

GARDEN GULLY PROJECT

**SUBTERRANEAN
FAUNA ASSESSMENT
CROWN PRINCE DEPOSIT**

**REPORT FOR
ORA GOLD LIMITED**

NOVEMBER 2024



Rockwater
HYDROGEOLOGICAL AND ENVIRONMENTAL CONSULTANTS



Report No. 586.1/24/01

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	SUBTERRANEAN FAUNA POLICY AND GUIDANCE	1
2	EXISTING ENVIRONMENT	2
2.1	CLIMATE	2
2.2	TOPOGRAPHY AND DRAINAGE	2
2.3	IBRA SUBREGIONS	2
2.4	GEOLOGY AND HYDROGEOLOGY	3
3	SUBTERRANEAN FAUNA DESKTOP STUDY	4
3.1	PREVIOUS SURVEYS AT GARDEN GULLY	4
3.2	SUBTERRANEAN FAUNA OF THE REGION	4
3.2.1	DATABASE SEARCHES	4
3.3	LITERATURE REVIEW	5
3.4	HABITAT AND DISTRIBUTION	8
3.4.1	ASSESSMENT OF POTENTIAL TROGLOFAUNA HABITAT	9
3.4.2	ASSESSMENT OF POTENTIAL STYGOFANA HABITAT	13
3.5	POTENTIAL IMPACTS OF MINING AT CROWN PRINCE DEPOSIT	15
3.5.1	CUMULATIVE IMPACTS	16
4	SAMPLING METHODOLOGY	17
4.1	SITE SELECTION	17
5	RESULTS AND DISCUSSION	18
6	CONCLUSIONS	20
	REFERENCES	22

Tables

Table 1: Average rainfalls and Dam Evaporation, Meekatharra (mm)	2
Table 2: Defined Search Parameters of Database and Internet Sources	4
Table 3: Subterranean Fauna Projects in the vicinity of Garden Gully	6
Table 4: Potential Direct and Indirect Impacts to Subterranean Fauna	16
Table 5: Number of Stygofauna Samples Collected at the Garden Gully Project – October 2024	17
Table 6: Results of stygofauna sampling at Garden Gully	19

Plate

Plate 1: Unsaturated geological sequence at site OGGDD524 (0 to 10.3 m below ground level), located in the central part of the deposit.	9
Plate 2: Unsaturated geological sequence at site OGGDD536 (0 to 10.3 m below ground level), located in the central part of the deposit.	10
Plate 3: Unsaturated geological sequence at site OGGDD537 (3.8 to 14.1 m below ground level), located in the south-eastern part of the deposit.	11
Plate 4: Unsaturated geological sequence at site OGGDD538 (0 to 13.2 m below ground level), located in the south-western part of the deposit.	12
Plate 5: Saturated geological sequence at site OGGDD524 (52.2 to 57 m below ground level), located in the central part of the deposit.	13
Plate 6: Representative core photograph at site OGGDD536 (31 to 38.7 m below ground level), located in the central part of the deposit.	14
Plate 7: Representative core photograph at site OGGDD537 (20 to 20.3 m below ground level), located in the south-eastern part of the deposit.	14
Plate 8: Saturated geological sequence at site OGGDD538 (57.3 to 67.7 m below ground level), located in the south-western part of the deposit.	15



TABLE OF CONTENTS

(Continued)

Figures

- 1 Site Locality
- 2 Regional Geology
- 3 Site Layout
- 4 Database Searches
- 5 Stygofauna Sampled Sites
- 6 Stygofauna Sampling Results

Appendix

- I Stygofauna Site Details and Field Water Quality Data Crown Prince

REVISION	AUTHOR	REVIEW	AUTHORISED	ISSUED
Rev 0	DS/NE	NE	NE	17/10/2024
Rev 1	DS/NE	PW	NE	26/11/2024

DISCLAIMER

This report has been prepared by Rockwater for Ora Gold Limited. Copyright and intellectual property associated with the document belong to Rockwater and Ora Gold Limited. No part of this work may be reproduced in any material form or communicated by any means without the permission of the copyright owner. This work has been carried out primarily for the purposes of environmental impact assessment under the Environmental Protection Act, and for evaluation by the Environmental Protection Authority (EPA WA) and other regulators including Department of Energy, Mines, Industry Regulation and Safety and the Department of Water and Environmental Regulation. The report presents interpretations by experienced practitioners of geological, hydrogeological and environmental conditions based on data that provide only a limited view of the subsurface, or the natural environment. Such conditions may vary in space or over time from the conditions indicated by the available data, and Rockwater accepts no responsibility for the consequences of such changes where they could not be reasonably foreseen from available data. At the time the document was prepared, current versions of plans, maps and spatial data were used, as provided by the client. Where possible, throughout the document the sources of data used have been identified. Unless stated otherwise, Rockwater has not verified such data and information. Rockwater does not represent such data and information as true or accurate, and disclaims all liability with respect to the use of such data and information. All parties relying on this document, do so entirely at their own risk in the knowledge that the document was prepared using some information that Rockwater has not verified.



1 INTRODUCTION

Ora Gold Limited is planning to mine gold at its Crown Prince deposit at Garden Gully, about 16 km north-north-west of Meekatharra (Figure 1). The Garden Gully Project (the Project), comprises a tenement package of several gold prospects covering the Abbots greenstone belt. There has been a long mining history at Garden Gully, with historical disturbance and groundwater extraction from several mining campaigns dating back to 1897.

Mining of the Crown Prince gold deposit has the potential to impact substrates that may provide habitat for subterranean fauna (stygo fauna and troglo fauna) in the vicinity of the Project. As such, Ora Gold engaged Rockwater to undertake a subterranean fauna investigation for the Project, to inform permitting applications and environmental approvals.

Subterranean fauna are defined as fauna which live their entire lives (obligate) below the surface of the earth (EPA 2016). Stygo fauna are aquatic and inhabit the groundwater environment, whereas troglo fauna are air-breathing and occur in suitable cavities of the unsaturated vadose zone (i.e. above the water table).

This report presents the findings of an initial subterranean fauna desktop study undertaken for the Project, to provide contextual information on the project setting, and to assess the potential for subterranean fauna in areas likely to be impacted by mining. The report also outlines the scope and findings of a basic stygo fauna survey at Garden Gully, undertaken in accordance with EPA guidelines following the desktop study.

1.1 SUBTERRANEAN FAUNA POLICY AND GUIDANCE

The EPA's framework for consideration of subterranean fauna during EIA is outlined in its *Technical Guidance - Subterranean fauna surveys for environmental impact assessment* (EPA 2021). The document provides guidance on the level of survey required for proponents and the information required to understand impacts. Also relevant is the EPA's *Environmental Factor Guideline – Subterranean Fauna* (EPA 2016). The following report considers relevant guidance for assessment of subterranean fauna.

2 EXISTING ENVIRONMENT

2.1 CLIMATE

Garden Gully is located within the Arid Region as delineated in Australian Rainfall and Runoff 1987. The nearest Bureau of Meteorology (BoM) station with a long data record is at Meekatharra Airport (Stn. 007045), located 19 km south-east of the project site.

