NATO/CCMS Pilot Study
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Redevelopment of Former Industrial Lands in the Australian Capital Territory

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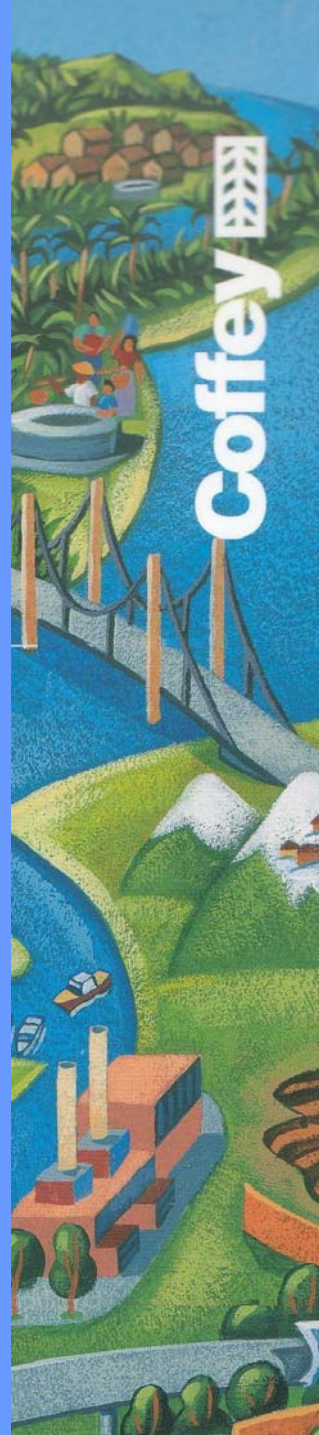
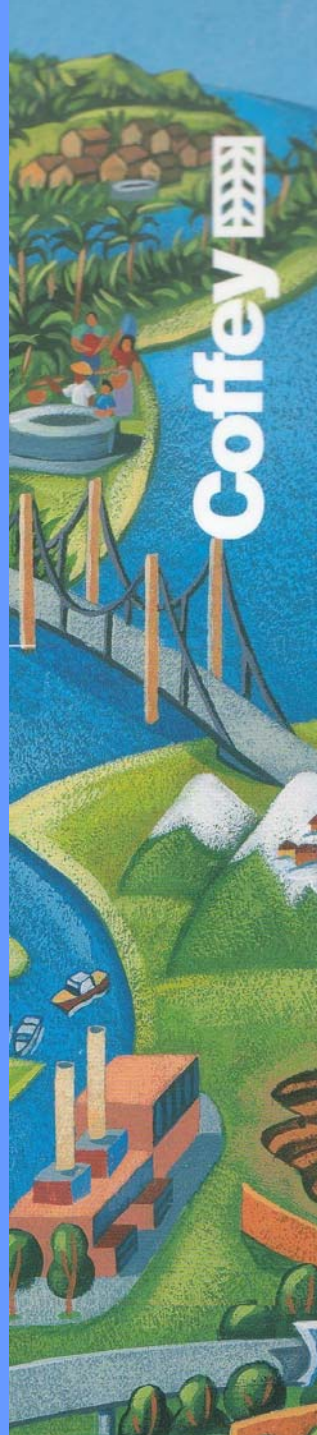
Kingston Foreshore

