Dinner Hill Wind Farm

Preliminary Hydrogeological Review

Final

August 2026

umwelt

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Prepared by
Umwelt (Australia) Pty Limited

On behalf of
OX2 Holdings Pty Ltd

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Acknowledgement of Country

Umwelt acknowledges the Traditional Owners of Country throughout Australia and their continuing values, culture and connection to the land, waters and sky.

We pay our respects to Elders past and present.

The below image is from the artwork *Yapung Maryiyang* (Pathway Forward) by Saretta Fielding.



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Executive Summary

Umwelt was engaged by OX2 Holdings Pty Ltd (OX2) to complete a desktop hydrogeological review for the proposed Dinner Hill Wind Farm development (the Project), located approximately 200 kilometres (km) north of Perth in Western Australia. It is understood the Project includes construction of up to 131 wind turbine generators and other associated infrastructure including (but not limited to) battery energy storage system (BESS), hardstand areas, substation and switch yard, operational and maintenance facility, control room, site offices and car parking, construction compound and laydown areas, concrete batching plants, quarries, overhead and underground cabling, and upgraded access tracks. This BESS included in this assessment is specific to the Project and is different to the Harvest BESS project, which has been excluded from this assessment.

The purpose of the desktop hydrogeological review was to collate and review publicly available information to identify the hydrogeological characteristics of the Project Area. This information is used to support Project design and inform on assessments needed to obtain planning approvals. Only preliminary details of the Project features, such as planned excavation depths of quarries and potential storage of contaminants/chemicals, are available at this stage of project development. Therefore, this review provides general advice only for the Project based on the information provided.

Review of publicly available information shows that the Project Area experiences hot dry summers, where evaporation exceeds rainfall in all months except June and July, limiting availability of surface water and rainwater capture. The Project Area lies within the Hill River catchment area, with the Hill River flowing westward along the southern Project area boundary. Ephemeral tributaries of Hill River, Winkardie Creek and Boothendarra Creek, occur within the Project Area.

Water resources within the Project Area are regulated under the Jurien Groundwater Allocation Plan, within the Badgingarra and Dinner Hill subareas. Any groundwater taken, either for water supply or during construction, will need to be licensed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). Key hydrogeological units and considerations for the Project include:

- **Alluvium** – shallow groundwater within unconfined alluvial aquifers mapped along Hill River and Boothendarra Creek. Groundwater dependent ecosystems (GDEs), culturally significant sites and potential for Acid Sulfate Soils have been identified in association with areas of mapped alluvium and along rivers. Therefore, any areas of potential excavation/ground disturbance or storage of chemicals in an area of alluvium may influence constructability and pose an environmental risk and require further design considerations to minimise impacts.

  The alluvial aquifer is also likely recharged from rainfall and surface runoff, therefore changes to the catchment area due to the Project surface infrastructure (i.e. roads) may influence streamflow and alluvial groundwater conditions.

- **Eolian dunes** – shallow unconfined groundwater unit associated with eolian dunes mapped to the west of the Project Area. Therefore, any areas of potential excavation/ground disturbance or storage of chemicals in an area of alluvium may influence constructability and pose an environmental risk and require further design considerations to minimise impacts.

- **Coolyena Group** – the Coolyena Group subcrops below the eolian dunes to the west of the Project Area. Limited groundwater data exists for the Coolyena Group within the Project Area but one available log from 2015 indicates the presence of groundwater at 86 m deep. The currently available information indicates the Project is unlikely to intersect groundwater associated with the Coolyena Group.
- **Parmelia Group** – the Parmelia Group occurs on the eastern side of the Project Area and underlies the Coolyena Group. Recent depth to groundwater data available within the Project Area indicate groundwater levels between 7 m to 72 m below ground with an increasing trend with time. The currently available information indicates the Project is unlikely to intersect groundwater associated with the Parmelia Group during construction but may be targeted for groundwater exploration to provide water during and post the construction phase.
- **Yarragadee Formation** – the Yarragadee Formation is a productive semi confined to confined aquifer that is present across the western half of the Project Area and is present at surface. The Yarragadee aquifer is a significant groundwater resource and provides town water supply to landholders and for the township of Badgingarra. GDEs have been mapped associated with the Yarragadee aquifer, and it is likely to have a range of cultural values and considerations. Therefore, any areas of potential excavation/ground disturbance or storage of chemicals where the Yarragadee Formation is present near surface may influence constructability and pose an environmental risk and require further design considerations to minimise impacts.

  The Yarragadee aquifer will be targeted for water supply purposes to the Project.

A preliminary review of potential groundwater related risks and considerations was undertaken for the Project. The review identified medium to high risks associated with:

- Impacts to groundwater quality associated with site construction activities, including ground clearance and exposure of dispersive soils, exposure of potential Acid Sulfate Soils, and potential introduction of contaminant sources. With potential impacts to GDEs, cultural values and water resources.
- Impacts to groundwater levels associated with a water supply bore field. With potential impacts to GDEs, cultural values and water resources.
- Impacts to groundwater quality due to chemical leaks from lithium-ion batteries (dependent on use of solid state or liquid design) or spills from coolant top up (dependent on sufficient storage controls such as bunding, and stormwater management). With potential impacts to GDEs, cultural values and water resources.

A separate desktop assessment was also conducted to determine if groundwater supply from the Yarragadee aquifer can meet the Project's water supply requirement during and post construction (Umwelt, 2026). The assessment indicated that sufficient groundwater resources are available to meet the Project's construction water requirement of approximately 2 ML/day.

As part of the Project planning, to address data gaps and risks the following are recommended:

- Design the BESS with appropriate storage controls (such as bunding or an alternative engineering solution) and stormwater management around battery storage areas to prevent potential mobilisation of contaminants of potential concern (COPC) to underlying permeable lithology and nearby waterways.

- Include design considerations to minimise areas of excavation and contaminants sources near alluvium. Where the Project is within these areas, include design considerations to minimise impacts (i.e. bunding).
- Include design considerations to minimise impacts to groundwater associated with the Yarragadee Formation, Parmelia Group, alluvium and eolian dunes, such as bunding and stormwater management within infrastructure areas.
- Where infrastructure/works are planned in areas of shallow groundwater (i.e. alluvium, eolian dunes and Yarragadee Formation), establish a groundwater monitoring network to collect site specific baseline data and establish baseline data of potential GDEs and water users in the area.
- Where infrastructure works are planned, undertake site specific studies of soil properties to verify potential for Acid Sulfate Soils, and inform design and erosion and sediment control measures.

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Appendix A Registered Bore Details

Appendix B Groundwater Supply Assessment

1.0 Introduction

Dinner Hill Wind Farm Pty Ltd (ACN 660 596 556), a subsidiary of OX2 AB and an affiliate of OX2 Holdings Pty Ltd (OX2), is seeking to develop the Dinner Hill Wind Farm (the Project). The Project is located approximately 200 km north of Perth in Western Australia, within the Dandaragan Local Government Area (LGA) and within the Central Coast Wheatbelt zone. The Project includes a wind farm and associated infrastructure such as a turbine hardstand area and substations in addition to up to 131 wind turbine generators.

Umwelt was engaged by OX2 to undertake a preliminary desktop hydrogeological review of the Project features and Project Area, presented within this report.

1.1 Project Details

The Project Area encompasses the proposed Dinner Hill Wind Farm, as shown in **Figure 1.1**. The land on which the Project is located spans approximately 30,024 hectares (ha) within the localities of Hill River, Boothendarra, and Badgingarra and is herein referred to as the Project Area. For the purposes of this report, the Project Area refers to the boundaries of all involved land parcels where consent has been granted for development of the Project and where all Project infrastructure will be contained.

The Project Area is located north of the Badgingarra township, east of Yerramullah Road and west of Coalara Road and includes 27 land parcels of freehold land tenure, the Brand Highway and local road corridors. The Project Area is almost entirely comprised of productive farmland that is largely cleared and utilised for mixed cropping and grazing.

The area is covered by the South West Settlement Indigenous Land Use Agreement (ILUA).

The Project consists of up to 131 wind turbine generators and associated necessary ancillary infrastructure including, but not limited to, a battery energy storage system (BESS), hardstand areas, substation and switch yard, operational and maintenance facility, control room, site offices, car parking, construction compound, laydown areas, quarries, concrete batching plants, overhead and underground cabling, and upgraded access tracks.

The Project has been conceptually designed to generate up to 943 MW of electricity for transmission into the South West Interconnected System (SWIS), which will be dependent on final turbine model and numbers.

The Project has been designed to ensure farming activities can co-exist within the development site and will provide supplementary income support for local farmers hosting the wind turbines. A Community Benefit framework is also proposed which includes a neighbour benefit framework, Community Benefit Fund (CBF), and benefit sharing with the Yued People community to ensure benefits are shared in the wider community over the life of the Project.

The depth of excavation associated with the site infrastructure is estimated to be a maximum depth of 4.5 m, with the exception of quarries where the excavation depth is currently unknown. All excavation depths will be determined in the detailed design stage and any required impact assessments will be undertaken at that time. It is expected that underground cables will follow access tracks where possible, at an anticipated depth of 900 mm.

Contaminants of potential concern (COPC) planned ground conditions and stormwater management design associated with the Project BESS cannot be defined at this stage of the Project. However, it is expected and assumed that Lithium Iron Phosphate is the primary COPC associated with the proposed lithium battery cell. Lithium Iron Phosphate is insoluble and will dissolve in water as a result of oxidation. As such, it has the potential to alter the chemistry of receiving waters and cause impacts to receptors.

Other typical COPCs associated with the construction and operation of BESS include ethylene glycol (coolant), Potassium 2- ethylhexanoate (coolant), 1,1,1,2- Tetrafluoroethane (refrigerant) and mineral oils.

1.2 Scope of Work

The purpose of the preliminary hydrogeological review was to collate and review publicly available information to identify the hydrogeological characteristics of the Project Area. This information supports the Project design to avoid and minimise impacts and inform assessments to obtain planning approvals.

The preliminary review includes:

- Review of publicly available information on the existing regional climate, topography, physiographic features, historical land use, and vegetation.
- Characterisation of the following hydrology and hydrogeology features within the Project Area:
    - Groundwater system.
    - Baseline water quality characteristics.
    - Environmental receptors and existing groundwater users.
    - Surface water and groundwater management areas that the Project intersects or may impact.
    - Consideration of potential surface-water and groundwater contamination.

A separate scope of works included high level identification of potential water supply sources at selected locations for potable and construction water supply. This assessment is summarised in the Dinner Hill Wind Farm Groundwater Supply Assessment (Umwelt, 2026) (Appendix B).

1.3 Limitations

The preliminary hydrogeological review was undertaken based on the currently available Project details, and publicly available information. No physical investigation or site-specific studies within the Project Area have been undertaken. The purpose of this review is to provide initial guidance of potential impacts and considerations for groundwater and does not represent a detailed groundwater impact assessment.

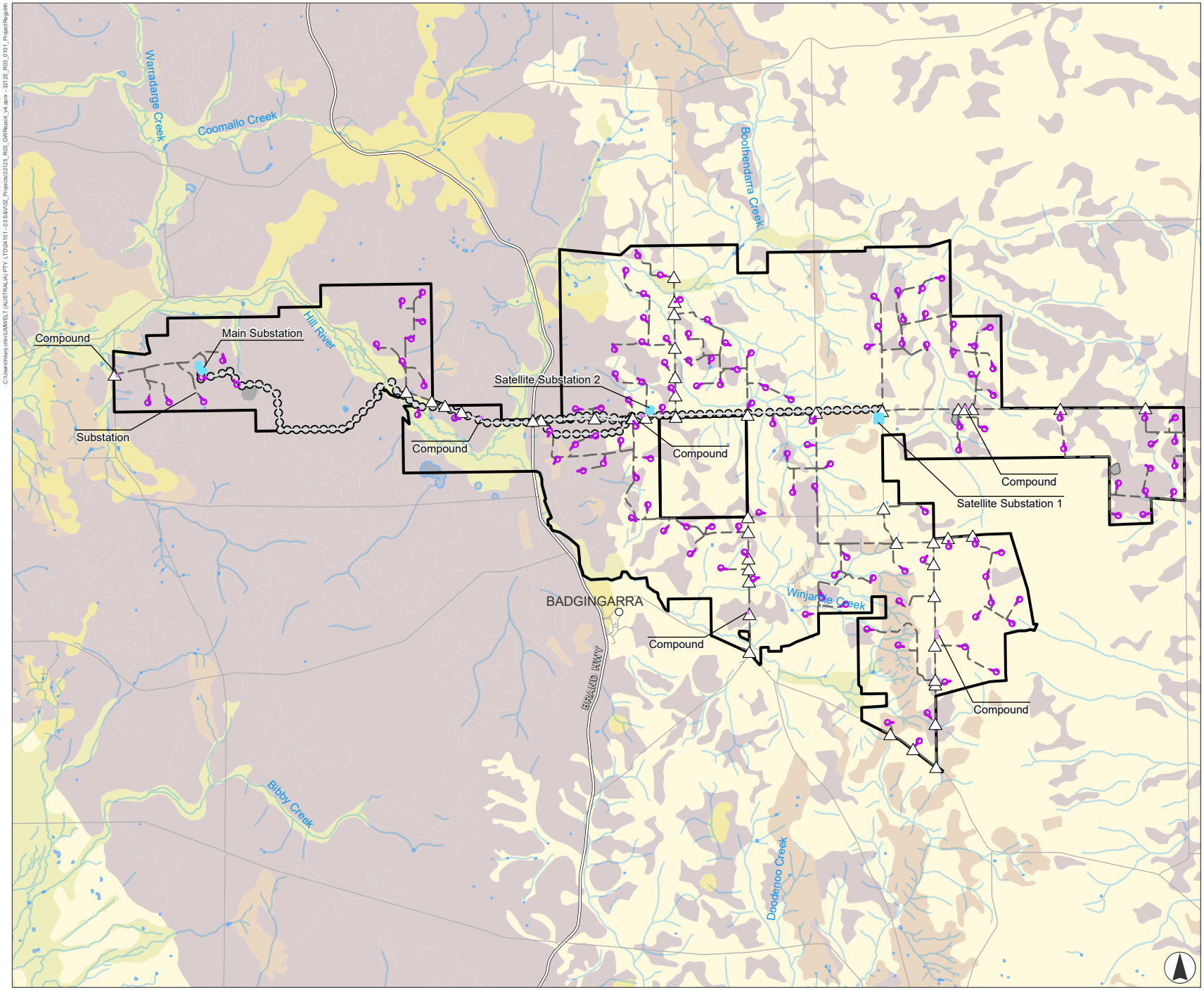


FIGURE 1.1

Project Area and Regolith Mapping

Legend

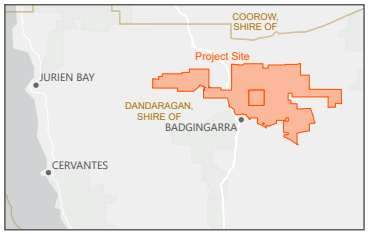
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Access Road
- Internal Transmission Line
- Internal TL Poles
- Quarry

Regolith

- Alluvial/fluvial unit, WCP
- Colluvial unit, WCP
- Eolian unit, WCP
- Exposed unit, WCP
- Lacustrine unit, WCP
- Residual or relict unit, WCP



0 2.5 5

Kilometres

Scale 1:200,000 at A4
GDA2020 MGA Zone 50

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Image Source: ESRI Basemap (2025) | **Data Source:** Landgate (2026), OX2 (2026)

2.0 Regulatory Setting

This section presents a summary of regulatory requirements relevant to water within the Project Area.

2.1 Rights in Water and Irrigation Act 1914

The *Rights in Water and Irrigation Act 1914* (*RIWI Act*) establishes the legislative framework for managing and allocating water resources in Western Australia, and the Department of Water and Environmental Regulation (DWER) administers the Act. Licences and permits to take water and undertake particular works are granted under this Act.

Most of the Project Area is located within the Hill River and Tributaries Catchment, managed under the *RIWI Act*. As such, if the Project construction or operation is likely to affect a watercourse, wetland or groundwater system, including water take, a licence under this Act will need to be obtained.

Water resources within the Project Area are regulated under the Jurien Groundwater Allocation Plan, within the Badgingarra and Dinner Hill subareas. **Table 2.1** outlines the available allocation limit for aquifers located within the Project Area and the status of water availability and licencing as identified in the Jurien Groundwater Allocation Plan (Government of Western Australia, 2010).

Table 2.1 Groundwater Allocation Limits and Water Available for Licencing

Resource		Allocation Limit (ML/yr)	General Licensable Component (ML/yr)	Status of Water Availability
Subarea	Aquifer			
Badgingarra	Cattamarra	400	400	Water available
	Yarragadee	27,500	26,560	Water available
Dinner Hill	Leaderville-Parmelia	12,600	11,100	Limited water available
	Mirrabooka	500	500	Unknown
	Surficial	1,000	470	Unknown

2.2 Country Areas Water Supply Act 1947

The *Country Areas Water Supply Act 1947* (*CAWS Act*) provides for the provision of reticulated water to country areas and safeguards water supplies. The Act defines the boundaries of surface and groundwater drinking water sources and defines the by-laws that protect the water quality of these sources. The Act also provides for the construction and maintenance of waterworks, supply and distribution of water, protection of works and prevention of waste, water rates and payment of water supply charges.

2.3 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The *Environment Protection Biodiversity Conservation Act 1999* (*EPBC Act*) is Commonwealth legislation relating to matters of national environmental significance (MNES), covering animals, plants, habitats and places, and any potential negative impacts on them are carefully considered before changes in land use or new developments are approved.

A search of the Australian Government, Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Seach Tool indicated that there are Terrestrial Protected areas located within and adjacent to the site. These include:

- Twyata Nature Reserve is located adjacent to the western portion of the Project Area and traverses along portions of Hill River.
- Hill River Nature Reserve is present within and adjacent to the north to northwestern portion of the Project Area.
- Badgingarra National Park is adjacent to the south-western portion of the Project Area.
- Unnamed Nature Reserve WA29719 is located adjacent to the northern Project Area.
- Boothendarra Nature Reserve is adjacent to the northern Project Area.
- Watheroo National Park is located ~1.8 km east of the eastern Project Area.
- Unnamed Nature Reserve WA44081 is located ~5.7 km south-east of the Project Area.

The abovementioned Terrestrial Protected Areas should be included in future groundwater impact assessments to identify any potential impacts and ensure sufficient protection measures are implemented.

3.0 Existing Environment

3.1 Land Use

The Project Area is within the Northern Wheatbelt zone. It is understood that infrastructure development will be focused on existing cleared land currently used for cropping and grazing.

As noted in **Section 2.3**, nature reserves are mapped within and adjacent to the Project Area, including Badgingarra National Park immediately south-west of the Project Area, Watheroo National Park located east of the Project Area and Hill River Nature Reserve along Hill River.

Within the region, petroleum extraction has occurred targeting the Cattamarra Coal Measures that underlie the Yarragadee Formation on the western side of the Project Area. This includes extraction from Cattamarra 1 and Cattamarra 2 petroleum extraction wells.

3.2 Climate

Surface water and groundwater conditions are influenced by climatic trends. Therefore, this section presents a summary of long-term climate trends and current climatic conditions within the Project Area.

Long term climate data was obtained from the Scientific Information for Landowners (SILO) database of historical climate records for Australia. This service interpolates raw rainfall and evaporation records obtained from the Bureau of Meteorology (BOM). Data gaps are addressed through data processing to provide a spatially and temporally complete climate data set. Climate data was obtained for a SILO grid point (Latitude -30.35, Longitude 115.55) that is north of Badgingarra and representative of the Project Area. This data was used to calculate long term climate trends from 1950 to 2025 (April).

Long term average rainfall data was obtained from the BOM Badgingarra Research Station (009037) located north of Badgingarra and near the Project Area. This data is used for comparison to SILO data and to show long term climate data in the area.

A summary of the monthly rainfall and evaporation data is presented in **Table 3.1**.The average annual rainfall for the Project Area is 516 mm from BOM climate data source and 530 mm from the SILO climate data source. Based on the SILO dataset from 1950 to 2025, the monthly average rainfall is 28 mm (50th percentile) and ranges between 0 (5th percentile) to 139 mm (95th percentile). Peak rainfall events at or above 189 mm (99th percentile) occurred on ten occasions, between 1956 to 1983.

Table 3.1 Average Monthly Rainfall and Evaporation

Data Type*	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Long Term Average Rainfall (BOM – STN 009037)	10	15	15	26	66	97	103	85	47	26	18	9	**516**
Average Rainfall (SILO)	11	17	16	26	70	103	107	84	46	28	16	7	**530**
Average Actual Evapotranspiration (SILO) (Morton) (mm)	319	274	243	152	103	70	69	84	116	180	236	296	**2140**
Average Evaporation (combined) (SILO) (mm)	113	85	66	42	31	26	34	55	80	106	111	123	**874**

**NB: All SILO data captures the average from 1950-2025 and BOM climate data presents the long term average monthly rainfall from 1965-2025.*

Figure 3.1 shows the SILO long-term average rainfall, evaporation (combined) and actual evapotranspiration (Morton). The graph shows that evaporation exceeds rainfall in all months except June and July, and evapotranspiration exceeds rainfall from September to April. This indicates that groundwater recharge largely occurs within the winter months.

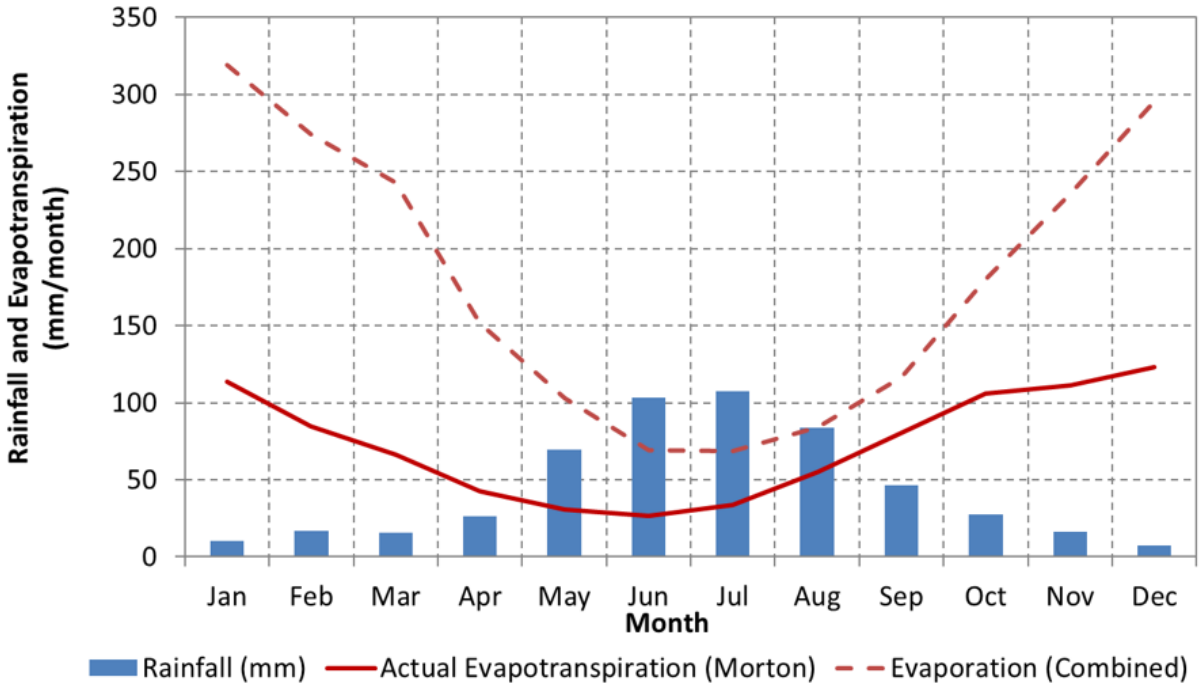


Figure 3.1 SILO Long Term Monthly Rainfall, Evaporation and Evapotranspiration

Monthly records from the SILO dataset were used to calculate the Cumulative Rainfall Departure (CRD). The CRD shows trends in recorded rainfall compared to long-term averages and provides a historical record of relatively wet and dry periods. A rising trend in the CRD indicates periods of above average rainfall for the dataset period, whilst a falling slope indicates periods of below average rainfall.