Rainfall at Meekatharra Airport has been recorded since 1944. Annual rainfall is highly variable, ranging from 66 mm to 573 mm over the period of record. The long-term mean annual rainfall is 234 mm, with the month of February having the highest monthly average of 36.1 mm and September the lowest at 5.0 mm (Table 1). Rainfall over the winter months is generally associated with the passage of cold fronts from May through to August. Summer rainfall is highly erratic, and generally results from thunderstorms or cyclonic weather activity in the north.

Table 1: Average rainfalls and Dam Evaporation, Meekatharra (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall	29.2	36.1	30.8	18.8	21.6	28.5	20.0	10.6	5.0	6.0	11.7	14.4	234.0
Dam Evap.	380	314	267	190	131	87	92	121	170	259	293	333	2,637

Average dam evaporation (Luke, Burke, and O'Brien, 1988) is also given in Table 1. It exceeds average rainfall in all months, and by a factor of 11 overall.

Monthly mean maximum temperatures at Meekatharra range from 19.3 °C in July to 38.4 °C in January; and monthly mean minimum temperatures range from 7.5 °C in July to 24.4 °C in January.

2.2 TOPOGRAPHY AND DRAINAGE

The Murchison bioregion has low hills and mesas separated by flat colluvium and alluvial plains (DCCEEW 2024a). The land surface of the alluvial plain in the vicinity of Garden Gully is bisected by a minor drainage known as Garden Gully. Garden Gully drains a moderately-large catchment that lies to the north and east of Garden Gully (Rockwater 2024). It drains to the south-west, towards Hope River, a palaeodrainage (located 35 km from the project site) that is a zone of groundwater (and surface water) discharge.

2.3 IBRA SUBREGIONS

The Interim Biogeographic Regionalisation for Australia (IBRA) is a biogeographic regionalisation of Australia developed by the Australian government's Department of Climate Change, Energy, the Environment and Water. The bioregions and subregions are the reporting unit for assessing the status of native ecosystems and their level of protection in the National Reserve System.

The Garden Gully Project lies within the Murchison bioregion in the southern rangelands of Western Australia, and is described as:

Mulga low woodlands, often rich in ephemerals, on outcrop and fine-textured Quaternary alluvial and eluvial surfaces mantling granitic and greenstone strata of the northern part of the Yilgarn Craton. Surfaces associated with the occluded drainage occur throughout with hummock grasslands on Quaternary sandplains, saltbush shrublands on calcareous soils and Halosarcia low shrublands on saline alluvia. Areas of red sandplains with mallee-mulga parkland over hummock grasslands occur in the east (DCCEEW 2024b).

The Murchison IBRA area has a 6.9% protection level; that is less than 7 % of the area is represented in the National Reserve System.

2.4 GEOLOGY AND HYDROGEOLOGY

The Tieraco 1:100,000 Geological map for the area (Chen and Ivanic, 2009) shows that the Garden Gully gold deposits are situated in an area of colluvial footslope (including ferruginous gravel and duricrust) with a northerly-trending, Proterozoic dolerite dyke. The Project location and regional geology are shown in Figure 2.

A description of the Archaean geology in the area of the Kyarra workings at Garden Gully, close to the Meekatharra Mount Clere Road is taken from St Barbara (1994). The mineralised area is underlain by undifferentiated felsic sedimentary rocks to the west, sheared felsic volcanic and volcanoclastic rocks to the east, with some local mafic to ultramafic units. Further east there is a thin unit of Stockyard Basalt, and then granitic intrusives. Geological interpretation by Boddington (2015) shows the host rock to be mainly a mafic volcanic (dolerite or basalt) with some ultramafic units (talc-chlorite and sericite schists).

Gold mineralization is associated with steeply dipping quartz veins within a series of anastomosing ductile shear zones. The linear drainage of Garden Gully is interpreted to follow a cross-cutting, north-easterly trending fault (Garden Gully Shear Zone) which truncates rock units to the south. Three other north-north-easterly trending faults are shown truncating mineralised zones on a plan in the Ora Gold October 2023 Investor Presentation. Aeromagnetic survey results for the area (MagSpec, 2016) show a complex structure for the area, including apparent northerly faults trending west of north, and east – west faults.

Photographs from four diamond-cored drillholes at Garden Gully, cored from ground surface, indicate that the main permeable broken zones are weathered, sheared mafics (generally dolerite) or ultramafics; or altered quartz mineralised zones (Rockwater 2024). Locations of the strongly-jointed core zones are shown in Figure 3. Most of the rocks below 90 m downhole (at 60° dip) appear to be weakly jointed and of relatively low permeability, although locally some open fractures extend down to about 140 m depth (downhole).

Many drillholes were recorded as having intersected water during drilling, commonly from depths below about 12 to 30 m (downhole) in completely oxidised or transition-zone rocks. Five drillhole logs recorded faults or shears along a north-north-easterly line. A number of drillholes intersected high water flows from strongly fractured rocks or stopes. The locations of the high-flow zones, faults and shears are shown in Figure 3. Three faults that are within the envelope of the planned western pit are reported to have yielded high airlift water rates (up to 20 L/s in some drilled holes).

A tributary palaeochannel of Tertiary age follows the Garden Gully drainage on its northern side (Fig. 3) and has been defined by a passive-seismic survey (Resource Potentials, 2024). The survey results suggest that the palaeochannel is about 70 m deep. The palaeochannel is likely to contain basal sands (Werillup Formation). One drillhole north of the drainage is reported to have intersected about 100 m of sand; and the Main Roads bore probably intersects the southern edge of the channel. The palaeochannel that has been delineated by the passive seismic survey is likely to contain basal sands of moderate permeability.

3 SUBTERRANEAN FAUNA DESKTOP STUDY

3.1 PREVIOUS SURVEYS AT GARDEN GULLY

There are few records of subterranean fauna in the Murchison region of Western Australia, and no publicly available records that indicate surveys for stygofauna or troglafauna have been undertaken in the Garden Gully area.

3.2 SUBTERRANEAN FAUNA OF THE REGION

3.2.1 DATABASE SEARCHES

A number of database searches were undertaken to detail any stygofauna or troglafauna previously recorded near to the Project area, and to identify if any threatened/priority ecological communities (TEC's/PEC's) relating to subterranean fauna or threatened fauna species occur in the vicinity of the Project. The database search areas are specified in Table 2.

Database sources included:

- Dandjoo Database of Western Australia;
- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened Fauna and TEC/PEC databases; and
- Atlas of Living Australia (ALA).

Table 2: Defined Search Parameters of Database and Internet Sources

Data Source	Search Area	No of records (un-screened)	No of records (screened for subterranean habitats)
DBCA TEC/PEC	100 km radius	9	4
DBCA Dandjoo Database		3,171	91
ALA	200 by 150 km rectangle	5,278	19

DBCA Threatened and Priority Ecological Community (TEC/PEC) database search

Results of a Threatened and Priority Ecological Community (TEC/PEC) database search confirmed that there are no TECs relating to subterranean fauna within a 100 km radius of the Project. The search returned several Priority Ecological Communities (PEC) pertaining to stygofauna communities in calcrete habitats, with all five communities listed occurring (at least partially) within a 50 km radius of the project (Figure 4). The nearest of these PECs is the (Priority 1) Belele calcrete groundwater assemblage, with its spatial buffer being approximately 34 km to the west of Garden Gully Project (Figure 4).

DBCA Threatened and Priority Fauna

A search of DBCA's Threatened and Priority Fauna database was screened for subterranean records within a 100 km radius of the Project. No subterranean fauna species were listed in the search results.

