

Sustainable Remediation Workshop

Stephen Maxwell
Senior Managing Consultant
Ramboll

Louise Wilson
Director
Collaborations

Current members of SuRF-ANZ Special Interest Group

Workshop Format

- Sustainable Remediation overview (ISO standard and tools)
- Intro to case study
- Workshop
- Review and discuss workshop results
- Q&A

Thank you to our fellow SIG members and Table Leaders!

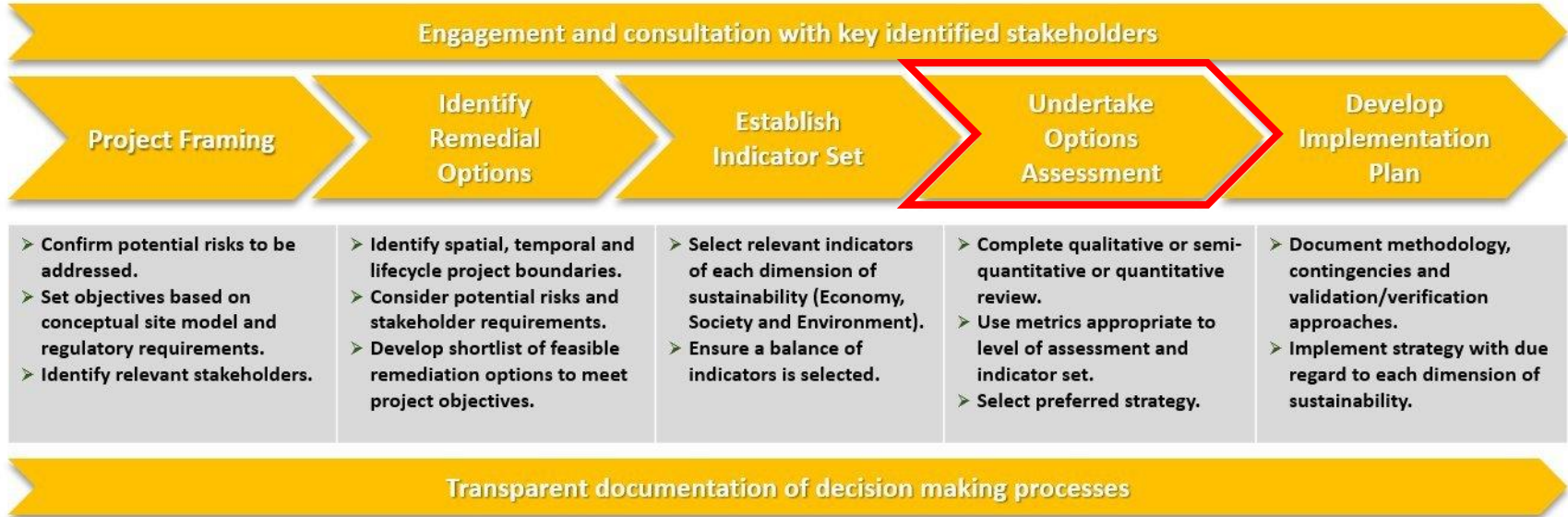


Sustainable Remediation Overview

- Australian Standard AS ISO 18504:2022
- Sets out a standard methodology to be utilised to determine and assess sustainable remediation solutions for contaminated sites
- Can be purchased from the Standards Australia website
<https://store.standards.org.au/product/as-iso-18504-2022>



Sustainable Remediation Framework



Available Tools

SiteWise

- Developed by Battelle & US Navy & Army Corp of Engineers
- Free online tool

Spreadsheets for Environmental Footprint Analysis (SEFA)

- Developed by EPA
- 3 workbooks that together provide comprehensive footprint analysis

Energy Institute: Greenhouse Gas Emissions Calculator

- Estimates carbon footprint
- Breaks down emission by category (transportation, energy use, waste, etc.)
- Suggests reduction strategies

SURE Tool by Ramboll

- Web-based freeware
- Used for this workshop



Case Study Introduction

A closed landfill

- Located on the bank of an estuary near the coast, on the West Coast of the South Island.
- Received waste from approx. 1950s to late 1990s.
- Likely received domestic waste, offal, car bodies and potentially chemical and other hazardous wastes.
- Footprint: Approximately 8,000m², assumed to be 2.5m deep = approx. 20,000m³.
- Minimal documentation held by the Territorial Authority.
- Not lined.
- Cap comprising approximately 0.5m of coarse grained material and topsoil, with scrubby vegetation at the surface.
- No surface or groundwater monitoring is currently being undertaken. There are no wells in the vicinity of the site.

