



Australian Success in Bioremediation Cluster Approach

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Overview

- Background and aims
- Treatment facility site and source site selection
- Contractual approach
- Soils management plan
- The benefits
- Lessons learnt/knowledge transfer

Background

- Contaminated soil classification: State / National
- Traditional options for NSW contaminated soil
 - Specific large scale on-site treatment
 - Landfill for pre-treatment / disposal
 - Hazardous – interstate or treated
- Key issues
 - Expense, difficulty, varying land values

Background

- Pilot trial in Sydney 2013-2015
 - Design development from April 2012
 - Planning permission for use as temporary treatment facility August 2013
 - EPA NSW issued a temporary treated soil exemption Licensing permission (expired October 2015)
- Service station sites: Hydrocarbon impacted soil
- Material: source site to pilot facility, treated and reused any site



Aims

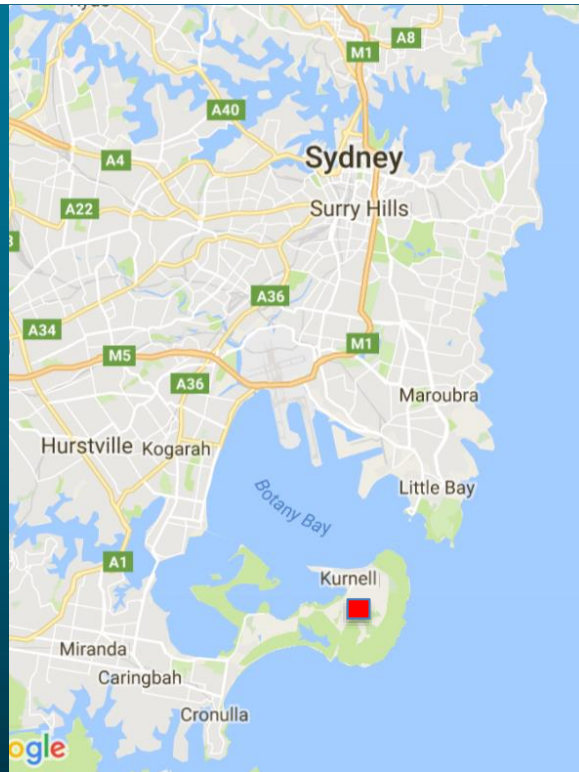
- To find a more sustainable solution for small or constrained sites
- To demonstrate the value of the facility for:
 - Economies of scale
 - Efficiencies
- To test uncertainties with the approach:
 - Contractual management
 - Material supply
 - Regulatory / consumer acceptance
- To enable lessons learnt to be applied to a permanent facility



The project

- Facility operational:
 - October 2013 – November 2015
- Treatment facility: Kurnell, NSW
- Source sites: 13 in greater Sydney
- Total material received: 7,204 T
- Total material treated: 7,140 t (64T oversize disposed)
- Treatment methodology: Bioremediation: biopiling and intensive (EPA reviewed / approved)





