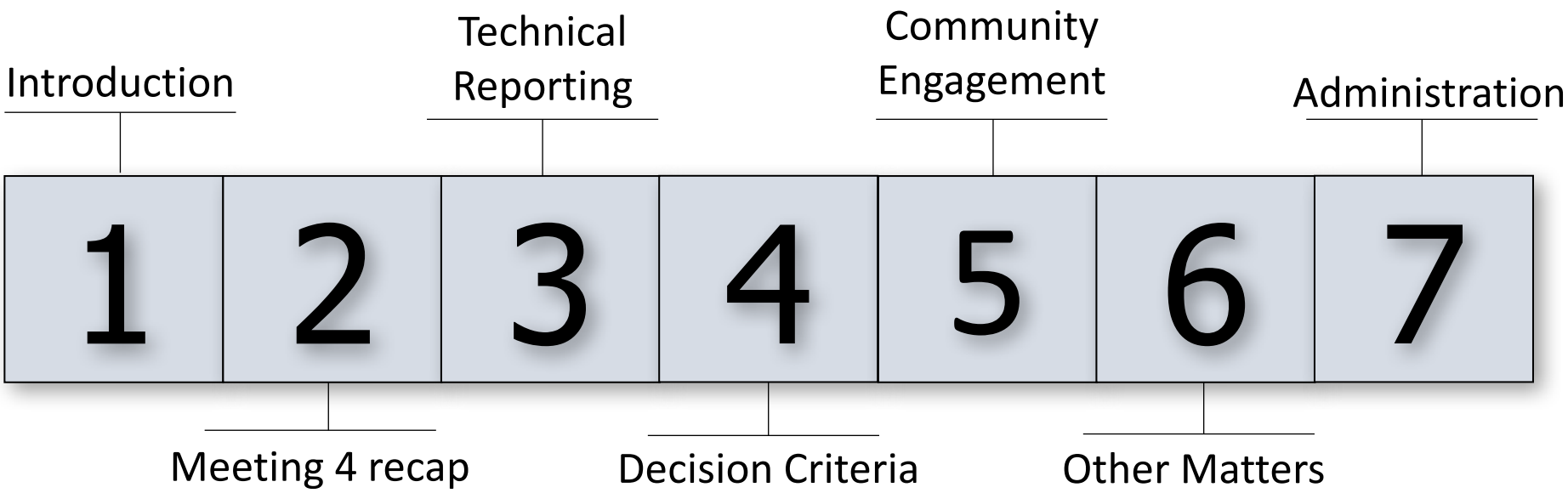
Wairoa Wastewater Scheme Stakeholder Group Meeting

Meeting 5 – 10 July 2017

INTRODUCTION

Outline



RECAP - MEETING 4

Recap

- Hastings WWTP
- Waipukurau WWTP

Highlights and lowlights

Similarities and differences

RECAP - MEETING 4

Parameter	Wairoa (2008-16)			Hastings			Waipukurau 2016-2017			NZ Pond Effluent Guideline
	Inflow	Effluent	Reduction	Inflow	Effluent	Reduction	Inflow	Effluent	Reduction	
pH	7.5	7.6	-1 %				7.4	7.4	0 %	
BOD_5 (g/m^3)							52	6	89 %	30
COD (g/m^3)	235	126	46 %							
CBOD (g/m^3)	78	23	84 %							
NH_3-N (g/m^3)	16.3	15.6	8 %				28.4	26.1	5.4 %	13
TKN (g/m^3)	22.0	-								
TN (g/m^3)	22.0	-					40.4	29.3	27.5 %	35
TP (g/m^3)	3.3						4.37	1.34	64 %	8
TSS (g/m^3)	-	52						12		40
E. coli (cfu/100 ml)	-	5,200					164,000	316	99.67 % (3 log)	5,000
Enterococci (cfu/100 ml)	340,000	1,100	99.56 % (2 log)							

TECHNICAL REPORTING – PROJECT STRUCTURE

A: Data Gathering – Technical Reports

- A1: Reticulation
- A2: Treatment
- A3: Water
- A4: Tangata Whenua
- A5:Land
- A6: Values
- A7: Planning

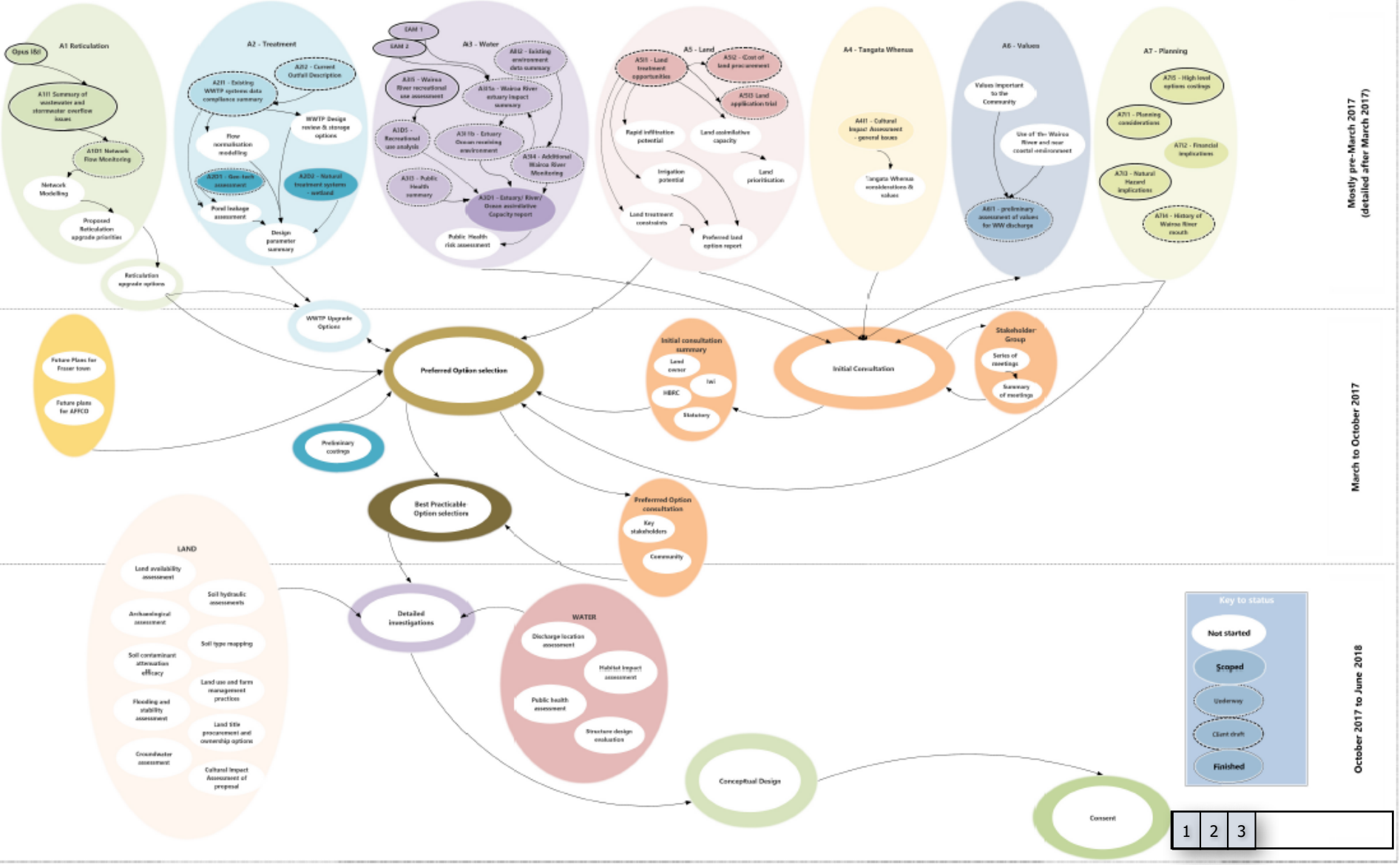
B: Options and Conceptual Design Reports

