Australian Government
Department of Industry, Innovation and Science

National Radioactive Waste Management Facility

JULY 2018

# Site characterisation studies

## Technical assessments to understand site suitability

Three sites in South Australia have been voluntarily nominated to host the National Radioactive Waste Management Facility – Wallerberdina Station, Napandee, and Lyndhurst. The Australian Government is consulting the surrounding community on what hosting the Facility means for their community.

As part of this detailed phase, studies are being undertaken to assess each site's environment, cultural heritage and access to infrastructure and enabling services.

The Government has commissioned independent contractors to undertake the works. Engineering firm AECOM is undertaking detailed site characterisation studies at each of the sites to gain a better understanding of each site's suitability for the Facility.

This factsheet describes the site characterisation assessment. Three site specific booklets and full reports with extensive information about each of the sites will be made available.

This document is part of a series of factsheets providing information on the process to site the National Radioactive Waste Management Facility.


For more information:

Call **13 28 46**

Email **radioactivewaste@industry.gov.au**

Visit **www.radioactivewaste.gov.au**

# Environmental assessment and technical field studies

The aim of the work is to gain an understanding of the environment at each of the three sites, specifically to determine whether there are any conditions that may preclude a site hosting the Facility. A wide range of environmental characteristics are considered, including:

- **climate** - are there any recorded conditions or future climate predictions that could impact the Facility?
- **bushfire** – is the vegetation on or near the site flammable in nature and are bushfires common in the landscape?
- **natural background radiation** – what are the background radiation levels at the site?
- **above-ground water** – where does surface water flow or accumulate at the site? Is local or catchment scale flooding likely and how significant could it be?
- **underground water** – how deep are the water tables? What could they be used for? Where does the underground water table go?
- **flora and fauna** – what habitats are present in and near the site and what species do they support?
- **conservation** – are there conservation or heritage sites?
- **land use** – what are the current land uses in the local area? What could the future land uses be? How would the Facility impact on these land uses and vice versa?
- **soils** – can the soils support the Facility buildings and structures? Are they susceptible to erosion or land degradation?
- **seismic activity** – are there faults beneath the sites? Could they cause ground movement that would damage the Facility if an earthquake occurs?

AECOM employed a range of technical specialists to carry out the works. Members of the local Aboriginal community near Wallerberdina Station, were also employed to ensure that any potential impact to cultural heritage values was avoided

The work involved conducting the field studies, processing and interpreting the data, and using those results to assess the site's individual environmental characteristics.


▲ *AECOM seismic survey works*

Some of the field studies undertaken include:

- **terrain mapping** – using aerial surveys to provide high resolution digital maps of the terrain of each site and surrounds;
- **bedrock mapping** – using aerial surveys to identify the presence and depth of below-ground bedrock with magnetic properties;
- **radiation mapping** – using aerial surveys to map the background radiation levels at the surface of each site and surrounds;
- **ecological surveys** – a walkover of each site and its surrounds to describe and map the vegetation and record observations of any animals;
- **seismic surveys** – an on-ground survey across each site to establish the profile of sediment and bedrock, and the presence of any faults down to hundreds of metres in depth;
- **drilling of boreholes** – drilling to recover and log cores of soil and rock, and install groundwater investigation wells to determine the depth, quality and potential connections between underground water tables. Studies also logged the density and conductivity of soil and bedrock and confirmed water bearing zones in the formation; and
- **excavation of pits** – shallow pits across each site were dug to describe the soil, determine spatial variability and conduct tests to determine if conditions are hazardous for the construction of the Facility buildings and structures.