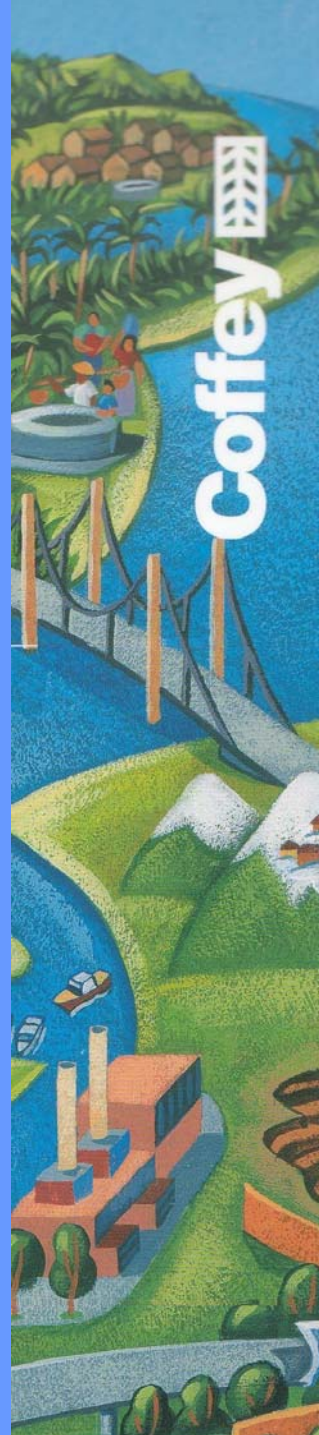


An Overview

- Site Background
- Contamination Issues
- Regulatory Framework
- The Assessment & Remedial Approach
  - Planning & Costing
  - Management of Project Uncertainties
  - Assessment
  - Site Remediation & Restoration
- Lessons Learned

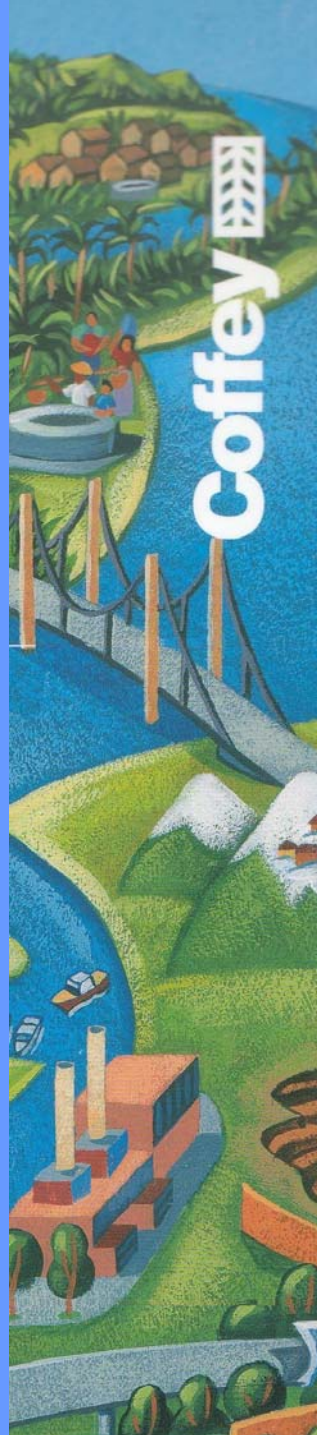


The Australian Capital Territory



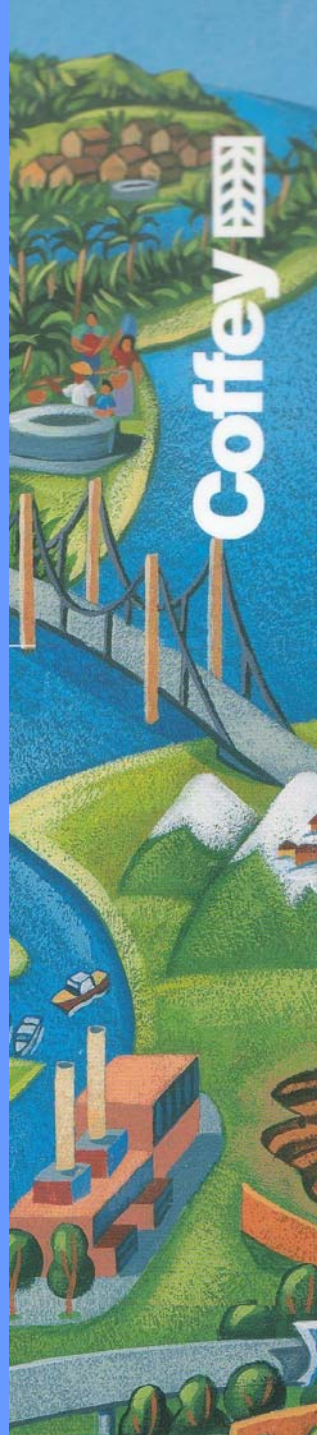
Site History

- Land Uses:
  - Government Printing Presses
  - Government Vehicle Fleets
  - Government Bulk Fuel Storage Depot
  - Power Station (Coal & Diesel)
  - Timber Mills & Construction Depots
  - Blacksmiths & Metal Fabricators
  - Maintenance Workshops
  - Rail Yards
  - Bulk Warehousing