Pilot Facility

LEGEND

■ SUMP

□ B BLOWER

→ TRAFFIC DIRECTION

▒ 200mm CRUSHED CONCRETE OR SIMILAR

▒ 300mm CRUSHED SANDSTONE

▒ GEOSYNTHETIC CLAY LINER

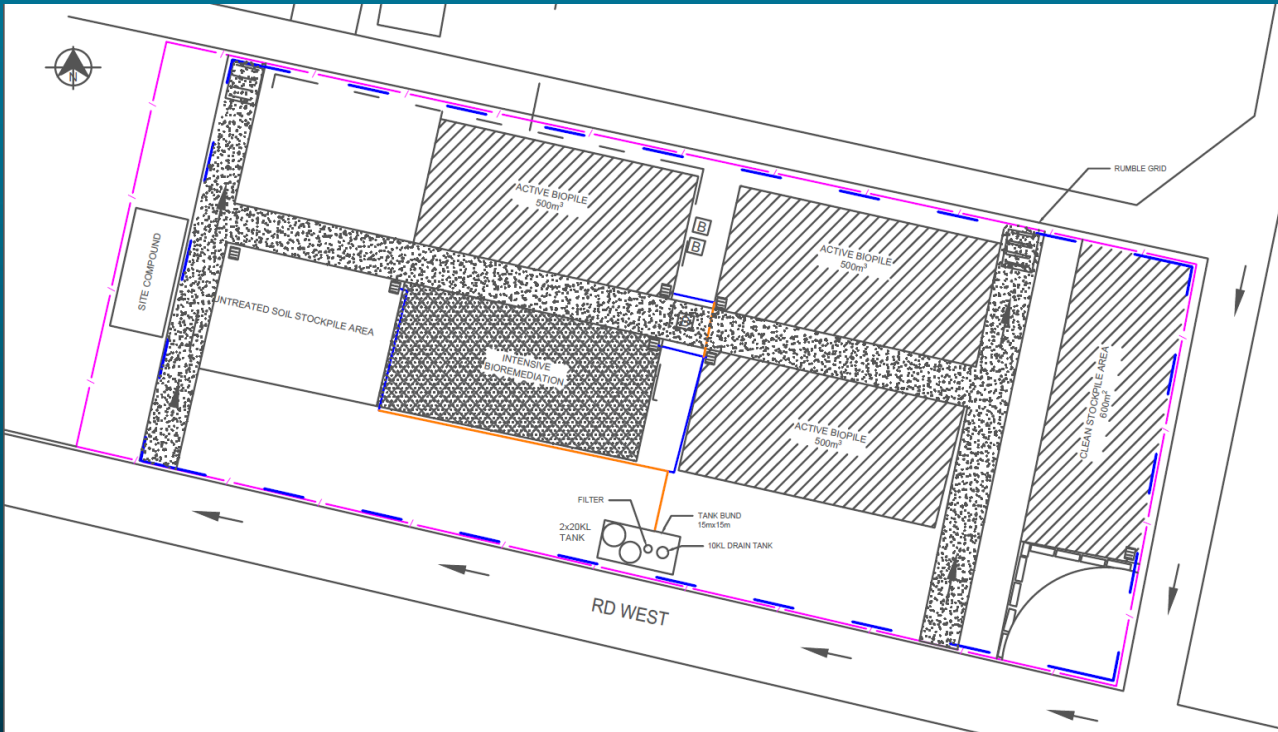
▒ HDPE LINED

— BUND 0.5m HIGH x 1m WIDE

— FENCE

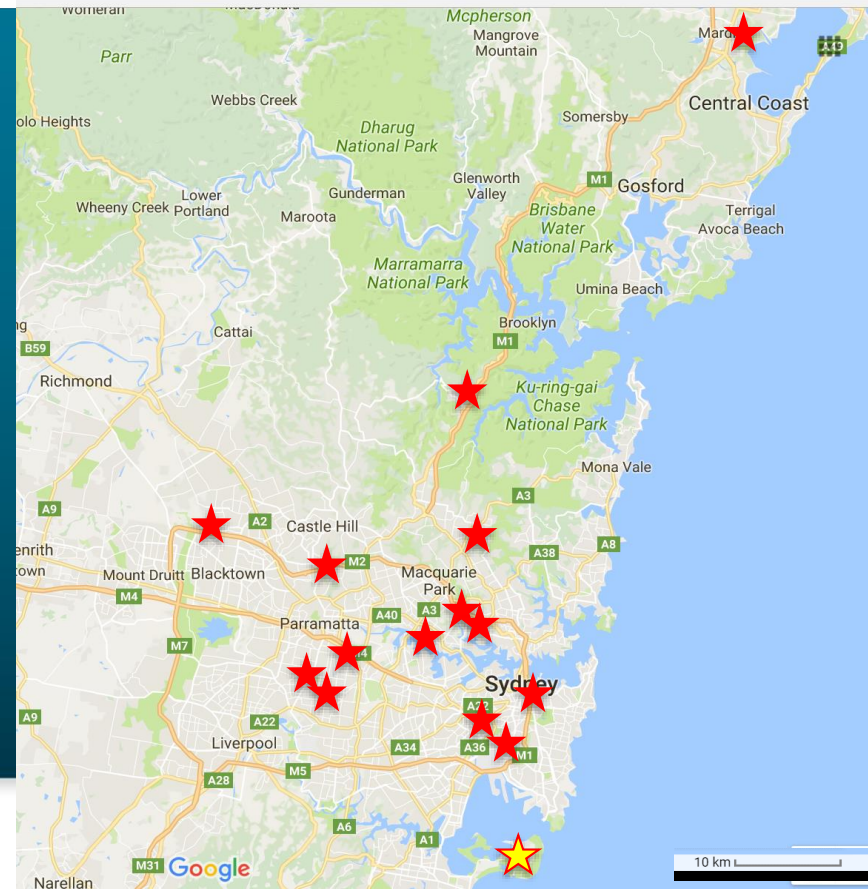
— UNDERGROUND LEACHATE WATER PIPE

— ABOVEGROUND LEACHATE WATER PIPE



Source site selection

- Current site use
- Program timing
- Extent/quality of investigation data
- Soil characteristics and types of contaminants
- Volume of material for treatment and volume of imported fill required