3.3 LITERATURE REVIEW

A literature review was conducted to gather existing information on subterranean fauna near to the Project area, using publicly available technical reports. The results of the closest of these reported studies are presented in Table 3, and locations of the projects are shown in Figure 1.

The closest record of subterranean fauna to Garden Gully is at Andy Well, 29 km to the north-north-east, within the Meekatharra-Wyldgee greenstone belt. Andy Well sits in the Murchison Mineral Field of the Yilgarn Craton, in a sequence of granite and granodiorite intrusions of basalt and porphyry rocks. Superficial cover includes degraded laterite profiles and ferruginised rubble and colluvium over areas of subdued relief. This grades into sheetwash deposits 5 to 8 metres thick, and alluvium in surrounding watercourses related to northwesterly flowing tributaries to the Yalgar drainage system. Alluvial cover over the Yalgar drainage system ranges up to 30 metres thick overlying channel clays up to 100 metres thick.

A subterranean fauna assessment for the Andy Well Project recorded 21 stygofauna species, including Nematoda, Rotifera, Aphanoneura, Oligochaeta, Ostracoda, Copepoda, Syncarida and Amphipoda (Bennelongia 2011). All but two species were recorded from both the mine footprint “impact area” and reference sites, which included nearby calcretes with known significant stygofauna assemblages (Karalundi and Killara North Calcretes). The two remaining species were known to be widespread species. Consequently, development of the Project was not considered to be a significant risk to conservation of stygofauna of detrital aquifers (alluvium and colluvium) at Andy Well. Two troglofauna species were also recorded; an isopod and a polyxenid. Neither species of troglofauna was restricted to the mine footprint “impact area”.

Results of a survey of the adjacent Gnaweeda gold project (Bennelongia 2017) demonstrated a depauperate stygofauna community and absence of troglofauna in subterranean habitats including fractured rock and overlying colluvium. Two stygofauna species were recorded, with both species found to be widespread across Australia. The survey, combined with results of a desktop review suggested that the Project would not significantly threaten species or communities of subterranean fauna.

Stygofauna has also been found from fractured rock habitats at three other projects within 100 km of Garden Gully (Table 3, Figure 1). In addition, sampling for subterranean fauna in granite and granodiorite habitats at the Yangibana Rare Earths Project in the Gascoyne region (~350 km northwest of Garden Gully) yielded several species of both stygofauna and troglofauna (Bennelongia 2018). All stygofauna species from the project area were found to be widespread, and also occurred in samples from nearby calcrete aquifers, which were considerably more diverse than habitats of the project area.

In other parts of the Yilgarn Craton, fractured rock aquifers have yielded few records of stygofauna, and where present, stygofauna communities have generally been found to be depauperate. Surveys in greenstone belts from Ravensthorpe to north of Southern Cross have recorded occasional records of stygofauna (e.g. Rockwater 2009 a, b, c, d; Bennelongia 2009a; GHD 2009). Where surveys of fractured rock aquifers have recorded stygofauna, cyclopoid and harpacticoid copepods appear to be the most common groups found in these habitats; however, these are typically in very low numbers.

Surveys of fractured rock habitats in the Yilgarn have also yielded occasional records of troglofauna. These studies have typically been associated with banded ironstone geology, or calcretes. Surveys of BIF habitats in the Yilgarn at Koolyanobbing, Mt Jackson, Mt Dimer, Lake Giles, Mt Caudan and the Watt and Yendilberin Hills have yielded depauperate to moderately rich troglofauna communities (Bennelongia 2008a, b, 2009a,b; Rockwater 2009a, 2010, 2011). Sampling of other fractured rock habitats comprising mafic units (amphibolites, basalt, dolerite and gabbro) have also yielded occasional records (e.g. Rockwater 2009d, 2010) indicating that troglofauna habitat is present across a range of geological units that are typically found in greenstones of the Yilgarn Craton.

Table 3: Subterranean Fauna Projects in the vicinity of Garden Gully

Site	Distance to GG	Reference / Year	Geological Setting	Studied for	Results
Andy Well	32 km north-north east	Bennelongia, 2011	Surface covering of colluvial deposits up to 11 m thick, which overlie basement rock (metabasalt) weathered to form saprolite and saprock, with the rock freshening with depth. All stygofauna recorded from sites with the surficial colluvium (and alluvium in reference sites)	Stygofauna	The survey recorded 21 stygofauna species from 71 samples in the Andy Well Project Survey; comprising Nematoda, Rotifera, Aphanoneura, Oligochaeta, Ostracoda, Copepoda, Syncarida and Amphipoda. Six of the 21 species were recorded from the impact footprint of the Andy Well Project. The study confirmed no stygofauna species were restricted to the detrital aquifers of the Andy Well Project, and the integrity of the nearby Priority 1 PECs at Karalundi and Killara North calcretes would not be threatened by the proposed mining. It was concluded that the proposed mining at Andy Well would not threaten stygofauna conservation values or the persistence of any stygofauna species.
				Troglofauna	A desktop assessment concluded that the risk to troglofauna from mining at Andy Well Project was low to very low. A field survey of 25 samples yielded a depauperate troglofauna community of two species (1 isopod and 1 polyxenid). Neither species was recorded within the Andy Well impact footprint and mining activities at the Project were not considered to be a threat to their persistence.
Gnaweeda	34 km north-east	Bennelongia, 2017	Alluvial and colluvial (detrital) deposits overlying deeply-weathered volcanic and sedimentary rocks	Stygofauna Desktop and Level 1 Sampling	A desktop assessment recorded three stygal specimens from three species within 10 km of the project. Targeted sampling of the mine impact areas (10 samples) recorded three specimens from two stygofauna species, the cyclopoid copepod <i>Mesocyclops notius</i> and the ostracod <i>Cypretta seurati</i> . Both species are widespread and have been recorded across Australia. Survey results were consistent with the desktop review and demonstrated a depauperate stygofauna community
				Troglofauna Desktop and Level 1 Sampling	A desktop assessment compiled nearby troglofauna records and revealed four troglofauna species collected within 10 km of the project (taken as part of the Andy Well sampling programme). These included at least two isopod species, a millipede and a symphylan. Targeted sampling of the Gnaweeda impact area returned no troglofauna. The study concluded that troglofauna at the Project will be depauperate.