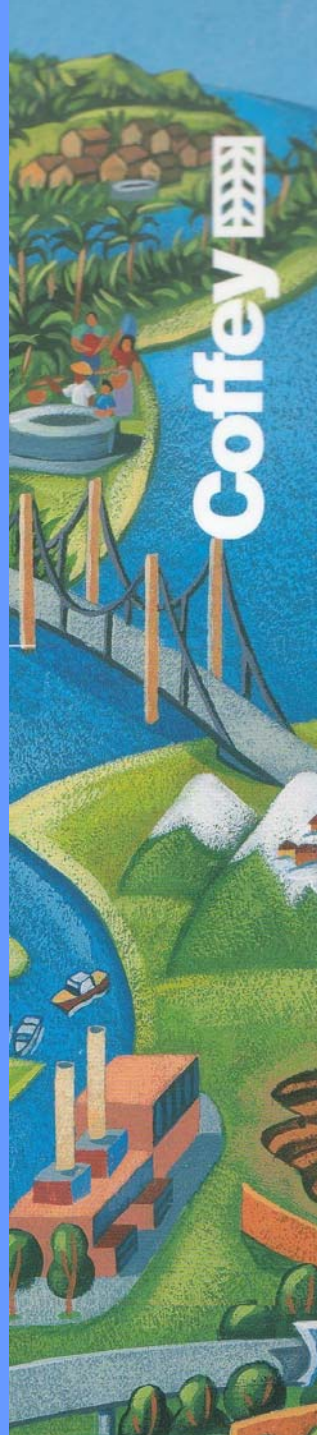


Contamination Issues

- **Soil**
  - Contamination over large areas (up to 7,000m^2)
  - Contaminated soil at depths of up to 6.5m
  - 40,000m^3 excavated and treated
  - Inorganic and organic contaminants
- **Groundwater**
  - A shallow water table(<2.5m depth)
  - Areas of “free phase” hydrocarbon
  - Dissolved phase contaminants over many areas including one site of 10,000m^2
  - Over 4 megalitres of groundwater recovered & treated