Contractual approach

Project innovator and
site owner



Onsite facility manager and
technical partner



Consultants
approval process



Contractual approach

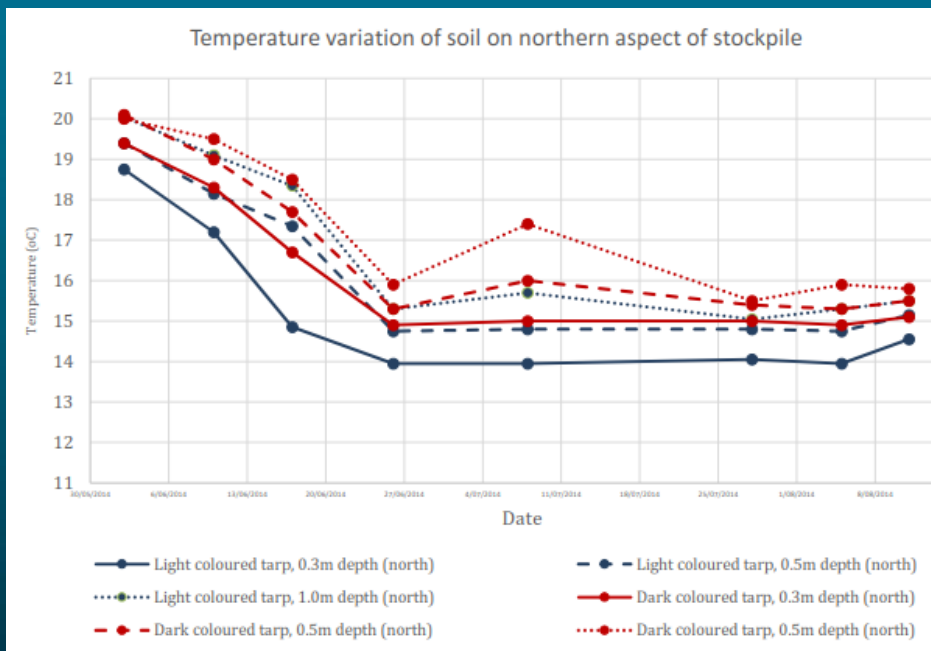
- Facility operated under a single contract, Enviropacific responsibility:
 - designing the treatment processes to achieve the reuse criteria
 - programming the works to optimise treatment times
 - reviewing of source site information / data
 - preparing regulatory progress reports
- Source sites had various consultants and contractors
- Consultant provided a soil classification report for their source site

Soil Management Plan

- Soil classification for each site by consultant
- Review of data and acceptance by Caltex / Enviropacific
- Sampling and visual inspection on arrival at facility

- Following treatment soil was validated
- Site specific exemption with reuse criteria
 - Based on NSW Excavated Natural Material Order
 - C10-36 average across a stockpile 250 mg/kg; absolute max for any sample 500 mg/kg
- Submission of data to EPA (source, arrival, validation)

Commercial scale applied research



- Stockpile covering
- Degradation patterns within stockpile
- Surface VOC release
- C source



The benefits

- for Caltex
 - treatment revenue and availability of material for re-use
- for customers utilising our service
 - lower cost than landfill and compressed redevelopment costs
- for communities
 - minimised impacts from contaminated sites
 - beneficial re-use of soil on local development
 - reduction in the quarrying of Virgin excavate material
 - reduced waste volumes to landfills prolonging lifespan

The benefits

- Reduction of environmental risks on 13 sites
- 15 tonnes of absorbed hydrocarbon removed
- Development of a model for future projects
- Recognised by a global innovation award - Edison Awards in New York (April, 2016)

Learnings (for permanent facility)

- Facility site selection takes time
- Approval process requires open discussions with all stakeholders
- Allowing contractor to input into the final design was positive
- Keep responsibilities clear (sampling, process method, reporting, regulator liaison)
- Material management and quality of reporting data is critical
- Build flexibility into the project and be prepared for changes

Permanent facility: CalSoil



Adam Searle MLC

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Today I visited the Caltex sustainable soil regeneration facility at Kurnell, with my Shadow Ministerial colleague, Mick Veitch MLC



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