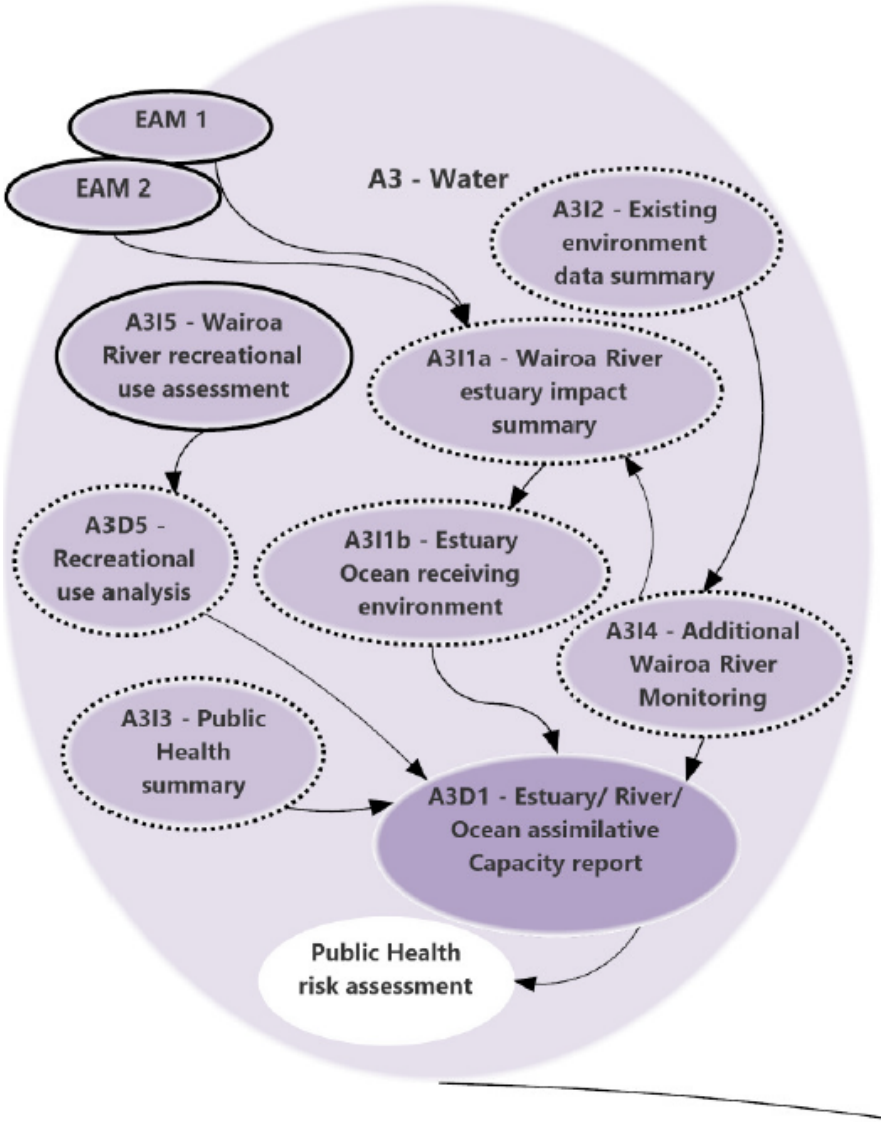
- B1: Preliminary Reports
- B2: Detailed Reports
- B3: Preferred Option

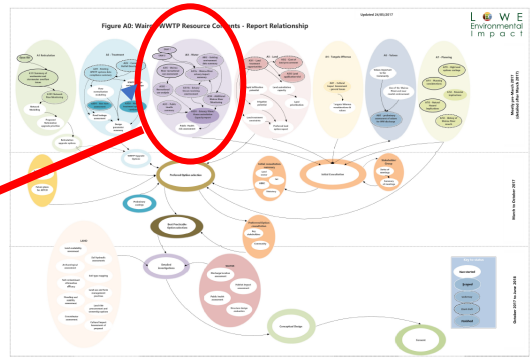
C: Resource Consenting

Updated 24/05/2017

Figure A0: Wairoa WWTP Resource Consents - Report Relationship




EAM 1
EAM 2
A3 - Water
A3I2 - Existing environment data summary
A3I5 - Wairoa River recreational use assessment
A3I1a - Wairoa River estuary impact summary
A3D5 - Recreational use analysis
A3I1b - Estuary Ocean receiving environment
A3I4 - Additional Wairoa River Monitoring
A3I3 - Public Health summary
A3D1 - Estuary/ River/ Ocean assimilative Capacity report
Public Health risk assessment



TECHNICAL REPORTING - SCOPES

A1I1 – Summary of wastewater and stormwater overflow issues

Date:	**3 June 2016**
Name:	Summary of wastewater and stormwater overflow issues.
Reference:	A1I1
Background:	The Wairoa wastewater treatment system requires a replacement consent by May 2019. The major consent non-compliance issue with the present system, and a major issue to be addressed in re-consenting, is the recurrence of wastewater overflows to the Wairoa River, from manholes and pump stations, during times of heavy rain and high river level.
Purpose:	To characterise the issue of uncontrolled overflows from the Wairoa municipal wastewater system in the light of available and existing information, and to recommend options to manage the issue.
What to Cover:	• Information on the location, timing, preceding rainfall and river level in relation to overflow events; • Information on the effects of overflows; • Assessment of causes of overflows; • Identification of priority actions required to reduce, and ultimately eliminate, the un-managed overflows; and • Recommendation of a program of investigations to identify specific works requirements for the reduction of the overflows.
Exclusions:	• Assessment of the Wairoa piped stormwater network.
Contributors:	LEI, WDC.
Project Manager:	HL
Who to Contact:	As needed
Who not to Contact:	Individual property owners.
Timing:	Started mid-2015; final report provided to Project Owner October 2015.
Costs:	
Type of Output:	Report and Recommendations.
Reference Material:	WDC asset information.
Status:	Completed.

TECHNICAL REPORTING – PROGRESS

Date: 7 July 2017 Task Label	Description	Future Reports	Scoped	Underway	Review - Neil	Review - Jamie	Completed
O1	Project Management						
O2	Consultation Plan						
O3	Stakeholder Group Terms of Reference						
O4	Project Risk Assessment & Management						
O5	Consultation						
A	**Resource Assessment & Data Gathering Reports**						
A1I1	Summary of Wastewater and Stormwater Overflow Issues						
A1D1	Network Flow Monitoring						
A2I1	Existing WWTP System Data & Compliance Summary						
A2I2	Current Outfall Description						
A2D1	Geotech Assessment						
A2D2	Natural Treatment - Constructed Wetland and Overland Flow						
A3I1a	Wairoa River Estuary Impact Summary						
A3I1b	Estuary/ Ocean Receiving Environment						
A3D1	Estuary/River/Ocean Assimilative Capacity						
A3I2	Existing Environment Data Summary						
A3I3	Public Health Summary						
A3I4	Additional Wairoa River Monitoring						
A3I5	Recreational Use Assessment						
A3D5	Recreational Use Analysis			Report		Memo	
A4I1	Cultural Impact Assessment – General Issues						
A4I2	Tangata Whenua Worldviews						
A5I1	Land Treatment Opportunities						
A5I2	Costs of Land Procurement						
A5I3	Land Application Trial						
A6I1	Preliminary Assessment of Values for WW Discharges						
A7I1	Planning Considerations						
A7I2	Financial Implications						
A7I3	Natural Hazard Implications						
A7I4	History of Wairoa River Mouth						
A7I5	High Level Options and Costings						
TBA	High Level Refined Discharge Option Costings						
TBA	Other Initial & Detailed Scopes						
B	**Optioneering & Conceptual Design**						
TBA	Feasibility Investigations						
C	**Resource Consent Preparation**						
TBA	Land Assessment of Environmental Effects						
TBA	Water Assessment of Environmental Effects						
TBA	BPO						

TECHNICAL REPORTING

Wastewater Treatment Plant Summary

Daily flow				Similar quality or better for pond systems	Compliance - generally complied, except	
2,700 m^3/d average	2,200 m^3/d summer	4,000 m^3/d winter	well above typical expected flows for communities the size of Wairoa		system overwhelmed from increased flows	bar closures

TECHNICAL REPORTING

Environmental Summary

ammoniacal nitrogen and nitrate-nitrogen are minimal

Water clarity is the worst out of 104 sites within the Hawke's Bay

due to sedimentary geology & farmed hill country

78% - 88% of *E. coli* results tested during summer are below alert level (260 cfu/100ml).