Site	Distance to GG	Reference / Year	Geological Setting	Studied for	Results
Murchison Gold Project – St Annes	34 km north-east			Desktop Assessment and Baseline Level 1 Survey	Twelve sites were sampled and five stygofauna species were collected, with most species determined to be widespread. The exception being one Ostracod species, which has not been collected elsewhere.
					Twelve sites were sampled for troglofauna, yielding three species; two millipede (Diplopoda) species and a slater (Isopoda: Oniscridea). No species were restricted to the impact area and the study concluded that troglofauna at the Project is be depauperate.
Gabanintha Vanadium Project (Australian Vanadium Project)	52 km south-east	Biologic 2021	Alluvial and colluvial deposits, ferruginous duricrust and felsic volcanic rock overlaying magnetite banded gabbro units	Stygofauna Desktop and Level 2 Sampling	A total of 1,460 stygofaunal and amphibious specimens were collected representing 34 unique taxa belonging to Nematoda, Aphanoneura, Oligochaeta, Syncarida, Copepoda and Ostracoda. Of these, nine species comprised regionally widespread, cosmopolitan, and higher order taxa. The remaining twenty-five species were recorded for the first time during the surveys and are currently only known from the Study Area. Eleven of the 25 species unique to the Study Area are amphibious enchytraeid worms that are not regarded as SREs. The remaining species comprise stygobites and potential stygobites.
				Troglofauna Desktop and Level 2 Sampling	Eleven troglofauna species were recorded, belonging to nine taxonomic groups: Pseudoscorpiones, Isopoda, Diplura, Zygentoma, Geophilida, Scolopendrida, Polyxenida, Pauropoda and Symphyla. Seven taxa were recorded from the Mining Area, two from the Water Supply Area and two from regional sites.
Gidgee Gold Project	90 km south-east	MBS 2013	Fractured Rock	Stygofauna – Level 1	Sixteen stygofauna species were recorded from 10 of the 20 sites sampled. Nine of these are considered common and widespread within the region and Western Australia. One juvenile Anzyclops sp. was collected and could not be identified to species level but is likely to be Anzyclops sp. B04. The remaining six are new undescribed species based on morphological differences.
				Troglofauna – Desktop only	A desktop review of potential habitat determined that the geology and hydrogeology of Gidgee was not suitable to support significant or unique troglofaunal habitat

3.4 HABITAT AND DISTRIBUTION

The probability that a site contains a diverse subterranean fauna community is largely determined by the region in which a site occurs, and biophysical attributes such as local geology. Geological, topographical and hydrological features influence subterranean faunal assemblages by allowing, or restricting, dispersal between populations. For stygofauna, karstic limestone and calcrete aquifers, alluvial formations and fractured rock habitats have historically been shown to provide stygofauna habitat in other parts of the Yilgarn Craton.

For troglofauna, the EPA notes that the probability of rich troglofauna assemblages in the Gascoyne and Murchison regions of Western Australia is typically only high where local geology includes calcrete, alluvium or banded ironstone (EPA 2007).

In the vicinity of the Crown Prince deposit, there are three geological formations that may provide habitat for subterranean fauna. These are;

- Ferruginous gravel and duricrust in the colluvial footslope;
- Fractured rock; and
- Calcrete associated with a tributary palaeochannel to the north of Garden Gully drainage.

The suitability of local geological formations as habitat for subterranean fauna can further be assessed by the presence of suitable voids within the rock type, which provide habitat spaces, and conduits for infiltration of oxygen and nutrients from the surface. Features such as fractures, vugs, and other voids in suitable lithologies facilitate fauna dispersal and infiltration of nutrients and organic material. These characteristics are considered essential for subterranean fauna habitat. Other important features include depth to surface, adjacent strata, geomorphology, vegetation types and presence of tree roots.

Locally, Ora Gold geologists have not encountered any cavities or vuggy sections of the surface duricrust layer within any drill holes at Crown Prince. The specific lithologies of the Crown Prince gold deposit at Garden Gully, combined with very shallow groundwater levels, suggests that potential troglofauna habitat is not widespread in the Project area.

Measured groundwater levels in the vicinity of the planned Crown Prince open pits are typically <10 m below ground level (bgl), with measured water levels ranging between 5 and 11 m bgl in drill holes and bores across the Project area. Initial hydrogeological studies indicate that the groundwater has a salinity of 690-3,500 mg/L TDS, and is circumneutral to slightly alkaline (pH 7.05-8.20, Rockwater 2024). These groundwater conditions appear to be conducive to stygofauna habitat, based on measured water quality ranges for groundwaters containing stygofauna in other parts of Western Australia.

The potential for the presence of subterranean habitats at the Crown Prince deposit was assessed using photos of diamond drill core at 4 holes across the Project area. These were inspected in detail and cross-referenced with lithological codes. Drill core photos were reviewed for any characteristic features such as vugs, fractures, holes, or pore spaces, pre-existing fractures (those show staining from groundwater, rather than fresh mechanical fractures from drilling), coarse gravel layers, or areas of significant core loss, which might indicate a subterranean cavity. The data was also inspected for key lithologies which, when sufficiently weathered or porous, are known to provide habitat for subterranean fauna in other parts of the Yilgarn Craton. Results of the assessment of diamond drill core are presented in section 3.4.1 (for troglofauna) and section 3.4.2 (for stygofauna).

3.4.1 ASSESSMENT OF POTENTIAL TROGLOFAUNA HABITAT

Four diamond core holes drilled from or near surface at Garden Gully provide insitu profiles of the geological sequence above the water table. Groundwater occurs at approximately 5 to 11 metres below ground level (bgl) at the deposit, and the unsaturated overburden consists of clay-rich duricrust. No vugs or cavities have been observed in diamond drill cores, or noted by site geologists in other drilling. Any voids formed in the weathering process have been filled with clay and are unlikely to support troglofauna.

Core photographs for the unsaturated sections of four diamond holes are presented in Plates 1 to 4 and the locations of the diamond holes are shown in Figure 5. The clay-rich profiles associated with surface detritals above the shallow water table at Crown Prince deposit are unlikely to support troglofauna.



Plate 1: Unsaturated geological sequence at site OGGDD524 (0 to 10.3 m below ground level), located in the central part of the deposit.



Plate 2: Unsaturated geological sequence at site OGGDD536 (0 to 10.3 m below ground level), located in the central part of the deposit.



Plate 3: Unsaturated geological sequence at site OGGDD537 (3.8 to 14.1 m below ground level), located in the south-eastern part of the deposit.



Plate 4: Unsaturated geological sequence at site OGGDD538 (0 to 13.2 m below ground level), located in the south-western part of the deposit.

3.4.2 ASSESSMENT OF POTENTIAL STYGOFAUNA HABITAT

Selected diamond core photographs from the four holes shown in Figure 5 outline the geological sequences of saturated sections of the deposit within the planned Crown Prince pits. All holes were drilled at -60° and depths discussed herein have been converted to vertical depth below ground level (bgl). Groundwater occurs at approximately 5 to 11 m bgl at the deposit. A clay-rich duricrust extends to approximately 13 to 40 m vertical depth at the deposit, below which weathered dolerite occurs to about 30 to 100 m bgl. Broken and fractured sections of this unit may provide potential habitat for stygofauna. Plates 58 show sections of broken/fractured ground below the water table that indicates areas of higher permeability within the Crown Prince gold deposit. The most prospective areas appear to be at top of the weathered dolerite, and considerably more fracturing is noted for holes intersecting faults (as mapped on Figure 3).



Plate 5: Saturated geological sequence at site OGGDD524 (52.2 to 57 m below ground level), located in the central part of the deposit.



Plate 6: Representative core photograph at site OGGDD536 (31 to 38.7 m below ground level), located in the central part of the deposit.



Plate 7: Representative core photograph at site OGGDD537 (20 to 20.3 m below ground level), located in the south-eastern part of the deposit.



Plate 8: Saturated geological sequence at site OGGDD538 (57.3 to 67.7 m below ground level), located in the south-western part of the deposit.

3.5 POTENTIAL IMPACTS OF MINING AT CROWN PRINCE DEPOSIT

Impacts to subterranean fauna are defined by the EPA's *Environmental Factor Guideline: Subterranean Fauna* (EPA 2016). These impacts may be direct or indirect.