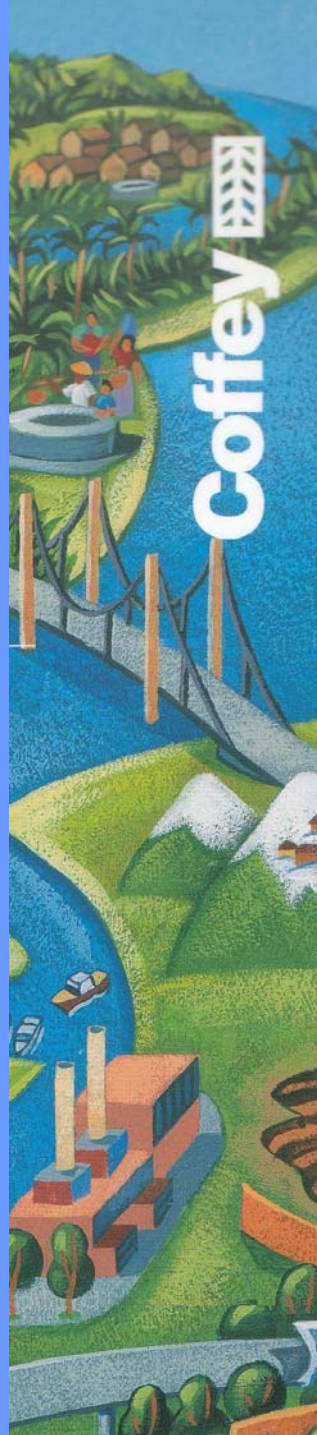
A High Profile & Sensitive Site



Regulatory Processes

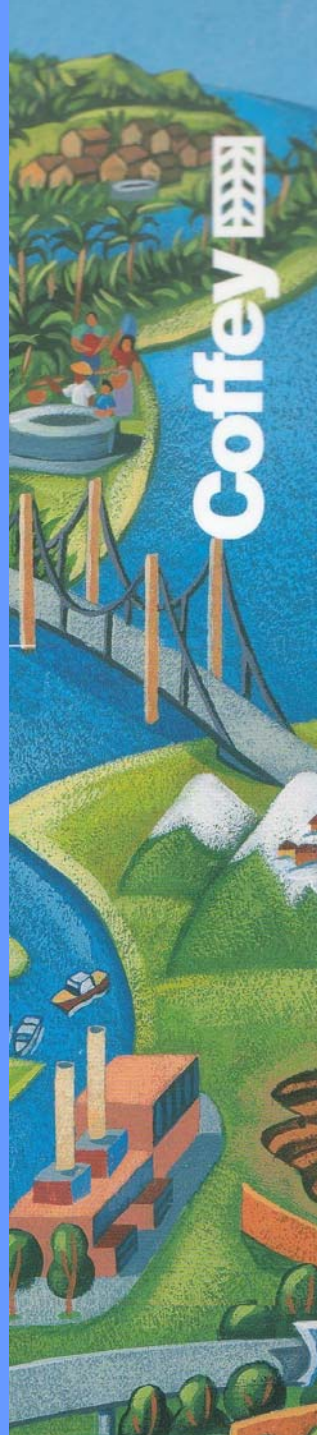
- Environmental Protection Agreement
  - ACT Land Development Agency
  - ACT Environmental Protection Agency
- Site Audit Scheme
- Independent Government Appointed Advisor/Reviewer

A collaborative approach was adopted for the project with a focus on continual improvement and use of best practice methodology

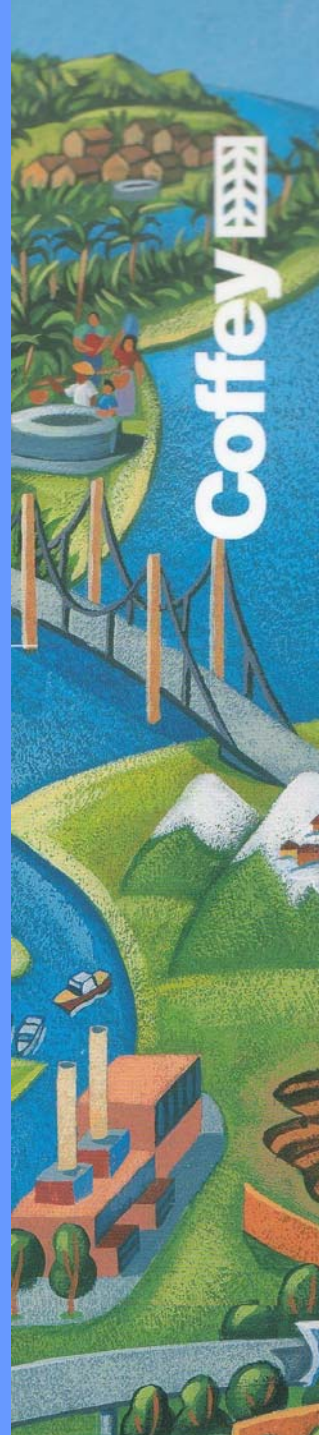


Assessment & Remedial Approach

- Site history review & technical appraisal
- Cost planning
- Design of a site-specific Audit Protocol
- Staged assessment to address higher risk areas and unlock valuable sites for early development
- Adoption of Contaminant Management Plans
- ***Analysis of uncertainty***