95th percentile is above 540 cfu/100ml = very poor standard under MfE/MoH guidelines for recreational water quality

information indicates that treated wastewater is currently not causing:

degradation of the Wairoa River water quality or the aquatic and estuarine ecosystems

TECHNICAL REPORTING

- A summary of water quality guidelines and observed quality in the Wairoa River Upstream of Wairoa (2004 – 2013) (Source: Ausseil, et al, 2016).

Parameter	Min	Median	Max	Guideline/Limit	Guideline Source
TP	0.004	0.026	2.200	0.033 mg/l maximum	ANZECC (2000) Lowland
DRP	0.002	0.006	0.043	0.010 mg/l maximum	ANZECC (2000) Lowland
DRP	0.002	0.006	0.043	0.015 mg/l maximum	HBRC RRMP (2006)
NH_4-N	0.005	0.010	0.119	0.1 mg/l maximum	HBRC RRMP (2006)
DIN	0.014	0.060	0.660	0.444 mg/l maximum	ANZECC (2000) Lowland
NO_3-N	0.001	0.040	0.373	3.8 mg/l maximum for 90% species protection from toxicity effects	Hickey (2013)
NO_3-N	0.001	0.040	0.373	2.4 mg/l maximum for 95% species protection from toxicity effects	Hickey (2013)
NO_3-N	0.001	0.040	0.373	1.0 mg/l maximum for 99% species protection from toxicity effects	Hickey (2013)
Clarity – black disc	0.0	0.6	2.1	1.6 m minimum for contact recreation	ANZECC (2000); HBRC RRMP (2006)
Clarity	0.0	0.6	2.1	3.5 m minimum for 'Significant' trout fishery	Hay, Hayes & Young (2006)
Clarity	0.0	0.6	2.1	5.0 m minimum for 'Outstanding' trout fishery	Hay, Hayes & Young (2006)
Suspended solids	1.5	13.5	2,900	25 mg/l maximum	HBRC RRMP (2006)
E. coli	1	46	14,000	540 cfu/100 ml maximum for contact recreation (health) Red alert/Action level	MfE/MoH (2003)
E. coli	1	46	14,000	260 cfu/100ml maximum for contact recreation (health) Amber alert	MfE/MoH (2003)
DO	6.8	9.4	12.6	$\geq$ 7.5 for protection of all aquatic organisms	MfE NPS-FW NOF (2014)

TECHNICAL REPORTING

Current Outfall

- Outfall constructed in 1981
- Outfall has become buried under 3 m sediment
- Risks to current discharge flow rates
- Diffuser tee installed 21 March 2017 to prevent backlog of wastewater

Wairoa River Impact Summary

- Flounder - concentrations of the trace metals Arsenic, Copper, Lead and Zinc were lower in Wairoa

Can't tell difference in sediment around diffuser

Recreational Use Summary

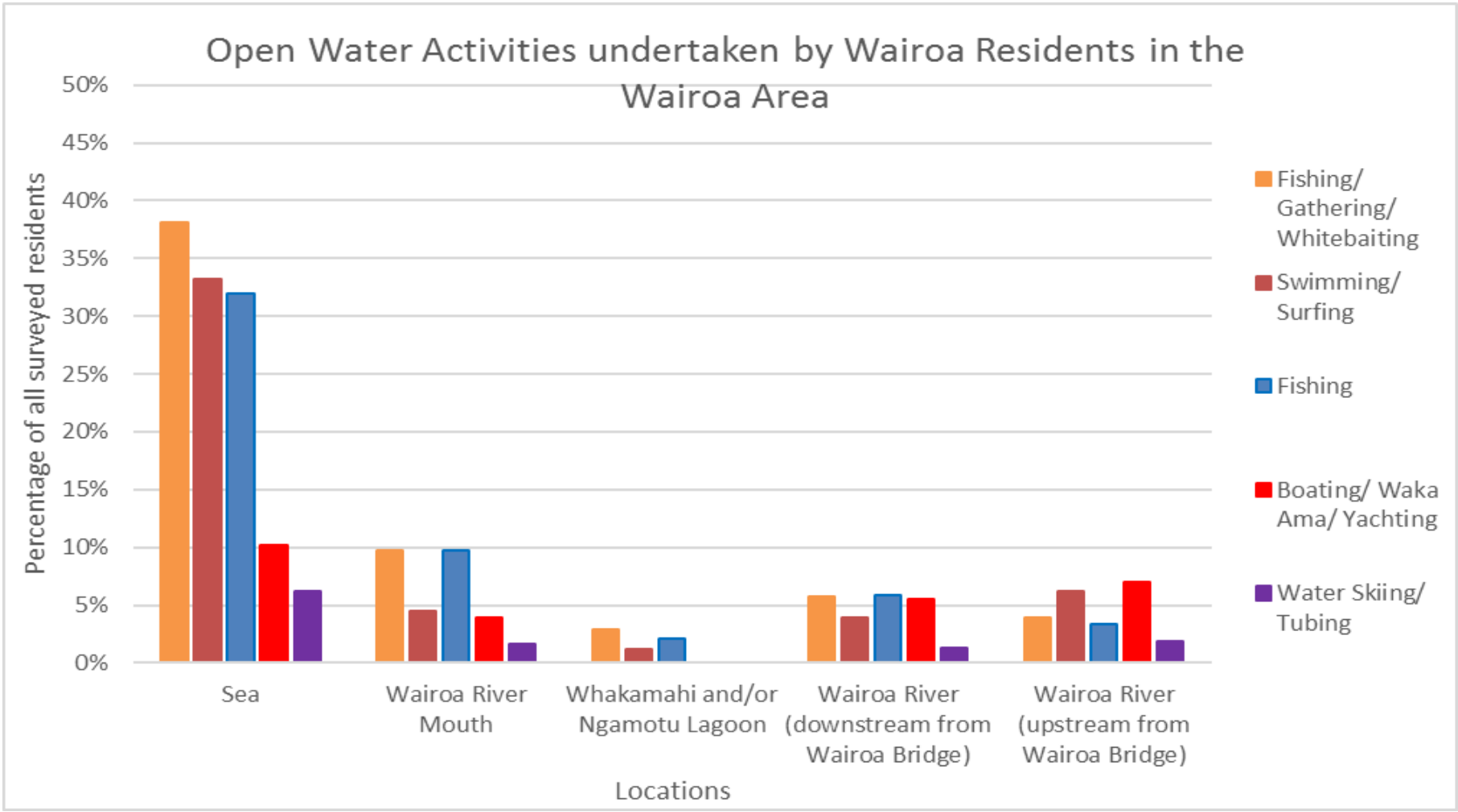
Age of sample population - 44% 0 – 18 years old