Figure 3.2 shows the monthly rainfall and CRD based on SILO data from 1950 to April 2025. The figure shows that the region generally experienced higher annual rainfall totals between 1950 to 1990 than recorded from 1990 to 2025. This is shown by the general rising trend in the CRD. The graph shows a general declining trend in the CRD from 1997 to 2020. In 2021 and 2022 the region experienced slightly above average rainfall. The highest monthly rainfall was 297 mm recorded in the month of June 1964.

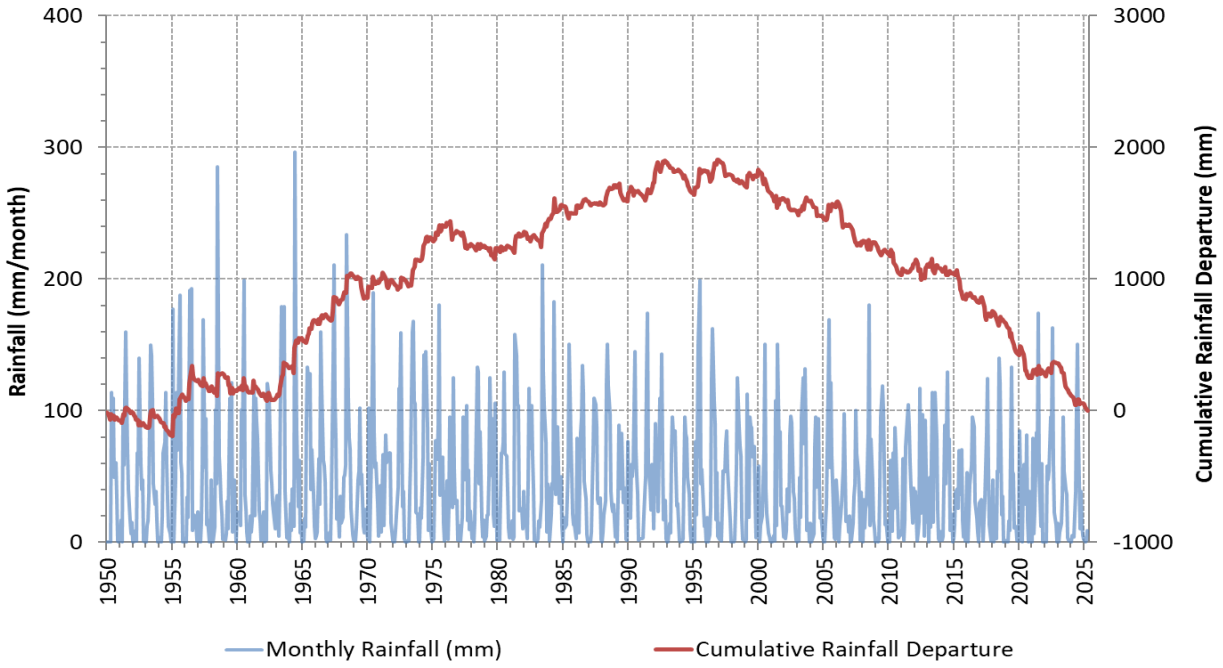


Figure 3.2 SILO Data Monthly Rainfall and CRD

3.3 Surface Water

The Project Area occurs within the catchment area of Hill River, an ephemeral river that flows westward for about 85 km to the Indian Ocean where it discharges into Jurien Bay. Winkardie Creek and Boothendarra Creek occur within the Project Area, flowing westwards into Hill River, as shown in **Figure 1.1**.

There is a government stream gauge along Hill River Springs (Site 617002), at the north-west end of the Project Area. Monitoring at Hill River Springs commenced in 1971 and covers a catchment area of 923 ha. The maximum gauged stage level was 11 m in July 1983, corresponding with the peak rainfall event (>99th percentile of 189 mm) that occurred in June 1983 (211 mm). Flow data for Hill River Springs indicates the creek is generally dry in spring, summer and autumn. In the winter months, median discharge of around 0.04 m^3/s to 0.32 m^3/s are recorded. Maximum discharge in the winter months is recorded at 2.5 m^3/s.

A flood map based on 2% Annual Exceedance Probability (AEP) (equivalent to 1 in 50 year flood event) was provided for the site by Surface Water Solutions (2025) who are undertaking a flooding assessment at the time of writing (to be finalised). The 2% AEP flood map indicates flooding across the Project Area is localised along Hill River and its tributaries.

3.4 Geology

Regional scale geological mapping of Western Australia includes mapping of the exposed surface geology (regolith) and underlying geology (Geological Survey of Western Australia, 2020). Regolith mapping for the Project Area is shown in **Figure 1.1** which shows the 1:500,000 state regolith geological mapping. Basement geology as characterised by the 1:500 000 State interpreted bedrock geology of Western Australia is shown in **Figure 3.3**. Details of the main geological units within the Project Area are summarised in **Table 3.2**.

The regolith mapping (**Figure 1.1**) shows the presence of alluvium (fluvial sediments) and colluvium localised along Hill River and its tributaries. Eolian sands (wind derived) are present across the eastern side of the Project Area.

Review of the Western Australia Acid Sulfate Soil Risk Mapping (CSIRO, 2024) indicates that the majority of the Project Area has an extremely low probability of the occurrence of Acid Sulfate Soils. An exception to this is associated with the alluvium along Hill River, with a small area (approximately 0.3 km^2) located to the south of Hill River mapped along the southeast Project Area boundary as having a high probably of the occurrence of Acid Sulfate Soils. Review of imagery and mapping indicates this area is also associated with a mapped high potential aquatic Groundwater Dependent Ecosystem (GDE). **Figure 3.4** shows the acid sulfate soil risk mapping in relation to the Project Area.

The basement geology mapping (**Figure 3.3**) shows that the Project Area is dominated by the Yarragadee Formation to the west and Parmelia Group to the east.

The geological formations trend in a north-south direction and dip towards the east. A syncline is mapped trending in a north-south direction on the eastern edge of the Project Area, where the Coolyena Group is mapped. Fault structures also trend in a general north-south direction within the region. This includes the Eneabba Fault and Coomallo Fault present in the Yarragadee Formation within the Project Area.

Table 3.2 Summary of Geology

Era	Stratigraphic Unit	Description
Recent	Alluvium	Clay, silt, sand, and gravel in channels and on floodplains
	Colluvium	Colluvium derived from different rock types; includes gravel, sand, silt and clay
	Eolian sediments	Eolian sand, silt and clay in sheet deposits and dunes
	Lacustrine sediments	Clay and silt in swamps, commonly surrounding clay ponds and lagoons
Cretaceous	Coolyena Group	Chalk, greensand, glauconitic sandstone, siltstone, marl; characteristically glauconitic
Jurassic	Parmelia Group	Predominantly sandstone; most formations recognized only in subsurface
	Otorowiri Formation	Micaceous siltstone, shale, minor glauconitic sandstone
	Yarragadee Formation	Fine- to coarse-grained sandstone, thin shale interbeds
	Cadda Formation	Grey shale, siltstone and sandstone; scattered carbonate lenses
	Cattamarra Coal Measures	Carbonaceous siltstone, shale, claystone, coal, sandstone
	Eneabba Formation	Interbedded red-bed sandstone and siltstone
Triassic	Lesueur Sandstone	Very fine to very coarse grained quartz sandstone; subordinate granule conglomerate; minor siltstone

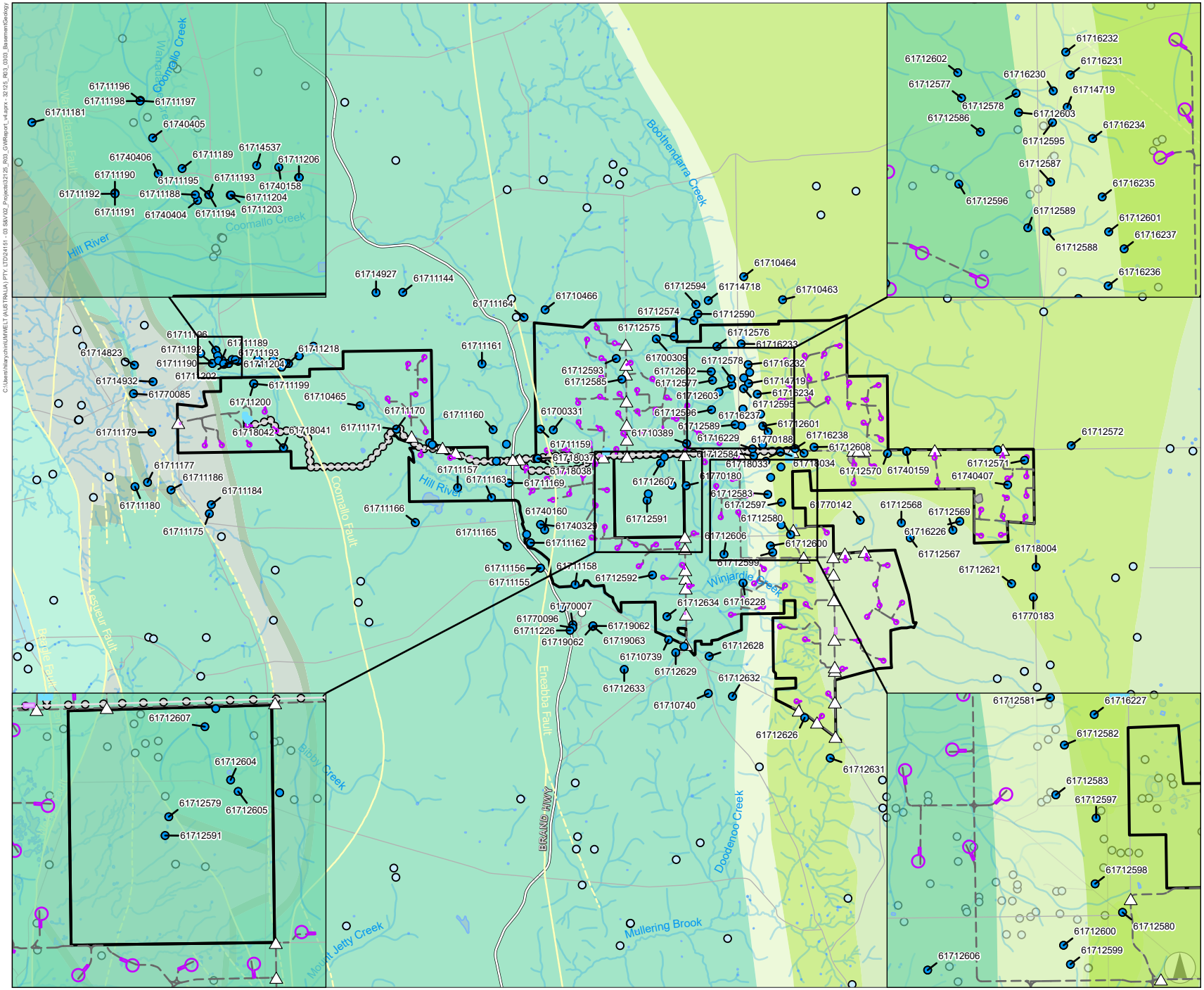


FIGURE 3.3

Basement Geology and Registered Bores

Legend

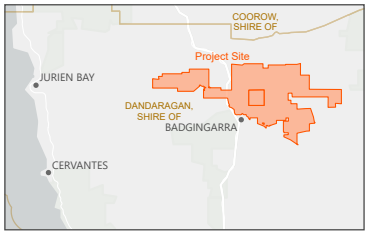
- NGIS Bore Within 3km With Geology
- NGIS Bore
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Access Road
- Internal Transmission Line
- Internal TL Poles
- Quarry

Basement Geology

- Cadda Formation
- Cattamarra Coal Measures
- Coolyena Group
- Eneabba Formation
- Lesueur Sandstone
- Otorowiri Formation
- Parmelia Group
- Yarragadee Formation
- Major fault or shear zone
- Fault or shear zone



0 2.5 5

Kilometres

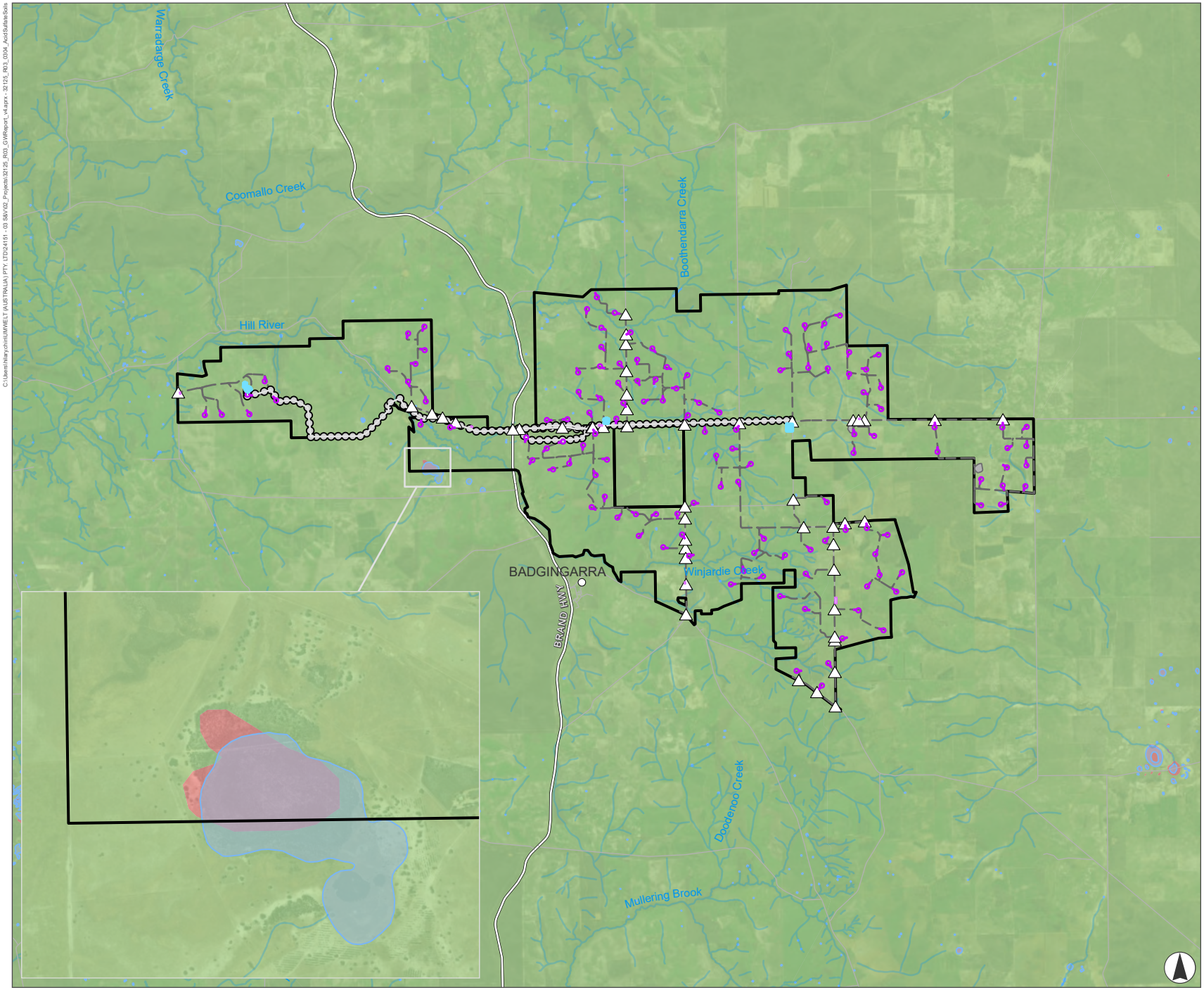
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FIGURE 3.4

Acid Sulfate Soils Mapping



Legend

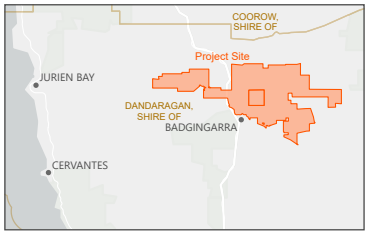
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Access Road
- Internal Transmission Line
- Internal TL Poles
- Quarry

Acid Sulfate Soils - Probability

- A - High Probability
- C - Extremely Low Probability



0 2.5 5

Kilometres

Scale 1:250,000 at A4
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Image Source: ESRI Basemap (2025) | **Data Source:** CSIRO (2023), Landgate (2026), OX2 (2026)

3.5 Hydrogeology

This section presents a summary of the main hydrogeological units within the Project Area, which include:

- Alluvium
- Eolian Dunes
- Coolyena Group
- Permelia Group
- Yarragadee Formation
- Cattamarra Coal Measures.

The hydrogeological units are described based on publicly available information, with limited current and site-specific data available to confirm the current hydrogeological conditions within the Project Area.

3.5.1 Alluvium

Within the Project Area, alluvium is mapped along Hill River and Boothendarra Creek. CSIRO (Wilford *et al.* 2015) regolith mapping indicates that the alluvium along Hill River and Boothendarra Creek is around 5 m to 25 m thick, with the alluvium thickest along the creek alignment.

There are five shallow registered bores (61711208, 61711211, 61711214, 61711221 and 61712628) within the Hill River alluvium, located near the Hill River Springs stream gauge. Lithological logs for the registered bores indicate the alluvium comprises interbedded sequences of clay, fine grained sand and minor gravel. Bore 61712628 recorded an alluvial groundwater level of 3.66 m below ground; however, no date is available for this record.

It is anticipated that the water table in the alluvium could be shallow, within 10 m below ground. This corresponds with the mapped moderate to high potential terrestrial GDEs and high potential aquatic GDEs (wetlands) in most areas where the alluvium is mapped. The GDE mapping is discussed further in **Section 3.6.3**.

The alluvial aquifer is likely to be unconfined, with groundwater recharge in response to rainfall and streamflow. Discharge may include evaporation, groundwater uptake by GDEs (evapotranspiration) and potential for localised and temporal baseflow contributions to Hill River and its tributaries, when groundwater levels are sufficient to drive a head gradient towards the creek line. Water quality in the alluvium may be fresh to brackish; however, there is no recorded water quality data available to confirm.

3.5.2 Eolian Dunes

Within the Project Area, eolian dunes are mapped at surface on the western end of the Project Area. CSIRO (Wilford *et al.* 2015) regolith mapping indicates that the eolian dunes may have a variable thickness, with regolith thickness in the area ranging between 2 m to 35 m in thickness.

Shallow registered bores were installed within the eolian dunes in the 1950's to 1970's and at the time indicated the presence of shallow water table, within 0.3 m to 3.4 m below ground (registered bore 61712583, 61712585, 61712588, 61712589, 61712595, 61712597, 61712598, 61712600, 61712601, 61714718, 61716229, 61716230, 61716233, 61716234, 61716235 and 61716237). As discussed in **Section 3.2** the region has experienced much lower rainfall totals since the 1990's, therefore these shallow water table levels are likely to have reduced over time. This corresponds with the GDE mapping indicating only low potential GDEs in this area, with some localised areas of moderate potential GDE. However, it is noted that above average rainfall was recorded in 2021 and 2022 that may have recharged the aquifer.

The eolian dunes are likely to be unconfined, with groundwater recharge in response to rainfall. Discharge may include evaporation, potential groundwater uptake by GDEs (transpiration) and potential for localised and temporal baseflow contributions to Hill River and its tributaries, when groundwater levels are sufficient to drive a head gradient towards the creek line. Water quality readings for bore 61716231 and 61716229 indicate a low electrical conductivity (EC) of 460 µS/cm and 200 µS/cm, respectively in 1971.

3.5.3 Coolyena Group

The Coolyena Group comprises Cretaceous age sediments, including chalk, greensand, glauconitic sandstone, siltstone and marl. The Coolyena Group occurs at subcrop below the eolian dunes, where a syncline structure has been mapped on the eastern side of the Project Area. The unit overlies the Parmelia Group.

There are four registered bores within the Coolyena Group situated near the Project Area, with one bore noted as being used for stock water supply. A geological log is available for one registered bore (61770142), which indicates the presence of yellow sand within the upper 12 m, overlying logged interbedded sequences of sand and clay to 132 m depth. Bore 61770142 recorded a groundwater level of 86 m below ground level in 2015 during drilling. There is no further data available on groundwater levels in the unit.

3.5.4 Parmelia Group

The Parmelia Group occurs on the eastern side of the Project Area and underlies the Coolyena Group. The Parmelia Group dominantly comprises sandstone and is underlain by the thin Otorowiri Formation that comprises micaceous siltstone, shale and minor glauconitic (green) sandstone. There are several registered bores with timeseries groundwater levels available for the Parmelia Group, as presented in **Figure 3.5**. The hydrograph shows groundwater levels compared to CRD, with the two long term bores 61718004 and 61718034 indicating a rise in groundwater levels over time. Prior to 1980 the bores recorded a depth to groundwater of around 75 m to 95 m for 61718004 and 61718034, respectively. In recent years (from 1990) the depth to groundwater has been measured between 7 m to 72 m below ground.

There are 19 bores within the Parmelia Group registered in the area, six are used for monitoring, three noted as being used for stock water supply and one for monitoring and irrigation. There are also limited mapped potential GDEs situated where the Parmelia Group occurs at subcrop.

Figure 3.5 shows the groundwater levels for bore 61718033 that is within the underlying Yarragadee Formation and is located adjacent to bore 61718034. Both bores show a similar rising trend in groundwater levels over time that does not align to climate trends. The cause for the rise was initially reported as related to clearing of vegetation. However, further review should be undertaken to confirm this, as the degree of rise in levels exceeds what is typically observed following land clearing. This is relevant for the Project as a sustained rise in groundwater levels over time may impact on the site conditions.

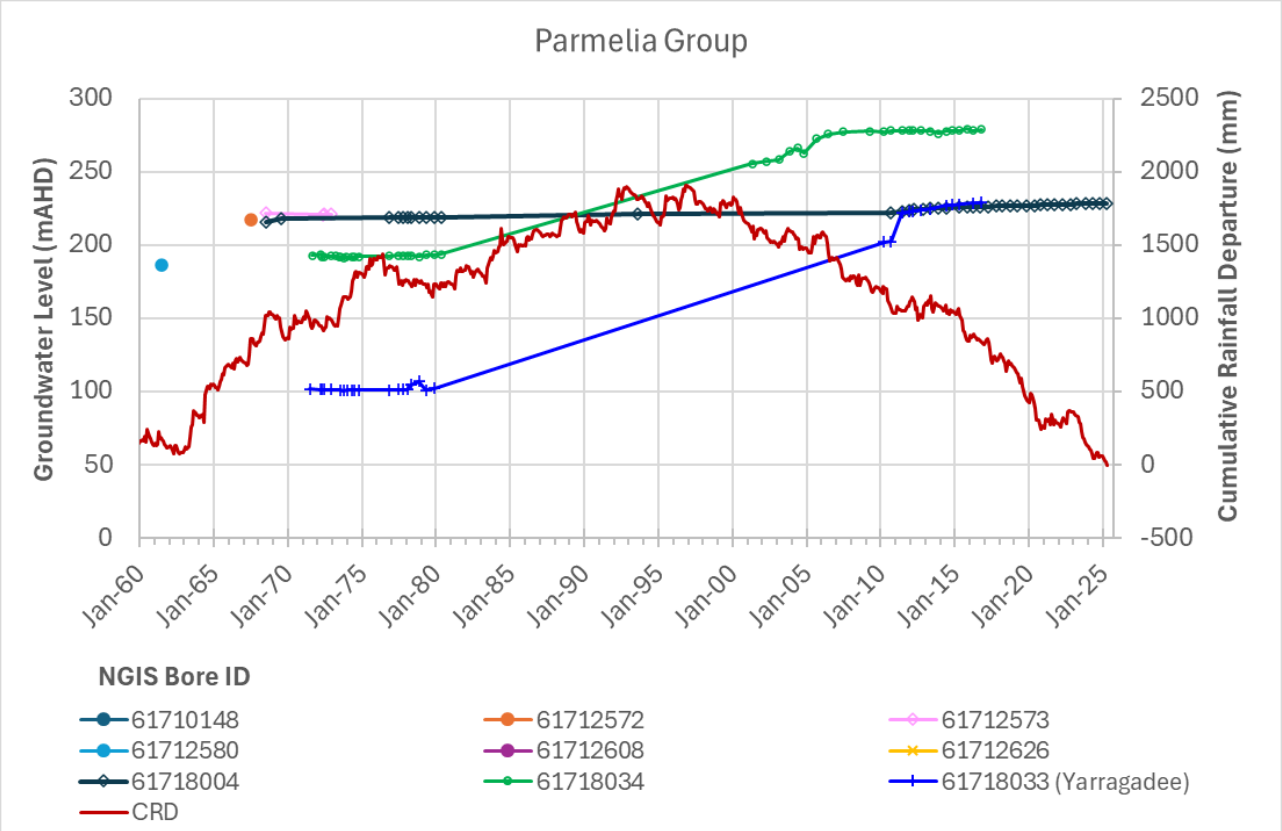


Figure 3.5 Parmelia Group Groundwater Levels vs CRD

3.5.5 Yarragadee Formation

The Yarragadee Formation is a productive aquifer that overlies the Cadda Formation and Cattamarra Coal Measures. The Yarragadee Formation is present across the western half of the Project Area and is present at surface as a weathered horizon (regolith) and underlies alluvium, colluvium and eolian dunes.

