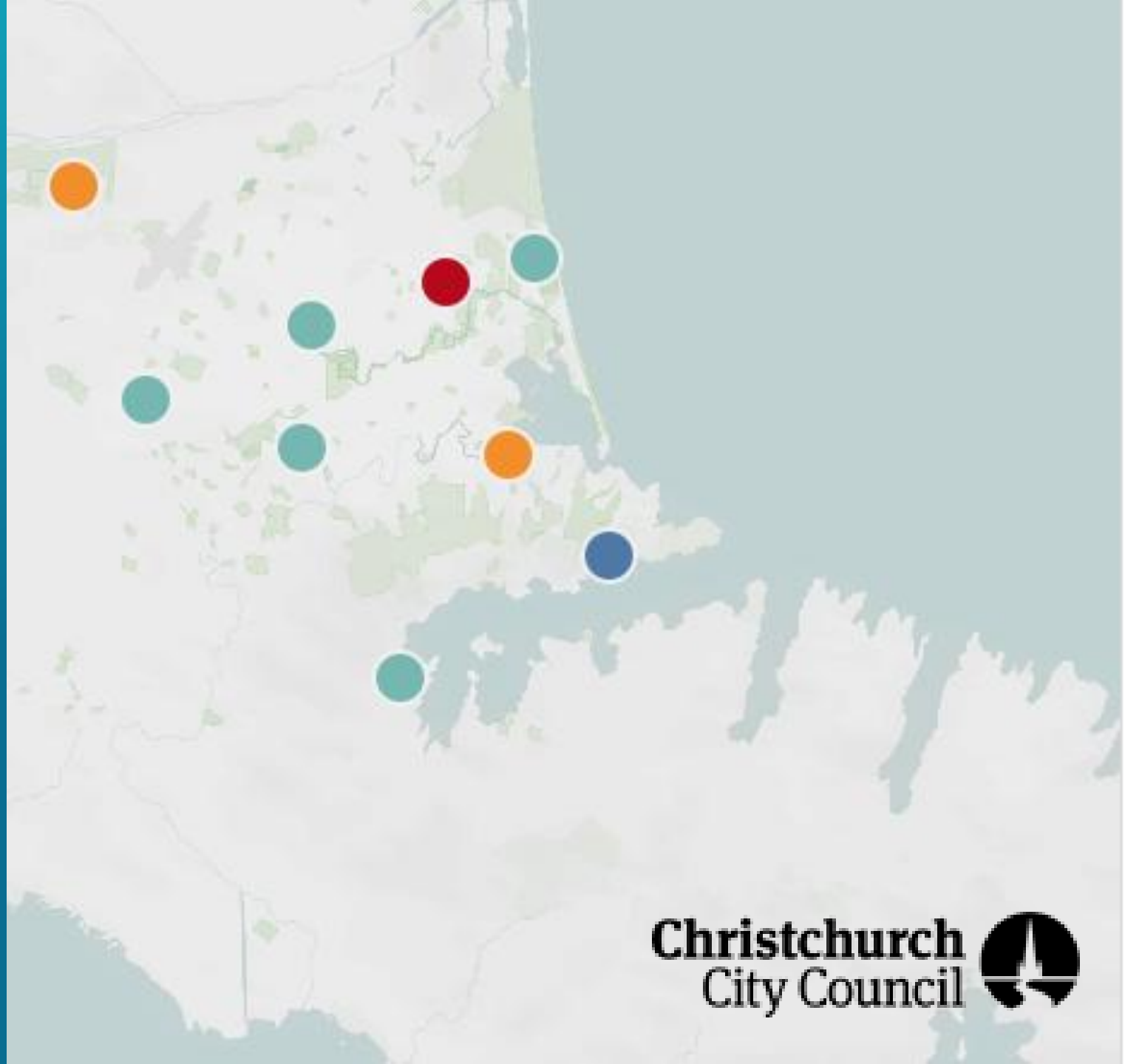


Closed landfill portfolio management

Progress towards a proactive adaptive management tool for strategic prioritisation of sites



Outline

Development of a strategic management tool:

- Why proactive strategic management is needed
- Risk framework and adaptive management approach
- Project vision and next steps