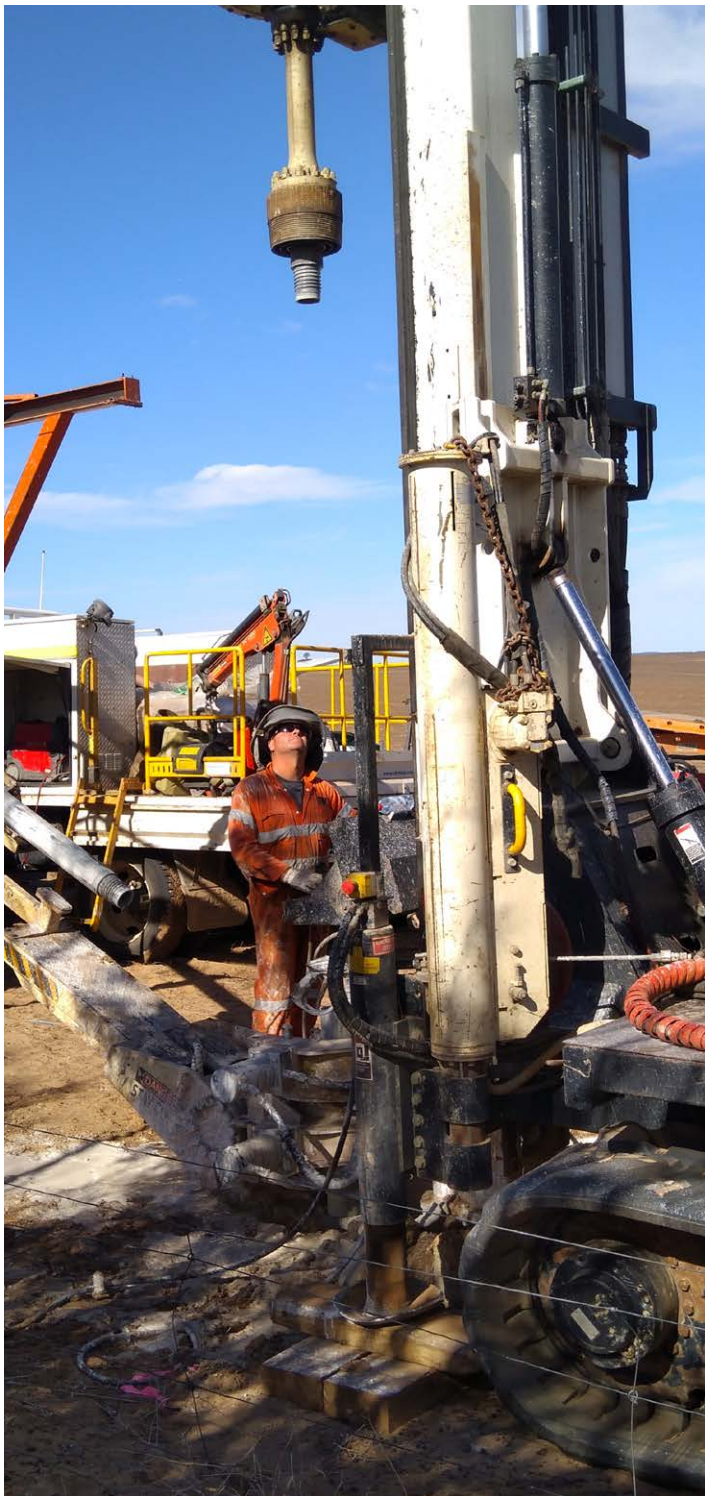
A summary of the technical assessments will be made available prior to the August 20 ballots.

*Wallerberdina Station technical assessment*

## Enabling infrastructure considerations

AECOM is also reporting on considering the critical service infrastructure needed to support the Facility, the 'enabling infrastructure'. The aim is to review the distance, standard, reliability and capacity of critical infrastructure required to build and operate the Facility. A wide range of enabling infrastructure was assessed, including:

- **water** – what are the options for access to water for use during construction and operation of the Facility without impacting on other users?
- **power** – where is the nearest power supply of sufficient capacity for the Facility? How reliable is the power supply and should a backup power source be considered?
- **renewable energy** – what renewable energy sources could be used on the site? What other measures could be used in combination with renewable energy to provide reliable power to the site?
- **communications** – what are the options for telephone and internet services using satellites, repeater towers or fixed cable? What upgrades are needed?
- **transport** – what roads could be used to provide access to and from the site? Will they require upgrades for year-round reliability or to meet the standards of the vehicle that would use them?
- **waste** – what general waste would be created and how would it be recycled or disposed of?



*Drilling of boreholes*

This assessment also includes engaging with utility asset owners and providers regarding connections and the standards, reliability and capacity of the existing infrastructure.

It will include consideration of how the enabling infrastructure will provide benefits to the community.

▲ *Targeted Aboriginal heritage survey*

## Cultural heritage assessments

An independent Aboriginal cultural heritage assessment is being undertaken by heritage management experts, RPS. The assessment is part of the Australian Government's work to ensure that the impacts to significant Aboriginal cultural and archaeological sites are avoided or minimised.

The aim of the cultural heritage assessment is to identify cultural heritage values at or near the nominated parcels of land, to inform decision making and minimise potential future impacts.

The cultural heritage assessment of Wallerberdina Station identified, documented and mapped locations of culturally sensitive areas across the site and surrounds, through the Heritage Working Group. In addition to the cultural heritage assessment of Wallerberdina Station, RPS has carried out a targeted archaeological survey in collaboration with 30 members of the Adnyamathanha community through the Heritage Working Group.

This targeted archaeological survey was undertaken to enable AECOM to commence technical investigations. Cultural heritage monitors were also engaged for the duration of AECOM's technical investigations, with monitoring led by the local Adnyamathanha community.

In relation to the two nominated sites at Kimba there are no heritage sites registered and we are committed to establishing whether there are any unregistered sites. We have commissioned work to progress this issue and we will work with the Barngarla people, who are the traditional owners of the land in that area, to identify and protect any heritage that may be impacted should the facility proceed at either site.

## Future works

These assessments will provide an understanding of the nominated sites, and the provisions needed to be made should a Facility be established at any of the sites.

If a site progresses to the next stage, further assessment will be needed, including:

- more detailed environmental assessments to further develop a conceptual site model and establish baseline environmental conditions, prior to submitting applications to regulators for approvals to construct the Facility;
- an Aboriginal Cultural Heritage Management Plan to manage cultural heritage values at and around the preferred site. This would be developed during a detailed technical cultural heritage investigation, and updated during the life of the Facility; and
- reviewing the options identified for enabling infrastructure and developing a concept design for a preferred option for each type of enabling infrastructure, with input from the community.