The Yarragadee Formation extends over 800 m below ground and comprises fine to coarse grained sandstone and shale. There are 120 registered bores within the Yarragadee Formation within 3 km of the Project Area. The Yarragadee Formation is widely used as a water source, including the Badgingarra town water supply. Moderate potential GDEs are also mapped associated with the Yarragadee Formation.

Groundwater in the Yarragadee Formation is semi confined to confined, with groundwater levels recorded at several bores across the Project Area. Long term groundwater level monitoring at a selection of registered bores in the Project Area is shown in **Figure 3.6**.

Groundwater heads are higher on the western side of the Project Area, at around 13 m above the Australian height datum (mAHD) (10 metres below ground level (mbgl), approximately 126 mAHD) for bore 61718041. On the eastern side of the Project Area, at bore 61718035, groundwater levels are at around 106 mAHD (111 mbgl). This indicates a gradient of flow towards the east. However, further investigation is required to confirm groundwater flow direction and groundwater levels.

Salinity data for registered bores indicates the EC is generally 870 µS/cm (median), but can range between 320 µS/cm to 11,700 µS/cm.

Water quality monitoring for the Badgingarra water supply network by the Department of Water (2017) indicates the following parameters:

- pH: 5.56 median, range of 5.43 to 5.94.
- Chloride: 232.5 mg/L median, 220 to 245 mg/L range.
- Barium: 0.14 mg/L.
- Boron: <0.025 mg/L median, <0.02 to 0.03 mg/L range.
- Chromium: 0.009 mg/L median, 0.008 to 0.037 mg/L range.
- Copper: 0.035 mg/L median, 0.035 to 0.07 mg/L range.
- Hardness as CaCO3: 45 mg/L median, 41 to 45 mg/L range.
- Iron (total): 0.01 mg/L median, <0.003 to 0.08 mg/L range.
- Lead: 0.004 mg/L median, 0.002 to 0.004 mg/L range.
- Manganese (total): 0.0085 mg/L median, <0.005 to 0.018 mg/L range.
- Nickel: 0.016 mg/L median, 0.005 to 0.085 mg/L range.
- Nitrate as N: 0.165 mg/L median, 0.16 to 0.17 mg/L range.
- Nitrite plus nitrogen: 0.175 mg/L median, 0.165 to 0.18 mg/L range.
- Silicon as SiO2: 44.5 mg/L median, 40 to 47 mg/L range.
- Sodium: 135 mg/L median, 130 to 140 mg/L range.
- Sulfate: 21 mg/L median, 21 to 22 mg/L range.
- Zinc: 0.06 mg/L median, 0.04 to 0.06 mg/L range.
- Radon-222: 3.14 Bq/L.

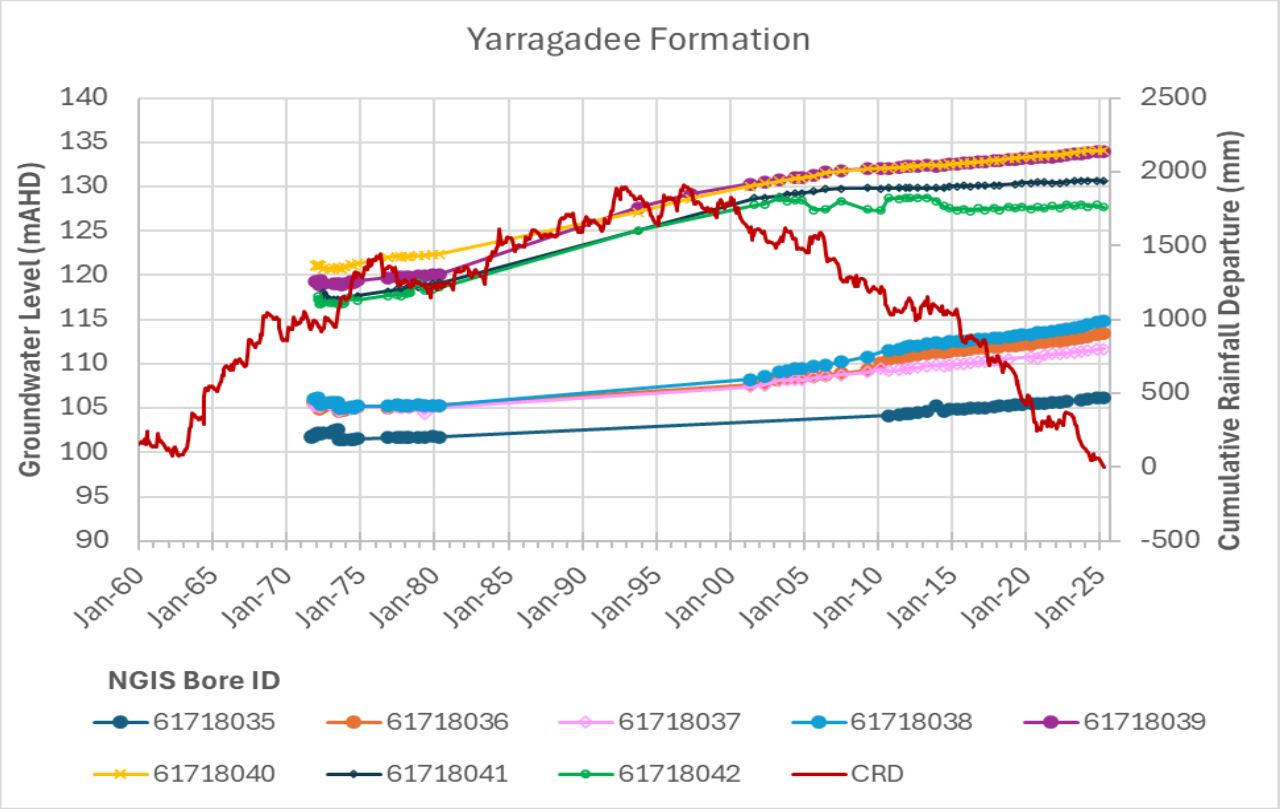


Figure 3.6 Yarragadee Formation Groundwater Levels vs CRD

3.5.6 Cattamarra Coal Measures

The Cattamarra Coal Measures underlie the thin Cadda Formation and underlie the Yarragadee Formation. The Cattamarra Coal Measures comprise carbonaceous siltstone, sandstone and coal and were targeted for coal mine and deeper petroleum extraction.

Groundwater in the coal measures is likely recharged from rainfall and connected aquifers. GDE mapping indicates moderate potential for terrestrial GDEs where the coal measures are mapped.

There are four bores registered within the Cattamarra Coal Measures, two used for stock water supply and one used for stock water supply and domestic use. One registered bore (61711184) recorded a depth to groundwater of around 45 mbgl and a salinity of 1,360 µS/cm in 1972.

3.6 Groundwater Use and Values

3.6.1 Anthropogenic

A review of the National Groundwater Information System (NGIS) database (Bureau of Meteorology, 2025) identified 182 privately owned bores within 3 km of the Project Area. A summary of the registered bore details is included in **Appendix A**. The registered bore locations are shown on **Figure 3.3**. The majority (120) of the bores are largely constructed within the Yarragadee Formation. There are 21 bores installed within the shallow eolian dunes, 19 bores into the Parmelia Formation and five bores within alluvium. The remaining bores are spread across the remaining lithological units. Bores within 3 km of the Project Area have depths ranging 12 m to 765 m, with the median depth of bores around 96 m.

Bores are classed as unknown (101), water supply (24), monitoring (26), stock and domestic (30) or irrigation (1). A summary of the water supply bores is presented in **Table 3.3**. Most water supply bores target the Yarragadee Formation. This includes two production bores that provide drinking water for the township of Badgingarra. These bores are located within the Badgingarra Water Reserve and are protected under the *CAWS Act 1947* and the Badgingarra Water Resource Protection Plan.

Table 3.3 Registered NGIS Bores with Water Supply Use

Bore ID	Easting^	Northing^	Bore Depth (m)	Drilled Date	Status	Likely Lithology*
61711177	335837	6643753	-	30/06/1967	Unknown	Cadda Formation
61711180	335247	6643550	-	30/06/1967	Unknown	Yarragadee Formation
61712582	365133	6643986	-	-	Unknown	Regolith
61712595	363857	6648157	-	30/06/1956	Unknown	Eolian
61712599	365230	6640465	-	-	Unknown	Regolith
61711175	338742	6642283	-	30/06/1967	Unknown	Cattamarra Coal Measures
61740155	341114	6649427	147	6/09/2002	Uknown	Yarragadee Formation
61740156	341021	6649537	138	26/10/1998	Unknown	Yarragadee Formation
61740158	339961	6649516	95	9/09/1999	Unknown	Yarragadee Formation
61711164	353534	6651508	-	30/06/1970	Unknown	Yarragadee Formation
61711165	352746	6640744	97.5	30/06/1977	Unknown	Yarragadee Formation
61712585	358136	6648598	-	-	Unknown	Eolian
61712629	360669	6635756	134.19	15/09/1966	Unknown	Yarragadee Formation
61710739	360335	6636360	162.5	9/09/2007	Unknown	Yarragadee Formation
61712575	360593	6650594	-	30/06/1957	Unknown	Yarragadee Formation
61712628	362239	6635583	-	-	Unknown	Alluvium?
61712579	359379	6643214	232.56	30/06/1960	Unknown	Yarragadee Formation
61719062 W0040462	356773	6636993	222	9/12/1989	In use – Town Supply	Yarragadee Formation
61712577	362396	6648549	-	15/11/1957	Unknown	Yarragadee Formation
61710740	362200	6633835	183	23/07/2008	Unknown	Yarragadee Formation
61719063 W0040458	356780	6637012	302	2/11/1989	In use – Town Supply	Yarragadee Formation

Bore ID	Easting^	Northing^	Bore Depth (m)	Drilled Date	Status	Likely Lithology*
61711159	354300	6646253	-	15/03/1970	Unknown	Yarragadee Formation
61711162	353843	6640917	-	15/12/1969	Unknown	Yarragadee Formation
61712605	360494	6643621	192.02	30/06/1972	Unknown	Yarragadee Formation

*Note: * geology inferred based on interpreted bedrock geology*

^ coordinates in GDA94 z56

3.6.2 Cultural

All waterways within Western Australia have potential cultural value, especially for Aboriginal people. Waterways provide important food resources, significant trade routes and camping sites. As reported in Umwelt (2025) known Aboriginal cultural heritage within the Project Area include registered and lodged sites including the JB1 camp site and Mungedar Well; along with three significant waterways, Hill River, Winjardie Creek, and Boothendara Creek. Waterways are significant to the Yued People for their association with intangible cultural values as well as having archaeological potential. The Project Area has high potential for additional Aboriginal cultural heritage values to be identified.

Within the region, the report 'Groundwater-dependent environmental values of the Dinner Hill and Irwin focus areas' (Department of Water and Environmental Regulation, 2018) indicates indigenous cultural values associated with Dandaragan Spring (approximately 18 km south of the Project Area) and a registered Aboriginal site referred to as Dandaragan Scarp. These are associated with the geology of the Lancelin Formation and the Poison Hill Aquifer, which do not occur within the Project Area (Rutherford *et al*. 2005).

3.6.3 Groundwater Dependent Ecosystems

A GDE is one in which the plant and/or animal community is dependent on the availability of groundwater to maintain structure and function. GDEs are classified into three types:

- Aquifer and cave ecosystems: subterranean GDEs.
- Ecosystems dependent on the surface expression of groundwater: aquatic GDEs, including river baseflow systems, springs and swamps.
- Ecosystems dependent on the subsurface presence of groundwater: terrestrial GDEs, including some riparian vegetation communities.

The GDE Atlas (BOM, 2022) ecosystem mapping was reviewed for aquatic and terrestrial GDEs.

Terrestrial GDEs are present in the western portion of the site, within shrublands and along drainage lines and depressions. **Figure 3.7** displays the terrestrial GDEs within the Project Area and the immediate surrounds. Terrestrial GDEs located within the Project Area include:

- Medium woodland; marri. Mostly low potential with some moderate potential.
- Medium woodland; marri, wandoo and paperbark. Moderate potential.

- Medium woodland; York gum (*Eucalyptus loxophleba*) & wandoo. High, moderate and low potential.
- Mosaic: Shrublands; hakea scrub-heath / Shrublands; dryandra heath. Moderate potential.

High potential terrestrial GDEs are located along Hill River and associated drainage lines within and along the southern portion of the site. The majority of terrestrial GDEs present within the Project Area are moderate potential GDEs.

Aquatic GDEs are present along Hill River and Boothendarra Creek and are high potential or moderate potential GDEs. Most of the aquatic GDEs present within the Project Area are not named. **Figure 3.8** shows the aquatic GDEs within the Project Area and immediate surrounds.

Review of the Geomorphic Wetlands Cervantes Eneabba (DBCA-015) mapping (Department of Biodiversity, Conservation and Attractions, 2015) maps the location, boundary and geomorphic classification of wetlands in the Cervantes Eneabba area. A review of this dataset showed wetlands are mapped within and adjacent to the western Project Area and to the west of the Project. The Development Footprint intersects these wetlands in the western Project Area.

These wetlands are associated with Hill River and its tributaries including Coomalloo Creek and Boothandarra Creek. The wetlands within 1 km of the Project Area have a geomorphic classification of Barlkarra, Dampland, Floodplain, Paluslope, Playa and Sumpland. These wetlands are aquatic GDEs and are shown in **Figure 3.8**. This mapping overlays the GDE Atlas Aquatic GDEs layer in the Moore-Hill Region.

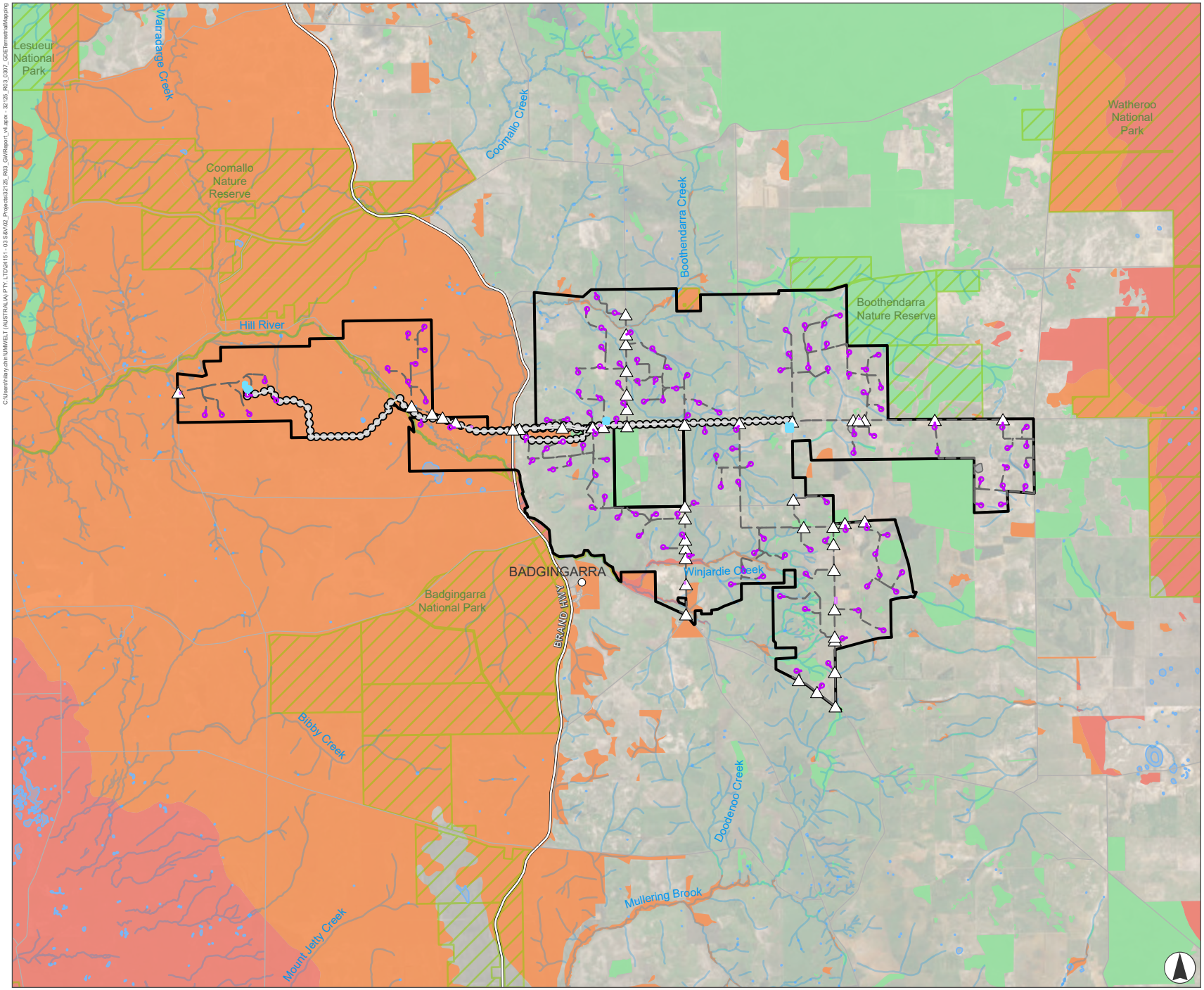


FIGURE 3.7

GDE Mapping - Terrestrial

Legend

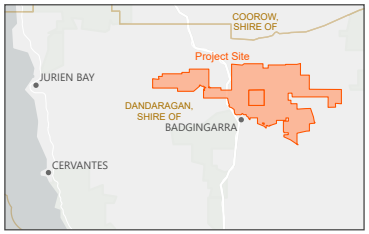
- Project Boundary
- National Park, Reserves and State Forests
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Access Road
- Internal Transmission Line
- Internal TL Poles
- Quarry

GDE - Terrestrial

- High potential GDE - from national assessment
- Moderate potential GDE - from national assessment
- Low potential GDE - from national assessment



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Kilometres

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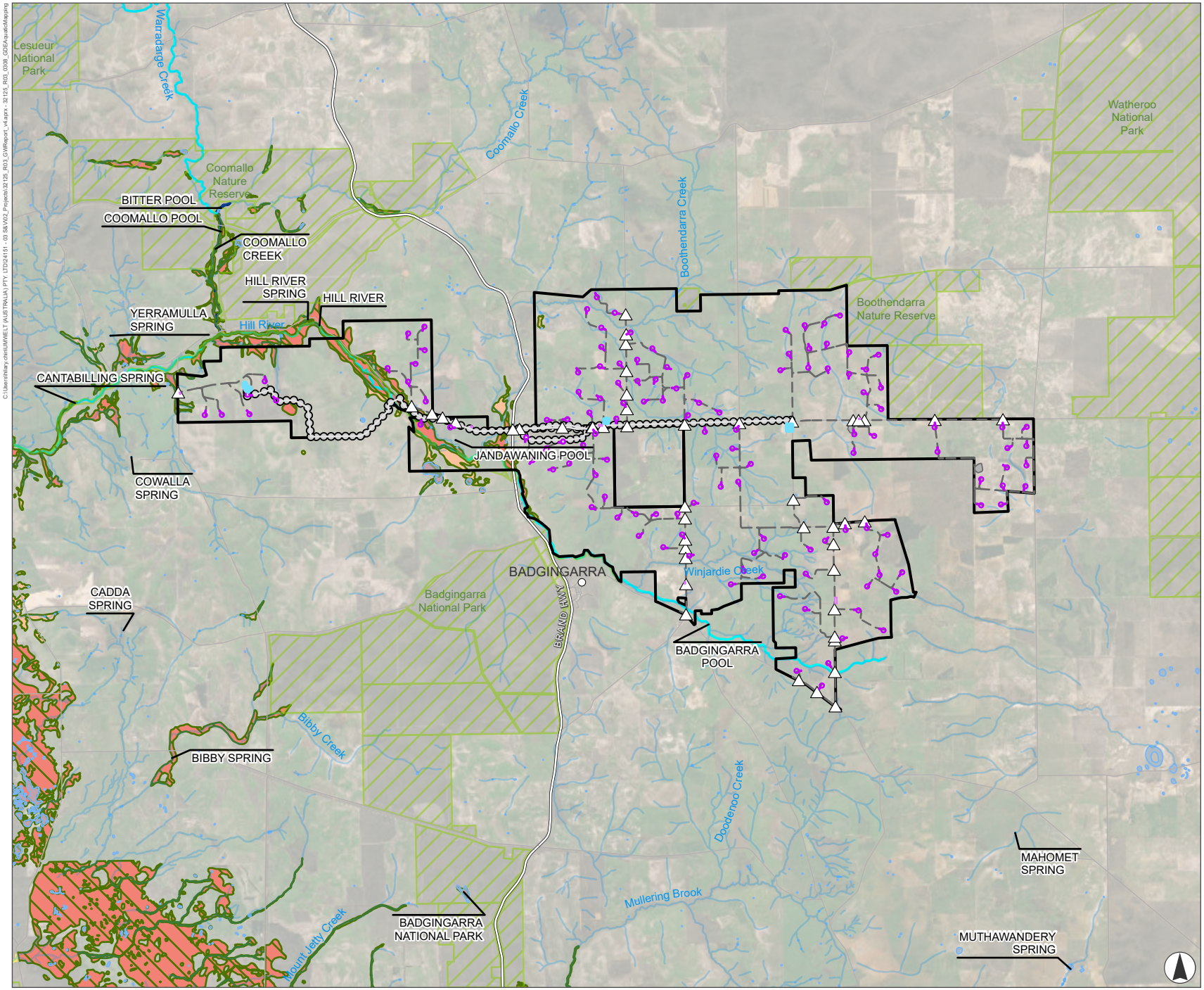


FIGURE 3.8

GDE Mapping - Aquatic

Legend

- Project Boundary
- National Park, Reserves and State Forests
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Infrastructure

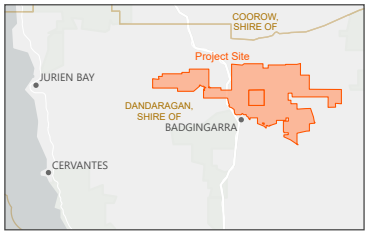
- Substation
- Compound Area
- Crane Pad
- Access Points
- Access Road
- Internal Transmission Line
- Internal TL Poles
- Quarry

GDE - Type

- Pool
- River
- Spring
- Wetland / Geomorphic Wetlands Cervantes Eneabba (DBCA-015)

GDE - Aquatic

- High potential GDE - from national assessment
- Moderate potential GDE - from national assessment
- Unclassified potential GDE - from regional studies



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3.7 Summary

This preliminary hydrogeological review was undertaken to collate and review publicly available information to identify the hydrology and hydrogeology characteristics of the Project Area. The Project Area occurs within the Northern Wheatbelt zone which experiences hot dry summers where evaporation exceeds rainfall in all months except June and July, and evapotranspiration exceeds rainfall from September to April.