Andrea Tuohy – Tonkin & Taylor,
Senior Environmental Scientist



Alec McNeil – Christchurch City
Council, Resource Recovery Manager

CCC's closed landfills



Traditional management approach



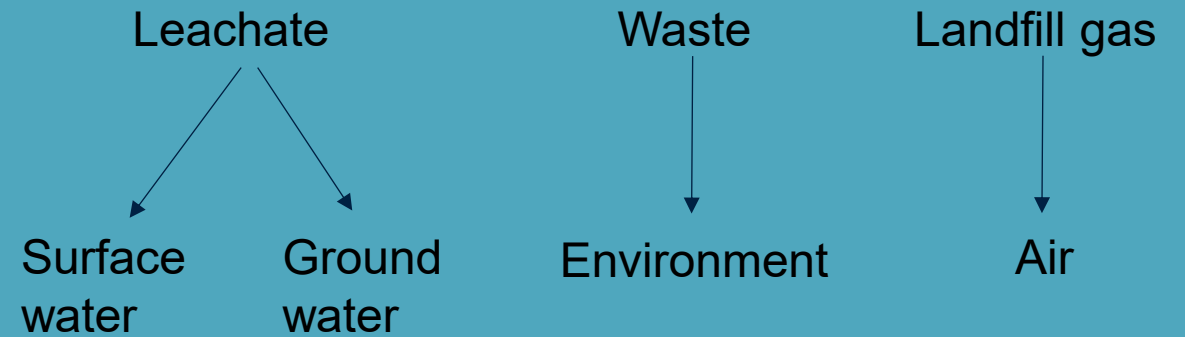
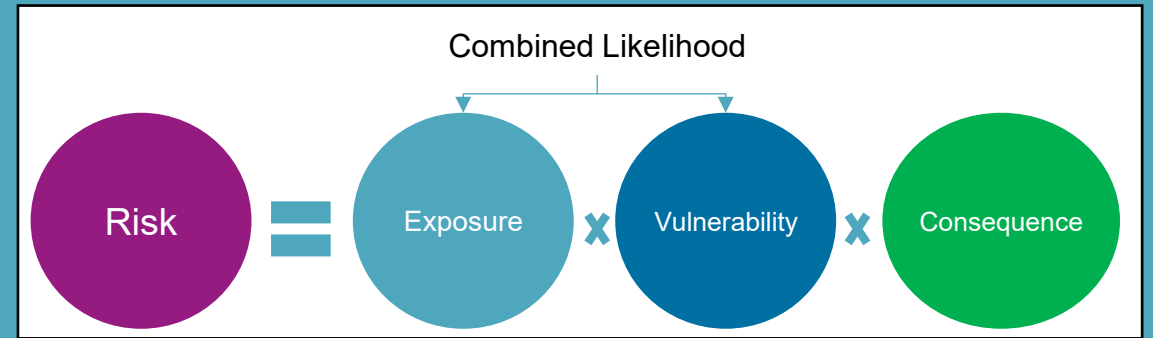
CCC's Management Objectives





Risk framework

- Risk of discharges to a receptor



Short term
~2030

Medium term
~2050

Long term
~2100

Coastal to
~2130

Risk framework

- Complementary tools



Risk framework

- Technical high-level risk rating
- Looking ahead to the long term to manage high risk sites that might require large scale costly interventions
- Risk modifiers

Technical risk rating for up to four timeframes

Technical risk filters															
Site Name/ Location	Leachate in SW				Leachate in GW				Waste to Environment				Landfill gas (LFG) to Environment		
	Current	Mid term	Long term	2130	Current	Mid term	Long term	2130	Current	Mid term	Long term	2130	Current	Mid term	Long term
Landfill A	High	High	High	High	High	High	High	High	Low	Low	Low	Low	High	High	High
Landfill B	Very low	Very low	Moderate	Moderate	Very low	Very low	Moderate	Moderate	Very low	Low	Moderate	Moderate	Low	Low	Low
Landfill C	High	High	High	High	High	High	High	High	High	High	High	High	Moderate	Moderate	Moderate
Landfill D	Very High	Very High	Very High	Very High	High	High	High	High	High	High	High	High	High	High	High
Landfill E	Very High	Very High	High	High	High	High	High	High	Low	Low	Low	Low	Moderate	Moderate	Moderate
Landfill F	Low	Low	Moderate	Moderate	Low	Low	Moderate	Moderate	Low	Low	Moderate	Moderate	High	High	High
Landfill G	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	High	High
Landfill H	Very High	High	High	High	Very High	High	High	High	High	High	High	Very High	High	High	Moderate
Landfill I	High	High	High	High	High	High	High	High	Low	Low	Low	Low	High	High	High
Landfill J	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	High	High