Fishing, swimming, boating, water skiing

23% households part take in open water activities on a daily basis in summer

Health and safety in open water – 28% suggested water quality most valuable

TECHNICAL REPORTING – RECREATIONAL USE



TECHNICAL REPORTING – LAND OPTIONS

Land treatment opportunities

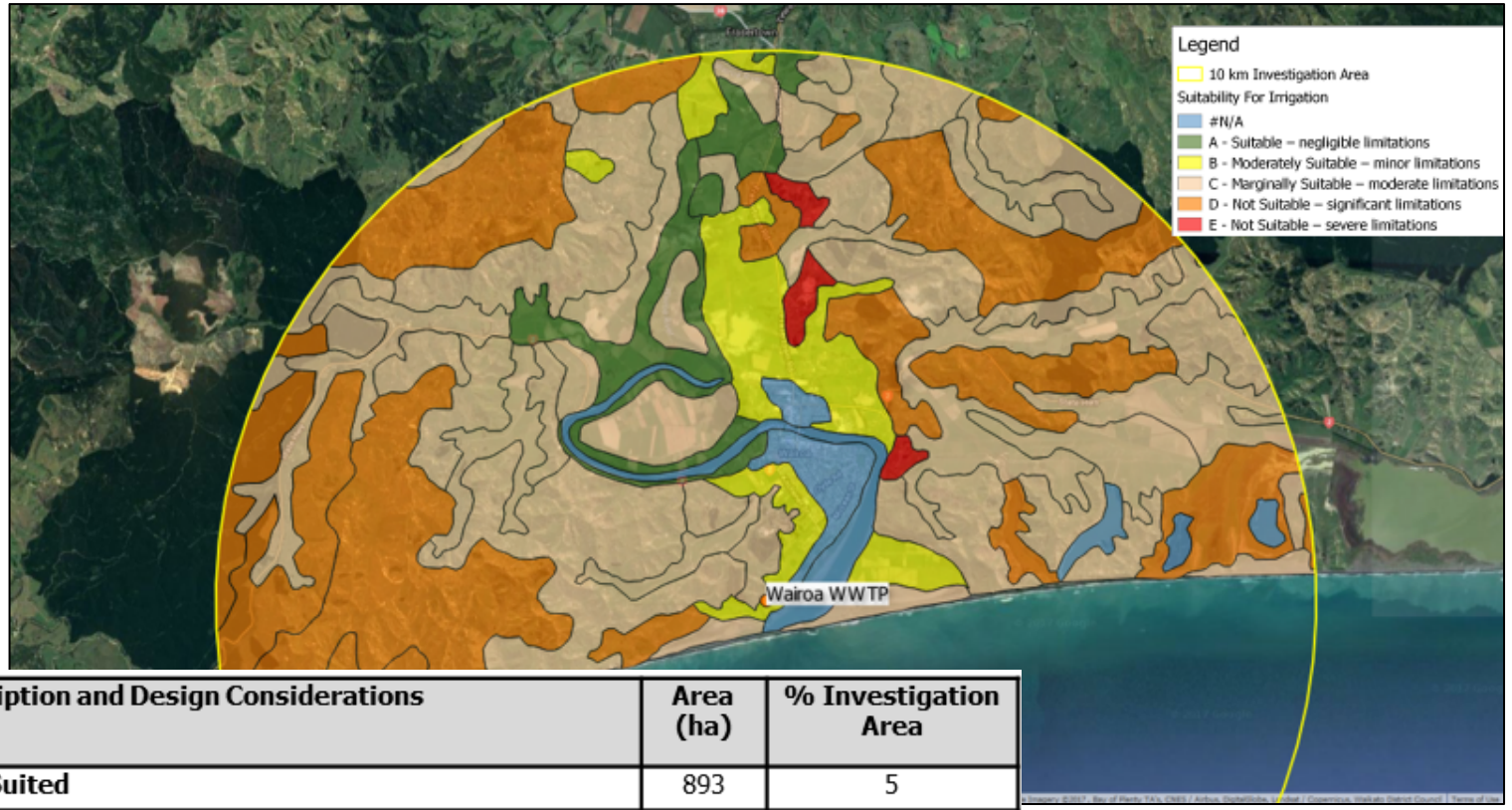
Assessment of land within a 10km radius of the WWTP

Parameters used to assess suitability of land

Zones established for irrigation suitability: A, B, C, D & E

- Slope, drainage, flooding, LUC class

TECHNICAL REPORTING – LAND OPTIONS



Zone	Description and Design Considerations	Area (ha)	% Investigation Area
A	Well Suited	893	5
B	Moderately Well Suited	1,238	7
C	Minor Limitations	8,665	50
D	Significant Limitations	5,714	33
E	Severe Limitations	163	1
N/A	Town, River and Lakes	771	4
Total	Total land within a 10 km radius of the Wairoa WWTP	17,444	100

TECHNICAL REPORTING – LAND OPTIONS

Cost of land procurement

- Buffer distance, storage
- Amount of land required

Zone	Discharge System plus Storage	Total Area Required (ha)	Indicative Cost to Purchase ($)
A	RI, 500 mm/d, 2 weeks' Storage	9.34	$280,200
A	RI, 200 mm/d, 2 weeks' Storage	10.15	$304,500
A	Irrigation, 2 mm/d, 90 days' Storage	155	$3.3 M
A	Irrigation, 2 mm/d, 120 days' Storage	159	$3.42M
B	Irrigation, 1.2 mm/d, 90 days' Storage	245	$5.1 M
B	Irrigation, 1.2 mm/d, 120 days' Storage	249	$5.2 M
C	Irrigation, 0.8 mm/d, 90 days'	358	$7.3 M
C	Irrigation, 0.8 mm/d, 120 days'	362	$7.42 M

TECHNICAL REPORTING

High rate land passage

Further treatment of wastewater

Acknowledge culturally (tapu to noa)

Mix of land and water options

	Suitable for:						How it works:			
	Small areas	On slopes	Fine textured soils	Low maintenance	Extra treatment	High Groundwater	Drainage through land	Pass over land	Pass through media	Planted
Open wetland	✗	✗	✓	✗	✓	✓	○	✓	✗	✓
Subsurface wetland	✓	✗	✓	✗	✓	✓	✓	✗	✓	✓
Rapid infiltration basin	✗	✗	✗	✗	○	✗	✓	✗	✗	○
Rock filter	✓	✓	✓	✓	✗	✓	✗	✓	✗	✗
Cascade structure	✓	✓	✓	✓	✗	✓	✗	✓	✓	○
Vegetated swale	✗	✓	○	✓	✓	✓	○	✓	✗	✓
Vertical Biotransformer	✓	✗	○	✗	✓	✓	✗	✗	✓	✗

TECHNICAL REPORTING

History of the Wairoa River Mouth

- Bar closures over previous 18 years – average 1 mechanical opening per year
- Dynamic environment, partial and full closures
- Has always been issues

TECHNICAL REPORTING

Planning

Two HBRC plans	Issues to be addressed include	Need to also consider
HBRC Management Plan Coastal Environment Plan	Reticulation, overflows, discharges structures Right to occupy Evaluation of land	Coastal Marine area Land use

TECHNICAL REPORTING

Natural Hazards

- Coastal hazards – tsunami
- Rain and its consequences
- Earthquakes
- Volcanic hazards

TECHNICAL REPORTING – BIG PICTURE

Cultural

Tangata whenua worldviews

Cultural impact assessment

TECHNICAL REPORTING – FORWARD REPORTING

- Summary of viable and acceptable technologies
- Best Practicable Option
- Cultural Impact Assessment
- Feasibility Investigations
- Conceptual Design
- Land AEE
- Water AEE