The Project Area occurs within the catchment area of Hill River, which is an ephemeral river that flows westward along the southern boundary of the Project Area. Ephemeral tributaries of Hill River, Winkardie Creek and Boothendarra Creek, occur within the Project Area. Groundwater resources within the Project Area are regulated under the Jurien Groundwater Allocation Plan, within the Badgingarra and Dinner Hill subareas.

Potential groundwater resources identified within the Project Area include:

- Alluvium – shallow groundwater occurring within unconfined alluvial aquifers mapped along Hill River and Boothendarra Creek.
- Eolian dunes – shallow unconfined groundwater unit associated with eolian dunes mapped to the west of the Project Area.
- Coolyena Group – the Coolyena Group subcrops below the eolian dunes to the west of the Project Area. Limited groundwater data exists for the Coolyena Group within the Project Area but one available log from 2015 indicates the presence of groundwater at 86 m deep.
- Parmelia Group – the Parmelia Group occurs on the eastern side of the Project Area and underlies the Coolyena Group. Recent depth to groundwater data available within the Project Area indicate groundwater levels between 7 m to 72 m below ground with an increasing trend with time.
- Yarragadee Formation – the Yarragadee Formation is a productive semi confined to confined aquifer that is present across the western half of the Project Area and is present at surface and extends to around 800 m deep. The unit also unconformably underlies alluvium, colluvium and eolian dunes.

The shallow alluvium and eolian dune groundwater units were found to respond directly to rainfall trends, indicating that groundwater recharge would largely occur during the winter months based on climate data. Limited water quality data exists for the alluvium; however, it is anticipated that groundwater would be of fresh to brackish quality. Available water quality data for the eolian dunes indicate a fresh water quality. Due to the potential shallow depth and unconfined nature and potential to host GDE, the alluvium and eolian dune groundwater units indicate the highest potential to be impacted by the Project. Acid Sulfate Soils have also been identified in a localised area, associated with the alluvium along Hill River.

The Yarragadee Formation is the primary productive groundwater source in the Project Area and is widely used in the region, including the Badgingarra town water supply. Up to 120 registered bores constructed within the Yarragadee Formation were identified within 3 km of the Project Area. Available groundwater level data for the Yarragadee Formation indicates a groundwater flow gradient towards the east. Review of available allocation limit for aquifers located within the Project Area indicate water availability for potential construction water use within the Yarragadee Formation, Parmelia Group and Cattamarra Coal Measures, subject to allocation application, proximity to receptors and licencing.

The groundwater memo has provided additional information on the available groundwater allocations as per the underlying aquifers to be targeted for water supply purposes.

Potential groundwater receptors identified within the Project Area include:

- Registered groundwater bores and groundwater users of the alluvium, shallow eolian dunes, Parmelia Formation and Yarragadee Formation, discussed in more detail in the groundwater supply assessment memo (Umwelt, 2026) (**Appendix B**).
- High potential terrestrial GDEs located along Hill River and associated drainage lines within and along the southern portion of the Project.
- High to moderate potential aquatic GDEs located along Hill River and Boothendarra Creek.
- Mapped geomorphic wetlands (DBCA-015) within and adjacent to the western Project Area and to the west of the Project. The Development Footprint intersects these wetlands in the western Project Area.
- Cultural values of waterways, springs and wetlands, including JB1 camp site, Mungedar Well, and waterways and waterholes, including Winjardie Creek and Boothendara Creek.
- Other neighbouring groundwater users such as agricultural and aquaculture businesses.

4.0 Preliminary Risk Review

This section presents details on the preliminary risk review and potential water supply options for the Project.

4.1 Review of Potential Groundwater Risks

A preliminary review of potential groundwater related risks and considerations for the Project are included in **Table 4.1**. The high-level risk review is approximate only and can be quantified with more certainty once the Project design has been finalised. The risk assessment will be updated when more information is available on BESS infrastructure design, COPC, excavation depth of civil infrastructure including quarries and footings, quarried material, and seasonal water supply requirements.

The review highlights the potential presence of shallow water table, particularly in association with the alluvium, eolian dunes and Yarragadee Formation. The preliminary review identified medium to high risks associated with:

- Impacts to groundwater quality associated with site construction activities, including ground clearance and exposure of dispersive soils, exposure of Acid Sulfate Soils, and potential introduction of contaminant sources, with potential impacts to GDEs, cultural values and water resources.
- Assessment of groundwater level impacts associated with the proposed water supply bores indicated impacts to other groundwater users, GDEs and cultural values are unlikely due to the lack of hydraulic connectivity between the proposed bore locations, targeted aquifers and the aquifers supporting these receptors (Umwelt, 2026) (**Appendix B**).
- Impacts to groundwater quality due to chemical leaks from lithium-ion batteries (dependent on use of solid state of liquid design) or spills from coolant top up (dependent on sufficient storage controls such as bunding, and stormwater management), with potential impacts to GDEs, cultural values and water resources.

As part of the Project planning, to address data gaps the following recommendations include:

- Consider hydrogeological constraints as further details of the Project design become available, including specific details regarding excavation depths, exact locations of underground cabling along access tracks, bunding and stormwater management design of infrastructure areas (i.e. substations and concrete batching plant) and BESS storage controls (such as bunding).
- Minimise areas of excavation and storage of contaminants sources near alluvium and surface water (see **Figure 1.1** for areas of mapped alluvium). Where the Project is within an area of alluvium or shallow groundwater, include design considerations to minimise impacts.
- Design the BESS with appropriate storage controls (such as bunding) and stormwater management around the battery storage areas to prevent potential mobilisation of COPC to shallow groundwater and nearby waterways.
- Include design considerations to minimise impacts to groundwater associated with the Yarragadee Formation, Parmelia Group, Cattamarra Coal Measures and eolian dunes, such as bunding and stormwater management within infrastructure areas.

- Where infrastructure/works are planned in areas of shallow groundwater (i.e. alluvium, eolian dunes and Yarragadee Formation) (see **Figure 1.1** and **Figure 3.3**), establish a groundwater monitoring network to collect site specific baseline data and establish baseline data of potential GDEs and water users in the area. Excavation depths of up to 4.5 m (except quarries) may intersect unconfined aquifer systems in areas of shallow groundwater.
- Where infrastructure works are planned, to undertake site specific studies of soil properties to verify potential for Acid Sulfate Soils and inform design and erosion and sediment control measures.
- A desktop groundwater supply assessment was conducted to determine if the underlaying aquifers at the proposed locations of the three primary target construction compounds can meet with the water supply requirements during construction (Umwelt, 2026). A planned approach has been discussed in the memo provided in **Appendix B**.

Table 4.1 Preliminary Groundwater Risk Review

		Consequences				
		Insignificant (A)	**Minor (B)**	**Moderate (C)**	**Major (D)**	**Catastrophic (E)**
Likelihood	**Remote (1)**	Negligible (A1)	Negligible (B1)	Very Low (C1)	Low (D1)	Medium (E1)
	Unlikely (2)	Negligible (A2)	Very Low (B2)	Low (C2)	Medium (D2)	High (E2)
	Possible (3)	Very Low (A3)	Low (B3)	Medium (C3)	High (D3)	Very High (E3)
	Likely (4)	Low (A4)	Medium (B4)	High (C4)	Very High (D4)	Extreme (E4)
	Almost Certain (5)	Medium (A5)	High (B5)	Very High (C5)	Extreme (D5)	Extreme (E5)

Phase	Activity/ Potential Impact	Effects	Initial Risk Rating	Further Details	Mitigation Considerations
Construction (Footings, quarries, underground cabling, road cuttings)	Water Levels	Excavation in areas with a shallow water table, resulting in water take or potential dewatering requirements. Localised water level drawdown.	Low (B3)	Review of publicly available data indicates shallow water table can occur within the alluvium, eolian dunes, Parmelia Group and Yarragadee Formation. There is limited information for other units also. Surface facilities, roads and excavations can change the surface catchment area and subsurface groundwater flow (shallow water table). Changes may impact on the condition of waterways and waterholes and impact on local ecological and indigenous values. Take of water may require licensing and assessment of impacts to surrounding users.	Confirm Project design details related to excavations. Where excavations may occur where shallow water table is likely, collect baseline data to characterise groundwater conditions to inform detailed design and support approvals process. This may include a water licence for dewatering if the dewatering exemption conditions cannot be achieved. Consideration of ecological and indigenous values of local waterholes and watercourses within the Project Area. A cultural heritage assessment considering indigenous values and ecological assessment considering impacts to GDE have been undertaken.

Phase	Activity/ Potential Impact	Effects	Initial Risk Rating	Further Details	Mitigation Considerations
Construction (general construction)	Water levels	Clearing of vegetation that may be groundwater dependent could result in changes in local water table.	Very Low (B2)	It is understood that the Project design is planned to minimise potential clearing of vegetation; therefore, this has been rated as unlikely. If more extensive clearing of vegetation is proposed, this should be reconsidered.	Project design to minimise requirement for land clearing.
Construction (general construction) and operation	Water Quality	Fuel or chemical spills, or inappropriate material storage, leads to contamination of groundwater and/or nearby waterways, resulting in environmental degradation and fines. Including oils and fuel used and stored on site and associated with the BESS substation and transformers.	Medium (C3)	Surface geology mapping indicates prevalence of sands at surface and permeable sandstone aquifers. Therefore, there is high potential for spills to seep into shallow groundwater. Waterways are present within the Project Area, within the catchment of Hill River. Changes may impact the condition of waterways and waterholes and impact on local ecological and indigenous values.	Consideration in Project design for use of bunding and asphalted surfaces to minimise accidental seepage to groundwater and waterways. Consideration of ecological and indigenous values of local waterholes and watercourses within the Project Area. Monitoring and management measures to enable early detection of any potential spills (i.e. Environmental Management Plan).
Construction (general construction)	Water Quality	Ground clearance and exposure of dispersive soils, increased sediment load to creeks.	High (C4)	Soil investigation to assess potential for sodic and dispersive soils required to inform construction and mitigation measures.	Construction to avoid disturbance of potentially dispersive soils where possible. Implementation of appropriate erosion and sediment control measures with an Erosion and Sediment Control Plan.

Phase	Activity/ Potential Impact	Effects	Initial Risk Rating	Further Details	Mitigation Considerations
Construction (footings, quarries, underground cabling, road cuttings)	Water Quality	Exposure of reactive soil material, including Acid Sulfate Soils.	Medium (C3)	Extremely low probability of the occurrence of Acid Sulfate Soils within the majority of the Project Area. However, a small area (~0.3 km^2) of high probability Acid Sulfate Soils has been mapped to the south of Hill River associated with the alluvium. This may indicate potential for Acid Sulfate Soils associated with alluvium in the area (refer to **Figure 3.3** and **Figure 3.4**).	Minimise disturbance of soils within area mapped as having a high probably of the occurrence of Acid Sulfate Soils and along the alluvium. If unavoidable, soils to be assessed and managed in accordance with guideline document 'Treatment and management of soil and water in acid sulfate soil landscapes' (Department of Environment Regulation, 2015).
Construction (concrete batching plant)	Water Quality	Concrete batching plant operation.	Medium (C3)	Concrete batching plant requirements and design to be confirmed. Wastewater from a batching plant can be highly alkaline and has the potential to change water quality. This is particularly relevant with the occurrence of the Yarragadee Formation aquifer that is used for town water supply in the area. Changes may impact the condition of waterways and waterholes and impact local ecological and indigenous values.	Concrete batching plant to be sited with sufficient setback to waterways, shallow groundwater and sensitive receptors. Consideration of ecological and indigenous values of local waterholes and watercourses within the Project Area. To be designed in accordance with Environmental Protection (Concrete Batching and Cement Products Manufacturing) Regulations 1998 (Concrete Batching Regulations). This includes appropriate bunding, hardstand of asphalt or concrete, cleaning protocols, wastewater management and prevention of stormwater discharge. Subject to approval under Section 54 of the *Environmental Protection Act 1986* (*EP Act*).

Phase	Activity/ Potential Impact	Effects	Initial Risk Rating	Further Details	Mitigation Considerations
Construction and Operation (water supply)	Water Levels	Water supply options may include a local borefield for groundwater supply, resulting in localised drawdown that may impact on receptors in the area such as GDEs, private groundwater users and agriculture and aquiculture businesses.	Medium (C3)	Groundwater resources are present within the Project Area and are the main source of water within the region due to limited surface water sources. The Yarragadee Formation is the main groundwater source, but other sources of water are also available. Dependent on the volume of groundwater required for construction, the abstraction of groundwater would result in a localised cone of depression in the target aquifer. The location, of the proposed production bore, aquifer targeted and abstraction volume of the bores, could therefore influence existing groundwater users.	A high-level groundwater supply assessment (**Appendix B)** (Umwelt, 2026) was undertaken which confirmed that sufficient groundwater is available to meet the Project's construction water requirement of approximately 2 ML/day. The Yarragadee Formation is expected to be the principal groundwater source. Water supply bores to be situated to minimise impacts to key receptors and support application process. Site specific data to be obtained to confirm groundwater baseline conditions and supply potential. If insufficient relevant groundwater data is available, the collection of site-specific baseline data (i.e. 1–2 years) may be required as indicated in the groundwater supply assessment to support future water supply approvals and identify GDEs. Groundwater Management Plan for ongoing monitoring of the proposed production bores performance and water level changes in the area.
Construction, Operation and Decommissioning	Water Levels and Quality	Impacts to groundwater quality due to poor groundwater bore construction or deterioration,	Medium (C3)	During bore installation the process can result in introduction of contaminants and poor construction of bores can result in connection between aquifers that could impact water quality.	Bores to be installed by a suitably licensed water bore driller in accordance with Australian Drilling Industry Association and in accordance with the Minimum Construction Requirements.

Phase	Activity/ Potential Impact	Effects	Initial Risk Rating	Further Details	Mitigation Considerations
		causing impacts to water quality.		Boreholes can also deteriorate over time, and the condition of bores is influenced by the operational activities.	Bore construction supervised and informed by a qualified hydrogeologist to help ensure construction prevents cross-contamination. Groundwater Management Plan to monitor performance of the production bores and early identification of bore deterioration.
Construction (water supply)	Water Flows	Water supply options may include surface water capture.	Low (C2)	Rainfall within the region is low, with only minor surface water flows. Therefore, use of surface water sources for the construction may be unlikely, but would vary dependent on actual climatic conditions.	The high-level groundwater supply assessment (Appendix B) (Umwelt, 2026) confirmed sufficient groundwater is available to meet the Project's construction water requirement of approximately 2 ML/day.
Operation	Water Levels and surface water – groundwater interactions	Change in surface water and shallow groundwater flow regime in areas of subsurface infrastructure, including underground cabling, footings for turbines and roads.	Low (B3)	Potential for shallow water table has been identified in the Project Area, particularly associated with alluvium, eolian dunes and the Yarragadee Formation. Limited surface water flow and rainfall; however, peak rainfall events can occur within the region.	Project design to include consideration of surface water and groundwater conditions for subsurface infrastructure. Where construction is to occur where shallow water table is likely, collect data to characterise baseline groundwater conditions and potential impacts.
Operation	Water Quality	Chemical release associated with fire risk and fire suppression methods associated	Medium (C3)	Fire event such as a bushfire or flood can result in large scale chemical release to the environment. Chemical release may relate to the release of chemicals from the compromised BESS infrastructure (i.e. Lithium Iron	The BESS and associated transformers are to be constructed and managed in accordance with Australian Standards (AS 2067). This includes requirements for minimum separation distance, storage

Phase	Activity/ Potential Impact	Effects	Initial Risk Rating	Further Details	Mitigation Considerations
		with BESS infrastructure.		Phosphate) or suppressant chemicals used in the firefighting effort.	controls capacity (such as bunding) and fire resistance. A Bushfire Management Plan has been prepared which details management measures relevant to bushfire risk for BESS Projects.
Decommissioning	Water Quality	Decay and corrosion of redundant infrastructure causing leaching of contaminants to shallow groundwater. and nearby waterways.	Low (B3)	Infrastructure to be decommissioned appropriately and in a timely manner to prevent corrosion and risk of chemical leaching.	Decommissioning and Rehabilitation Plan to be prepared for the Project.
Decommissioning	Water Levels and Quality	Deterioration of redundant water supply bores allows cross-connection and entry of surface fluids to aquifers.	Medium (C3)	Redundant water supply bores to be decommissioned appropriately and in a timely manner to minimise risk to aquifers.	Redundant water supply bores to be decommissioned in accordance with Minimum Construction Requirements for Water Bores in Australia (National Uniform Drillers Licencing Committee , 2020).

4.2 Water Supply Options

A site-specific groundwater supply assessment has been undertaken to determine the groundwater availability, water quality suitability and overall site water demand of 2 ML/day during construction, operation and 0.4 ML/day during the decommissioning project phases (Umwelt, 2026) (**Appendix B**). Groundwater has been identified as the preferred water supply source and as such it is recommended that bores be installed at the selected Construction Compound locations within the Project Area, targeting the underlaying aquifers to collect baseline data and undertake hydraulic testing to provide sustainable aquifer yields, and minimise local impacts. The groundwater demand has been discussed in more detail in the memo provided in Appendix B with indications as to the available general licensable component of each targeted aquifer to be obtained under the *RIWI Act 1914*.

The 2 ML/day water requirement for the Project is anticipated to include the following:

- Potable drinking water for construction workers, site operation and decommissioning staff.
- Industrial water supply for concrete batching plants.
- Dust suppression of roads, open excavation areas and quarries.
- Accidental or deliberate take of groundwater during construction or operation including excavation of trenches and quarries.
- Firefighting requirements as detailed by legislation.

At a high level, there are four available water supply options:

- Surface water capture: Unlikely due to low rainfall occurrence within the area and ephemeral creeks.
- Trucked water: Likely to be available; however, may not meet supply demands and is unlikely to be a sustainable and cost-effective long-term solution.
- Roof capture (site offices and O&M buildings): May be used to substitute some water demand; however, will not meet site water demand due to limited roof area.
- Groundwater: Likely to be the most cost-effective solution which can meet the total water demand and ongoing groundwater investigations to determine and confirm.

The hydrogeological review, outlined in **Section 3.5**, details available information on groundwater within key Project hydrogeological units. Based on publicly available information, the Yarragadee Formation and Parmelia Group aquifers may be the most suitable aquifers for groundwater extraction, as discussed in more detail in the groundwater supply memo (**Appendix B**). The sources are widely used as a water source, including for the Badgingarra town water supply. Whilst available water supply information indicates that the water may be favourable for use as a drinking water supply, the water would need to be treated to meet drinking water standards as outlined in the Australian Drinking Water Guidelines (NHMRC, 2011).

Water resources within the Project Area are regulated under the Jurien Groundwater Allocation Plan, which indicates that water is currently available to be licenced within the Badgingarra Sub Area, including the Cattamarra, Parmelia and Yarragadee aquifers (Government of Western Australia, 2010). The groundwater supply memo (**Appendix B**) provides detailed information on the aquifers to be targeted at the proposed locations of the Construction Compounds, including the licenced allocations available.

5.0 Conclusion

This preliminary hydrogeological review identified that water supply options are limited with regards to surface water supply; however, groundwater sources are present within the Project Area. This includes the productive Yarragadee Formation and Parmelia Group aquifers.

A separate desktop assessment was also conducted to determine if of groundwater supply from the underlaying aquifers can meet the Project's water supply requirement during and post construction (Umwelt, 2026). The assessment indicated that sufficient groundwater resources are available to meet the Project's construction water requirement of approximately 2 ML/day.

The preliminary risk review identified a range of considerations for the Project design to help minimise potential impacts to groundwater and water users within the region. This includes areas of potential shallow water table where excavations may intersect groundwater, consideration of infrastructure design and management on water quality, including the quarries, roads/tracks and the concrete batching plant, and impacts associated with water supply bores if groundwater was to be used for water supply.

As part of the Project planning, to address data gaps, it is recommended that:

- Hydrogeological constraints should be considered in the Project design. This could be assisted by running a workshop between Umwelt and OX2 to discuss the design details further. In general, the considerations include:
    - Minimise areas of vegetation clearing.
    - Minimise areas of excavation and storage of contaminants sources near alluvium and watercourses/waterholes.
    - Where the Project is within an area of alluvium, shallow groundwater or watercourse/waterhole, include design considerations to minimise impacts (i.e. bunding).
    - Include design considerations to minimise impacts to groundwater associated with the Yarragadee Formation, Parmelia Group, alluvium and eolian dunes, such as bunding and stormwater management within infrastructure areas.
    - Consider the COPC and planned BESS ground design, including ensuring sufficient storage controls (such as bunding) and stormwater management to prevent migration of contaminants.
    - Consider fire prevention and fire suppression methods required for BESS infrastructure.
- Establish site specific baseline datasets and verify assumptions, focused on areas of potential impact/interaction, including:
    - Establish a groundwater monitoring network to collect site specific baseline data.
    - Baseline field survey of potential GDEs, indigenous water values and water users in the area.
    - Pending the location of the final site construction activities, a soil survey to characterise soil properties and verify potential for Acid Sulfate Soils may be required in the mapped 'High Probability' area.