Very low =  Low =  Moderate =  High =  Very High = 

Risk modifier options (add to risk)

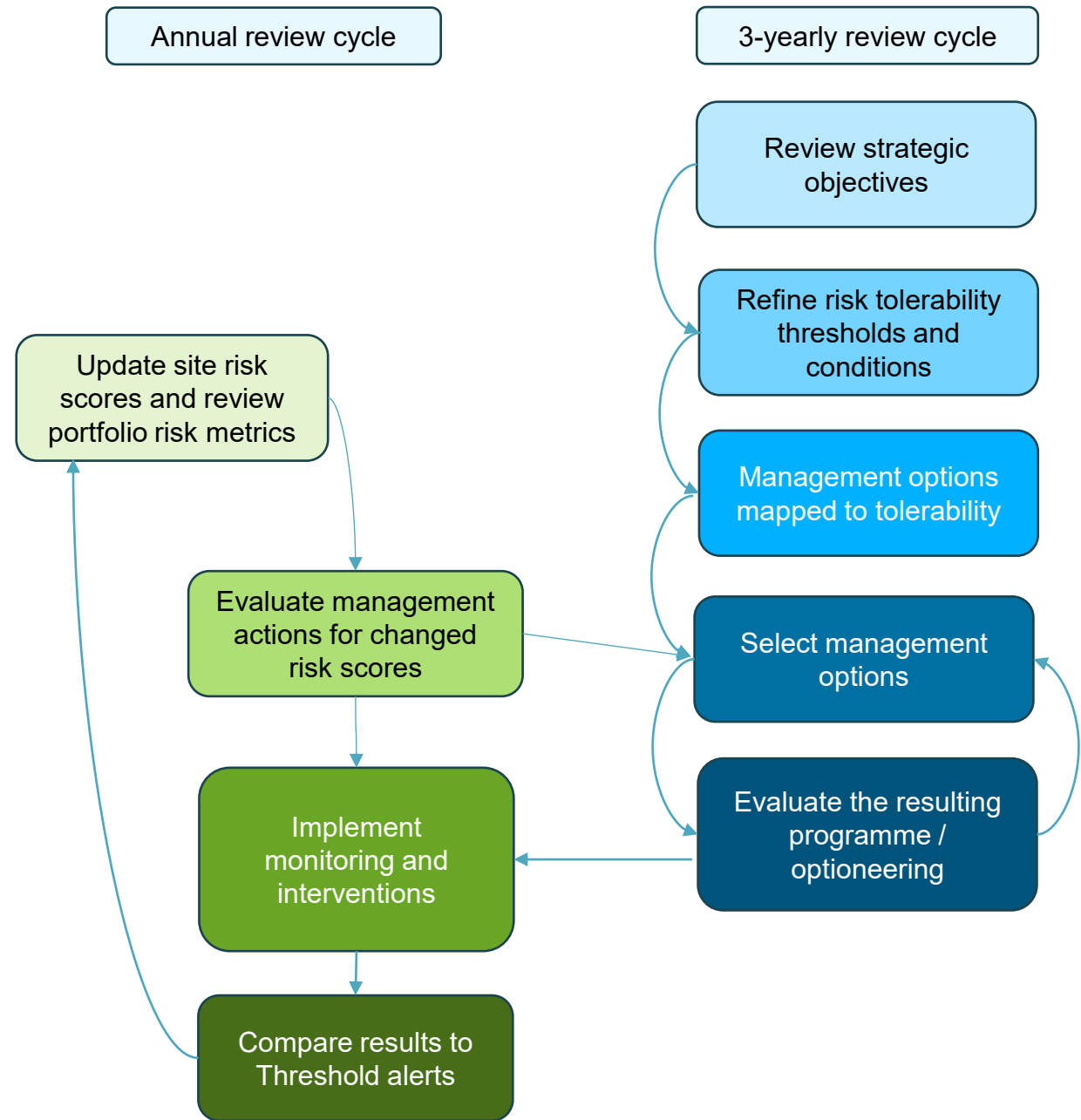
Political
factors

Reputational
factors

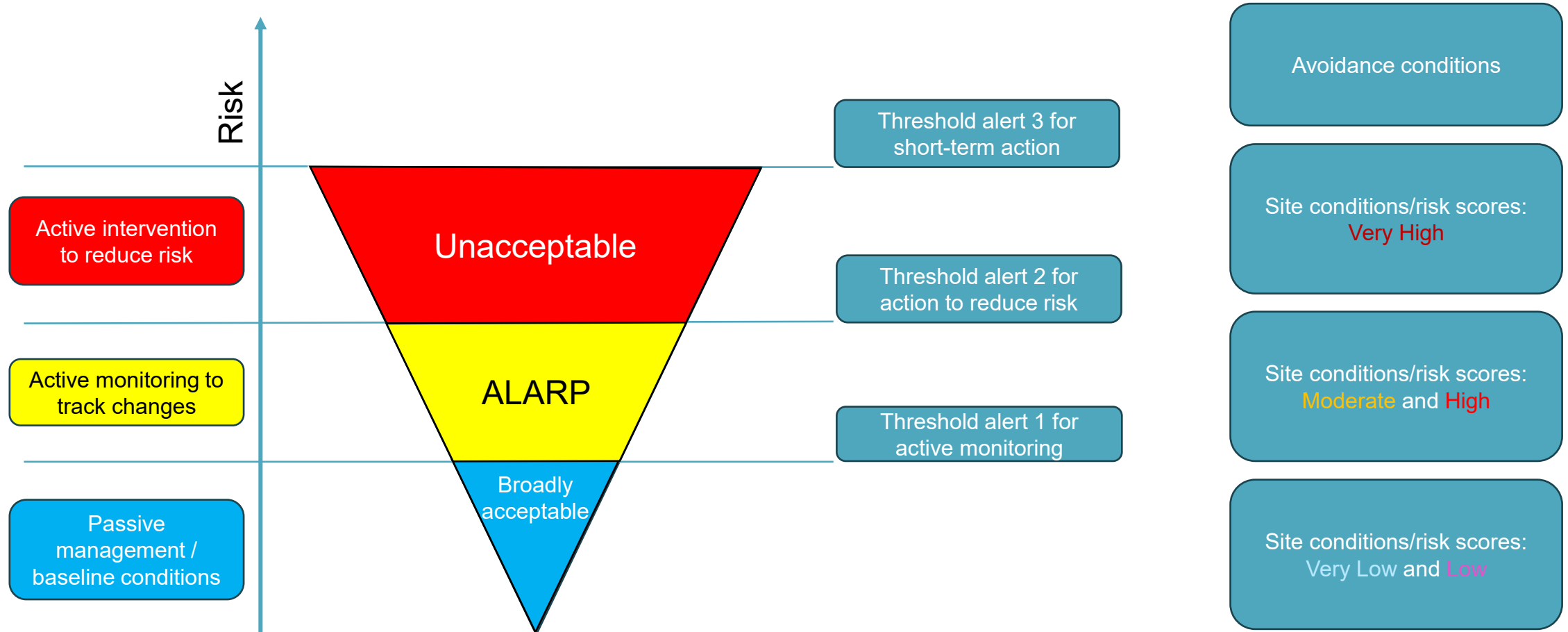
Community
feedback

Council
Strategic plans/
projects

Adaptive management approach



Risk tolerance and prioritisation



Management actions

Passive Management

- Ad-hoc or baseline 5-yearly site inspections

Active Monitoring

- Surface/groundwater sampling +/- LFG monitoring
- Site investigations

Active Interventions

Protection interventions:

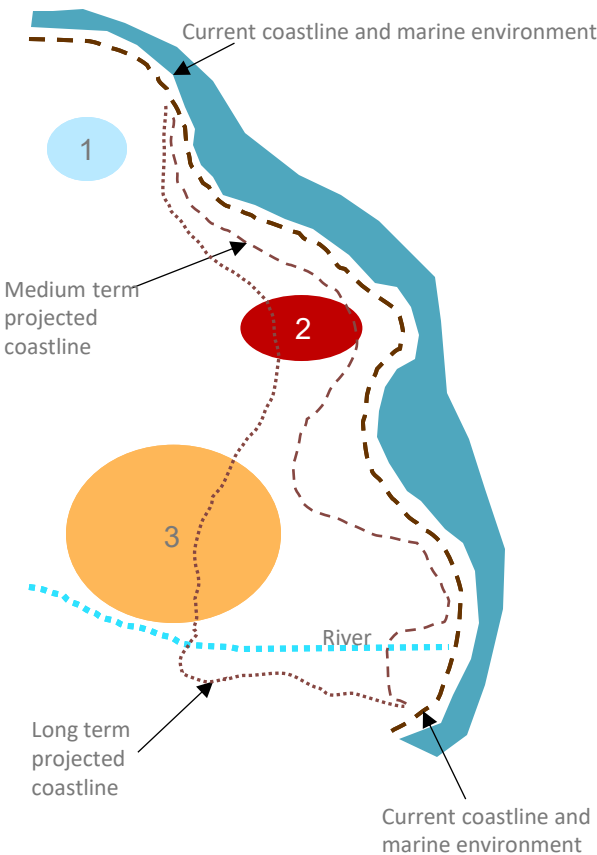
- Cap repair
- Cap replacement
- Containment bund/cut-off drains
- Maintenance of protection structures
- Flare/gas extraction
- Installation of protection structures

Removal interventions:

- Partial removal of waste
- Full removal of waste

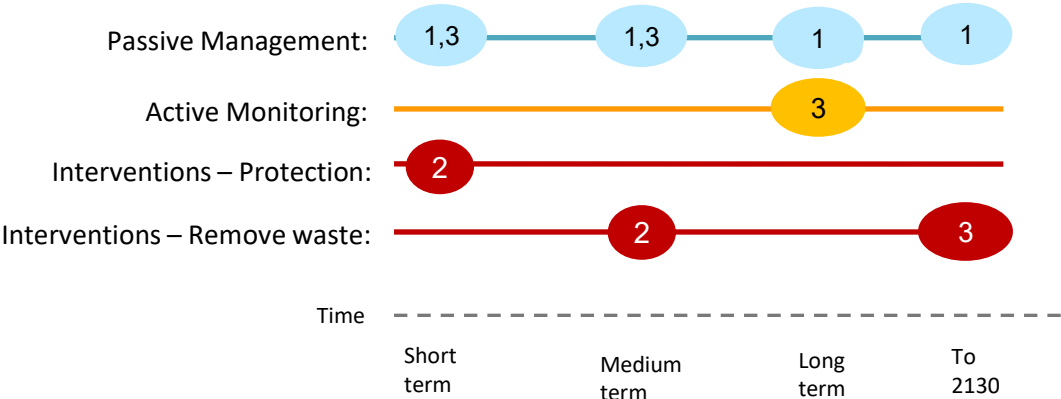
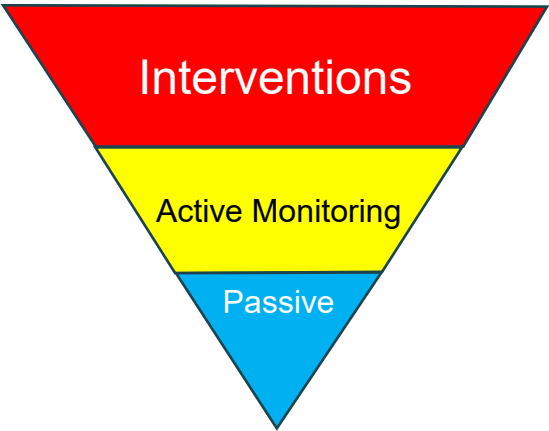
Programmes of work

Hypothetical Sites:



Risk of waste discharge to the environment

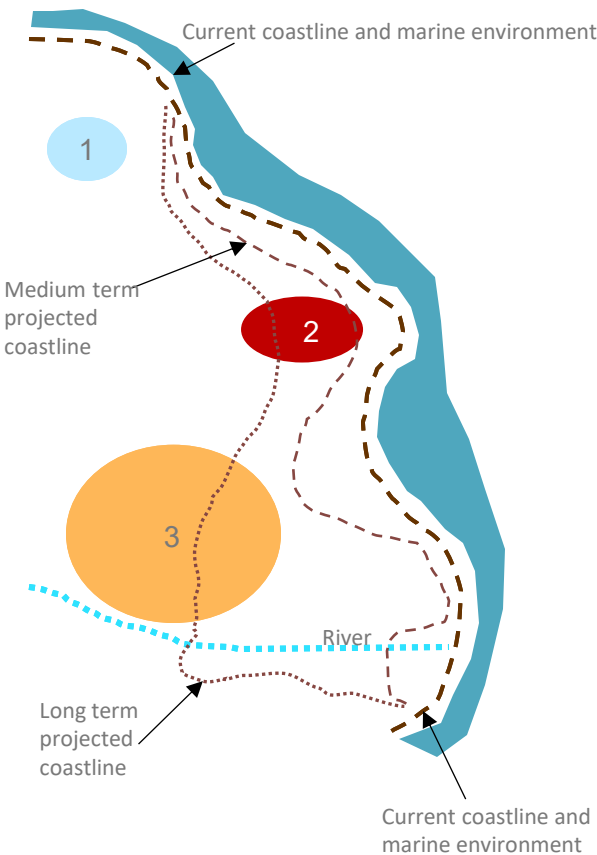
Site	Short term	Medium term	Long term	To 2130
1				
2				
3				



Programme – Achieve high risk reduction
Risk summary outcome – Remove waste at Site 2, partial removal at Site 3 to achieve high risk reduction. Likely costs are very high.

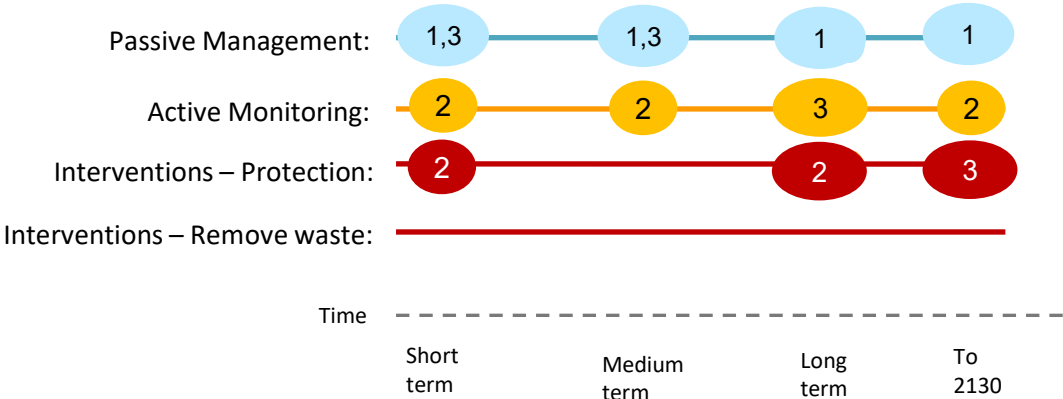
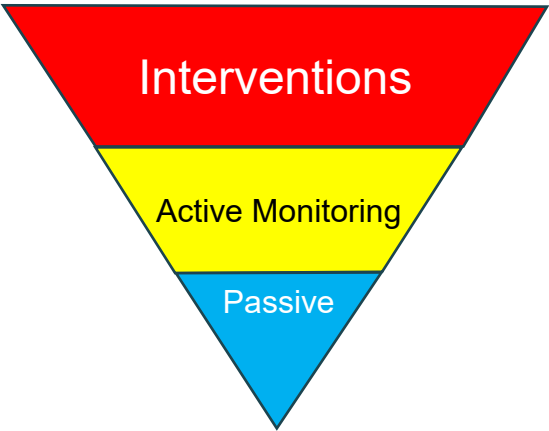
Programmes of work

Hypothetical Sites:



Risk of waste discharge to the environment

Site	Short term	Medium term	Long term	To 2130
1				
2				
3				



Programme – Protection preferred, moderate risk reduction required.

Risk summary outcome – Commitment to maintaining protection over the long term, risk is reduced, but not as much as if waste was removed. Overall programme costs are lower.



Next steps





Christchurch
City Council