The Kingston Foreshore Precinct
Site Audit Areas – A Staged Approach

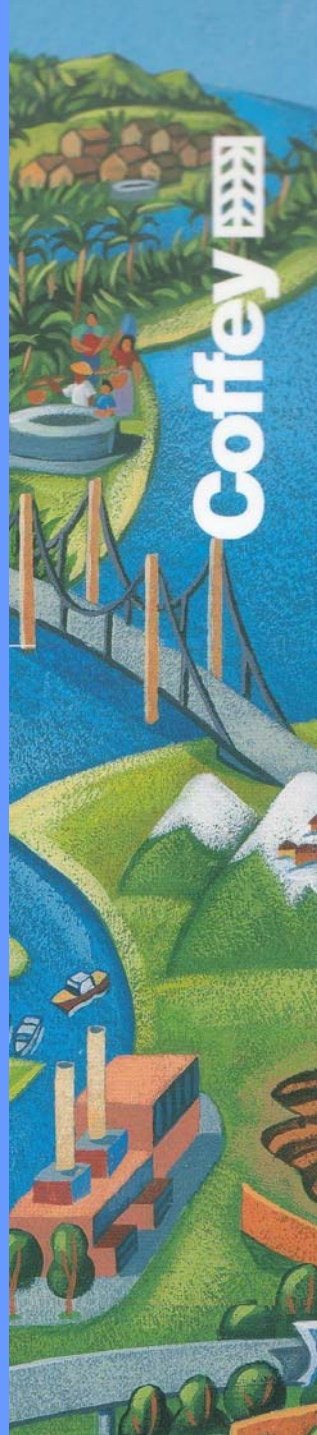


Coping with Project Uncertainty

"…the inherent presence of uncertainty is the main cause of remediation project cost and time blow outs"

So how did we reduce this inherent project uncertainty in the Australian Capital Territory?

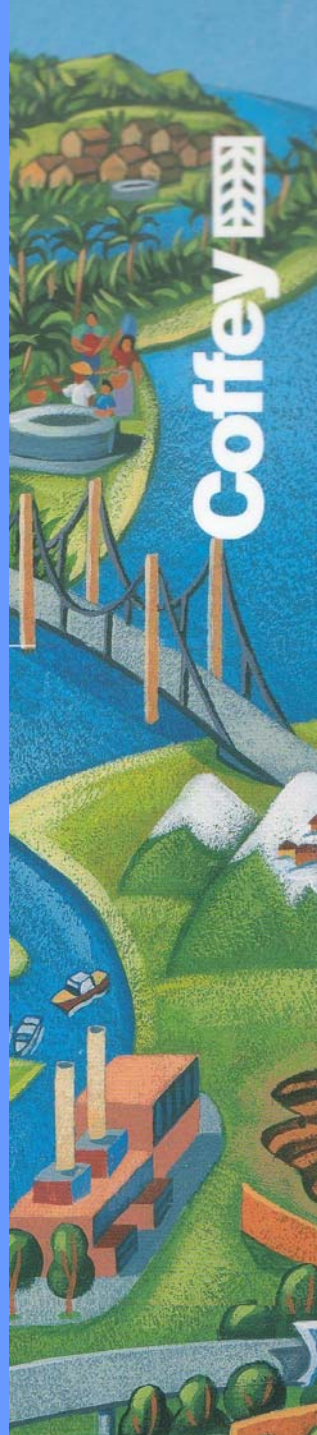
- Appropriate land investigations
- Use of risk management techniques
- Contingency planning
- Communication



Appropriate Site Investigations

- Focus on desired outcomes at the outset
- Ask the right questions
- Look critically at your work as well as that of others