6.0 References

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Appendix A

Registered Bore Details

Table A.1 Registered Bore Details

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61716227	365612	6644476	0	0	UNK	Unknown		Parmelia Formation	Yes	-	-	-	-	0
61740407	376274	6643635	0	0	UNK	Monitoring		Parmelia Formation	Yes	-	-	-	-	0
61710464	363867	6653417	0	0	UNK	Unknown		Parmelia Formation	Yes	-	-	Yes	Yes	1
61710463	365693	6652334	0	0	UNK	Unknown		Parmelia Formation	Yes	-	-	Yes	Yes	1
61714719	364095	6648403	0	0	UNK	Unknown		Otorowiri Formation	Yes	-	-	-	-	0
61710389	361176	6645573	0	0	UNK	Unknown		Yarragadee Formation	Yes	-	-	Yes	Yes	1
61714823	335221	6649260	0	0	UNK	Unknown		Yarragadee Formation	Yes	-	-	-	-	0
61711189	339325	6649507	0	0	UNK	Unknown		Yarragadee Formation	Yes	-	-	-	-	0
61714933	342350	6649349	0	0	UNK	Unknown		Yarragadee Formation	Yes	-	-	-	-	0
61740404	339427	6649297	0	0	UNK	Monitoring		Yarragadee Formation	Yes	-	-	-	-	0
61740405	339131	6649708	0	0	UNK	Monitoring		Yarragadee Formation	Yes	-	-	-	-	0
61740406	339168	6649472	0	0	UNK	Monitoring		Yarragadee Formation	Yes	-	-	-	-	0
61710465	345828	6647351	0	0	UNK	Unknown		Yarragadee Formation	Yes	-	-	Yes	Yes	1
61714932	336095	6648482	0	0	UNK	Stock and Domestic		Cattamarra Coal Measures	Yes	-	-	Yes	-	1
61740160	354508	6641521	0	0	UNK	Monitoring		Yarragadee Formation	Yes	-	-	-	-	0

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61710466	354527	6651864	0	0	UNK	Unknown		Yarragadee Formation	Yes	-	-	Yes	Yes	1
61719061	355324	6637850	0	0	UNK	Unknown		Yarragadee Formation	Yes	-	-	Yes	Yes	1
61716232	364071	6649287	0	1.52	UNK	Unknown		Eolian	Yes	-	-	-	-	0
61716230	363870	6648664	0	1.52	UNK	Unknown		Eolian	Yes	-	-	Yes	-	1
61712600	365120	6640771	0	1.6	UNK	Stock and Domestic		Eolian	Yes	-	-	Yes	-	1
61716237	365009	6646127	0	1.83	UNK	Unknown		Eolian	Yes	-	-	Yes	-	1
61712583	364995	6643186	0	2.13	UNK	Stock and Domestic		Eolian	Yes	-	-	Yes	-	1
61716234	364502	6647899	0	2.13	UNK	Unknown		Eolian	Yes	-	-	Yes	-	1
61714718	362197	6652297	0	2.13	UNK	Unknown	30/06/1966	Eolian	Yes	-	-	Yes	-	1
61716231	364144	6648922	0	2.44	UNK	Unknown		Eolian	Yes	-	-	-	Yes	0
61712584	364336	6645001	0	2.51	UNK	Stock and Domestic		Regolith	Yes	-	-	Yes	-	2
61712599	365230	6640465	0	2.59	UNK	Water Supply		Regolith	Yes	-	-	Yes	Yes	1
61712598	365626	6641758	0	2.72	UNK	Stock and Domestic	30/06/1962	Eolian	Yes	-	-	Yes	-	1
61712597	365643	6642815	0	2.87	UNK	Stock and Domestic	30/06/1962	Eolian	Yes	-	-	Yes	-	1
61712589	363462	6646465	0	2.92	UNK	Stock and Domestic	30/06/1955	Eolian	Yes	-	-	Yes	-	2
61716236	364753	6645533	0	3.05	UNK	Unknown		Eolian	Yes	-	-	-	-	0
61712595	363857	6648157	0	3.1	UNK	Water Supply	30/06/1956	Eolian	Yes	-	-	Yes	-	1
61712588	363765	6646408	0	3.35	UNK	Stock and Domestic	30/06/1955	Eolian	Yes	-	-	Yes	-	2
61716233	363743	6650259	0	3.35	UNK	Unknown		Eolian	Yes	-	-	Yes	-	1

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61712585	358136	6648598	0	3.66	UNK	Water Supply		Eolian	Yes	-	-	Yes	-	2
61712601	364761	6646401	0	4.01	UNK	Stock and Domestic	30/06/1955	Eolian	Yes	-	-	Yes	-	1
61716235	364656	6646961	0	4.27	UNK	Unknown		Eolian	Yes	-	-	Yes	-	1
61712582	365133	6643986	0	4.57	UNK	Water Supply		Regolith	Yes	-	-	Yes	Yes	2
61716229	364274	6645331	0	4.57	UNK	Stock and Domestic	30/06/1955	Eolian	Yes	-	-	Yes	Yes	1
61711208	342134	6649167	12	13	UNK	Unknown	2/12/1989	Alluvium	Yes	Yes	Yes	-	-	0
61770188	366697	6645123	0	9	UNK	Unknown	19/03/1996	Regolith	Yes	-	-	-	-	0
61770183	377480	6638362	0	10	UNK	Unknown	13/01/1995	Eolian	Yes	-	-	-	-	0
61770180	361161	6643600	0	18	UNK	Unknown		Eolian	Yes	-	-	-	-	0
61711211	341145	6649397	12	13	UNK	Unknown	15/12/1989	Alluvium	Yes	Yes	Yes	-	-	0
61711214	341751	6649512	14	15	UNK	Unknown	13/12/1989	Alluvium	Yes	Yes	Yes	-	-	0
61712568	371276	6641849	0	25.91	UNK	Stock and Domestic		Coolyena Group	Yes	-	-	-	Yes	0
61712567	371690	6641147	0	27.43	UNK	Unknown		Coolyena Group	Yes	-	-	-	-	0
61711221	342957	6649694	17	25.5	UNK	Unknown	10/12/1989	Alluvium	Yes	Yes	Yes	-	-	0
61712587	363828	6647201	0	36.58	UNK	Unknown		Otorowiri Formation	Yes	-	-	-	-	0
61712602	362336	6648957	0	36.58	UNK	Unknown	15/11/1971	Yarragadee Formation	Yes	Yes	Yes	Yes	-	1
61711180	335247	6643550	0	36.58	UNK	Water Supply	30/06/1967	Yarragadee Formation	Yes	-	-	-	-	0
61711179	336038	6646110	0	36.58	UNK	Stock and Domestic	30/06/1967	Cattamarra Coal Measures	Yes	-	-	Yes	-	1
61711177	335837	6643753	0	37.19	UNK	Water Supply	30/06/1967	Cadda Formation	Yes	-	-	Yes	Yes	1

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61711157	350416	6643501	0	42.06	UNK	Stock and Domestic	30/06/1964	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61712576	362605	6650137	0	43.28	UNK	Stock and Domestic	30/06/1957	Yarragadee Formation	Yes	Yes	Yes	Yes	-	4
61712577	362396	6648549	0	43.28	UNK	Water Supply	15/11/1957	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	2
61711162	353843	6640917	0	63.4	UNK	Water Supply	15/12/1969	Yarragadee Formation	Yes	-	-	Yes	Yes	2
61711175	338742	6642283	0	64.01	UNK	Water Supply	30/06/1967	Cattamarra Coal Measures	Yes	-	-	Yes	-	1
61712578	363274	6648625	0	64.62	UNK	Stock and Domestic	30/06/1954	Yarragadee Formation	Yes	-	-	Yes	-	1
61711156	354305	6639724	0	71.63	UNK	Unknown	30/06/1960	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	3
61712596	362352	6647167	0	73.15	UNK	Unknown		Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	1
61712581	364908	6644749	0	85.34	UNK	Unknown	30/06/1953	Otorowiri Formation	Yes	-	-	-	-	0
61712571	377067	6644791	0	86.87	UNK	Unknown		Parmelia Formation	Yes	-	-	-	-	0
61716226	374023	6641924	0	91.44	UNK	Unknown		Parmelia Formation	Yes	-	-	-	-	0
61716228	363831	6639029	0	91.44	UNK	Unknown		Yarragadee Formation	Yes	-	-	-	-	0
61712570	370622	6645108	0	95.1	UNK	Unknown		Parmelia Formation	Yes	-	-	-	-	0
61712569	373698	6641508	0	95.4	UNK	Unknown	30/06/1930	Coolyena Group	Yes	-	-	-	-	0
61712631	367929	6630799	0	97.54	UNK	Stock and Domestic	30/06/1970	Parmelia Formation	Yes	-	-	Yes	-	1

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61711164	353534	6651508	0	108.51	UNK	Water Supply	30/06/1970	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	1
61711161	351558	6649320	0	115.82	UNK	Stock and Domestic	15/01/1970	Yarragadee Formation	Yes	-	-	Yes	Yes	1
61712575	360593	6650594	0	121.92	UNK	Water Supply	30/06/1957	Yarragadee Formation	Yes	-	-	Yes	Yes	2
61711163	352006	6643040	0	121.92	UNK	Stock and Domestic	15/06/1970	Yarragadee Formation	Yes	-	-	Yes	-	1
61711159	354300	6646253	0	129.84	UNK	Water Supply	15/03/1970	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	1
61711158	355942	6638948	0	140.21	UNK	Stock and Domestic	15/09/1969	Yarragadee Formation	Yes	-	-	Yes	Yes	2
61712592	359576	6639402	0	148.74	UNK	Stock and Domestic	15/11/1969	Yarragadee Formation	Yes	-	-	Yes	-	1
61711160	352081	6646229	0	151.79	UNK	Stock and Domestic	15/12/1969	Yarragadee Formation	Yes	-	-	Yes	Yes	1
61718004	377608	6639778	0	169.47	USE	Monitoring	30/06/1968	Parmelia Formation	Yes	Yes	-	Yes	Yes	111
61712591	359320	6642913	0	192.02	UNK	Stock and Domestic	30/06/1967	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	1
61712604	360373	6643805	0	197.21	UNK	Unknown	30/06/1972	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	1
61712632	363335	6633701	0	201	UNK	Stock and Domestic	15/09/1977	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61716243	361061	6636045	0	213.97	UNK	Unknown		Yarragadee Formation	Yes	-	-	Yes	-	1
61711226	355702	6636799	0	214.58	UNK	Irrigation	15/06/1970	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	1
61712593	357871	6649571	0	230.12	UNK	Stock and Domestic	30/06/1969	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	1
61700648	349097	6645612	0	250	UNK	Unknown	19/06/1988	Yarragadee Formation	Yes	-	-	-	-	0

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61712626	366730	6632695	0	240.79	UNK	Unknown		Parmelia Formation	Yes	Yes	Yes	Yes	-	3
61712606	362936	6640373	0	259.08	UNK	Stock and Domestic	15/10/1972	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	3
61714927	346580	6652666	0	274.32	UNK	Unknown	15/01/1974	Yarragadee Formation	Yes	-	-	Yes	-	1
61711155	354307	6639729	0	345.03	UNK	Unknown	30/06/1959	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61712580	366067	6641300	0	275.84	UNK	Stock and Domestic	30/06/1961	Parmelia Formation	Yes	Yes	Yes	Yes	Yes	3
61711181	338336	6649810	0	579.12	UNK	Unknown	30/06/1962	Yarragadee Formation	Yes	-	-	Yes	-	2
61710148	375800	6645286	0	319.43	UNK	Monitoring		Parmelia Formation	Yes	Yes	Yes	Yes	-	3
61712586	362699	6648003	43.28	47.55	UNK	Stock and Domestic	30/06/1958	Yarragadee Formation	Yes	Yes	Yes	Yes	-	1
61716238	366282	6645338	0	366	UNK	Unknown		Parmelia Formation	Yes	-	-	-	-	0
61711212	341145	6649395	45	49.5	UNK	Unknown	15/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61712574	361519	6651355	0	21.34	UNK	Unknown		Alluvium overlying Yarragadee	Yes	-	-	Yes	Yes	1
61712590	361709	6651666	0	24.69	UNK	Stock and Domestic	30/06/1967	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0
61712594	361616	6652113	0	27.74	UNK	Unknown	15/02/1970	Alluvium overlying Yarragadee	Yes	-	-	Yes	-	1
61711218	342459	6649335	22	23	UNK	Unknown	3/12/1989	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61711199	340831	6648387	24	25.5	UNK	Unknown	25/01/1990	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0
61711196	339051	6649955	27	31.5	UNK	Unknown	19/01/1990	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0
61711190	338883	6649346	28	31.5	UNK	Unknown	23/01/1990	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0
61711173	352239	6644750	29.5	30	UNK	Unknown	9/02/1989	Alluvium overlying Yarragadee	Yes	-	-	Yes	-	1
61711202	339642	6649332	32	37.5	UNK	Unknown	15/01/1990	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0
61711193	339500	6649334	34	37.5	UNK	Unknown	11/01/1990	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0
61711205	340092	6649447	36	37.5	UNK	Unknown	17/01/1990	Alluvium overlying Yarragadee	Yes	Yes	Yes	-	-	0
61711185	343639	6650150	39.5	100	UNK	Unknown	11/01/1989	Alluvium overlying Yarragadee	Yes	-	-	Yes	-	3
61712628	362239	6635583	0	4.88	UNK	Water Supply		Alluvium?	Yes	-	-	Yes	-	1
61711219	342460	6649334	48	50	UNK	Unknown	3/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711186	336939	6643400	44.2	70	UNK	Unknown	6/01/1989	Cadda Formation	Yes	-	-	Yes	-	3
61711209	342135	6649167	50	51	UNK	Unknown	2/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61711191	338883	6649344	50	55.5	UNK	Unknown	23/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711222	342957	6649696	53	55.5	UNK	Unknown	10/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711200	340831	6648389	54	55.5	UNK	Unknown	25/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711203	339645	6649332	56	61.5	UNK	Unknown	15/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711206	340094	6649448	56	61.5	UNK	Unknown	17/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711194	339502	6649334	58	61.5	UNK	Unknown	11/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711197	339049	6649953	58	61.5	UNK	Unknown	19/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711215	341749	6649512	58	61.5	UNK	Unknown	13/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61712603	363313	6648317	71.32	71.32	UNK	Stock and Domestic	15/11/1971	Yarragadee Formation	Yes	Yes	Yes	Yes	-	1
61700309	359754	6650492	71.37	71.37	UNK	Unknown	31/05/2008	Yarragadee Formation	Yes	-	-	-	-	0
61770085	335174	6647920	78	78	UNK	Unknown	2/04/1977	Yarragadee Formation	Yes	-	-	-	-	0
61711216	341752	6649512	88	91.5	UNK	Unknown	13/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61740185	353661	6641306	90	90	UNK	Monitoring	24/01/2007	Yarragadee Formation	Yes	Yes	-	Yes	-	1
61711210	342137	6649168	90	103.5	UNK	Unknown	2/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711207	340096	6649448	90	110	UNK	Unknown	17/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711213	341145	6649394	91	103.5	UNK	Unknown	15/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61711172	352239	6644750	91.5	100	UNK	Monitoring	9/01/1989	Yarragadee Formation	Yes	-	-	Yes	-	3
61711204	339647	6649333	92	100	UNK	Unknown	15/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711198	339048	6649951	92	110	UNK	Unknown	19/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711195	339504	6649335	92	111	UNK	Unknown	11/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711188	339412	6649334	93	98	UNK	Unknown	5/02/1990	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61711187	342191	6649376	93	110.7	UNK	Unknown	29/11/1989	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61711223	342958	6649697	94	103.5	UNK	Unknown	10/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61714537	339816	6649527	95	127	UNK	Unknown	9/09/1999	Yarragadee Formation	Yes	Yes	-	-	-	0
61740158	339961	6649516	95	127	UNK	Water Supply	9/09/1999	Yarragadee Formation	Yes	Yes	-	-	-	0
61711184	338834	6642706	94.49	94.49	UNK	Unknown	15/01/1972	Cattamarra Coal Measures	Yes	-	-	Yes	Yes	3
61711217	342248	6649360	96	103.5	UNK	Unknown	30/11/1989	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61711201	340832	6648390	96	104	UNK	Unknown	25/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711165	352746	6640744	97.5	99	UNK	Water Supply	30/06/1977	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61711220	342461	6649334	99	103.5	UNK	Unknown	3/12/1989	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61711192	338883	6649341	100	110	UNK	Unknown	23/01/1990	Yarragadee Formation	Yes	Yes	Yes	-	-	0

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61740329	354312	6641774	110	133	UNK	Monitoring	10/03/2011	Yarragadee Formation	Yes	Yes	-	-	-	0
61712629	360669	6635756	134.19	134.72	UNK	Water Supply	15/09/1966	Yarragadee Formation	Yes	Yes	Yes	Yes	-	1
61770142	369340	6641970	102	132	UNK	Unknown	29/06/2015	Coolyena Group	Yes	Yes	-	Yes	-	1
61712633	358247	6634963	135.94	137.16	UNK	Unknown	30/06/1979	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61740156	341021	6649537	138	138	UNK	Water Supply	26/10/1998	Yarragadee Formation	Yes	Yes	-	-	-	0
61712634	360253	6637449	146	151	UNK	Unknown	18/12/1984	Yarragadee Formation	Yes	Yes	Yes	-	-	0
61770007	355832	6637067	146.85	203	UNK	Unknown	25/02/2013	Yarragadee Formation	Yes	Yes	-	-	-	0
61740155	341114	6649427	147	150	UNK	Water Supply	6/09/2002	Yarragadee Formation	Yes	Yes	-	-	-	0
61770096	355822	6636923	162	200	UNK	Unknown	18/01/2013	Yarragadee Formation	Yes	Yes	-	Yes	-	1
61710739	360335	6636360	162.5	166	UNK	Water Supply	9/09/2007	Yarragadee Formation	Yes	Yes	-	Yes	-	1
61740159	371525	6645201	156	156	UNK	Monitoring	4/11/1999	Parmelia Formation	Yes	Yes	-	Yes	-	1
61712572	379258	6645482	160.02	603.5	UNK	Monitoring	30/06/1967	Parmelia Formation	Yes	Yes	Yes	Yes	Yes	3
61710740	362200	6633835	183	195	UNK	Water Supply	23/07/2008	Yarragadee Formation	Yes	Yes	-	Yes	-	1
61712607	359959	6644660	183.49	183.79	UNK	Monitoring		Yarragadee Formation	Yes	-	-	Yes	Yes	18
61712621	376456	6638995	168	170	UNK	Stock and Domestic		Parmelia Formation	Yes	Yes	Yes	Yes	-	1
61712608	367169	6645409	178.31	305	UNK	Unknown		Parmelia Formation	Yes	Yes	Yes	Yes	-	3

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61712573	371529	6645224	182.88	573.938	USE	Monitoring	26/05/1968	Parmelia Formation	Yes	Yes	Yes	Yes	Yes	12
61711166	348423	6641868	190	190	UNK	Unknown	31/07/1985	Yarragadee Formation	Yes	Yes	Yes	Yes	-	1
61712605	360494	6643621	192.02	204.22	UNK	Water Supply	30/06/1972	Yarragadee Formation	Yes	-	-	Yes	Yes	3
61718038	354189	6644871	198.12	198.12	USE	Monitoring	11/11/1971	Yarragadee Formation	Yes	Yes	-	Yes	Yes	180
61718040	349220	6645525	202.69	202.69	USE	Monitoring	13/12/1971	Yarragadee Formation	Yes	Yes	-	Yes	Yes	189
61711168	352711	6645546	203.7	204	UNK	Unknown	14/06/1981	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61711169	352829	6643724	207.5	207.5	UNK	Unknown	24/02/1982	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61719063	356770	6636991	219.3	302	UNK	Monitoring	2/11/1989	Yarragadee Formation	Yes	Yes	-	Yes	Yes	1
61712625	361061	6636037	219.46	219.46	UNK	Unknown	30/06/1958	Yarragadee Formation	Yes	Yes	Yes	Yes	-	6
61719062	356775	6637010	222	222	UNK	Monitoring	9/12/1989	Yarragadee Formation	Yes	Yes	-	Yes	Yes	1
61712579	359379	6643214	232.56	319.13	UNK	Water Supply	30/06/1960	Yarragadee Formation	Yes	Yes	Yes	Yes	-	3
61718042	342232	6645374	250.2	304	USE	Monitoring	25/01/1972	Yarragadee Formation	Yes	Yes	-	Yes	Yes	180
61711144	347836	6652682	274.32	304.8	UNK	Unknown	15/01/1974	Yarragadee Formation	Yes	Yes	Yes	Yes	-	1
61700331	354912	6646217	346	600	UNK	Unknown	28/03/2008	Yarragadee Formation	Yes	Yes	-	Yes	-	1
61718034	365585	6645181	258.62	258.62	DCM	Monitoring	14/07/1971	Parmelia Formation	Yes	Yes	-	Yes	Yes	138
61711171	347539	6646250	397	397	UNK	Unknown	10/03/1989	Yarragadee Formation	Yes	-	-	Yes	-	3

Hydro Code	Easting GDA94 Z50	Northing	Construction Depth (m)	Total Drilled Depth (m)	Status	FType Class (Purpose)	Date Drilled	Lithology	Construction Details	Lith Log	Hydro strat	Water Level	Salinity	Water Count
61711170	347539	6646250	398	412	UNK	Unknown	11/03/1989	Yarragadee Formation	Yes	-	-	Yes	-	3
61718035	360134	6644951	398.98	762.18	USE	Monitoring	30/06/1971	Yarragadee Formation	Yes	-	-	Yes	Yes	150
61718037	354174	6644874	546.66	547.12	USE	Monitoring	4/11/1971	Yarragadee Formation	Yes	Yes	-	Yes	Yes	177
61718039	349240	6645524	754.99	754.99	USE	Monitoring	8/12/1971	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	177
61718036	354138	6644873	757.73	757.73	USE	Monitoring	4/10/1971	Yarragadee Formation	Yes	Yes	-	Yes	Yes	186
61718041	342223	6645376	764.7	764.7	USE	Monitoring	30/06/1972	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	171
61718033	365594	6645180	765.28	765.28	DCM	Monitoring	6/07/1971	Yarragadee Formation	Yes	Yes	Yes	Yes	Yes	93
W0040462	356773	6636993	0	222	USE	Water Supply	9/12/1989	Yarragadee Formation	Yes	Yes	-	Yes	-	89
W0040458	356780	6637012	0	302	USE	Water Supply	2/11/1989	Yarragadee Formation	Yes	Yes	-	Yes	-	90

Note: Lithology based on registered bore details. Where it was unknown the geology was inferred based on bore depth and mapped geology

Appendix B

Groundwater Supply Assessment



umwelt

Briefing Note

To	Grace Stewart
E	grace.stewart@ox2.com.au
From	Jessica Henderson-Wilson
Date	2 September 2026
Subject	**Dinner Hill Wind Farm Groundwater Supply Assessment**

1.0 Introduction

Dinner Hill Wind Farm Pty Ltd (ACN 660 596 556), a subsidiary of OX2 AB and an affiliate of OX2 Holdings Pty Ltd (OX2), is seeking to develop the Dinner Hill Wind Farm (the Project). The Project is located approximately 200 km north of Perth in Western Australia, within the Dandaragan Local Government Area (LGA). The Project includes a wind farm and associated infrastructure such as a turbine hardstand area and substations in addition to up to 131 wind turbine generators.

Umwelt was engaged by OX2 to undertake an assessment of groundwater supply for the Project during and post construction. The outcome of the assessment is presented in this memo.

OX2 has proposed a water supply strategy, comprising multiple production bores distributed across the Project Area to supply water to Primary and Secondary Construction Compounds (CC). This memo has assessed the viability and potential impact of this water supply strategy.

2.0 Methodology

The assessment was undertaken as a desktop-level review to evaluate the availability and suitability of groundwater to meet the Project's construction water demand of approximately 2 ML/day and the reduced 0.4 ML/day post-construction.

Publicly available DWER groundwater allocation, licensing and bore information, regional geological and hydrogeological publications, groundwater-dependent ecosystem (GDE) mapping and previous investigations were reviewed. The information was used to:

- identify the aquifers underlying the proposed CC locations;
- assess groundwater allocation availability, groundwater levels, water quality and reported bore yields;
- identify existing groundwater users and potentially sensitive environmental receptors; and

This briefing note and any attachments are confidential and are intended to provide information for use in discussions between Umwelt and the named recipient(s) only.
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- select appropriate target aquifers for the proposed production bores.

Representative transmissivity, storability, aquifer thickness and anisotropy values were adopted from available literature for the Yarragadee Formation and Leederville-Parmelia Group. Where aquifer-specific information was limited, indicative values were adopted from comparable regional hydrogeological units.

Construction and post-construction pumping scenarios were developed based on the anticipated daily water demand, distribution of supply between the CC locations, and proposed 10-hour and 12-hour pumping cycles. AQTESOLV Version 4.5 was used to estimate drawdown and the lateral extent of the cone of depression associated with each scenario. The estimated areas of influence were compared spatially with registered bores and mapped environmental receptors to identify potential bore interference and groundwater-related impacts.

The assessment is based on regional and publicly available information and does not include site-specific drilling, groundwater monitoring, water-quality sampling or pumping testing. The results are therefore preliminary and should be confirmed through bore drilling, baseline monitoring, water-quality testing and site-specific pumping tests before finalising the groundwater supply design and abstraction licence application.

Further investigation is required to characterise groundwater use by various operations in the surrounding area, including the location, operational status, abstraction rates and yields of production bores, including the water supply sources associated with the aquaculture facilities northwest of the Project Area.

3.0 Groundwater Sources

The hydrogeological units (groundwater sources) are described based on publicly available information for the Project Area. A summary of the main hydrogeological units within the Project Area include:

- Alluvium – shallow groundwater within unconfined alluvial aquifers mapped along Hill River and Boothendarra Creek. Groundwater dependent ecosystems (GDEs), culturally significant sites and potential for Acid Sulfate Soils (ASS) have been identified in association with areas of mapped alluvium and along rivers.
- Eolian Dunes – shallow unconfined groundwater unit associated with eolian dunes mapped to the west of the Project Area.
- Coolyena Group – subcrops below the eolian dunes to the west of the Project Area. Limited groundwater data exists for the Coolyena Group within the Project Area but one available log from 2015 indicates the presence of groundwater at 86 m below ground level (mbgl)
- Parmelia Group – occurs on the eastern side of the Project Area and underlies the Coolyena Group. Recent depth to groundwater data available within the Project Area indicate groundwater levels between 7 m to 72 m below ground with an increasing trend with time.
- Yarragadee Formation – is a productive semi confined to confined aquifer that is present across the western half of the Project Area and is present at surface. The Yarragadee Formation aquifer is a significant groundwater resource and provides town water supply to landholders and for the township of Badgingarra. Groundwater levels have been reported between 10 mbgl to 111 mbgl.

