



# Wallerberdina Station site study

## Site characterisation studies at Wallerberdina Station completed

Located around 30 kilometres north-west of Hawker is Wallerberdina Station, one of three sites in South Australia currently being considered as a potential location for a National Radioactive Waste Management Facility.

The nominated land at Wallerberdina Station is approximately 6,300 hectares in size. The Facility will require just 100 hectares of land – 40 hectares for the Facility footprint itself, and an additional 60 hectares as a buffer zone.

The current phase of the site selection process involves a detailed technical assessment of each

nominated site, which has now been completed, and in-depth community consultation to inform and gauge community sentiment, which is ongoing and includes a community ballot in August 2018.

**After completion of the technical assessments at Wallerberdina Station, the Department of Industry, Innovation and Science has been advised that with further assessment, any supporting infrastructure constraints and risks posed by environmental hazards such as seismic and flooding events, can be mitigated via design solutions.**

Information about the Wallerberdina Station site and a summary of the key facts and findings of recent technical assessments are detailed in this factsheet.

The full technical reports for all three nominated sites can be found at [www.radioactivewaste.gov.au](http://www.radioactivewaste.gov.au).

# Overview of Wallerberdina Station

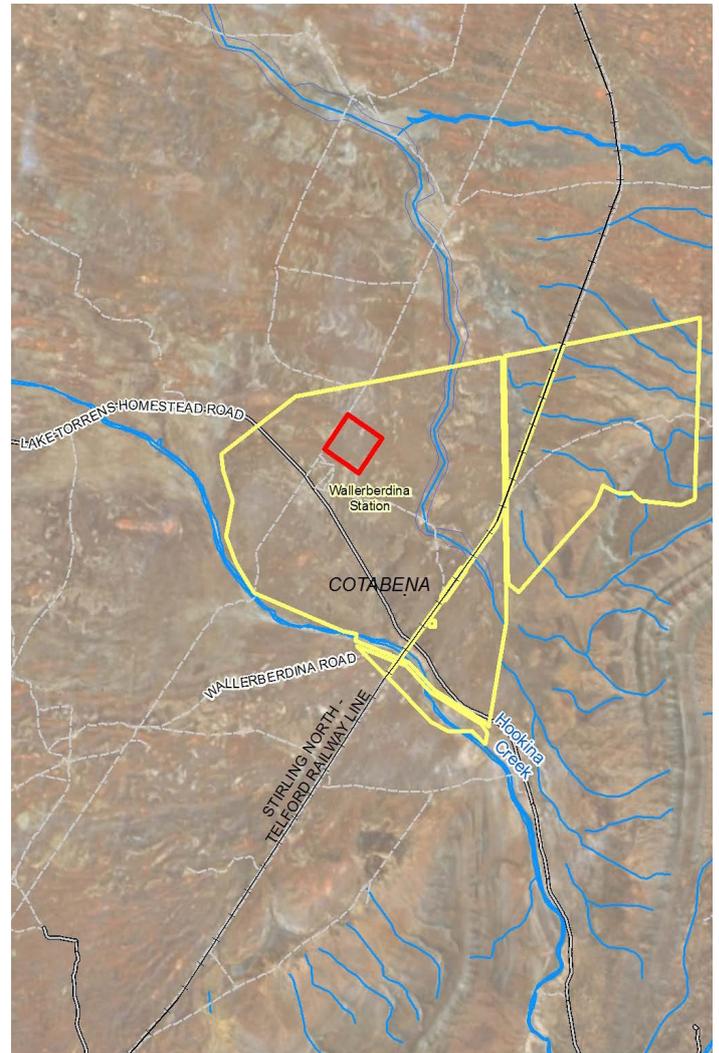
Wallerberdina Station is 30 kilometres north-west of the town of Hawker, and about 75 kilometres north-east of Quorn. These local townships could provide an ongoing workforce, and would benefit from the construction and operation of the Facility.

Less than 1 per cent of the nominated site would be taken up by the 40 hectare Facility, which is covered by a pastoral lease and currently provides native grazing pasture for cattle and sheep.

Wallerberdina Station is primarily located on plains at the western edge of the foothills of the Flinders Ranges. The disused Stirling North (Port Augusta) to Telford (Leigh Creek) Railway Line runs through the site.

A dry section of Hookina Creek is located more than 3 kilometres south of the 100 hectare parcel of land that was investigated. Water would only ever flow along this section of the Hookina Creek under short-lived or 'ephemeral' conditions associated with heavy rainfall.

Spring fed water does not typically flow along Hookina Creek as far as the Wallerberdina Station boundary. Further upstream along Hookina Creek are the registered Aboriginal sites of Hookina Waterhole (8 kilometres from the site) and Hookina Spring (12 kilometres from the site).