Geology and Hydrology

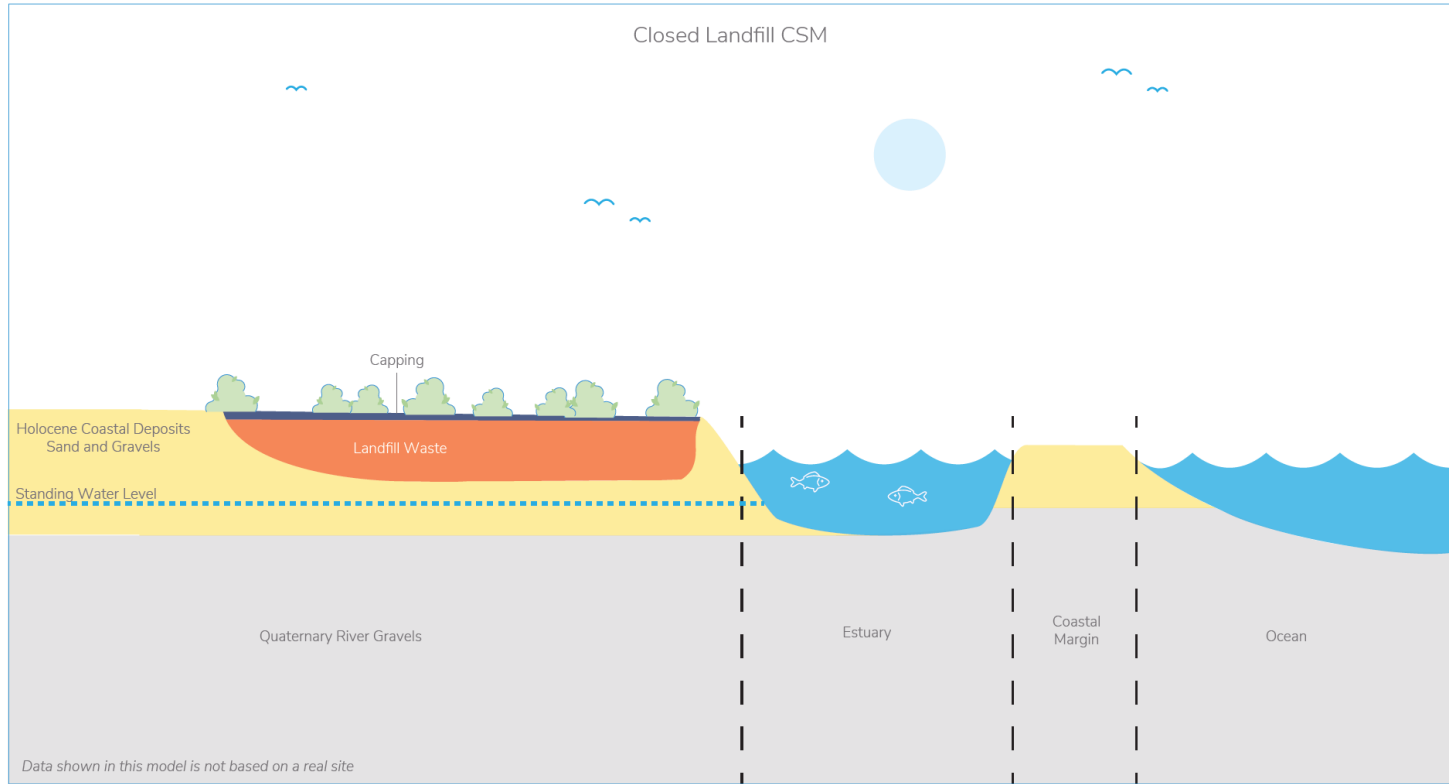
- The underlying geology is Holocene river deposits comprising predominantly gravel.
- The river that flows into the estuary has a large catchment and has been experiencing increased flood events due to climate change and higher intensity rainfall events that have been occurring over the past decade.

Surrounding land use and cultural values

- The estuary has historically been used as a māhinga kai food source for local iwi, however in recent years this has not been done due to concerns around potential landfill leachate impacting shellfish and fish in the estuary.
- The landfill is located within a coastal environment which contains native bush, with popular coastal walking tracks nearby.
- The estuary and coastline are accessed by locals for recreational activities.



Draft CSM



Workshop Overview

Summary of AS ISO 18504:2022 Framework

Engagement and consultation with key identified stakeholders
Transparent documentation of decision making processes

Project Framing

- Confirm potential risks to be addressed.
- Set objectives based on conceptual site model and regulatory requirements.
- Identify relevant stakeholders.

Identify Remedial Options

- Identify spatial, temporal and lifecycle project boundaries.
- Consider potential risks and stakeholder requirements.
- Develop shortlist of feasible remediation options to meet project objectives

Establish Indicator Set

- Select relevant indicators of each dimension of sustainability (Economy, Society and Environment).
- Ensure a balance of indicators is selected.

Undertake Options Assessment

- Complete qualitative or semi-quantitative review.
- Use metrics appropriate to level of assessment and indicator set.
- Select preferred strategy.

Develop Implementation Plan

- Document methodology, contingencies and validation/ verification approaches.
- Implement strategy with due regard to each dimension of sustainability.

Case Study Background

Historical closed landfill located in a sensitive coastal environment. See CSM.

- Option 1: excavation and removal
- Option 2: partial excavation and removal, rock armouring installed
- Option 3: leave in situ and monitor

Economic

- Direct costs (CAPEX) - PRELOADED
- Resilience to climate change

Environmental

- Greenhouse Gases - PRELOADED
- Flora, fauna and food chains

Social

- Cultural Values
- Human health impacts

Write a RAP

Workshop Guidance Notes

Using the cloud-based excel workbook collaboratively score remediation options against sustainability indicators.

- assign score of 1 – 5 to each option for each indic:



5 minutes per indicator

Workshop lead to input the average stakeholder score for each option and indicator to the SURE tool.

Review the outcome with the stakeholder group considering:

- the appropriateness of adopting the option with the highest score
- the contributions of sustainability indicators and domains
- the effect of weighting

Refine the assessment if required.

Select the preferred option.