- Cattamarra Coal Measures – the coal measures underlie the thin Cadda Formation and underlie the Yarragadee Formation. The Cattamarra Coal Measures comprise carbonaceous siltstone, sandstone and coal and were targeted for coal mine and deeper petroleum extraction. Groundwater levels of 45 mbgl were documented in 1972. There is no more recent data available.

4.0 Groundwater Licence

Groundwater allocations within the Jurien Groundwater Area, part of the Northern Perth Basin, are managed under the *Jurien Groundwater Allocation Plan*, within the localities of Hill River, Boothendarra, and Badgingarra, herein referred to as the Project Area. Available licence data for the Badgingarra subarea indicates the following groundwater availability:

- Alluvial Aquifer: No water available.
- Cattamarra Coal Measures Aquifer:
    - Allocation limit 400 ML/yr, with an available general licensable component of 400 ML/yr. The general licensable component reflects the portion of a groundwater resource's allocation limit that is available for licensing to general water users. It is therefore not reserved for specific purposes, such as public drinking-water supply or environmental requirements.
- Leederville-Parmelia Group Aquifer:
    - Allocation limit 12,600 ML/yr, with an available general licensable component of 11,100 ML/yr.
- Yarragadee Formation Aquifer:
    - The allocation limit is 27,500 ML/year, of which 26,560 ML/year is designated as the general licensable component.
    - Of this general licensable component, 5,368 ML/year is currently allocated under groundwater licences, leaving a calculated balance of approximately 21,192 ML/year potentially available for licensing, subject to confirmation by DWER, including consideration of pending applications and the groundwater licence assessment process.

5.0 Construction Water Supply Requirements

5.1 Construction Compounds

The water supply requirements for the Project during construction will be in the order of 2 ML/day, only servicing three Primary CCs. As such, each CC will be allocated in the order of 0.67 ML of water per day.

It is anticipated that water supply will be sourced from onsite groundwater.

Based on the locations of the three Primary CC, the groundwater will be sourced from the underlaying Yarragadee Formation aquifer for the Primary CC 1 and 2 and the Leederville-Permelia Group aquifer for the Primary CC3, as indicated in **Figure A.1**.

Secondary CCs (4 and 5) may also be utilised, targeting the underlaying Yarragadee Formation aquifer (CC 4 & 5), as indicated on **Figure A.2**.

5.2 Fire Fighting

The final required volume will be determined by a fire engineer in accordance with AS 2419.1 '*Fire Hydrant Installations* (Standards Australia, 2021)' and any relevant fire authority requirements.

Fire water storage should account for both asset and bushfire response requirements. Based on a yard area greater than 3,000 m^2 and up to 9,000 m^2, the following provisions are proposed to be determined by a fire engineer in accordance with AS 2419.1 '*Fire Hydrant Installations* (Standards Australia, 2021)' and any relevant fire authority requirements:

- a dedicated fire water storage tank with a minimum capacity of 288,000 L (0.288 ML);
- provision of two hydrants; and
- sufficient storage to operate both hydrants simultaneously at 10 L/s each for four hours.

If the Project footprint exceeds 9,000 m^2, additional fire water storage and hydrant capacity may be required, subject to confirmation by the project fire engineer and relevant fire authority.

5.3 Post Construction

The water supply requirements post construction and decommissioning are anticipated to be 0.4 ML/day, less than the requirements during construction. The proposed production bores can therefore be utilised in a reduced capacity to meet this ongoing requirement.

It is noted that due to the 30 year operational life of the Project that water supply for operations and decommissioning is reviewed and confirmed as part of the environmental management plans for each phase post construction.

6.0 Target Aquifers and Drawdown

6.1 Aquifer Parameters

The Primary CCs, as indicated in **Section 5.1**, are located on the Yarragadee Formation and the Leederville-Parmelia Group aquifers. The literature review carried out provided the following hydrogeological parameters of the underlaying aquifers (Department of Water and Environmental Regulation, 2022):

Table 5.1 Primary Location Aquifer Parameters

Parameters	Yarragadee Formation	Leederville-Parmelia Group
Transmissivity (m^2)	1000	100
Storativity	1.7×10^{-3}	1.0×10^{-4}
Aquifer thickness (m)	40	40
Kz/Kh	1×10^{-3}	1×10^{-3}
General bore yields (ML/day)	2 to 4	1 to 4
Water Quality		
• pH	5.56 (Median)	6.40 (Average)
• EC µS/cm	870 (Median)	750 (Average)

Note: An aquifer thickness of 40 m was selected for the pumping tests to determine the lateral drawdown estimations.

For the purposes of this memo the aquifers have assumed to be unconfined at the locations where the production bores may be installed to service the primary CC locations.

The Secondary CCs are located on the Yarragadee Formation as indicated on **Figure A.2**.

Table 5.2 Secondary Location Aquifer Parameters

Parameters	Yarragadee Formation
Transmissivity (m^2)	1000
Storativity	1.7×10^{-3}
Aquifer thickness (m)	40
Kz/Kh	1×10^{-3}
General bore yields (ML/day)	2-4
Water Quality	
• pH (Median)	5.56
• EC µS/cm (Median)	870

*Note: An aquifer thickness of 40 m was selected for the pumping tests to determine the lateral drawdown estimations. *Estimates not available in literature as limited testing have been completed. Assumed values similar to surrounding geological Formations and Groups.*

ND – not data available

6.2 Production Bore Drawdown

To determine the pumping rates required to meet water supply requirements the aquifer parameters were used within pumping test software to determine the lateral drawdown/cone of depression and the aquifer recovery requirements.

Pumping test software, Aqtesolv (HydroSOLVE, Inc., 2025), was used and for the purposes of the pumping test, the pump was installed at a depth of 50 mbgl and the standing water level was set at 10 mbgl. The available drawdown was therefore 40 m.

The aquifer parameters obtained from the literature study were used to determine the cone of depression/lateral drawdown at various pumping rates and cycles tabulated below. Based on the location of the proposed production bore, the groundwater drawdown cone of depression will indicate if any existing production bores could be impacted, based on the selected production bore location and extracted groundwater volume.

The pump cycles have been selected to present two pumping periods and the associated recovery cycles within the 24 hour period. The pumping tests included the recovery calculations, which in all test results was 100% of the original groundwater levels, prior to commencing the next pumping cycle. The full recovery ensures the aquifer will not be impacted and affect existing groundwater users.

The pumping scenarios in **Table 5.3** reflect the pumping rates required at the construction and post construction phases to meet with the water supply requirements at the three Primary CCs. The lateral drawdown within the target aquifer is provided based on the pumping test outcomes.

Table 5.3 Primary Compound Pumping Rate vs Drawdown

Total Daily Volume Required (ML/day)	Pumping Cycle (Hrs)	Pumping Rate (ML/hr) / (L/s)	Pumping Rate at Each Site (ML/hr) (L/s)	Lateral Drawdown/Cone of Depression (m)
Construction Phase				
2	10	0.20 / (18.5)	0.067 (18.5)	600 m – Yarragadee 850 m – Parmelia
2	12	0.17 / (15.4)	0.055 (15.4)	500 m – Yarragadee 830 m – Parmelia
Post Construction				
0.4	10	0.04 / (3.7)	0.013 (3.7)	400 m – Yarragadee 630 m – Parmelia
0.4	12	0.033 / (3.1)	0.011 (3.1)	340 m – Yarragadee 600 m – Parmelia

Table 5.3 above represents the impact of the different pumping rates and pump cycles on the lateral drawdown/cone of depression around each of the three proposed production bores, screened within the Formation indicated.

The Aqtesolv pumping curves indicate the cone of depression from the pumping bore. The **Figures B.1**-**B.8** for each of the scenarios has been included in **Appendix B**.

As per the pumping test results in **Appendix B** and in **Table 5.3** above, the drawdown within the Leederville-Parmelia Group aquifer extends up to 850 m from the production bore at a pumping rate of 0.2 ML/hr and pumping cycle of 10 hours. The lateral the drawdown in the Yarragadee Formation aquifer extends up to 600 m from the production bore at the similar pumping rates and cycles.

The size of the blue spheres represents the proposed production bores and varies according to the pumping rate, pumping regime (cycle), and target aquifer, as summarised in **Table 5.3**. The grey spheres represent the estimated radius of influence (cone of depression) for bores where site-specific pumping test data are unavailable. These have been calculated using representative transmissivity and storativity values for the screened aquifer and a nominal abstraction rate of 2 ML/day. Consequently, differences in sphere size reflects variations in the hydraulic properties of the respective aquifers. This is presented on the attached figures in **Appendix A**.

6.3 Production Bore Drawdowns and Cone of Depression

As seen in **Figure A.3** in **Appendix A** there are a multitude of bores within and adjacent to the Project Area. Umwelt (2026) identified 182 privately owned bores within 3 km of the Project Area. The majority (120) of the bores are largely constructed within the Yarragadee Formation. There are 21 bores installed within the shallow eolian dunes, 19 bores into the Parmelia Formation and five bores within alluvium. The remaining bores are spread across the remaining lithological units. Bores within 3 km of the Project Area have depths ranging 12 m to 765 m, with the median depth of bores around 96 m.

Of the three Primary CC target areas, only CC 1 has existing production bores in proximity to the compound. A review of publicly available data does not show whether these bores are still in use or what their pumping rates could be. As such, for the purposes of this memo, they have been assumed to be active and pumping at the same rate that the Project bores would be pumping to deliver 2 ML/day, presenting a possible worst-case scenario. The abstraction rates provided in the **Table 6.1** and **Table 6.2** is based on an airlift yield recorded at the end of drilling, and not from a pumping test analysis.

The figures in **Appendix A show the** known production bores within close proximity to the proposed Primary CC areas

The area around Primary CC 1 contains two registered bores that appear to be located at the same coordinates, as shown in **Figure A.4** and summarised in **Table 6.1**. The bores No 61711172 (monitoring bore) and No 61711173, (no data are available). As a result, the potential impacts of abstraction from an additional production bore at Primary CC 1 cannot be adequately assessed. Should future data confirm an actual overlap or identify a potential interference risk, the proposed production bore location should be located to the west or north to mitigate impacts.

Primary CCs 2 and 3 are not located in close proximity to existing production boreholes. There are no overlapping cones of depression due to the absence of bores in the areas, as graphically presented in **Figure A.5** and **Figure A.6** respectively.

Table 6.4 Existing Registered Bores Within 1 km of the Cone of Depression of Primary Construction Compounds Production Bores

Compound Adjacent to Registered Bore	Registered Bore No.	Type & Class	Screened Lithology	Date Drilled	SWL* at Time of Installation (mbgl)	Abstraction Rate at Time of Installation/Air Lift (ML/d)
1	61711157	Stock and Domestic	Yarragadee Formation	30/06/1964	6	0.314
1	61711160	Stock and Domestic	Yarragadee Formation	15/12/1969	6	0.314
1	61711163	Stock and Domestic	Yarragadee Formation	15/06/1970	6	0.314
1	61711168	Unknown	Yarragadee Formation	14/06/1981	6	ND
1	61711169	Unknown	Yarragadee Formation	24/02/1982	6	0.314
1	61711172	Monitoring	Yarragadee Formation	11/01/1989	6	ND
1	61711173	Unknown	Yarragadee Formation	17/01/1989	6	ND

*Note: *SWL – Standing Water Level ND – no data*

Of the Secondary Target locations, each CC area had a singular bore with overlapping parameters, as shown in **Table 6.2**.

Secondary CCs 5 and 6 are overlapped by a singular sphere of influence each as shown on **Figure A.7** and **Figure A.8**, respectively. As shown in **Table 6.2**, bore No 61712634 and No 61712570 are of unknown type and status. As such, similar to Primary CC 1, there is no current ability to confirm the possible interaction between the bores. If it is determined that there is overlap, the bore at Secondary CC 4 should be located north or east and the bore at Secondary CC 5 should be moved north.

Depending on the maximum distance that the production bores can be located from the CCs, the production borehole may not be able to be moved far enough to not have overlapping cones of depression from existing production bores. As such lower abstraction rates would need to be implemented so that there is no overlap. To make up for the loss of water abstraction, an additional bore with a similarly lower abstraction rate could be installed in the same area, to reduce the cones of depression and still supply the required volume of water to the CC.

Table 6.5 Existing Registered Bores Within the Cone of Depression Due to Secondary Construction Compounds Production Bores

Compound Adjacent to Registered Bore	Registered Bore No.	Type & Class	Screened Lithology	Date Drilled	SWL* at Time of Installation (mbgl)	Abstraction Rate at Time of Installation (ML/d)
4	61712634	Unknown	Yarragadee Formation	18/12/1984	ND	ND
5	61712570	Unknown	Parmelia Group	ND	ND	ND

*Note: *SWL – Standing Water Level ND – no data*

As shown in the **Table 6.1** and **Table 6.2**, the registered bores were installed more than 35 years ago and data updates on their current standing water level (SWL) and potential abstraction rates are not available. Of the surrounding bores: four are stock and domestic bores with four of the borehole's status being listed as unknown, and one listed as a monitoring bore. As such confirmation on current abstraction rates and SWL for the bores is required.

7.0 Groundwater Dependent Ecosystems

The GDEs present within the Project Area have been discussed in detail in the Umwelt report (UMWELT, 2026).

The production bores to be installed at the proposed Primary CC areas and the underlying aquifers to be targeted, is unlikely to have hydraulic connection with the identified GDEs in the Project Area. The available data indicates groundwater levels in the Parmelia Group aquifer are between 7 mbgl to 72 mbgl.

The local GDEs are located within the shallow unconfined alluvium and eolian dune groundwater units, which are not targeted for water supply purposes in the Project Area.

8.0 Proposed Monitoring

The proposed abstraction of approximately 2 ML/day, would require a groundwater licence from DWER. The information and monitoring requirements supporting the application would be determined by DWER based on factors including the requested annual entitlement, target aquifers, proposed pumping regime, existing groundwater users and proximity of groundwater-dependent environmental or cultural receptors. DWER may also require an operating strategy containing abstraction, monitoring, management and reporting commitments as part of the licence.

A two-year groundwater monitoring period before construction is not considered an automatic requirement. However, DWER may require sufficient baseline information to characterise existing groundwater conditions and assess the potential effects of the proposed abstraction. The supporting investigations may include the following:

- review of regional hydrogeological, groundwater allocation and existing bore information;
- verification of the location, construction, operational status and current use of nearby registered bores;
- installation of dedicated monitoring bores where suitable existing bores are unavailable;
- baseline monitoring of bores groundwater levels to establish natural conditions and seasonal variability;
- baseline groundwater-quality sampling to be carried out to confirm suitability for the proposed uses and allow the establishment of pre-abstraction conditions;
- drilling and construction of the proposed production bores;
- conducting step-drawdown and constant-rate pumping tests to assess bore performance, aquifer response, to determine the sustainable yield and recovery requirements;
- monitoring of nearby bores to be carried out during pumping tests, where practicable, to assess potential interference; and
- assessment of potential effects on neighbouring groundwater users such as agriculture and aquaculture businesses, GDEs and other identified environmental or cultural receptors.

To support and strengthen the groundwater licence application and establish a defensible baseline, it is recommended that groundwater levels are initially monitored for approximately 6 to 12 months, where the Project schedule permits. This period would allow seasonal groundwater-level variation to be assessed before full-scale abstraction commences. Baseline water-quality sampling should also be undertaken, preferably during contrasting seasonal conditions.

Following commissioning, groundwater levels, abstraction volumes and groundwater quality should continue to be monitored to confirm that the production bores are performing as anticipated and that unacceptable impacts are not occurring. The final monitoring frequency, bore network, assessment criteria, reporting requirements and any management triggers should be developed in consultation with DWER and documented in the groundwater licence operating strategy.

9.0 Conclusion

Based on the desktop assessment, sufficient groundwater resources are considered available within the Project Area to meet the Project's construction water requirement of approximately 2 ML/day. The Yarragadee Formation is expected to provide the principal and most reliable groundwater source due to its substantial available allocation and reported bore yields of approximately 2 to 4 ML/day. The Leederville-Parmelia Group and Cattamarra Coal Measures may provide supplementary local supplies, subject to confirmation of aquifer performance and licence availability.

The proposed water supply strategy, comprising multiple production bores distributed across the CC areas, is considered feasible and would allow the required volume to be supplied while managing pumping rates and potential localised drawdown. However, the sustainable yield and water quality of each bore should be confirmed through drilling, bore construction and site-specific pumping tests before the water supply design is finalised.

The location, operational status and current abstraction rates of nearby registered bores, and businesses reliant on groundwater, should also be verified to assess potential interference and refine the proposed production bore locations. Where overlapping cones of depression are identified, potential impacts may be managed by relocating production bores, reducing individual bore pumping rates, adjusting pumping cycles or installing additional lower-yield bores.

Overall, groundwater is considered a viable source for supplying the Project's required 2 ML/day, subject to:

- obtaining the necessary groundwater abstraction licence and allocation from DWER;
- confirming production bore yields and aquifer response through pumping tests;
- verifying potential impacts on neighbouring groundwater users and environmental receptors;
- confirming that groundwater quality is suitable for the intended uses; and
- implementing an appropriate baseline and operational groundwater monitoring program.

10.0 References

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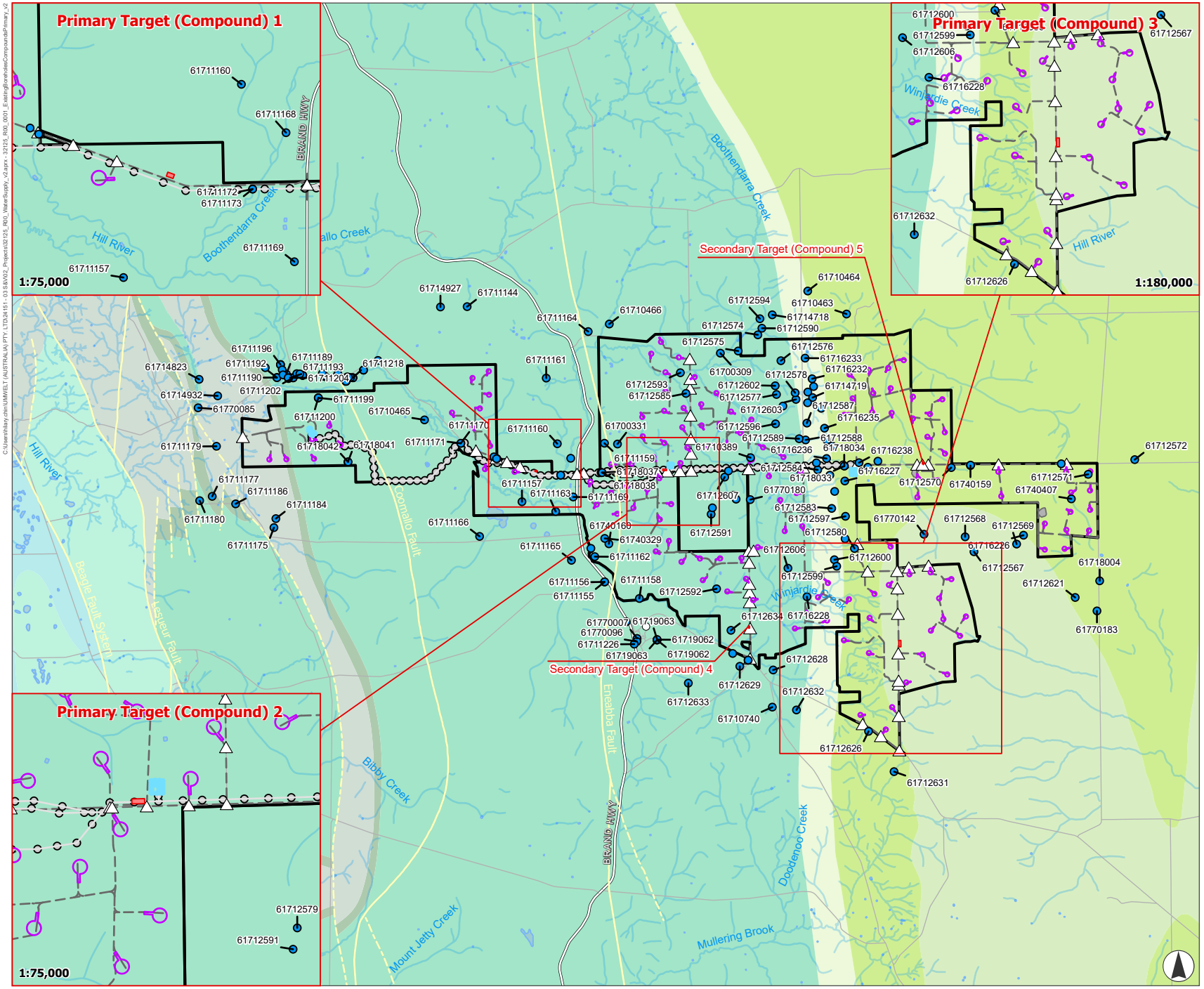
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Appendix A

Figures

FIGURE A.1

Existing Boreholes/Compounds - Primary Targets



Legend

- NGIS Bore Within 3km With Geology
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Access Road
- Internal Transmission Line
- Internal TL Poles
- Quarry

Basement Geology

- Cadda Formation
- Cattamarra Coal Measures
- Coolyena Group
- Eneabba Formation
- Lesueur Sandstone
- Otorowiri Formation
- Parmelia Group
- Yarragadee Formation
- Major fault or shear zone
- Fault or shear zone

0 2.5 5
Kilometres

Scale 1:250,000 at A4
GDA2020 MGA Zone 50

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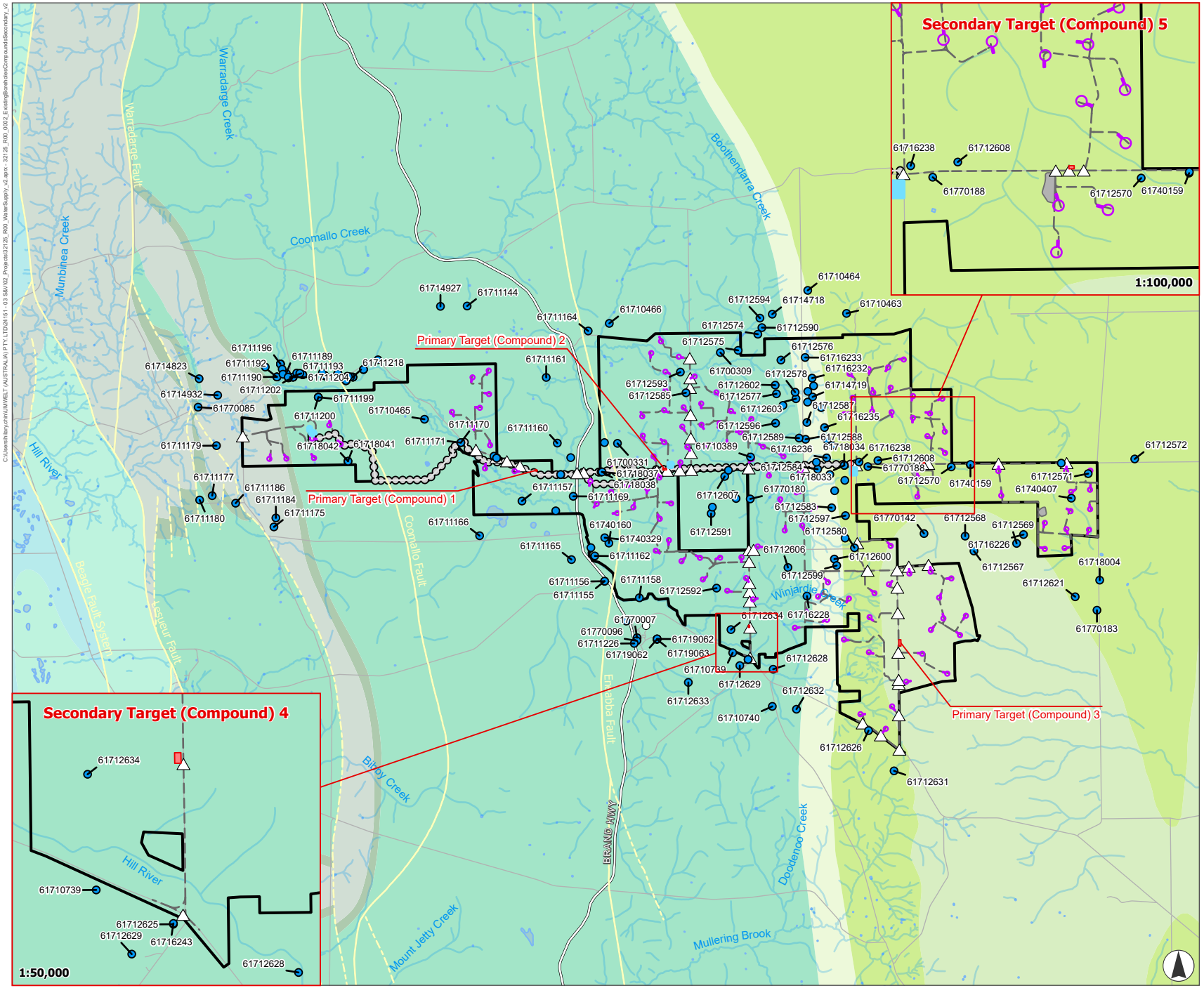