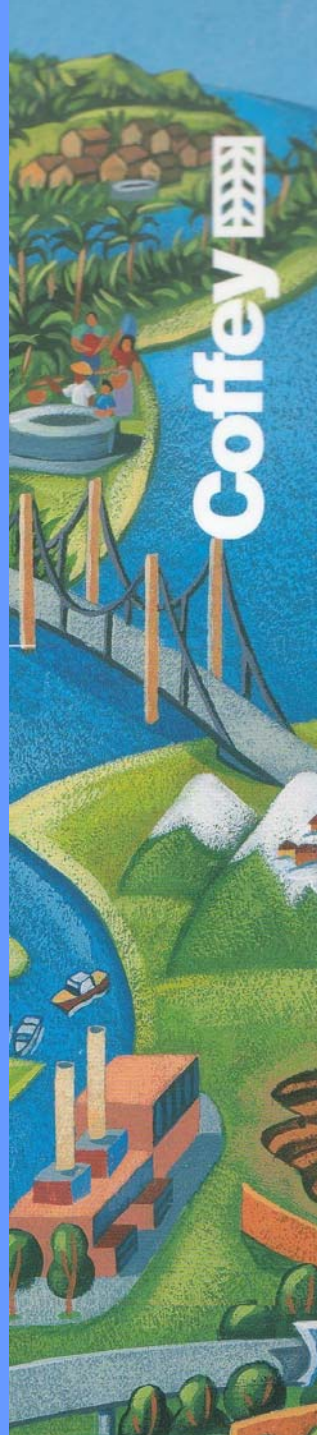
As a minimum,
an accurate model
of site conditions is required



Risk Management Techniques

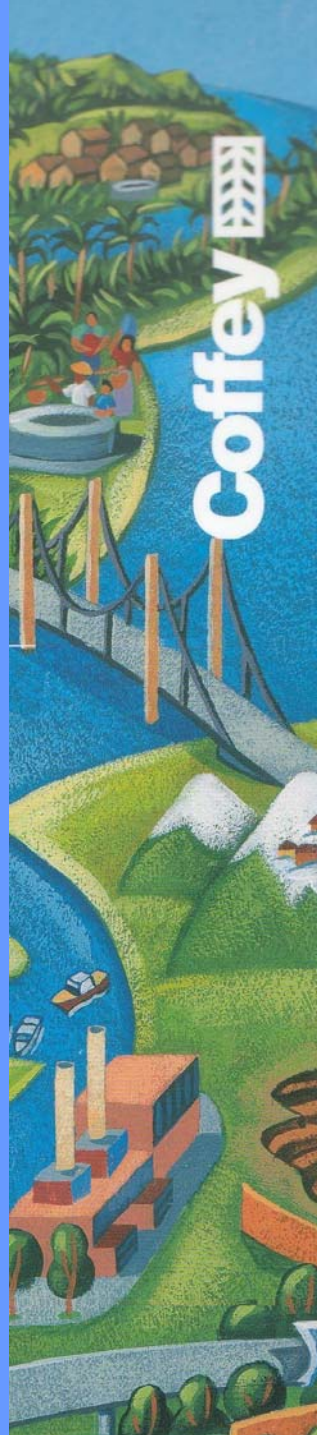
There are significant benefits to be gained through the proactive management of risk

- Risk Assessment (Australian Standard AS4360:1999 was adopted)



Contingency Planning

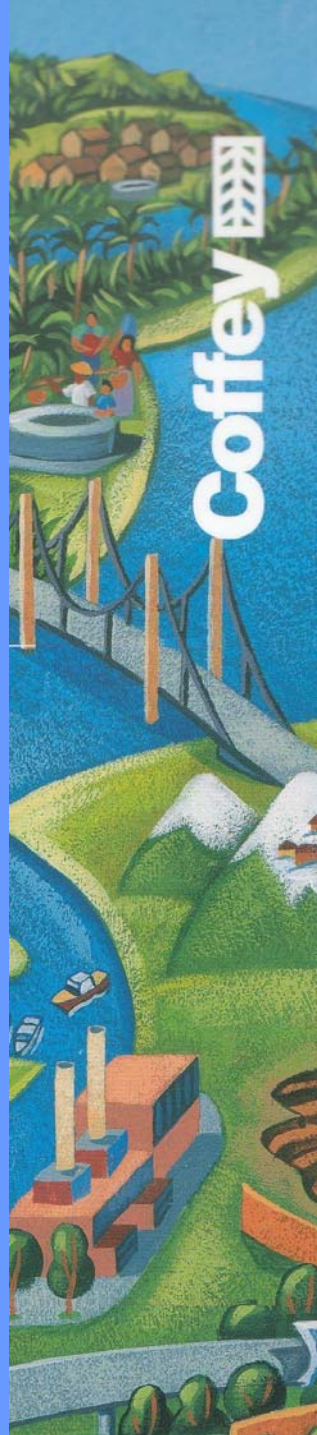
- Have measures in place to identify potential project issues and risks
- “Plan for the worst and hope for the best”
- Aim to strike a balance between over-conservative and ‘realistic’ contingency planning