▲ Map showing Wallerberdina Station site (yellow) and the 100 hectare study area (red)

▼ Wallerberdina Station from the air



# Key facts and findings: Wallerberdina Station



**No significant environmental hazards or enabling infrastructure constraints have been identified that would exclude a Facility being located at Wallerberdina Station.**

## Climate



Wallerberdina Station is characterised by hot summers, and low annual rainfall, which is predominantly experienced during the winter and spring months. A hotter and drier future climate is projected, with an increased intensity of infrequent and episodic heavy rainfall events. Climate hazards can be addressed via the Facility design. Climate change impacts have been considered in the assessment of bushfire and flood risks.

## Background radiation



Elevated background levels of radiation do not exist at the ground surface of the site and its surrounds. This will assist in effective future monitoring against the baseline conditions.

## Bushfire risk



The site is not impacted by bushfire hazards due to the low flammability of the sparse shrubland across the site and its surrounds which is unlikely to sustain a fully developed fire front. Facility infrastructure can be protected if setback from native vegetation and protected by firefighting infrastructure.

## Underground (subsurface) water



The water table is more than 20 metres below the ground surface. Groundwater in the water table aquifers are reasonable water quality and yield. Groundwater is primarily used on Wallerberdina Station and surrounding stations for stock watering. With extraction and pre-treatment, the groundwater could be utilised at the Facility.

## Local roads and access



The site is serviced by unsealed local roads that would require upgrades to accommodate vehicle movements needed for operation of the Facility.

## Surface water (hydrology and flood risk)



A hydrological model was developed for the catchment by a specialist arid zone hydrologist. Predictive flood modelling using industry accepted software was undertaken at the Wallerberdina Station and site. The modelling considered the level of inundation and stream flow conditions under events of varying magnitude with the potential to occur once or twice within the period of a person's lifetime (50 and 100 years) up to once in within a millennium (1000 years).

Hookina Creek is more than 3.5 kilometres from the site and passes through and beyond the southern edge of Wallerberdina Station. There is a tributary of Hookina Creek 1.5 kilometres east of the site. The predicted model indicated that at the peak of a one-in-100-year flood event, waters from Hookina Creek would only reach the edges of the 100 hectare site. For even rarer flood events, it was predicted that flood water depths on the site may temporarily increase up to an average depth of around 0.5 metres.

The study concluded that impacts of these very rare flood events can all be mitigated through the use of bunds, levees and other diversion structures.

## Flora and fauna



The site predominantly contains low shrub land, grazed primarily by cattle. There is one threatened plant (native lime) and one threatened animal species (elegant parrot) with the potential for occurrence in the broader local area, and further targeted surveys would determine the likelihood of them being impacted by the the Facility, if the site was selected. There are no conservation reserves located near Wallerberdina Station.

## Water



The closest potable water main is located in Hawker. Installation of a network of groundwater extraction bores and onsite desalination would be considered to provide an alternative supply option.

## Land use



The site is well separated from development and sensitive land uses. The nearest homestead is located approximately 12 km to the west. There are a number of mineral leases or licenses in the local area which will be considered in detail in future, should they have the potential to proceed to development.

## Soils and geology



The ground beneath Wallerberdina Station is made up of layers of clay, silt, sand and gravel, underlain at significant depth by layers of weathered bedrock. The ground conditions at the site do not present any unacceptable hazards or constraints to support the Facility.

## Future changes in the landscape



The site is situated on the Hookina Creek alluvial fan and would only be subject to material sediment deposition during rare episodic flood events, whose impact on the site can be mitigated (see “surface water” section). During extended dry periods in the future, windblown sand could potentially deposit on the site from the adjacent dune field or further afield. If the site were to proceed, further hydraulic modelling would assess floodplain scour and sedimentation, and the course of Hookina Creek over the long-term.

Mitigation measures to minimise wind and water erosion include maintaining vegetation cover along sand dunes near the site, managing runoff from sealed developed areas during heavy rainfall, or the construction of structures to divert water or prevent inundation during rare flood events.

## Other services



Wastewater will need to be collected and treated onsite. Stormwater runoff will need to be managed onsite (such as through use swales and detention basins).

## Seismic events



An on-ground seismic survey of the site confirmed, with a high-level of confidence, the absence of active faults within or near the foundation beneath the study area.

Although the Western Range front faults are assumed to exist in the nearby area, hazards from ground shaking or deformation can be mitigated through design and implementation of structural engineering measures, as per industry standards and methods.

## Power



The site is around 20 kilometres from the closest appropriate transmission substation, and located alongside a transmission line. There is moderate to high solar exposure in the area. Onsite renewable energy generation and supporting energy storage technologies, such as batteries (short-term) and diesel (long-term) could provide both commercial and power reliability benefits to the Facility.

## Waste recycling and disposal



There is a waste management facility operated in Hawker by the Flinders Range Council. Other ordinary waste types may need to be transported to facilities in Stirling North / Port Augusta, for recycling, treatment or disposal.