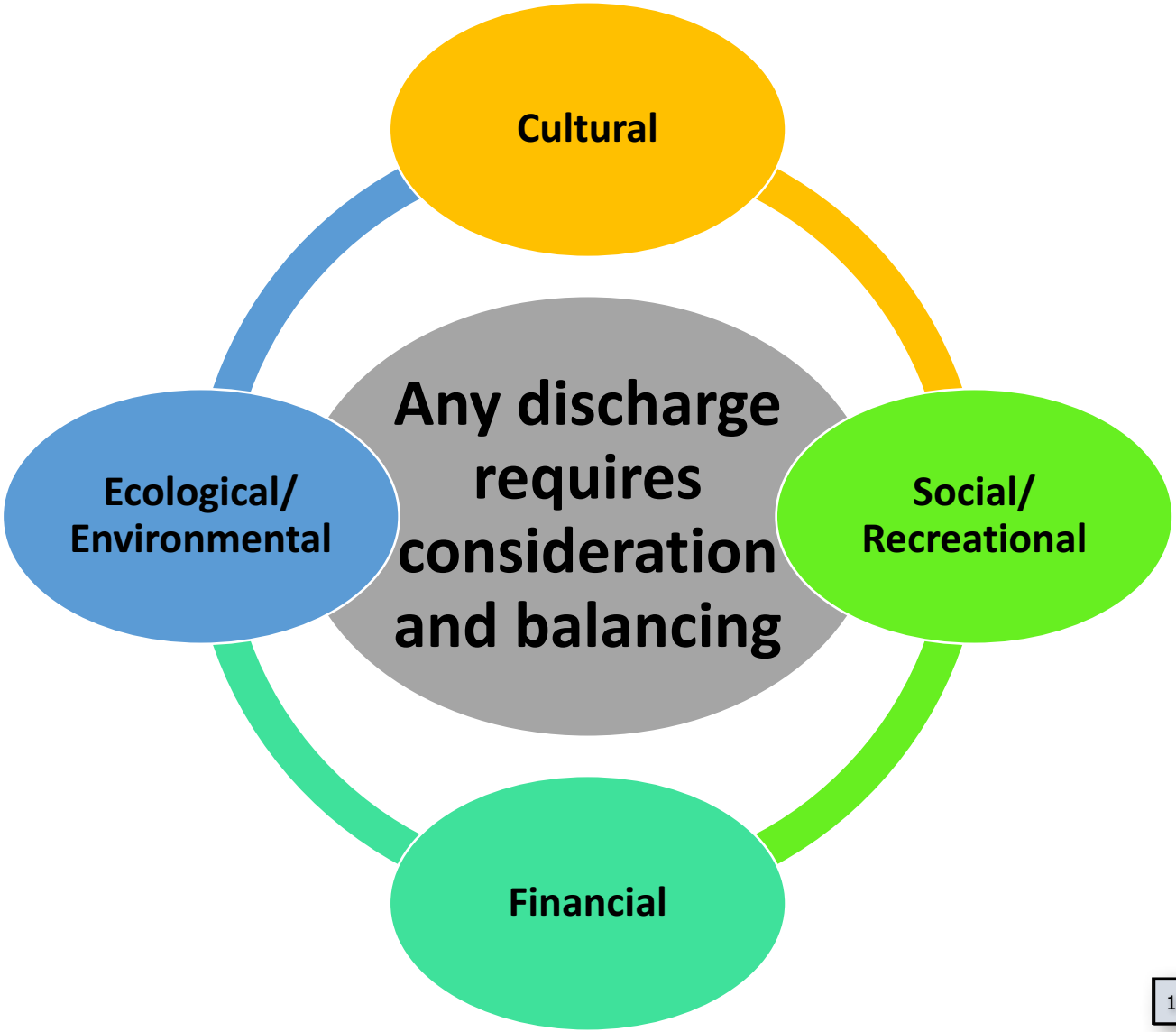
DECISION CRITERIA – CONCEPT SELECTION

What structure/criteria should we use?

What engagement should we use to get feedback?

Preferred option selection criteria

DECISION CRITERIA – THE BALANCE



DECISION CRITERIA – ARE THERE BOTTOM LINES FOR EACH PILLAR?

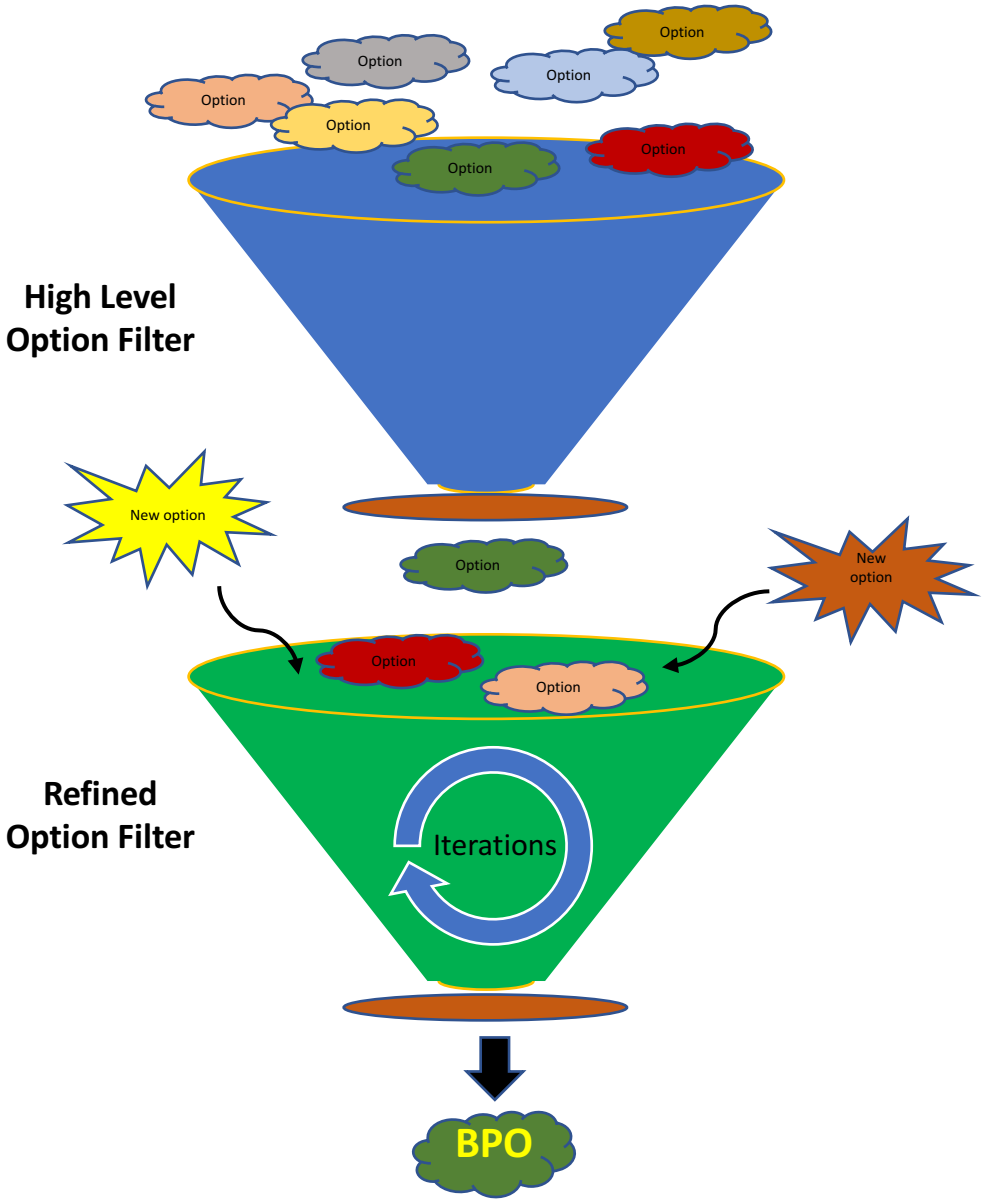
Fixed bottom lines (must have)

- Requirements that HAVE to be met
- Don’t change
- Can be a number
- Can be a position