FIGURE A.2

Existing Boreholes/Compounds - Secondary Targets

Legend

- NGIS Bore Within 3km With Geology
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Access Road
- Internal Transmission Line
- Internal TL Poles
- Quarry

Basement Geology

- Cadda Formation
- Cattamarra Coal Measures
- Coolyena Group
- Eneabba Formation
- Lesueur Sandstone
- Otorowiri Formation
- Parmelia Group
- Yarragadee Formation
- Major fault or shear zone
- Fault or shear zone

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Kilometres

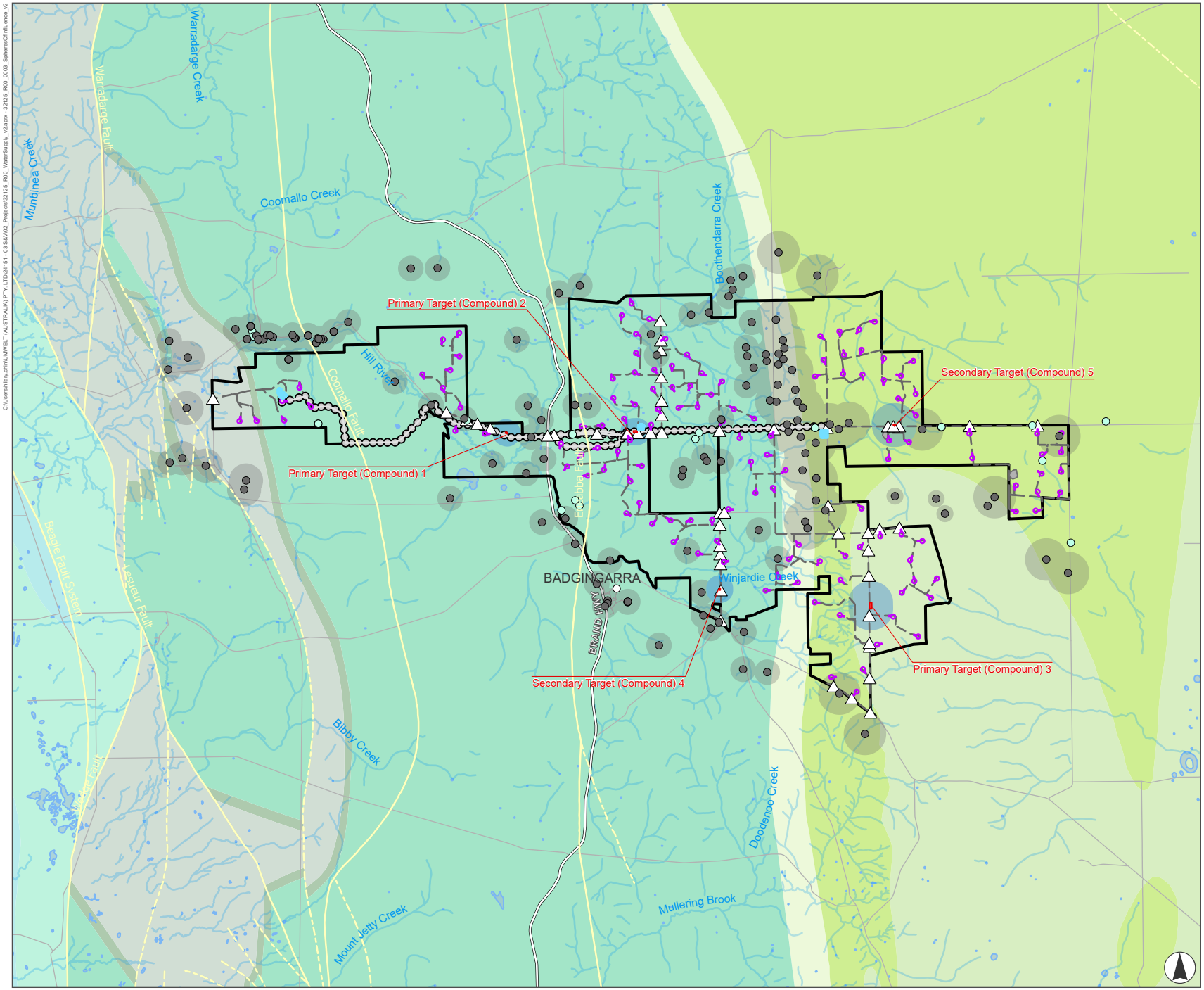
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FIGURE A.3

Spheres of Influence - Overview



Legend

- Monitoring
- Non-Monitoring
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Spheres of Influence

- Compound Area
- Non-Monitoring Bores

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Internal Transmission Line
- Internal TL Poles
- Quarry
- Access Road

Basement Geology

- Cadda Formation
- Cattamarra Coal Measures
- Coolyena Group
- Eneabba Formation
- Lesueur Sandstone
- Otorowiri Formation
- Parmelia Group
- Yarragadee Formation
- Major fault or shear zone
- Fault or shear zone

0 2.5 5
Kilometres

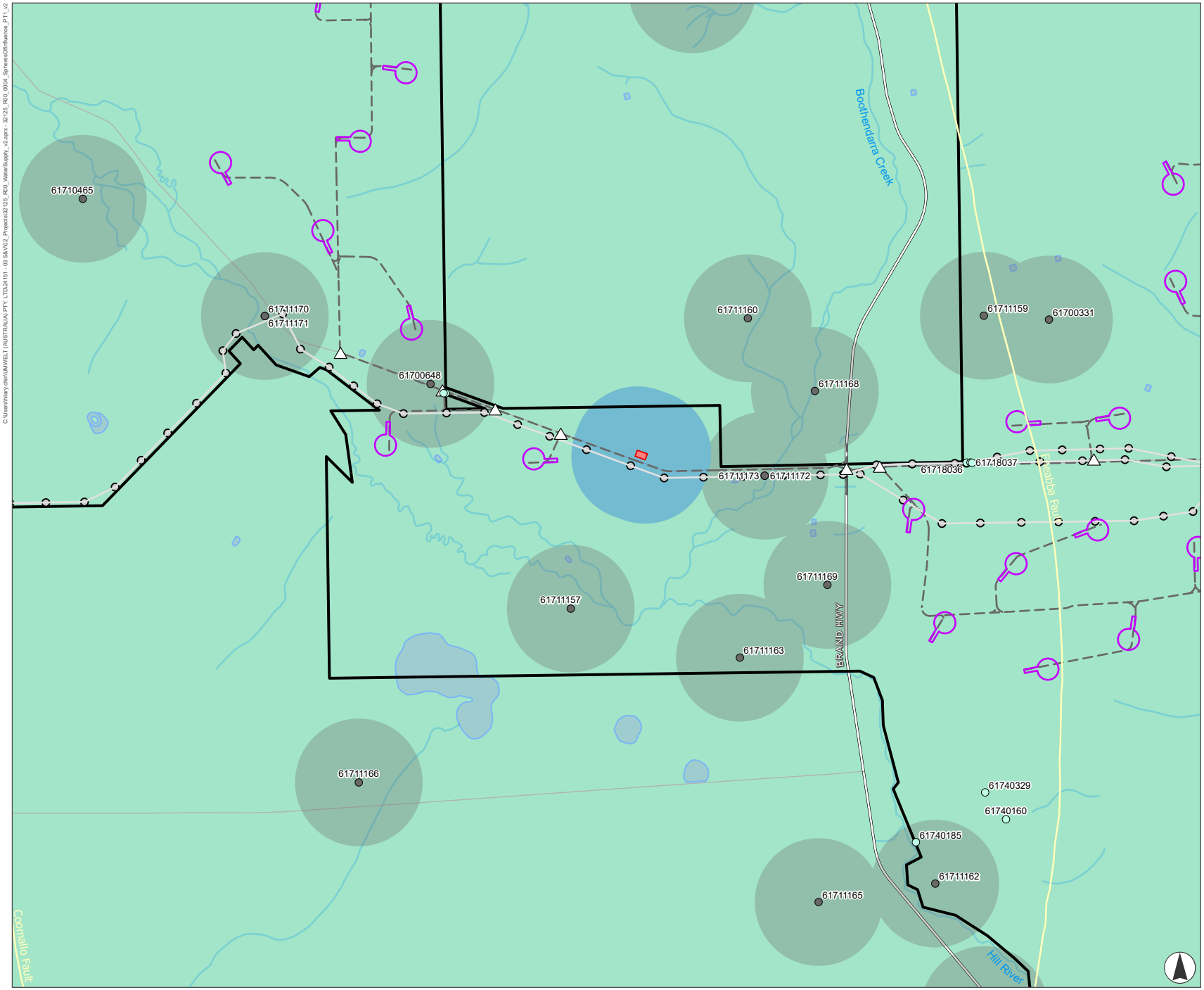
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FIGURE A.4

Spheres of Influence - Primary Target 1

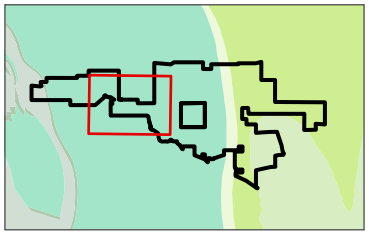


Legend

NGIS Bore Within 3km With Geology
- Monitoring
- Non-Monitoring
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road

Spheres of Influence
- Compound Area
- Non-Monitoring Bores
- Compound Area
- Crane Pad
- Access Points
- Internal Transmission Line
- Internal TL Poles
- Access Road

Basement Geology
- Yarragadee Formation
- Major fault or shear zone



0 1 2

Kilometres

Scale 1:50,000 at A4
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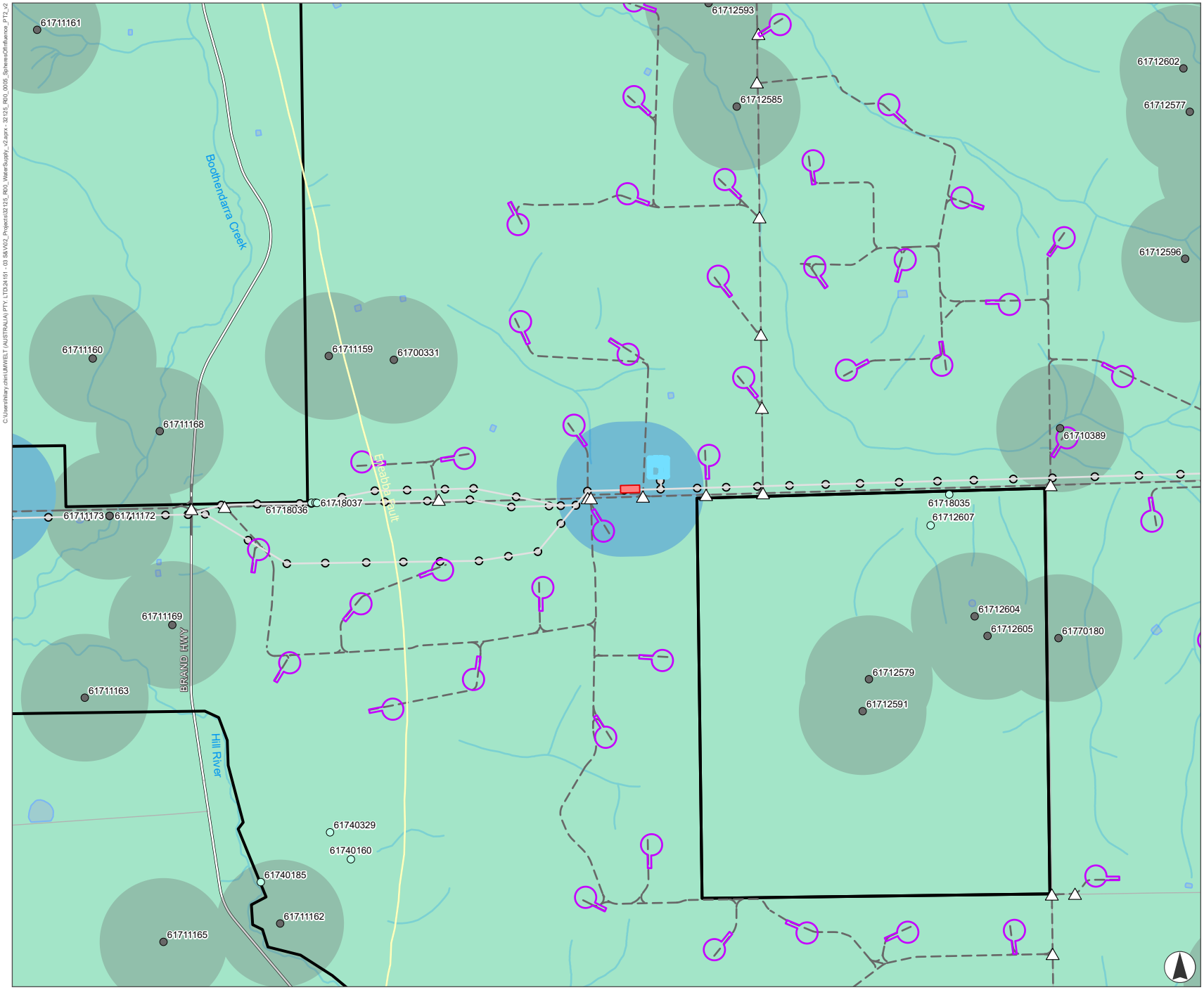


FIGURE A.5

Spheres of Influence - Primary Target 2

Legend

- Monitoring
- Non-Monitoring
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road

Spheres of Influence

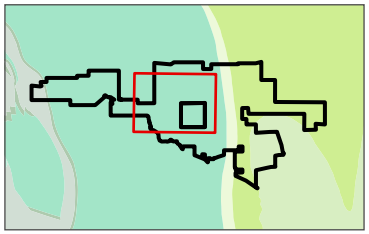
- Compound Area
- Non-Monitoring Bores

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Internal Transmission Line
- Internal TL Poles
- Access Road

Basement Geology

- Yarragadee Formation
- Major fault or shear zone



0 1 2

Kilometres

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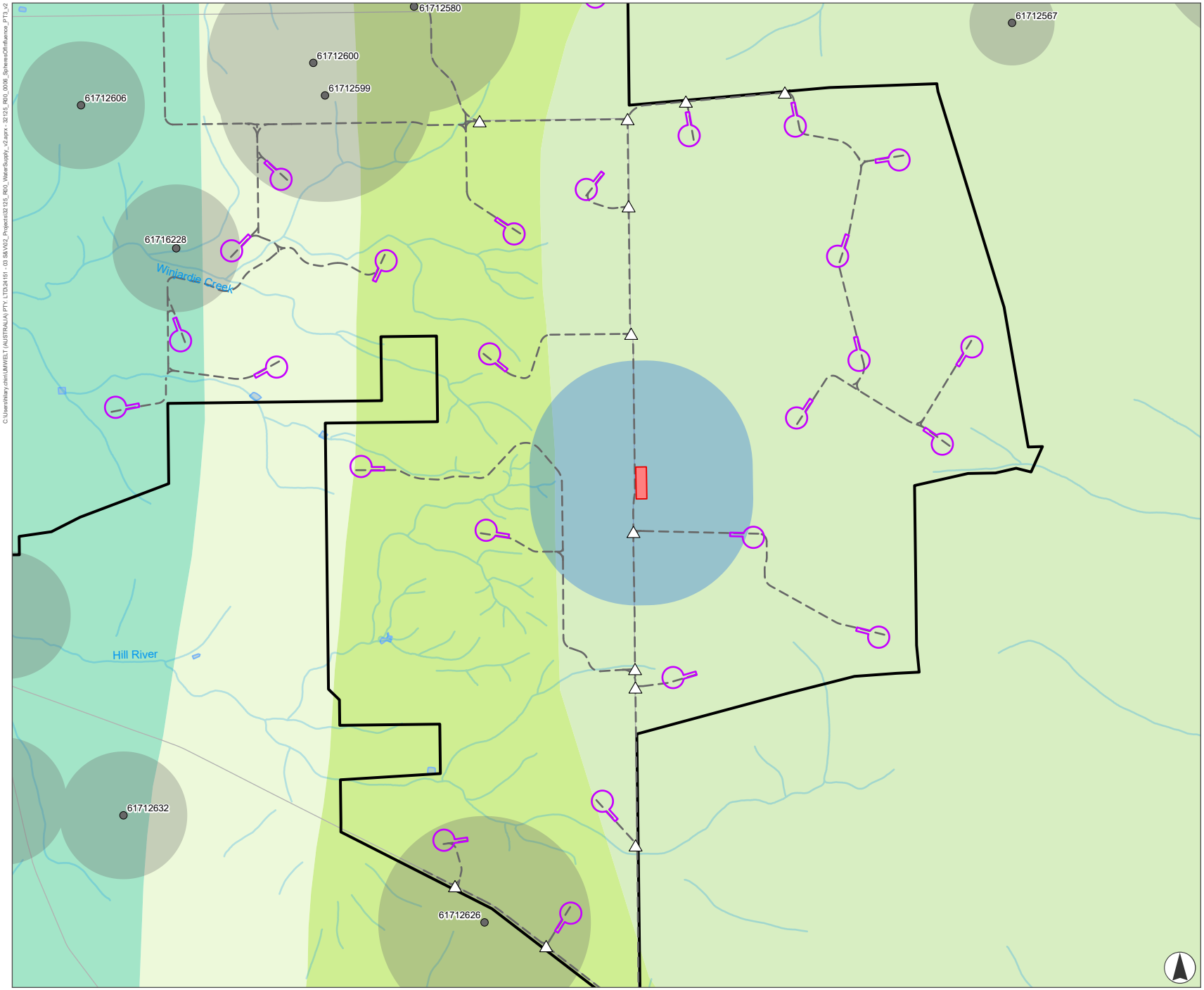


FIGURE A.6

Spheres of Influence - Primary Target 3

Legend

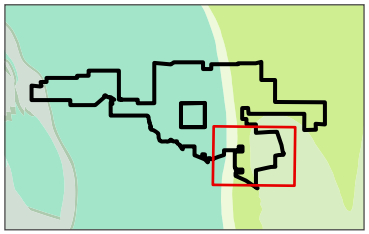
- Non-Monitoring
- Project Boundary
- Waterbody
- Watercourse
- Minor Road

Spheres of Influence

- Compound Area
- Non-Monitoring Bores
- Compound Area
- Crane Pad
- Access Points
- Access Road

Basement Geology

- Coolyena Group
- Otorowiri Formation
- Parmelia Group
- Yarragadee Formation



0 1 2

Kilometres

Scale 1:50,000 at A4
GDA2020 MGA Zone 50

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Image Source: ESRI Basemap (2025) | **Data Source:** Landgate (2026), OX2 (2026)

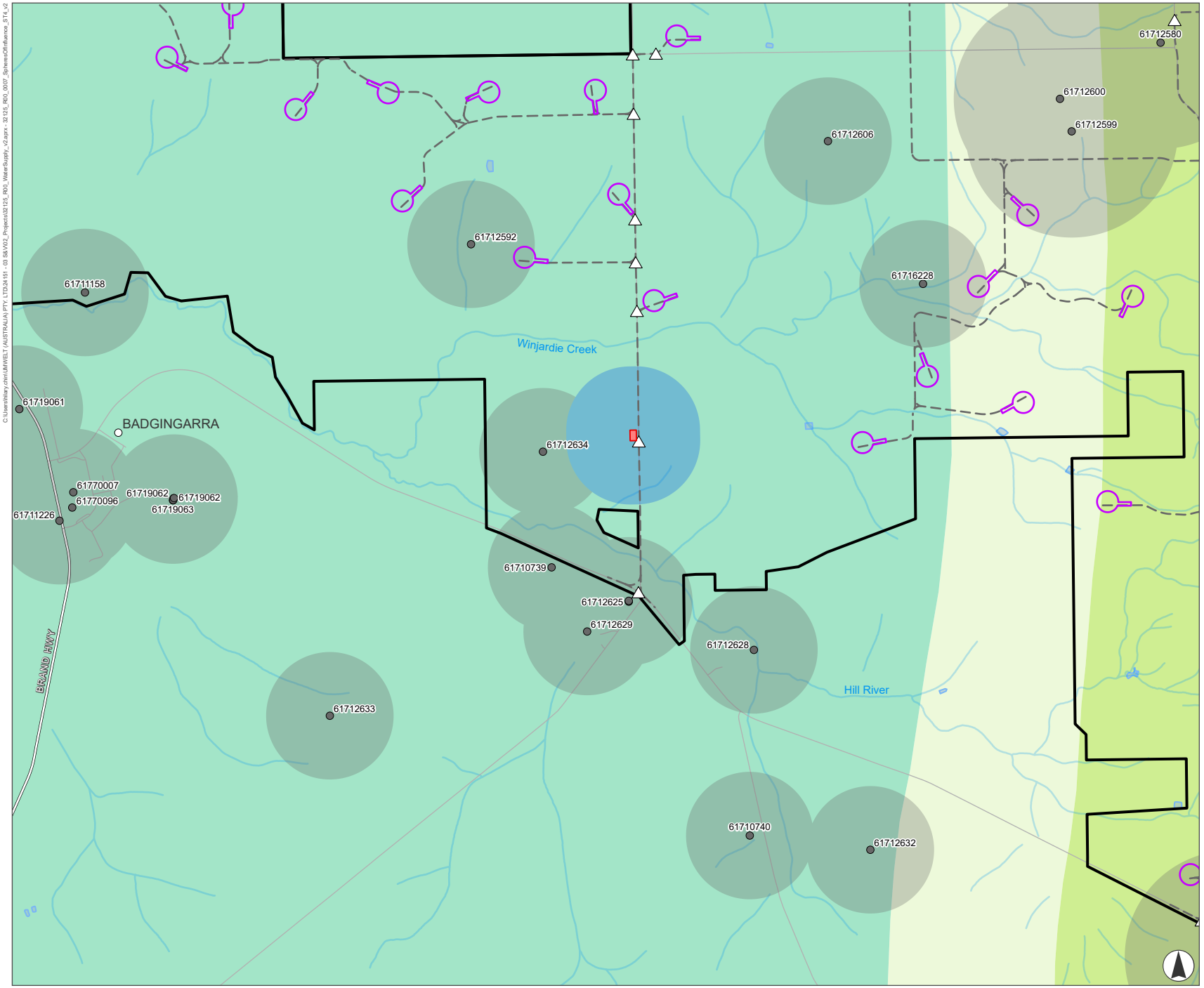


FIGURE A.7

Spheres of Influence - Secondary Target 4

Legend

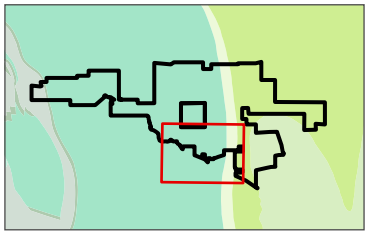
- Monitoring
- Non-Monitoring
- Project Boundary
- Waterbody
- Watercourse
- Major Road
- Minor Road
- Populated Place