Direct impacts include the removal or destruction of habitat by drawdown of water levels, inundation, or water quality changes. The main threats include excavation of rock types/habitat known to support subterranean fauna; groundwater extraction for process or domestic purposes; dewatering to facilitate mining below the water table, and groundwater reinjection of waste or excess water.

Indirect impacts include changes to hydrology, siltation, void collapse, alteration to nutrient balance and contamination. The main threats include changed surface topography due to compaction or creation of hard surfaces resulting in altered groundwater flow paths, increased runoff, and reduced infiltration and aquifer recharge; clearing of surface vegetation leading to sedimentation and changed nutrient inputs;

potential leaks or leaching including tailings and waste water resulting in alterations to ground water chemistry and quality, and introduction of toxins or radiation; and salinisation due to intrusion of saline water into freshwater aquifers and leaching from pit voids.

The potential impacts to stygofauna and troglofauna associated with mining are summarised in Table 4.

Table 4: Potential Direct and Indirect Impacts to Subterranean Fauna

Impact Type	Description
Direct Impacts (open pit and groundwater drawdown)	Direct impacts to subterranean fauna habitat due to mine development, excavation of open pit (stygofauna and troglofauna) and groundwater drawdown (for stygofauna) due to pit dewatering.
Indirect Impacts (open pit and other mining infrastructure)	Impacts that may modify subterranean habitats, such as clearing and/or modifying landform, and activities associated with construction of infrastructure where such activities cause siltation, void collapse, alteration to nutrient balance and contamination.
Cumulative Impacts	Impacts of Mining Proposal with consideration of other projects/users potentially impacting subterranean fauna. These include: 1. Pit Dewatering (nearby mines) 2. Other groundwater users

Two pits are planned to be mined at Crown Prince, to depths of about 136 m and 53 m, respectively, on the southern side of the Garden Gully drainage (Figure 3), over a three-year period. Model-calculated groundwater-level drawdowns (Rockwater 2024) suggest that the largest drawdowns will occur at the end of mining of the deeper (western pit); and that at the end of mining of both pits, the 0.5 m drawdown contour could extend up to 6.4 km north-south by 3.1 km east-west. The modelled drawdown is shown for the end of mining and dewatering in Figure 5.

The post mining landscape will include pit lakes from the final mine voids, which will be groundwater sinks. Water-balance calculations for the planned pits show that the final, post-mining pit lake levels will be slightly lower than current groundwater levels (Rockwater 2024). In the case of the (shallower) eastern pit, the pre-mining groundwater level and predicted post-mining lake level are so close that it may be a flow through feature. The modelling and water balances also suggest that there will be no seepage from the pit lakes back into the surrounding groundwater.

There will be no direct impacts to troglofauna habitat as a result of the Garden Gully Proposal as the water level is shallow (typically < 10 m below ground surface) and there is limited prospective habitat in the clay-rich detrital profile between the ground surface and water table.

Indirect impacts from clearing and related risks to subterranean habitats such as siltation, void collapse, alteration to nutrient balance and contamination are considered unlikely, given the local geology and small scale of the project.

3.5.1 CUMULATIVE IMPACTS

Cumulative impacts of drawdown from the other mining operations are not considered relevant to the Crown Prince proposal, as there will be no interactions between mine pit dewatering and drawdown associated with any current projects. There are no other significant groundwater users in the area that could impact the aquifers of the Project Area. The Meekatharra Water Reserve, which includes the Sherwood Borefield that provides water for the town, is about 2.5 km from Crown Prince at its closest point (Rockwater 2024). However, the nearest Sherwood Borefield production bore is about 9 km from Crown Prince deposit.

4 SAMPLING METHODOLOGY

The stygofauna sampling methodology implemented for the Garden Gully Project was prepared in accordance with relevant EPA guidance statement (EPA 2021). The investigation constitutes a basic survey following on from the desktop study and the sampling effort complies with the requirements of the EPA.

Sampling was undertaken by Daisy Scott, Senior Environmental Scientist and Nick Eveleigh, Principal Environmental Scientist (both of Rockwater Pty Ltd) in October 2024 in accordance with Regulation 27 Permit No. BA 27 001 173 (Fauna Taking (Biological Assessment) Licence), issued by DBCA.

Prior to stygofauna sampling at each bore, water quality was measured on a bailed sample using a multi-parameter probe. Representative samples were also taken from a selection of open RC and diamond drill holes. Water quality parameter readings (including conductivity, pH, dissolved oxygen, and temperature) were recorded. Measurements of total depth, collar height, diameter and other bore details were also recorded.

Stygofauna sampling was undertaken using modified plankton nets. Each site was sampled using sampling nets with a diameter approximately two-thirds of the bore casing and filter mesh sizes 50 µm and 150 µm. Net samples were obtained by lowering sampling nets into each bore using a reel of braid until they reached the bottom of the bore where they were agitated to disturb sediment and any animals that may be present. Each biological sample was taken using three net-hauls of the 50 µm stygofauna sampling net and three net-hauls of the 150 µm sampling net, which were combined and stored in 120 mL polycarbonate vials. Samples from several reference sites and one impact site were pumped using existing installed pumps. Samples were preserved using 100% (absolute) ethanol.

To avoid contamination between sites, the sampling nets were thoroughly washed with a decontaminant solution (Decon 90) and then rinsed with distilled water. All samples were transported to Perth and forwarded to specialist stygofauna biologists for sorting and identification.

4.1 SITE SELECTION

The 2024 stygofauna sampling programme surveyed a combination of existing monitoring bores at the site, open reverse circulation (RC) exploration holes and diamond drill core holes across the proposed mine pit area and pastoral bores/wells in the immediate surrounds (Fig. 5). Table 5 outlines numbers of stygofauna samples collected by the Garden Gully stygofauna survey.

Eighteen stygofauna samples were collected from Project area impact sites, defined by the modelled 0.5 m drawdown contour of Rockwater (2024). Six additional reference sites were taken from regional bores and wells.

Table 5: Number of Stygofauna Samples Collected at the Garden Gully Project – October 2024

	Number of Samples			Total Samples
	Net	Pump	Total	
Project Area	17	1	18	24
Reference	3	3	6	

5 RESULTS AND DISCUSSION

Surveys of other fractured rock habitats in the Murchison, Gascoyne, and wider Yilgarn Craton have yielded few records of stygofauna or troglifauna, and where present, these subterranean fauna communities have generally been found to be depauperate. Based on previous surveys of similar habitats, there appears to be low potential for significant stygofauna or troglifauna at Crown Prince deposit.

Given the very clayey surface lithology of the Crown Prince deposit and the shallow water table (typically <10 m bgl) there is a low probability that suitable troglifauna habitat exists locally. Therefore, there is a low likelihood of any impacts to troglifauna habitat or troglifauna conservation values associated with the Project.

Stygofauna has generally been found to occur in alluvial or calcrete aquifers in the region. Stygofauna communities of alluvial aquifers have generally been shown to be widespread, and are unlikely to have restricted distribution ranges (at individual project scales).

There are no calcrete or karstic formations in the Project area; however, several bores located upstream of the Ora Gold project intersected significant thicknesses of porous calcrete that have historically had moderately high groundwater yields (Rockwater 2024). In addition, several regional calcretes have been shown to provide habitat for significant stygofauna assemblages (Figure 4). The nearest of these PECs is the (Priority 1) Belele calcrete groundwater assemblage, with its spatial buffer being approximately 34 km to the west of Garden Gully Project (Figure 4). Other Priority 1 calcrete PECs within 50 km of the Project including Killara North, Karalundi, Killara and Polelle are shown on Figure 4.