Communication of Uncertainties

An important but often under-utilised tool:

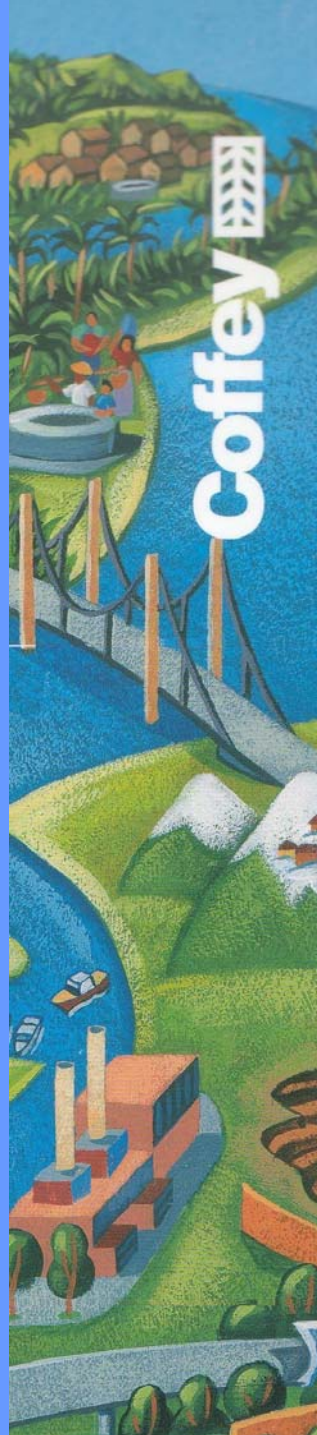
- Communication for all: Project teams, clients, stakeholders & regulators
- Communication of uncertainties should:
  1. Start early
  2. Be effective; and
  3. Form part of the core on-going project management strategy



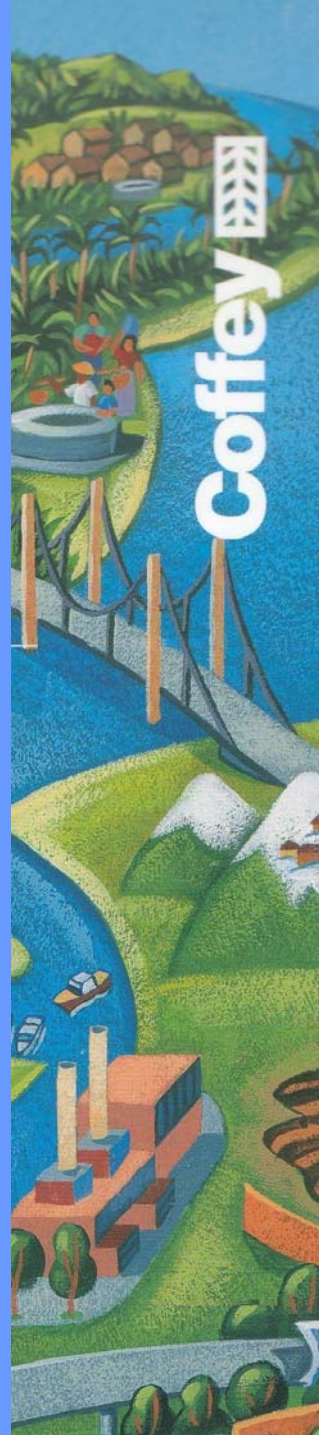
Case Study - Remedial Program at Bulk Fuel Storage Depot