Spheres of Influence

- Compound Area
- Non-Monitoring Bores
- Compound Area
- Crane Pad
- Access Points
- Access Road

Basement Geology

- Otorowiri Formation
- Parmelia Group
- Yarragadee Formation



0 1 2

Kilometres

Scale 1:50,000 at A4
GDA2020 MGA Zone 50

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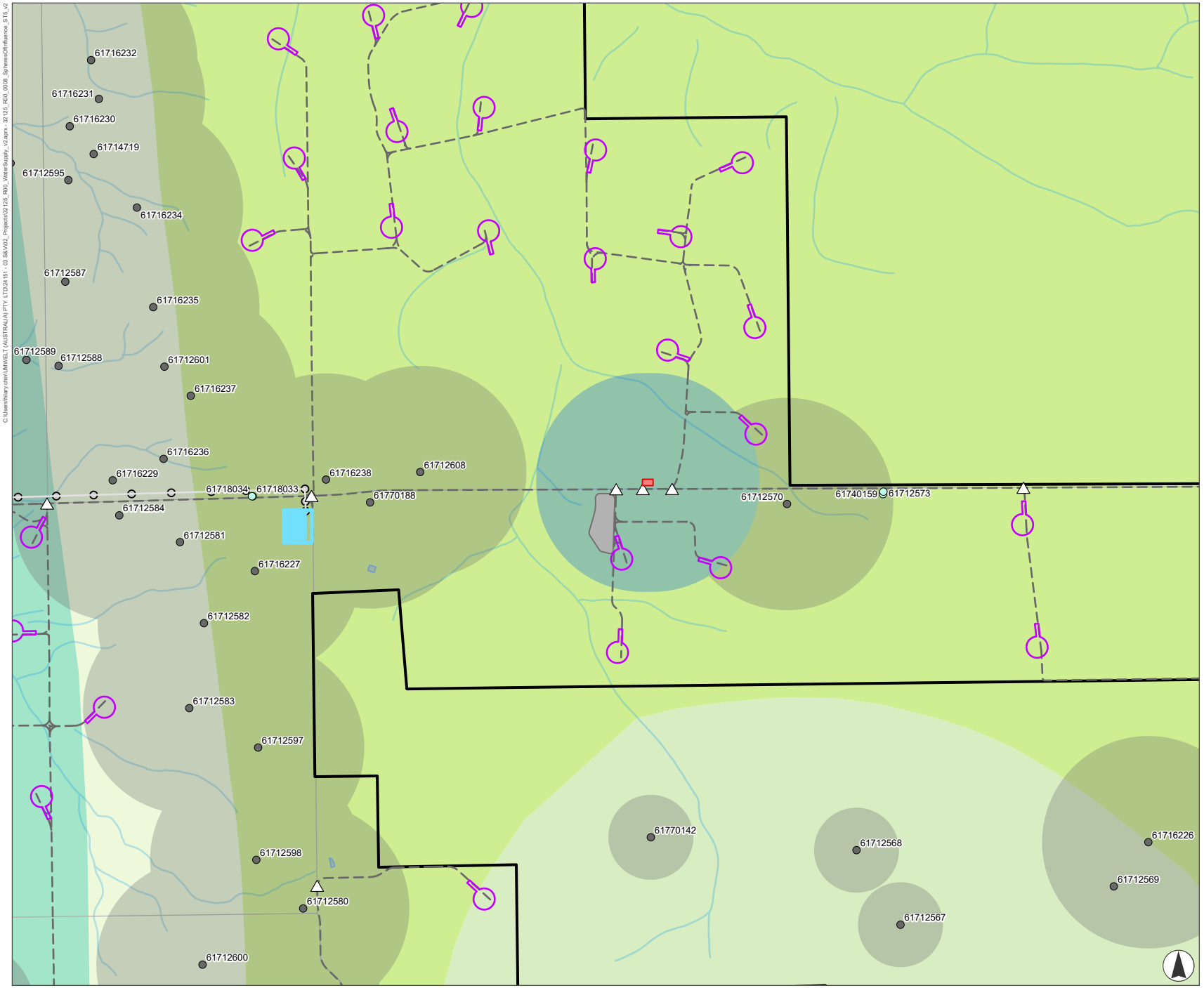


FIGURE A.8

Spheres of Influence - Secondary Target 5

Legend

- Monitoring
- Non-Monitoring
- Project Boundary
- Waterbody
- Watercourse
- Minor Road

Spheres of Influence

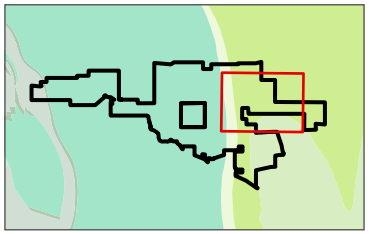
- Compound Area
- Non-Monitoring Bores

Infrastructure

- Substation
- Compound Area
- Crane Pad
- Access Points
- Internal Transmission Line
- Internal TL Poles
- Quarry
- Access Road

Basement Geology

- Coolyena Group
- Otorowiri Formation
- Parmelia Group
- Yarragadee Formation



0 1 2

Kilometres

Scale 1:50,000 at A4
GDA2020 MGA Zone 50

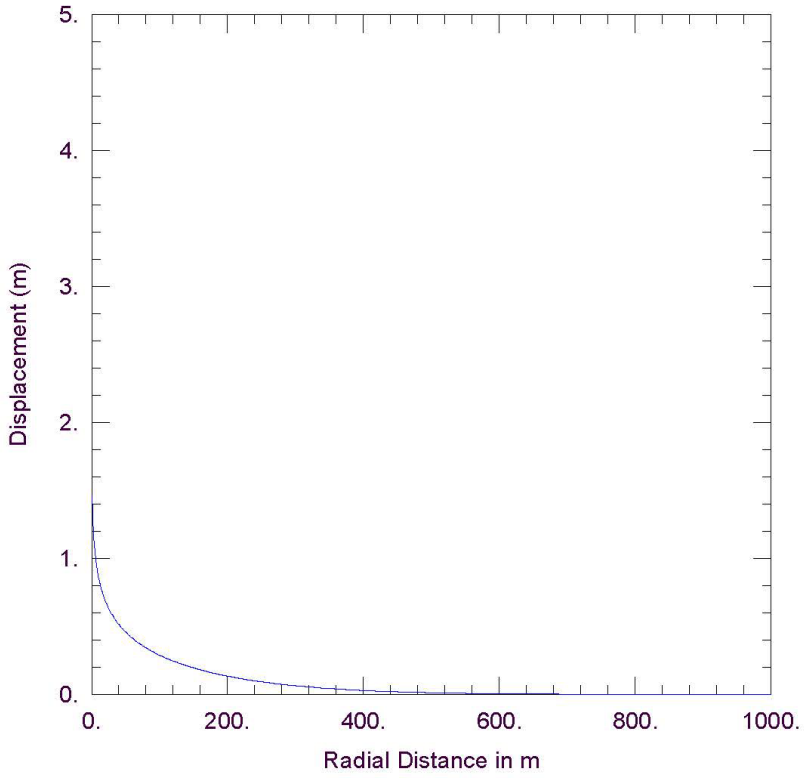
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Appendix B

Aqtesolv Pump Test Results

B.1 Yarragadee Pump Test at 18.5L/s – 600 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Yarragadee_18.5Ls_10h_Theis.aqt
Date: 08/14/26 Time: 09:48:34

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

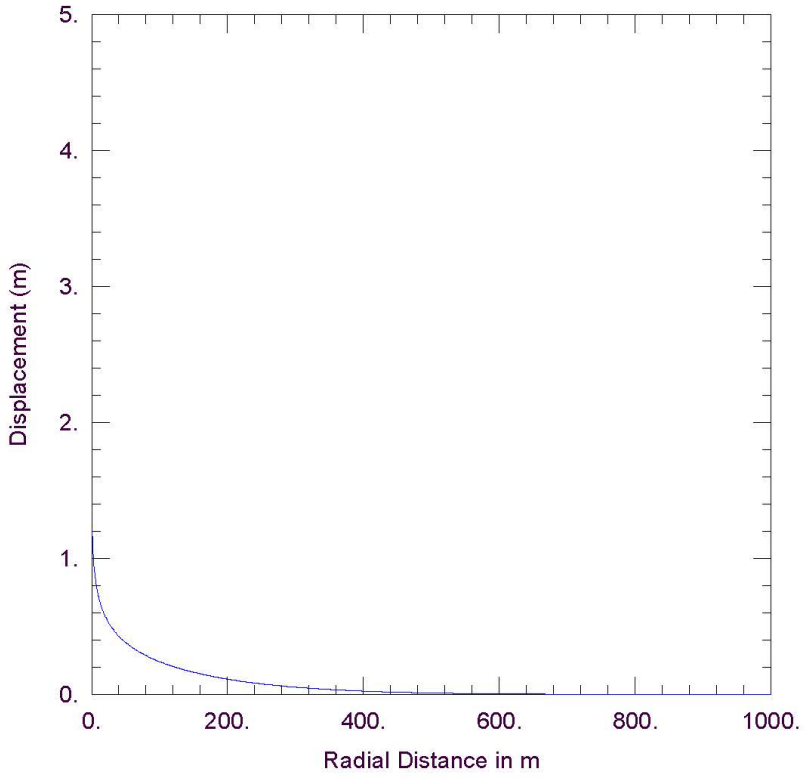
Well Name	X (m)	Y (m)
OB1	1000	0
Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
T = 1000. m^2/day
Kz/Kr = 0.001

Solution Method: Theis
S = 0.0017
b = 40. m

B.2 Yarragadee Pump Test at 15.4L/s – 500 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Yarragadee_15.4Ls_12h_Theis.aqt
Date: 08/14/26 Time: 10:51:31

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

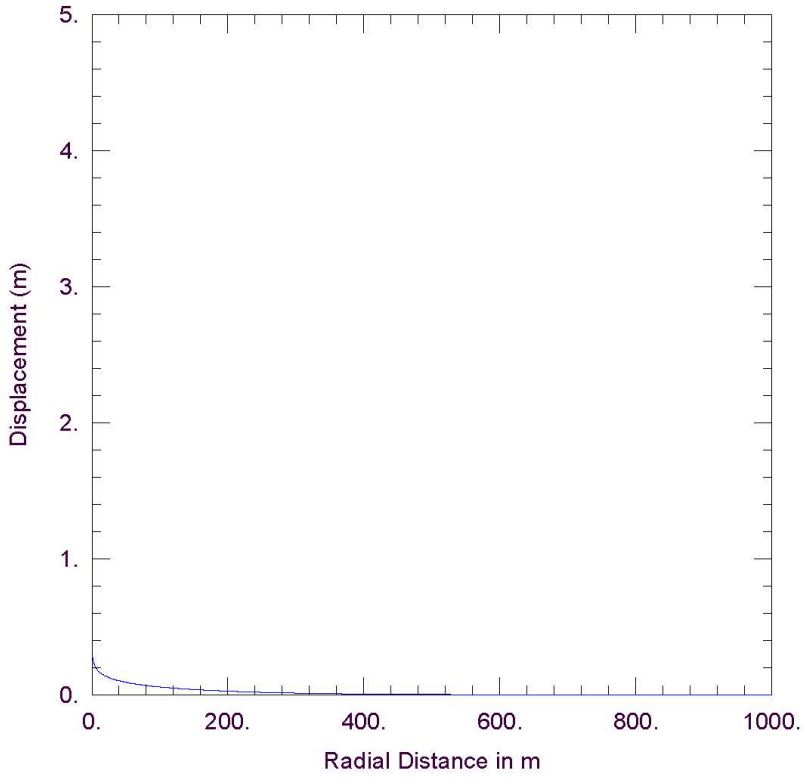
Well Name	X (m)	Y (m)
OB1	1000	0
Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
T = 1000. m^2/day
Kz/Kr = 0.001

Solution Method: Theis
S = 0.0017
b = 40. m

B.3 Yarragadee Pump Test at 3.7L/s – 400 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Yarragadee_3.7Ls_10h_Theis.aqt
Date: 08/14/26 Time: 09:50:46

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

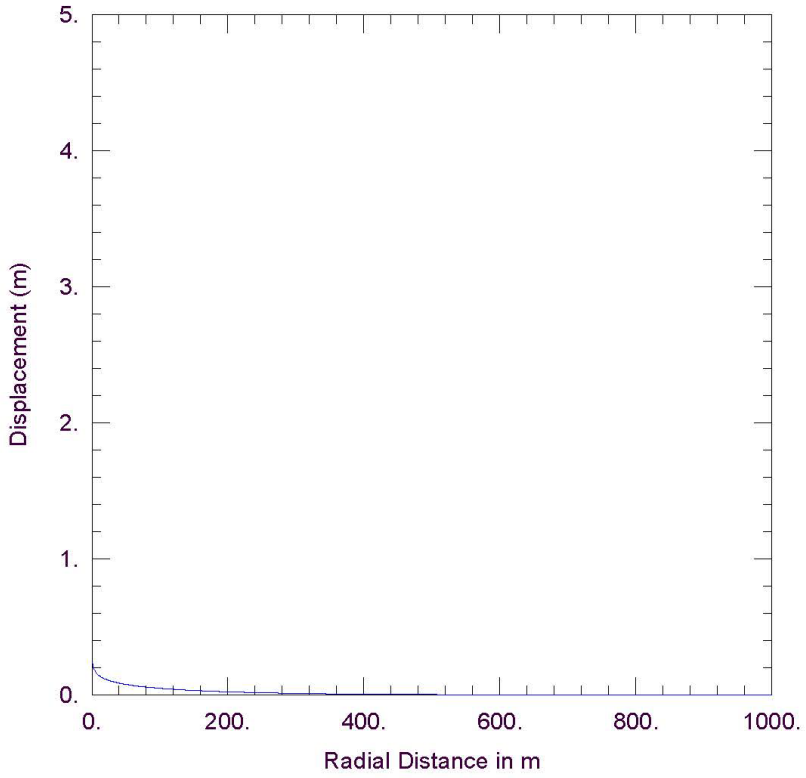
Well Name	X (m)	Y (m)
▫ OB1	1000	0
▫ Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 1000. m^2/day
Kz/Kr = 0.001
S = 0.0017
b = 40. m

B.4 Yarragadee Pump Test at 3.1L/s – 340 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Yarragadee_3.1Ls_12h_Theis.aqt
Date: 08/14/26 Time: 12:22:28

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

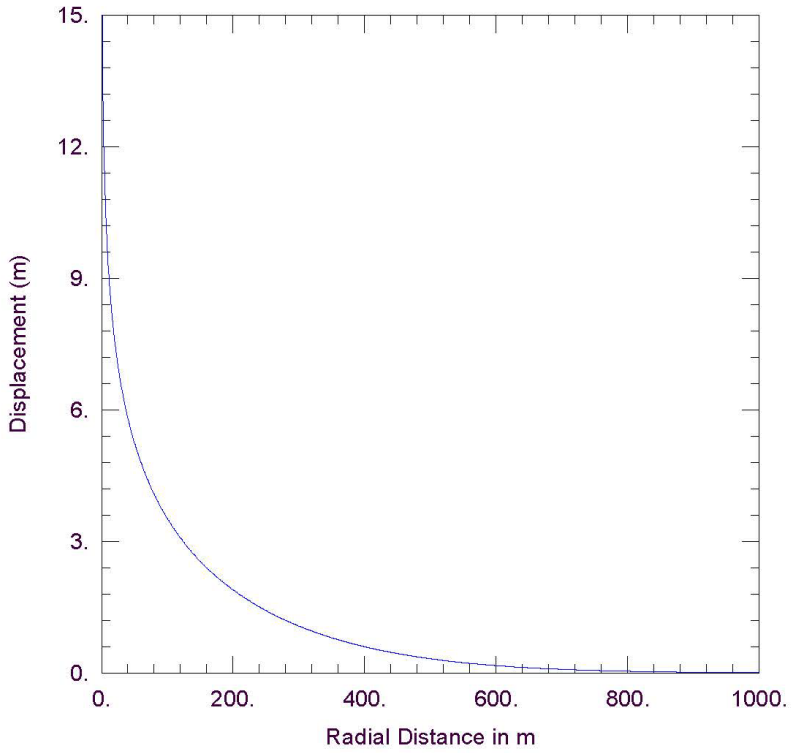
Well Name	X (m)	Y (m)
▫ OB1	1000	0
▫ Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 1000. m^2/day
Kz/Kr = 0.001
S = 0.0017
b = 40. m

B.5 Parmelia Pump Test at 18.5L/s – 850 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Parmelia_18.5Ls_10h_Theis.aqt
Date: 08/14/26 Time: 09:35:08

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

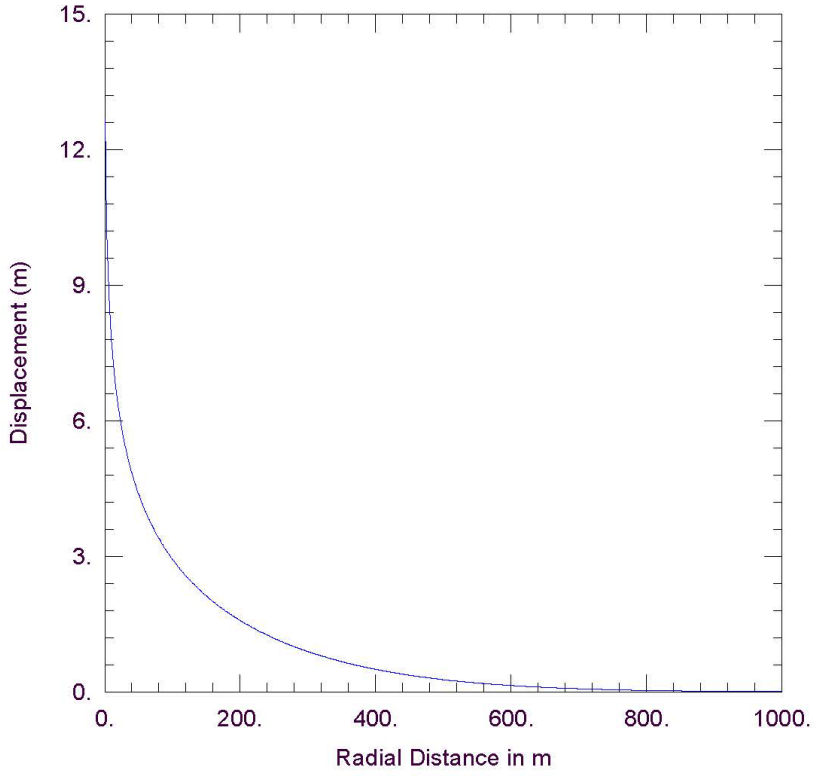
Well Name	X (m)	Y (m)
▫ OB1	1000	0
▫ Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 100. m^2/day
Kz/Kr = 0.001
S = 0.0001
b = 40. m

B.6 Parmelia Pump Test at 15.4L/s – 830 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Parmelia_15.4Ls_12h_Theis.aqt
Date: 08/14/26 Time: 10:58:32

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

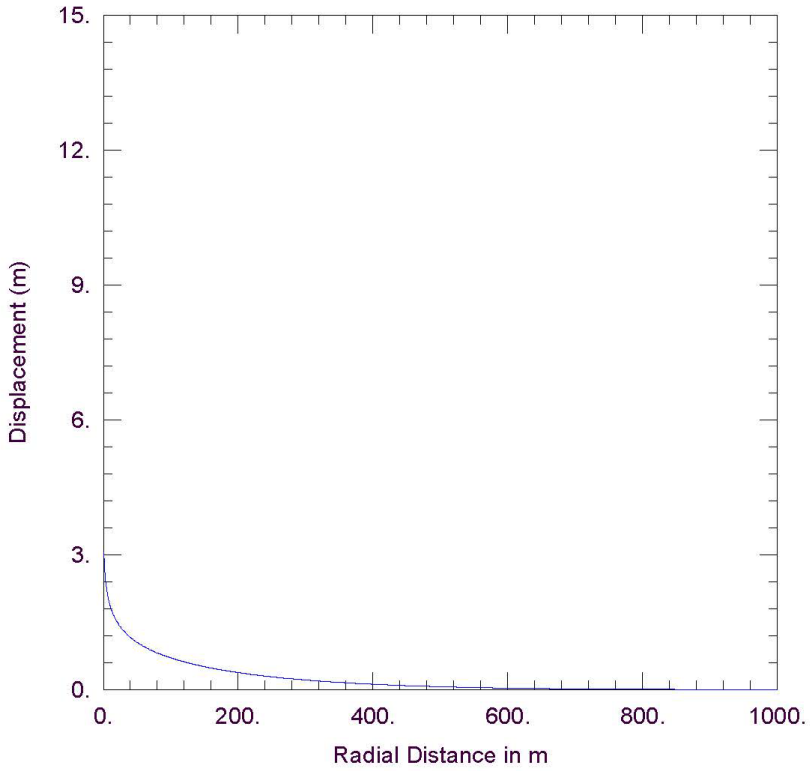
Well Name	X (m)	Y (m)
▫ OB1	1000	0
▫ Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 100. m^2/day
S = 0.0001
Kz/Kr = 0.001
b = 40. m

B.7 Parmelia Pump Test at 3.7L/s – 630 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Parmelia_3..71Ls_10h_Theis.aqt
Date: 08/14/26 Time: 09:38:02

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

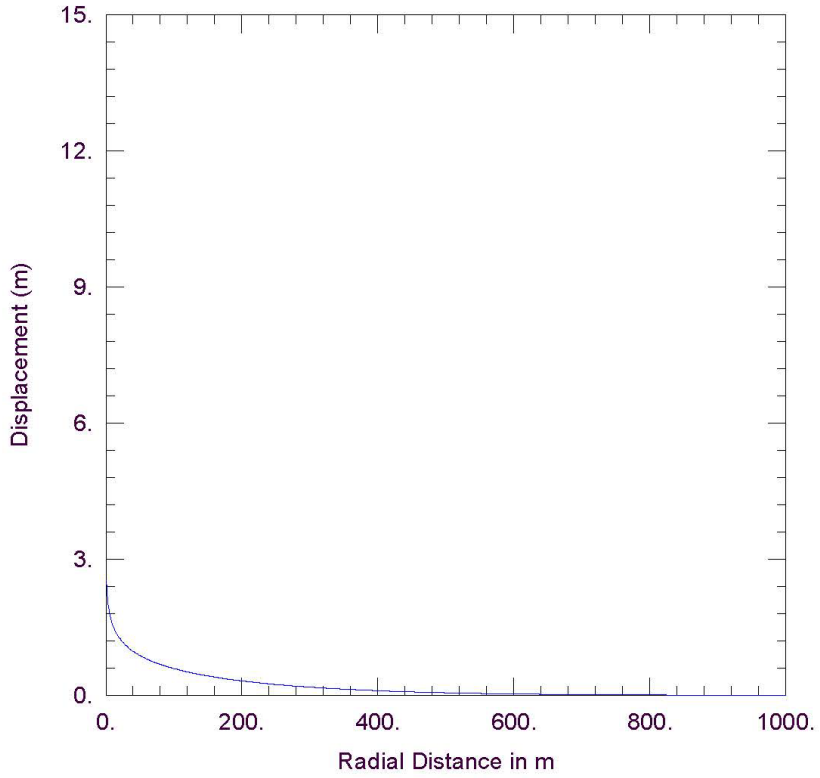
Well Name	X (m)	Y (m)
OB1	1000	0
Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 100. m^2/day
S = 0.0001
Kz/Kr = 0.001
b = 40. m

B.8 Parmelia Pump Test at 3.1L/s – 600 m Cone of Depression



WELL TEST ANALYSIS

Data Set: C:\...\DinnerHill_Parmelia_3.1Ls_12h_Theis.aqt
Date: 08/14/26 Time: 10:55:11

PROJECT INFORMATION

Company: Umwelt
Client: DHWF
Location: DH
Test Well: test1
Test Date: 29/03/2026

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
Pumping Well	0	0

Observation Wells

Well Name	X (m)	Y (m)
OB1	1000	0
Pumping Well	0	0

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 100. m^2/day
Kz/Kr = 0.001
S = 0.0001
b = 40. m

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