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National Radioactive Waste Management Facility Site Characterisation Project

February 2018

Objectives and Scope of the Site Characterisation

Objectives:

- To document the surface and subsurface environment; and
- To document existing infrastructure in the area around each of the shortlisted sites with reference to the facility requirements
- To provide information to support work to design the facility

Our Stage 1 work scope involves:

  - Desktop review of available data and information *currently underway – local knowledge and information is needed to inform our work*
  - Field surveys to document the environment at each site *early works started*
  - Technical reports
  - Preparation of a work plan for more detailed surveys on the preferred site(s) i.e. Stage 2

AECOM Team

AECOM is managing this project from its local Adelaide office, with a range of staff that are specialists in the technical area from around the country

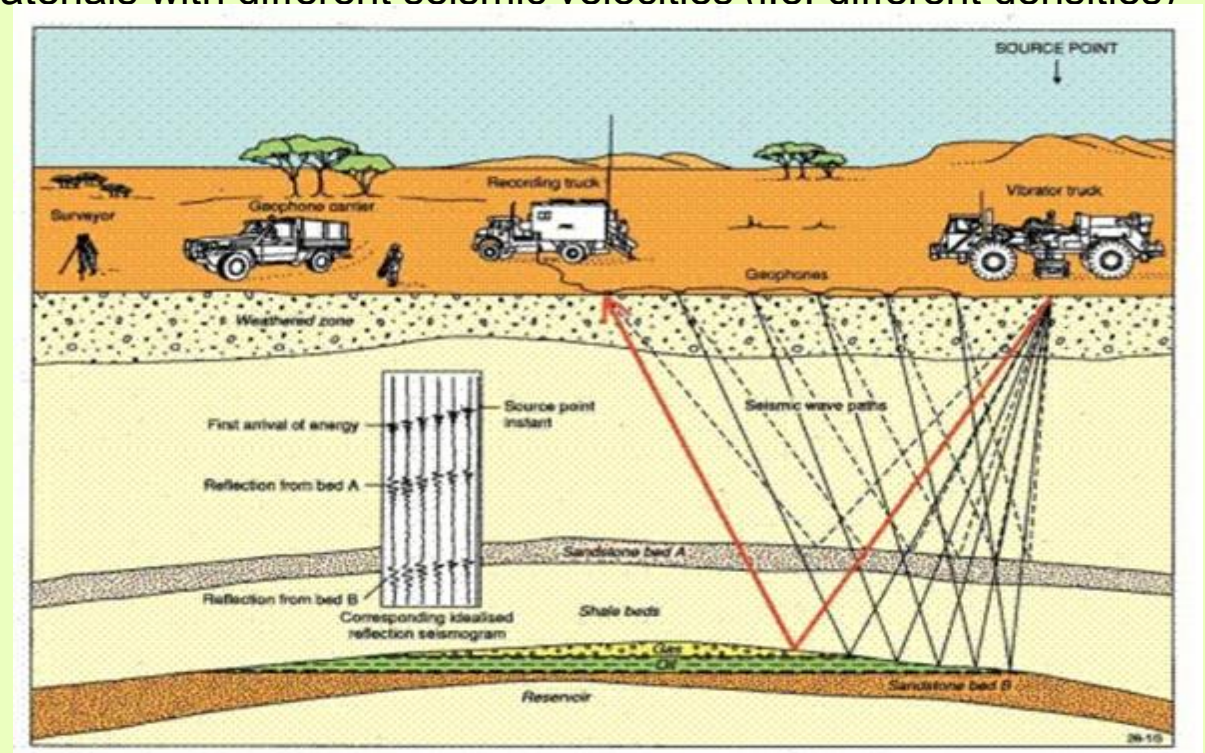
- Our team includes:
  - Specialists to lead each of the Technical Themes
  - Staff experienced in conducting plant and animal surveys, and the logging and sampling of soil, rock and groundwater
  - Subcontractors specialising and licensed in conducting geophysical surveys, drilling boreholes and installing groundwater wells
  - A Technical Advisory Group which includes international experts with experience in conducting similar works to this project, and experience in preparing safety cases for siting and licensing of radioactive waste facilities, and design and construction of similar facilities.