There were no subterranean fauna species listed in the results of a search of DBCA's Threatened and Priority Fauna database for the Project area. Results of other database searches (see section 3.2.1) identified subterranean fauna records from groups including Insecta, Malacostraca, Maxillopoda, Arachnida, Entognatha and Oligochaeta (Figure 4). The majority of these records are associated with a 2011 survey at the Andy Well Project, which recorded 2 troglifauna species and 21 stygofauna species from surficial colluvium and alluvial habitats of the project area (Bennelongia 2011). None of the stygofauna recorded by that survey were restricted to the weathered basement rock (metabasalt).

The October 2024 stygofauna survey at the Crown Prince deposit sampled a total of 24 sites, including six regional bores and wells; some of which are located in areas of calcrete upstream of the Project (Figure 5). Sampling results are presented in Table 6. Twelve possible stygofauna species were recorded, indicating a moderately diverse stygofauna community. The stygofauna recovered from samples included copepods, ostracods, syncarids, and aquatic worms. Seven stygofauna species were recorded within the Project impact area, which is defined by the 1,580 ha area of drawdown influence on groundwater levels. Stygofauna recorded by the survey, together with the extent of drawdown resulting from pit dewatering, are shown in Figure 6.

Only one of seven species recorded from the area of drawdown influence at Garden Gully has not been recorded from regional sites. The cyclopoid copepod, *Parastenocaris* 'BHA433', is a potential new species that is currently only known from a single site approximately 1.1 km west-north-west of the Project (Figure 6). Another *Parastenocaris* specimen was recorded from bore GG2, approximately 5 km east of the Project (Figure 6). The specimen was female (males are required for species level identification) and may represent another record of *Parastenocaris* 'BHA433'.

Table 6: Results of stygofauna sampling at Garden Gully

	Order	Family	Taxon	n	Project Area	Reference
CRUSTACEA						
Copepoda	Cyclopoida	Cyclopidae	Dussartcyclops uniarticulatus s.l.	5	-	CP Bore, GG2
	Cyclopoida	Cyclopidae	<i>Mesocyclops brooksi</i>	12	OGGRC555	LPGG5
	Cyclopoida	Cyclopidae	<i>Paracyclops chiltoni</i>	1	CPMB001	Widespread species
	Cyclopoida	Parastenocarididae	<i>Parastenocaris</i> 'BHA433'	10	Main Roads Bore	-
	Cyclopoida	Parastenocarididae	<i>Parastenocaris</i> sp.	1		GG2
Ostracoda	Podocopida	Cyprididae	<i>Sarscypridopsis aculeata</i>	4	-	Pettiford Mill
	Podocopida	Cyprididae	<i>Sarscypridopsis</i> sp.	2	-	Joe Well
	Podocopida	Limnocytheridae	<i>Limnocythere</i>	1	-	Pettiford Mill
Syncarida	Bathynellacea	Parabathynellidae	<i>Atopobathynella</i> 'BSY387'	12	-	GG1, LPGG5, GG2
ANNELIDA						
Polychaeta		Aeolosomatidae	<i>Aeolosoma</i> sp.*	20	CPMB001	-
Oligochaeta	Tubificida	Enchytraeidae	Enchytraeidae '2 bundle' s.l. (long thin 2 per seg)	8	-	GG2
	Tubificida	Enchytraeidae	Enchytraeidae '3 bundle' s.l. (short sclero)	61	OGGRC555, OGGDD0S1	Joe Well, GG2
	Tubificida	Phreodrilidae	<i>Phreodrilidae</i> sp. AP DVC s.l.	15	-	Joe Well, LPGG5, GG2
	Tubificida	Naididae	<i>Tubificinae</i> 'BOL106'	2	CP Bore	GG2
			TOTAL	154		

* Denotes taxa not expected to be identified to species level (EPA, 2007)

Harpacticoid copepods of the Pilbara region have been shown to have variable ranges, with most showing at least catchment scale distributions (Halse *et al.* 2014). *Parastenocaris* 'BHA433' is expected to have a range extending well beyond the area of groundwater drawdown associated with the Project. The Garden Gully specimens of this taxon were recorded from a 74 m deep production bore, where the aquifer has a recorded saturated thickness of at least 68 m. The maximum modelled drawdown of approximately 1.5 m at this site will not affect the conservation status of the species.

Two cyclopoid copepods (*Mesocyclops brooksi* and *Paracyclops chiltoni*) recorded from impact sites are cosmopolitan species that are also known to occur more widely, including from freshwater habitats of the Pilbara region. Most of the remaining stygofauna species are known to occur more widely than the Project impact area. The exception is the aquatic annelid worm *Aeolosoma* sp., which cannot be assessed for EIA purposes due to the lack of a suitable taxonomic framework to further identify the species. All stygofauna

species recorded by the survey are expected to have distribution ranges at least an order of magnitude greater than the Project area of drawdown influence.

In the Pilbara and Murchison regions, stygofauna distributions are usually restricted by surface drainage catchments, aquifer discontinuity, geological barriers or habitat preference. There is no evidence to suggest that distribution ranges of any species are limited at the project-scale by any such factors. The habitats sampled at Garden Gully are not unique in a regional context, and there appear to be no real constraints of geological barriers or aquifer boundaries that would restrict dispersal of stygofauna more widely than the Project area. Sampling results indicate that continuous stygofauna habitat extends beyond the area of drawdown influence. Consequently, none of the recorded species are likely to have distribution ranges limited to the localised extent of dewatering impacts. Mining of the Crown Prince Prospect is unlikely to threaten the conservation of any individual stygofauna species recorded by the survey, or to impact any stygofauna conservation values of the wider Garden Gully area.

Results of groundwater sampling, undertaken in conjunction with the stygofauna field survey at Garden Gully, indicate a groundwater salinity range of 1,180 to 5,943 mg/L TDS and circumneutral to slightly alkaline pH (7.28 to 7.85) (Appendix I). Dissolved oxygen levels ranged from 1.51 to 8.25 mg/L (18.3 to 91.6 % saturation). The water quality results indicate that the groundwater conditions are within suitable ranges recorded for stygofauna habitat at other locations in Western Australia. Therefore, water quality is unlikely to be a limiting factor for stygofauna at Crown Prince deposit.

There will be no interactions between the Crown Prince mine pit dewatering and drawdown associated with groundwater extraction from the Meekatharra town water supply borefield, or from dewatering of other current mining operations in the region over the life of the mine. The Crown Prince deposit and the nearest Meekatharra borefield production bore are separated by a distance of at least 9 km. There are no other nearby developments or projects that could present a cumulative impact to stygofauna in the vicinity of the Project.

6 CONCLUSIONS

A basic stygofauna survey was undertaken over the Crown Prince deposit at Garden Gully, in conjunction with a desktop subterranean fauna study. Results of the desktop study indicate that there appears to be no suitable habitat for troglifauna, and the aquifers of the immediate Project area are unlikely to host a rich stygofauna community. Results of 24 samples from the Project area included 12 possible stygofauna species, including copepods, ostracods, syncarids, and aquatic worms. Most of the stygofauna species from the Project area were found to occur more widely. However, one cyclopoid copepod species (*Parastenocaris* 'BHA433') collected from the area of drawdown influence as a singleton record is currently known only from the Garden Gully area. The modelled drawdown at the site it was recorded at represents 2% of the aquifer thickness, which will not affect the conservation status of the species. Drawdown associated with the Project affects an area of approximately 1,580 ha and is unlikely to impact any stygofauna conservation values of the wider Garden Gully area.