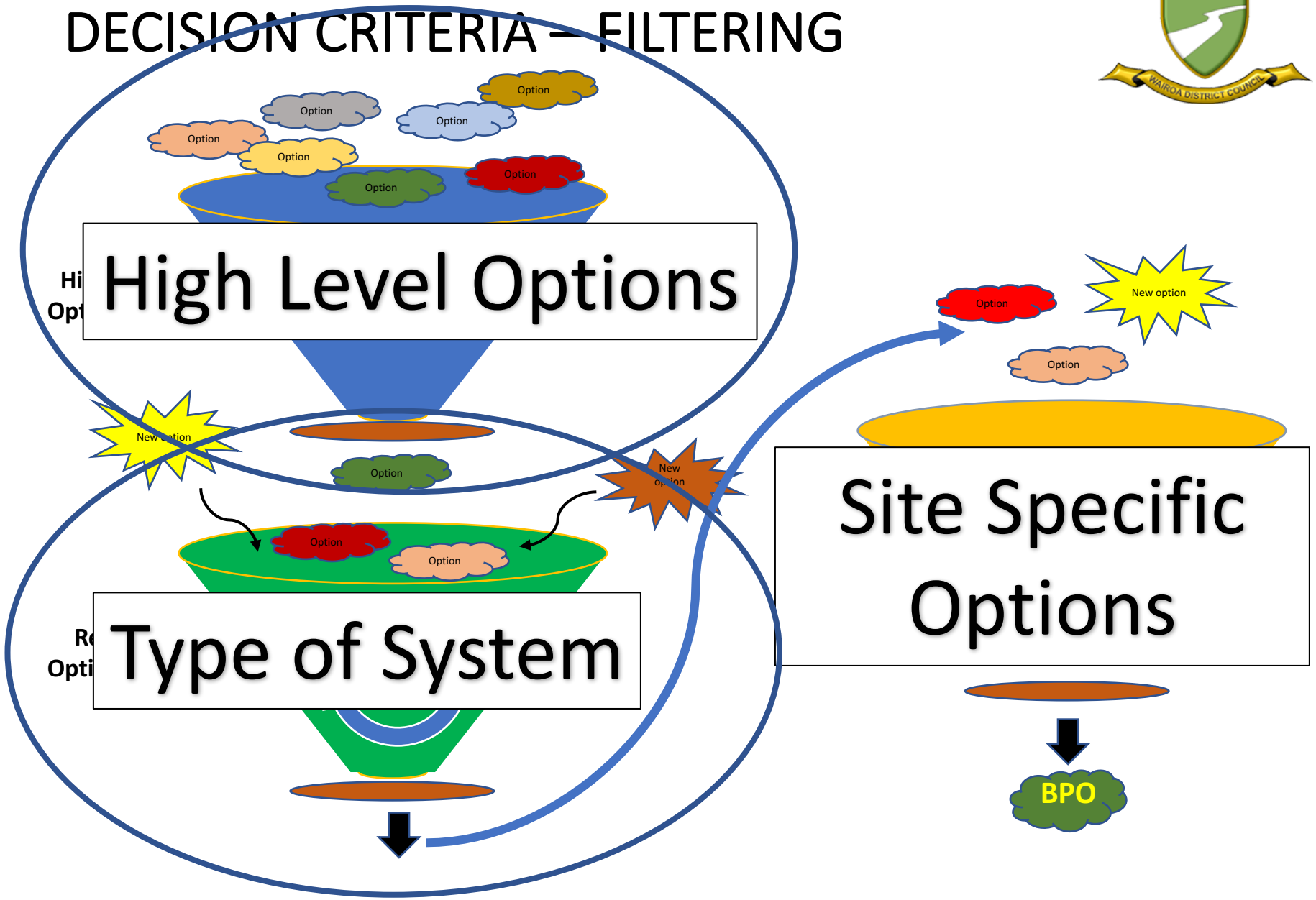
Negotiable or flexible bottom lines (nice to have)

- Conditional or can happen if other factors are addressed/met
- Factors include timing, frequency, duration, effect

DECISION CRITERIA – FILTERING



DECISION CRITERIA – FILTERING



DECISION CRITERIA – FILTERING

High Level Options

Land,

water, or

combination

Can we rule this out?

Type of System

Current Treatment?

Additional Treatment?

Status quo?

New?

Are we up to here?

Site Specific Options

What system?

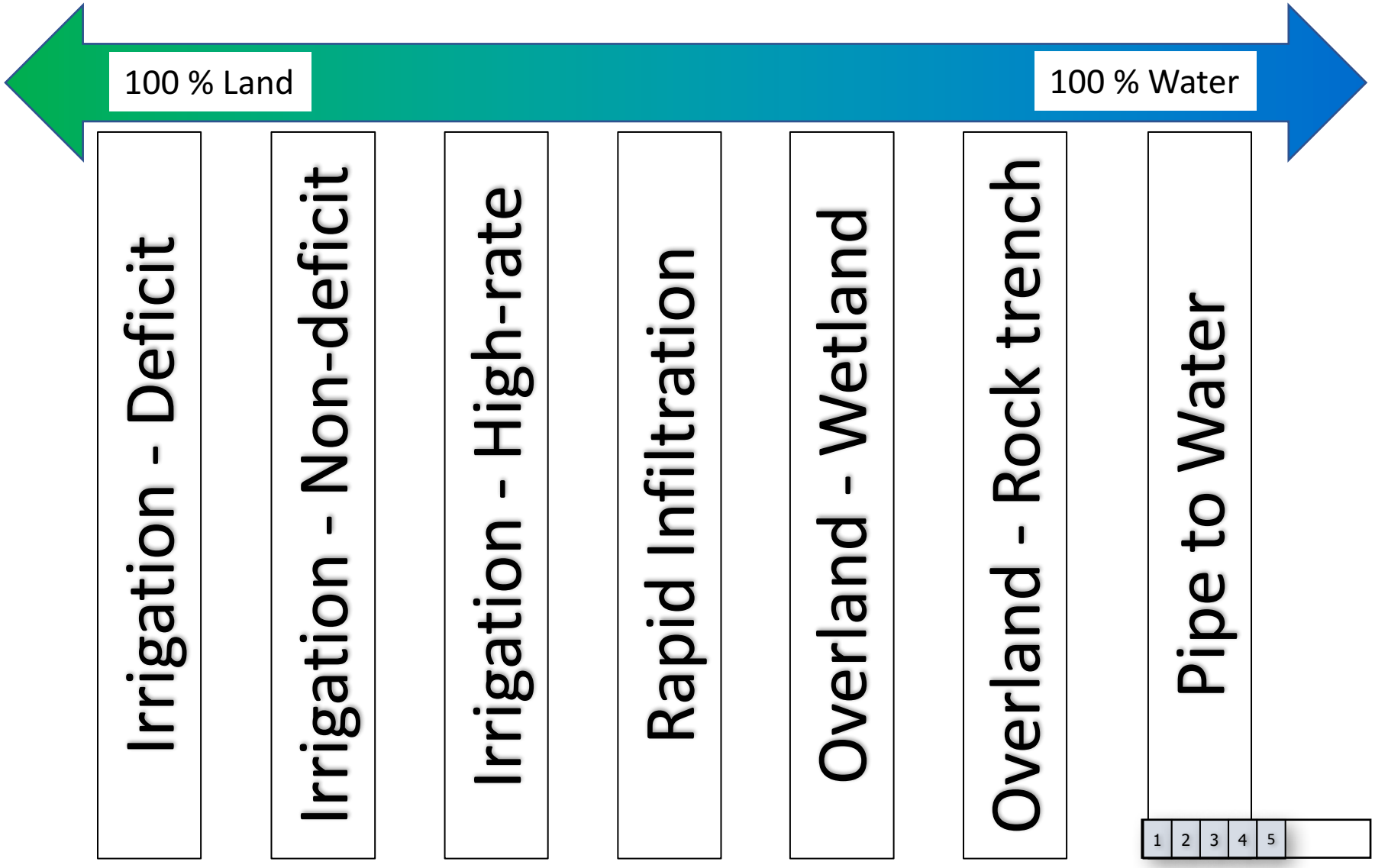
Where is it placed?

What do we need to do to get to here?

OPTIONS – WHAT ARE OUR DISCHARGE OPTIONS

- Status quo
- Ocean
- Overland flow - Rock trench/land passage/papatuanuku channel
- Overland flow - Wetland
- Rapid infiltration
- Irrigation – non-deficit
- Irrigation - deficit

OPTIONS – WHERE DOES THE WATER GO?