Theme	Key Items to be Investigated
Flora, Fauna, Conservation	Habitats that may be used by any endangered or threatened plants or animals
Landscape and landforms	Long-term stability of landscape and landforms
Geotechnical	Stability of the soil/ ground to support buildings and other structures for a facility
Seismicity	Location and properties of faults (if any) that could lead to near-surface ground movement or an earthquake in the future
Geology, Hydrogeology, Soil, Hydrogeochemistry, Geochemistry	Soils, bedrock, groundwater
Hydrology	Flow of surface water across land and waterways – risk of flooding
Wastes and Emissions	Wastes that are not radioactive produced by the facility – recycling, disposal options
Climate and Bushfire	Extreme weather conditions – wind, bushfire, cold/ heat
Climate Change	Predictions of changes to climate
Background radiation	Baseline conditions
Utilities, energy, infrastructure, human impacts	Needs, reliability and proximity of existing services and power in area Current and future potential land uses, population and activities on land in the area
Transport	Needs, reliability and standard of transport (e.g. roads) to/ from the sites

Stage 1 - Seismic Survey

February / March

- **Seismic surveys** to obtain images displaying major changes in the soils and rock beneath the surface up to 200 m depth
  - A ‘shot’ of energy is produced at surface
  - The travel time upon which the energy waves return to the surface, is measured with ground motion sensors or ***geophones***
  - In the subsurface, seismic energy is ***refracted*** (i.e. bent) and/or ***reflected*** at interfaces between materials with different seismic velocities (i.e. different densities)



Stage 1 - Seismic Survey

February / March

- A road impactor will be used to send out a ‘shot’ of energy
- This is repeated at regular intervals every few metres along diagonal lines across the sites
- Ground motion sensors ‘geophones’ are also place at regular intervals every few metres along the ‘survey lines’
- The points at which the road impactor and geophones are to be used will be marked out
- The information obtained by the geophones is monitored from inside a truck
- The survey works will take about 1 day per 1 kilometre of survey carried out by team of about 10

Mini-SOSIE Vibratory Rammer

Geophones

Mini-SOSIE Operation

Recording Vehicle

AECOM

Stage 1 - Seismic Survey

February / March

- Each point at which the road impactor or geophones are used will be marked out using plastic marker flags or wooden pegs, which are then removed
- Rocks at surface will be cleared to create a smooth surface for the road impactor
- No native plants (shrubs and trees) are to be removed when conducting the survey
- The survey works will take about 1 day per 1 kilometre of survey

The Department will arrange cultural heritage monitors to be present during the seismic survey

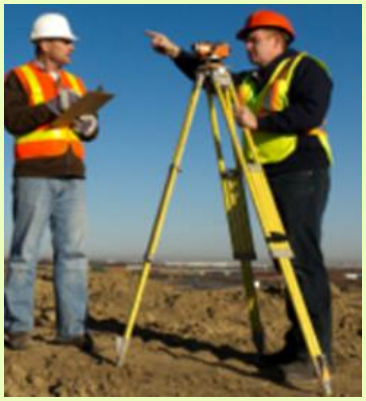
Stage 1 – Drilling Bores, Test Pits, Groundwater Wells

April

To record, sample and test properties of soil, bedrock and groundwater at each site:

- Borehole drilling using sonic rigs (uses vibration) for installation of 5 shallow groundwater wells and 1 deeper well per site
- Excavation of test pits to record soil types and test soil properties across the site
- Groundwater will be sampled and the depth gauged

The Department will arrange for cultural heritage monitors to be present during drilling and excavation works



Stage 1 – Survey of Flora and Fauna (Plants and Animals)

April

- To record the vegetation types and ecological communities/ habitats present on-site and in the local area
- Assess whether such habitats could contain any endangered or threatened plants or animals
- A more detailed survey of the plant and animals present at each area will occur in the future

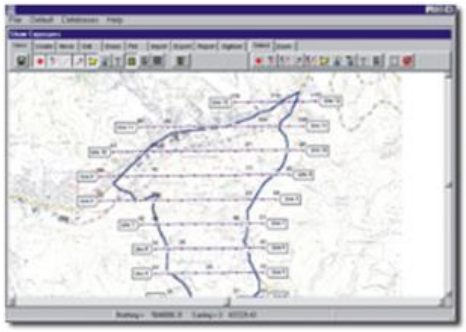
Stage 1 – Inspection of Local Features and Infrastructure

April

- On-ground inspections to observe land uses and existing local infrastructure e.g. roads, capacity of substations, power lines, available services

Stage 1 Reporting

- Technical Reports for each site covering all aspects of the surface environment, subsurface environment, and infrastructure needs and
- Summaries reports for communication with each local community and others interested
- Work plan for more detailed Stage 2 site characterisation work on preferred site(s)



Local Business Opportunities

Local knowledge and skills will be invaluable to project success

Project Phase	Services that may be required
Site Characterisation (AECOM) stages	• Fuel supply to drill rigs and vehicles • Excavation of test pits • Cartage of water, soil • Accommodation • Catering/ meals • Labour hire • Licensed surveying • Environmental support (local knowledge) • Cultural heritage monitors, where heritage values have the potential to be identified on or near the site
Construction (subject to site suitability and approvals)	In addition to the above • Civil works (earthmoving and trenching) • Supply of raw and building materials, and furnishings • Engineering/ fabrication • Trades e.g. electrician, builder, crane operator, plumber, fencing • Equipment, office and yard hire • Safety and environmental supervision of construction
Operation and Maintenance (subject to licensing of facility)	Site operational roles and support services to be outlined by Department