The nearest calcrete groundwater assemblage with significant conservation values (Belele P1 Priority Ecological Community) has its spatial buffer approximately 34 km to the west of Garden Gully Project, and 33 km from any modelled drawdown impacts associated with pit dewatering at Crown Prince deposit. There appears to be no risk from the Project to any stygofauna conservation values associated with listed threatened or priority ecological communities. The localised drawdown from pit dewatering over the life

of the Project is unlikely to impact any stygofauna values at Garden Gully, or the persistence of any stygofauna species recorded by the survey.

DATED: 25 November 2024

Rockwater Pty Ltd



Daisy Scott
Senior Environmental Scientist



N C P Eveleigh
Principal Environmental Scientist

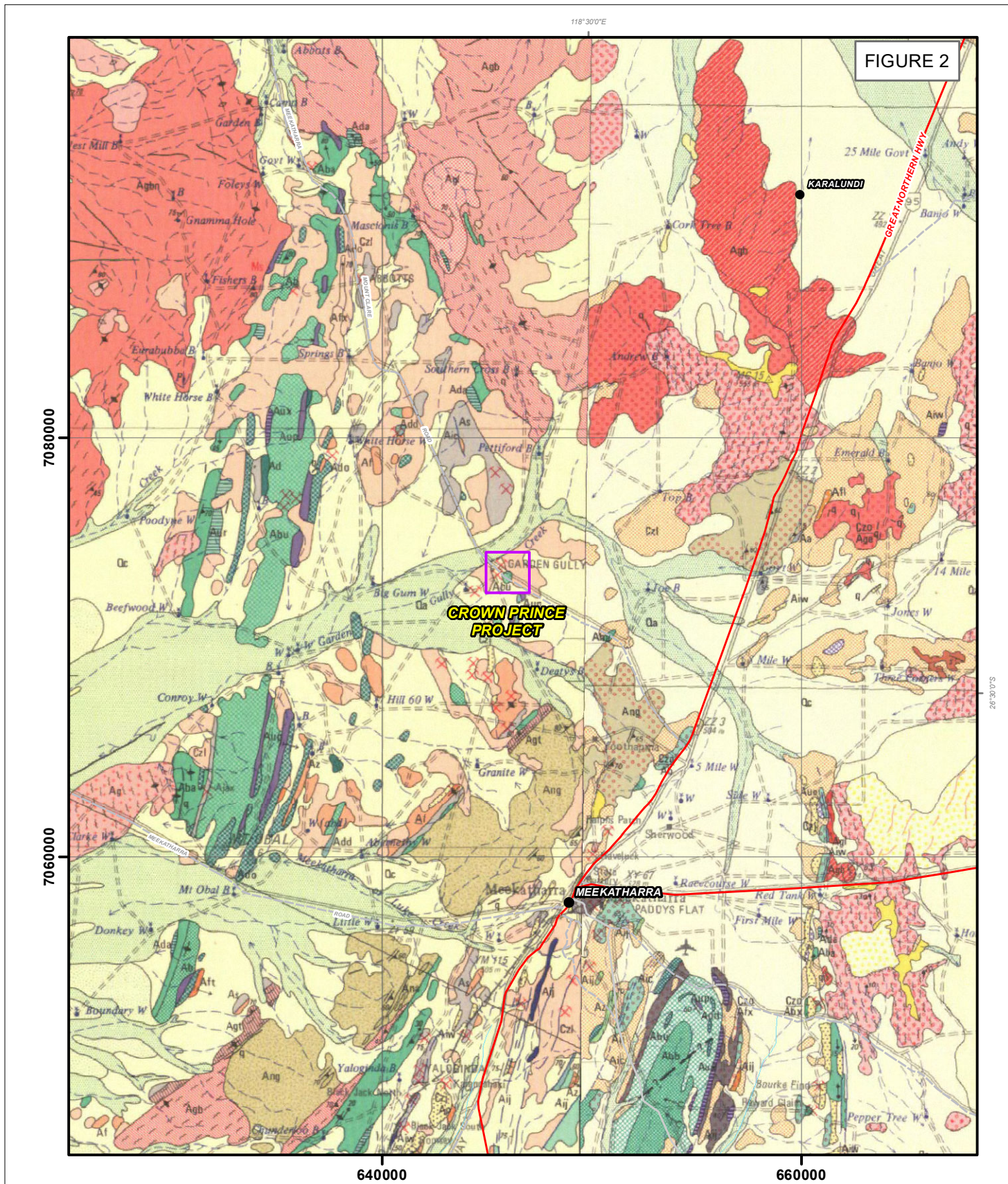
REFERENCES

- Australian Rainfall and Runoff (ARR 2019) <https://arr.ga.gov.au/arr-guideline>
- Bennelongia (2008a) Troglifauna survey at Koolyanobbing. Report 2008/49. Bennelongia Environmental Consultants Pty Ltd, Jolimont 19 pp.
- Bennelongia (2008b) Troglifauna survey at Mount Jackson. Report 2008/50. Bennelongia Environmental Consultants Pty Ltd, Jolimont, 15 pp.
- Bennelongia (2009a). Yilgarn Iron Ore Project: Carina Deposit, Subterranean Fauna Assessment. Bennelongia Pty Ltd. Consultants report for Polaris Metals NL.
- Bennelongia (2009b). Troglifauna survey at F Deposit, Koolyanobbing. Report 2009/73. Bennelongia Pty Ltd Consultants for Cliffs Asia Pacific Iron Ore Pty Ltd.
- Bennelongia (2011). Subterranean Fauna Assessment for the Andy Well Project. Report 2011/131. Bennelongia Pty Ltd Consultants for Doray Minerals Ltd.
- Bennelongia (2016a). Yangibana Project: Subterranean Fauna Assessment. Report 2017/293, Bennelongia Environmental Consultants, Jolimont, 39 pp.
- Bennelongia (2017). Gnaweeda Project: Subterranean Fauna Assessment. Report 2017/300. Bennelongia Pty Ltd Consultants for Doray Minerals Ltd.
- Biologic (2021) Gabanintha Vanadium Project: Subterranean Fauna Survey. Consultant's report for Technology Metals Australia Pty Ltd.
- Boddington, T. (2015). Report on the geological mapping and assessment of gold mineralization potential of the Garden Gully project. Report to Red Dragon Mines NL.
- Chen, S.F., and Ivanic, T.J. (2009). Tieraco WA Sheet 2545, Geological Survey of W.A. 1:100,000 Geological Series.
- Department of Climate Change, Energy, the Environment & Water (DCCEEW) (2024a). <https://www.dcceew.gov.au/sites/default/files/env/resources/a8015c25-4aa2-4833-ad9c-e98d09e2ab52/files/bioregion-murchison.pdf>
- Department of Climate Change, Energy, the Environment & Water (DCCEEW) (2024b). Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Regions) – 2012. <https://arcg.is/0mDWzn>
- Environmental Protection Authority (EPA), (2007). Guidance for the Assessment of Environment Factors. Sampling Methods and Survey Considerations for Subterranean Fauna in Western Australia. No 54a – Technical Appendix to Guidance Statement No. 54). Dated August 2007.
- Environmental Protection Authority (EPA) (2016), Environmental Factor Guideline: Subterranean Fauna, EPA, Western Australia, December 2016.
- Environmental Protection Authority (EPA) (2021), Technical guidance – Subterranean fauna surveys for environmental impact assessment, EPA, Western Australia, December 2021.
- GHD (2009) Report for Jack Hills Expansion Project, Regional Stygofauna Phase 1 Survey. Unpub report for Crosslands Resources Ltd.