OPTIONS – WHAT ARE THEY

Pipe to water – River/Ocean

- Location: Existing location or off shore
- Area needed: NA
- Receiving environment: River/estuary/ocean
- Changes in reticulation: Not essential
- Changes in effluent quality: Not essential
- Storage required: None
- Indicative cost[1]: $1,000,000 to $20,000000
  - $40 to 800/rateable connection

1: Indicative costs are for the structure and associated capital works. They exclude consenting and contingency.

OPTIONS – WHAT ARE THEY

Overland flow –

Rock trench/land passage/papatuanuku channel

• Location:	Close to river
• Area needed:	0.1 to 2 ha
• Receiving environment:	Land then river
• Changes in reticulation:	Not essential
• Changes in effluent quality:	Not essential
• Storage required:	None
• Indicative cost:	$50,000 to $500,000
•	$2 to 20/rateable connection

OPTIONS – WHAT ARE THEY

Overland flow – Wetland

• Location:	Relatively close to river
• Area needed:	3 to 5 ha
• Receiving environment:	Land then river
• Changes in reticulation:	Not essential
• Changes in effluent quality:	Not essential
• Storage required:	None
• Indicative cost:	$200,000 to $500,000
•	$8 to 20/rateable connection

OPTIONS – WHAT ARE THEY

Rapid Infiltration –

• Location:	Close to river
• Area needed:	2 to 5 ha
• Receiving environment:	Land then river/sea
• Changes in reticulation:	Ideally reduction
• Changes in effluent quality:	Not essential
• Storage required:	None to some minor
• Indicative cost:	$200,000 to $700,000
•	$8 to 28/rateable connection

OPTIONS – WHAT ARE THEY

Irrigation –

Non-deficit

• Location:	Some close, most > 2 km
• Area needed:	200 to 300 ha
• Receiving environment:	Land
• Changes in reticulation:	Ideally reduction
• Changes in effluent quality:	Potentially reduce bugs
• Storage required:	Some to large
• Indicative cost:	$7,000,000 to $11,000,000
•	$280 to 440/rateable connection