## Communications (mobile telephone and internet)



National Broadband Network (NBN)'s fixed wireless service is not scheduled to be provided to the Hawker region in the near future. There would be a requirement for connections to be established to the Sky Muster satellite system (which services the Hawker area).

Communications towers for data communications and mobile coverage will be required. The potential to extend benefits of such infrastructure to the community are being considered within a separate more detailed assessment.

## Technical assessments

Engineering firm AECOM undertook the technical assessments of the sites, which involved:

- characterising the above-ground (surface) environment within and surrounding a 100 hectare study area, including surveying and documenting the flora, fauna and conservation values, and describing any hazards associated with the climate, bushfire, background radiation, flooding, and nearby human activities and land uses;
- characterising the below-ground (subsurface) environment within and surrounding a 100 hectare study area, including consideration of hazards associated with the long-term stability of the landscape and landforms, the soil, bedrock and underground water, and seismic (earthquake) activity; and
- a preliminary assessment of constraints and options for enabling (supporting) infrastructure that would be required for the Facility such as roads, power, water and telecommunications.

The works were undertaken to determine whether there were any significant issues or constraints that may preclude siting the Facility at any of the nominated parcels of land.

More information on what was involved in fieldwork can be found in the factsheet, *Site characterisation studies* and in the technical report available at [www.radioactivewaste.gov.au](http://www.radioactivewaste.gov.au).



▲ Gauging of underground water levels



▲ Soil core samples



▲ Seismic field survey

# Cultural heritage assessment

The Australian Government is also assessing the nature of any cultural heritage values at each of the nominated sites, to ensure that Aboriginal culture and values are protected, preserved and promoted.

Archaeologists from consulting firm RPS Group have carried out onsite surveys, in collaboration with members of the Adnyamathanha community through the Heritage Working Group, to identify, document and map the locations of culturally sensitive areas, across the site and its surrounds.

Targeted Aboriginal heritage surveys were carried out prior to the start of AECOM field studies, to ensure there would be no impact on cultural heritage at proposed drilling and test pit locations.

The Australian Government is aware of the significant heritage value of identified sites in the local area, including Hookina Creek. The 100 hectare site being considered for the Facility is well separated from those sites and Hookina Creek and was chosen so as to not impact on any sites of known heritage.

The Australian Government (along with its representatives) will continue to work with the Viliwarinha Yura Aboriginal Corporation, Adnyamathanha Traditional Lands Association and the local Aboriginal community members, to advance heritage assessments at the Wallerberdina Station site, if it is selected.

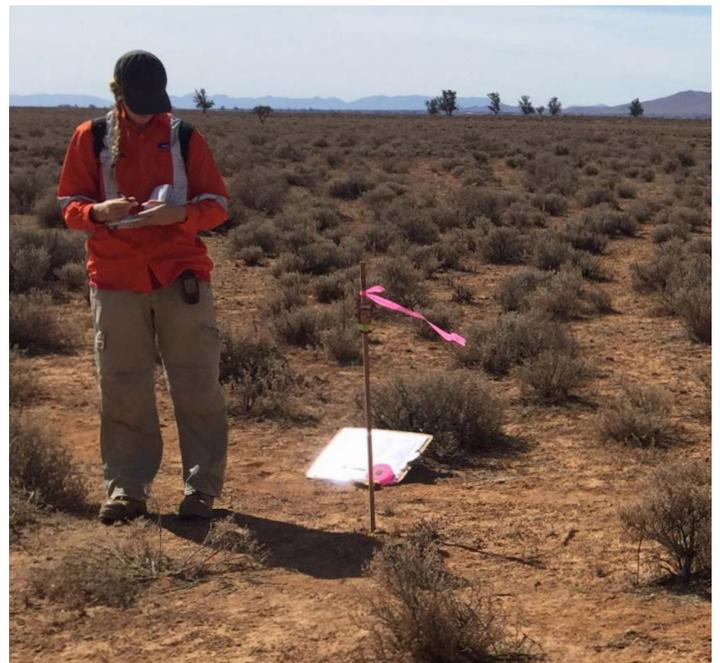
More information on cultural heritage assessment is available in the *Heritage at Wallerberdina Station factsheet*, available at: [www.radioactivewaste.gov.au](http://www.radioactivewaste.gov.au).

## Next steps

Later in 2018, following community ballots, Minister for Resources and Northern Australia, Matt Canavan, will make a decision on whether any of the three sites under consideration can be taken forward as the preferred site for the Facility.

At any selected site, further technical assessments will be conducted, and detailed design of the Facility and the enabling infrastructure will be undertaken, in consultation with the community.

The process to obtain construction approvals will involve independent regulators including the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and the Department of the Environment and Energy.



Cultural heritage assessment ►



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

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