Recovery & Treatment of Hydrocarbon Based Contaminants

- De-watering
- “Free phase” product & groundwater recovery
- Contaminated soil excavation
- On-site water treatment
- On-site soil treatment



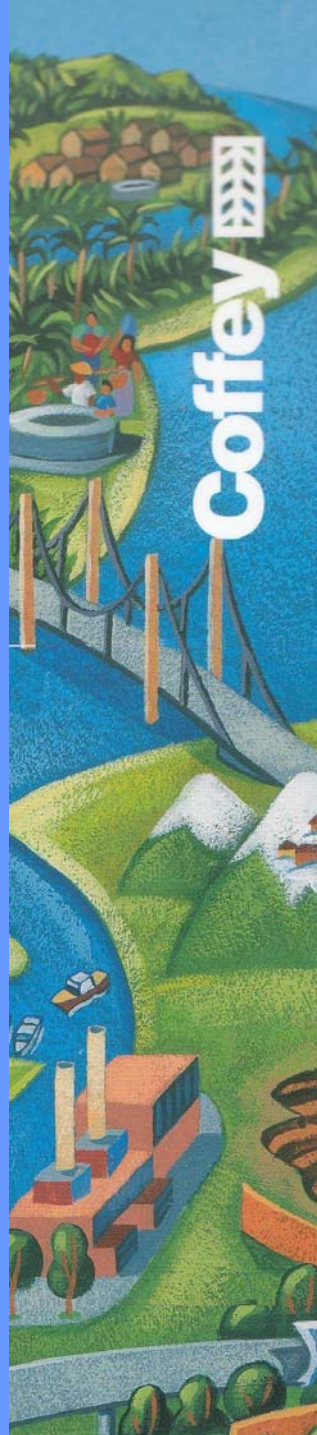
Remedial Works at the Kingston Site



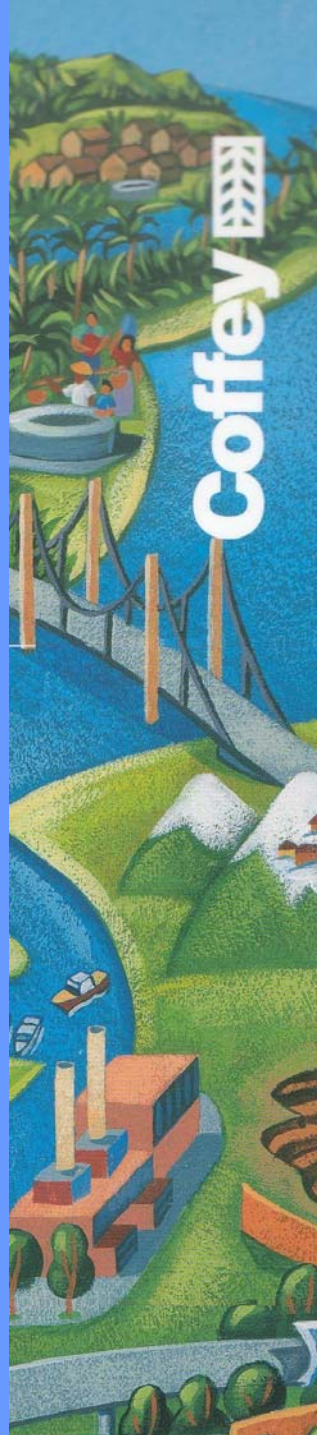
Case Study - Remedial Program at Bulk Fuel Storage Depot

Innovative Techniques with emphasis on on-site treatment & ESD principles

- Critical appraisal of site models
- Treatment & re-use of contaminated soil & groundwater
- Reduction in contaminant loading at off-site facilities
- Re-use of other site wastes for restoration



On-Site Treatment of Contaminants at the Kingston Site



Lessons Learned

- Use of a staged approach and the Site Audit Scheme for dealing with a larger site
- Risk management and collaborative approaches adopted with excellent outcomes
- Importance of regular and open communication
- Social, environment and economic value added