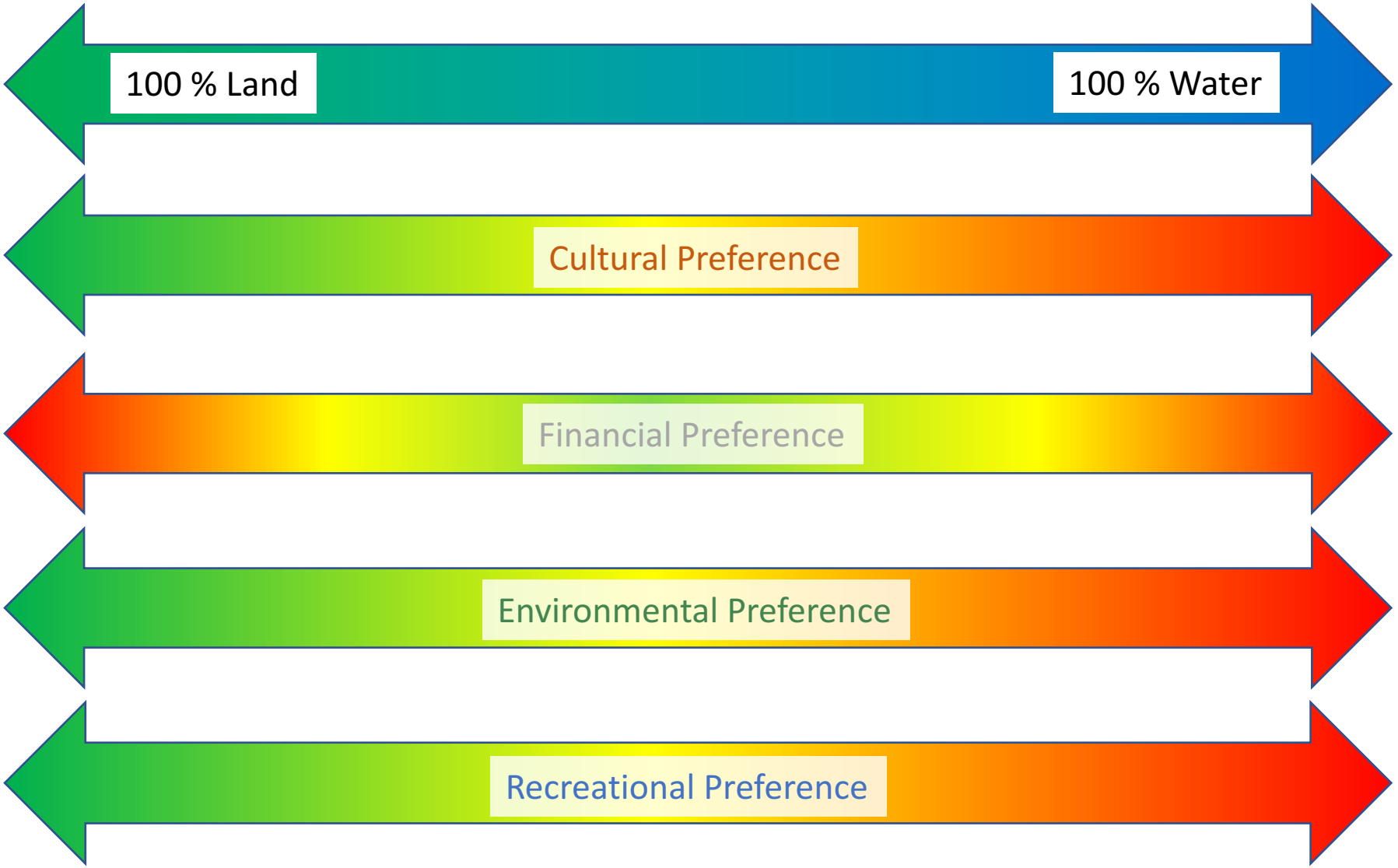
OPTIONS – WHAT ARE THEY

Irrigation –

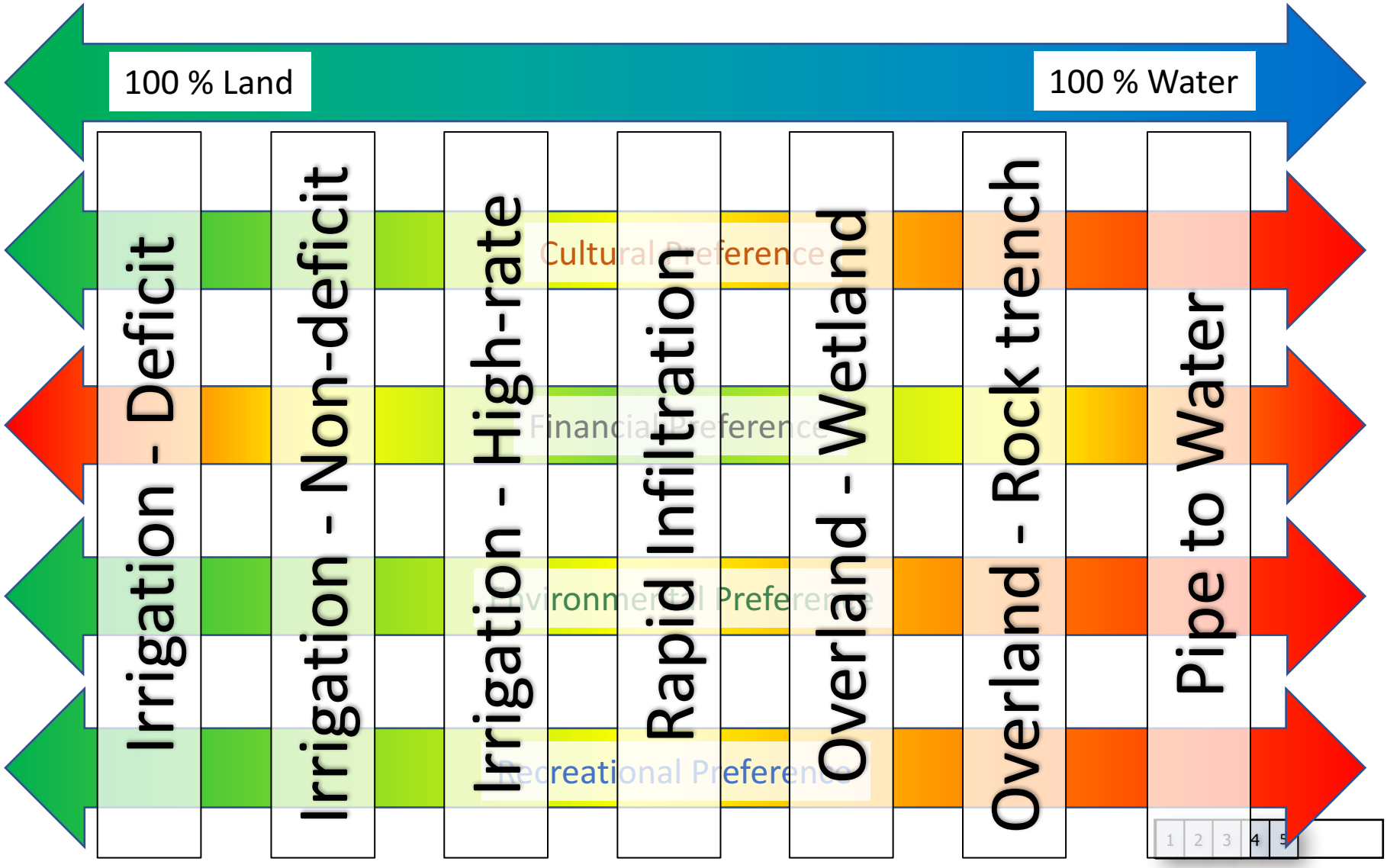
Deficit

• Location:	Some close, most > 2 km
• Area needed:	400 to 500 ha
• Receiving environment:	Land
• Changes in reticulation:	Preferable reduction
• Changes in effluent quality:	Potentially reduce bugs
• Storage required:	Large
• Indicative cost:	$14,000,000 to $18,000,000
•	$560 to 720/rateable connection

OPTIONS – HOW DO WE USE - CRITERIA



OPTIONS – HOW DO WE CHOOSE - CRITERIA



OPTIONS – WHAT ARE OUR DISCHARGE OPTIONS

~~Status quo **(no treatment)**~~

~~Ocean **(no treatment)**~~

Overland flow - Rock trench/land passage/papatuanuku channel

Overland flow - Wetland

Rapid infiltration

Irrigation – non-deficit

Irrigation - deficit

DECISION CRITERIA – FILTERING

High Level Options

Land,

water, or

combination

Can we rule this out?

Type of System

Current Treatment?

Additional Treatment?

Status quo?

New?

Are we up to here?

Site Specific Options

What system?

Where is it placed?

What do we need to do to get to here?

DECISION CRITERIA – EVALUATION

		RT/LP /PC	W	RI	NDI	DI
Cultural	Allows for food gathering No pathogen contamination in shell fish Requires irrigation Has some form of land passage					
Financial	Impact on rates					
Social	Swimmable at discharge Swimmable at _____ m					
Environmental	No nuisance weed/macrophyte growth Biodiversity greater than QMCI of _____					
Look at further						

DECISION CRITERIA – EVALUATION

		RT/LP /PC	W	RI	NDI	DI
Cultural	Allows for food gathering					
	No pathogen contamination in shell fish					
	Requires irrigation					
	Has some form of land passage					
Financial	Impact on rates					
Social	Swimmable at discharge					
	Swimmable at _____ m					
Environmental	No nuisance weed/macrophyte growth					
	Biodiversity greater than QMCI of _____					
Look at further						

1 2 3 4 5

DECISION CRITERIA – EVALUATION

		RT/LP /PC	W	RI	NDI	DI
Cultural	Allows for food gathering					
	No pathogen contamination in shell fish					
	Requires irrigation					
	Has some form of land passage					
Financial	Impact on rates					
Social	Swimmable at discharge					
	Swimmable at _____ m					
Environmental	No nuisance weed/macrophyte growth					
	Biodiversity not compromised					
Look at further						

DECISION CRITERIA – WHAT NEXT

Your help please

What types of system can we narrow down to

How do we choose

What information is needed

AFTERNOON TEA

COMMUNITY ENGAGEMENT

Council Forum

- Tomorrow 11 July, will outline project to date and consultation process

Newspaper articles

- Two articles to be published informing of community meeting 31 July

Community Meeting

- 31 July to cover the current wastewater system and the communities involvement in the decision process for a BPO

Group Meetings

- 1st August will be the opportunity for community groups to discuss their views on this project and how it affects their group

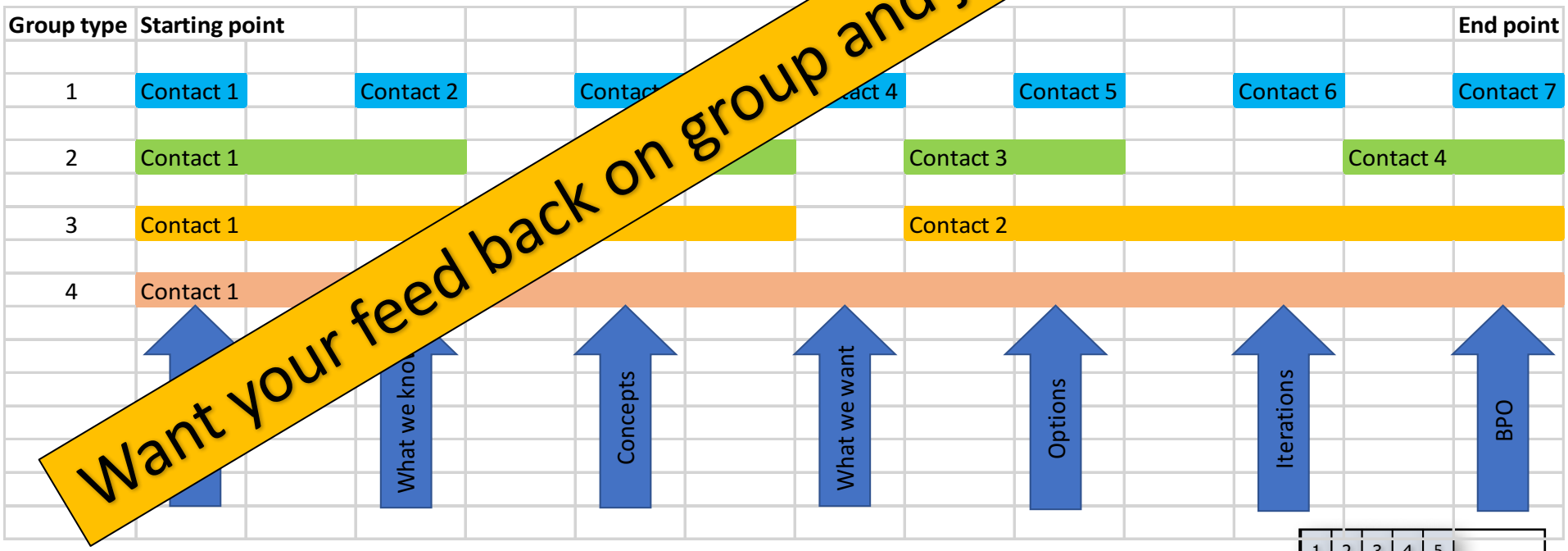
COMMUNITY ENGAGEMENT – COMMUNITY AND GROUP MEETINGS

Engagement sequence

- Variable with different groups
- Multiple contacts over time or one main contact (Iwi may prefer multiple contacts)

Topics to be discussed

- Issues
- Concept
- Options
- BPO



Want your feed back on group and journey for that group

OTHER MATTERS

Any other Fact Sheets needed?

What technical information is needed?

ADMINISTRATION

Future topics for discussion

Next meeting Focus

Information on line – everyone can access?