- Halse, S.A. Scanlon, M.D., Cocking, J.S., Barron, H.J., Richardson, J.B., and Eberhard, S.M., (2014). Pilbara stygofauna: deep groundwater of an arid landscape contains globally significant radiation of biodiversity. Records of the Western Australian Museum, Supplement 78: 443–483 (2014).
- MBS (2013). Gidjee Gold Project; Subterranean Fauna Assessment. Consultant’s report for Panoramic Gold Pty Ltd, dated September 2013.
- Rockwater Pty Ltd (2009a). Yilgarn Iron Ore Project, Regional Troglifauna Investigation. Unpub. Report (349.1/09/01) for Polaris Metals NL, November 2009.
- Rockwater Pty Ltd (2009b). Spotted Quoll Deposit Stygofauna Investigation, Results of Second Phase Sampling. Unpub. Report (298.2.1/09/01) for Western Areas NL, March 2009.
- Rockwater Pty Ltd, (2009c) Spotted Quoll Deposit Regional Stygofauna Investigation. Unpub. Report (298.2.1/09/02), for Western Areas NL June 2009.
- Rockwater Pty Ltd (2009d). Subterranean fauna pilot study, Mt Cattlin Lithium/Tantalum Deposit, Unpub. Report (352.1/09/01) for Galaxy Resources Ltd, February 2009.
- Rockwater Pty Ltd (2010). Parker Range Iron Ore Project, Subterranean Fauna Investigation. Unpub. Report (361.0/10/02) for Cazaly Resources Ltd, September 2010.
- Rockwater Pty Ltd (2011). Lake Giles Iron Ore Project, Subterranean Fauna Pilot Study. Unpub. Report (376.1/11/01) for Macarthur Minerals Ltd, March 2011.
- Rockwater Pty Ltd (2024). Garden Gully Project, Meekatharra. Hydrological & Hydrogeological Assessment. Report for Ora Gold Limited, October 2024.
- St Barbara Mines Ltd (1994). Annual report 1 August 1993 to 31 August 1994, Garden Gully project area. Report No. GG/01/94 (DMIRS A41877).

FIGURES





Data Source: Service Layer Credits: Geological Survey of Western Australia L:/GIS Projects/422-0 - Tappa Tappa/ Fig. 2024_1-1 - Locality.mxd	● Populated place — Roads/Tracks — Principal Road — Secondary Road — Minor Road — Lakes — Rivers_DoW		1:250,000 A4		Grid: MGA 1994 Zone 50	
---	---	--	----------------------------	--	--------------------------------------	--

CLIENT: Ora Gold Ltd PROJECT: Garden Gully Project Subterranean Fauna Desktop Assessment DATE: October 2024 DWG NO: 586-1/24/01-2	REGIONAL GEOLOGY
--	--

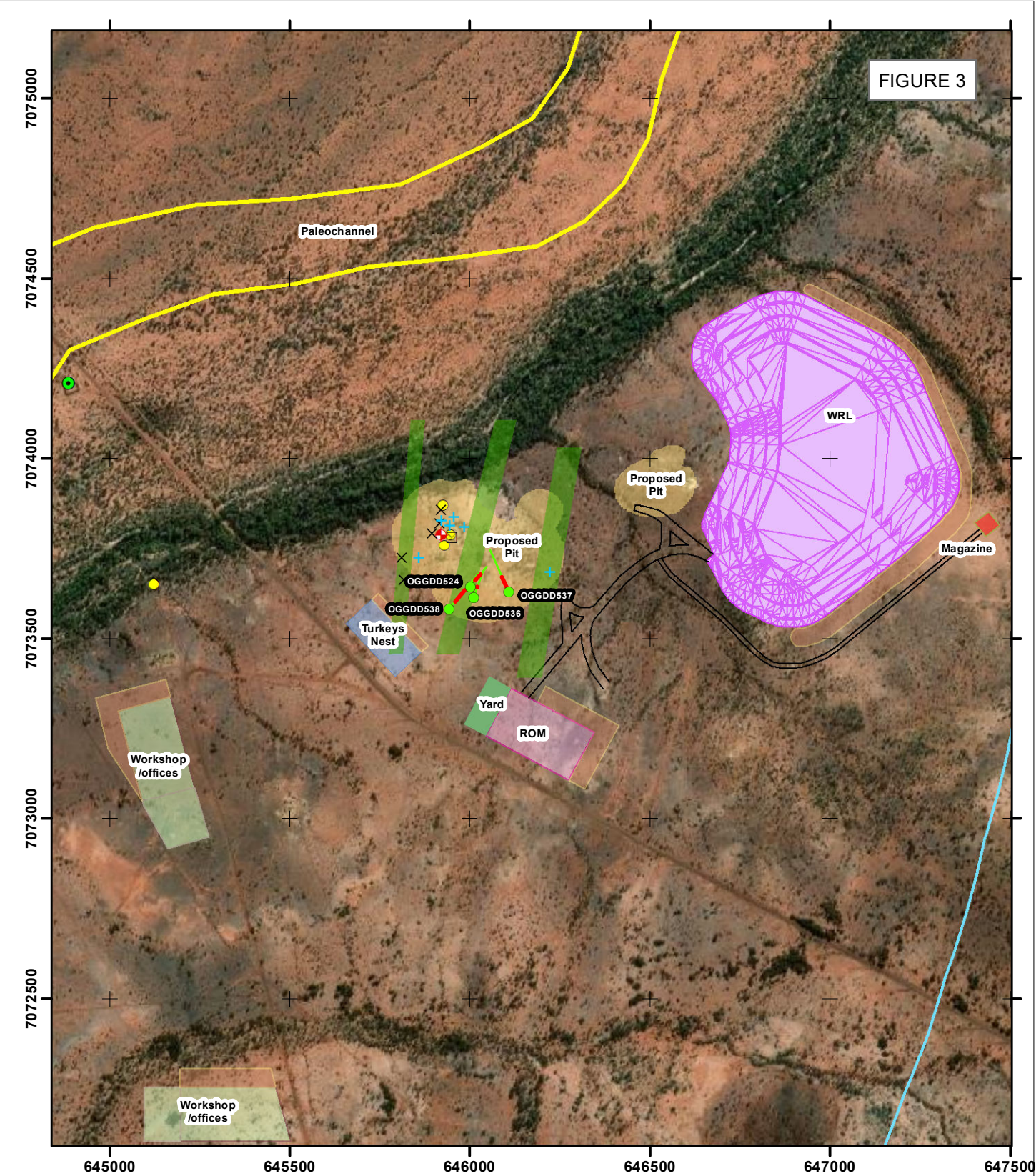
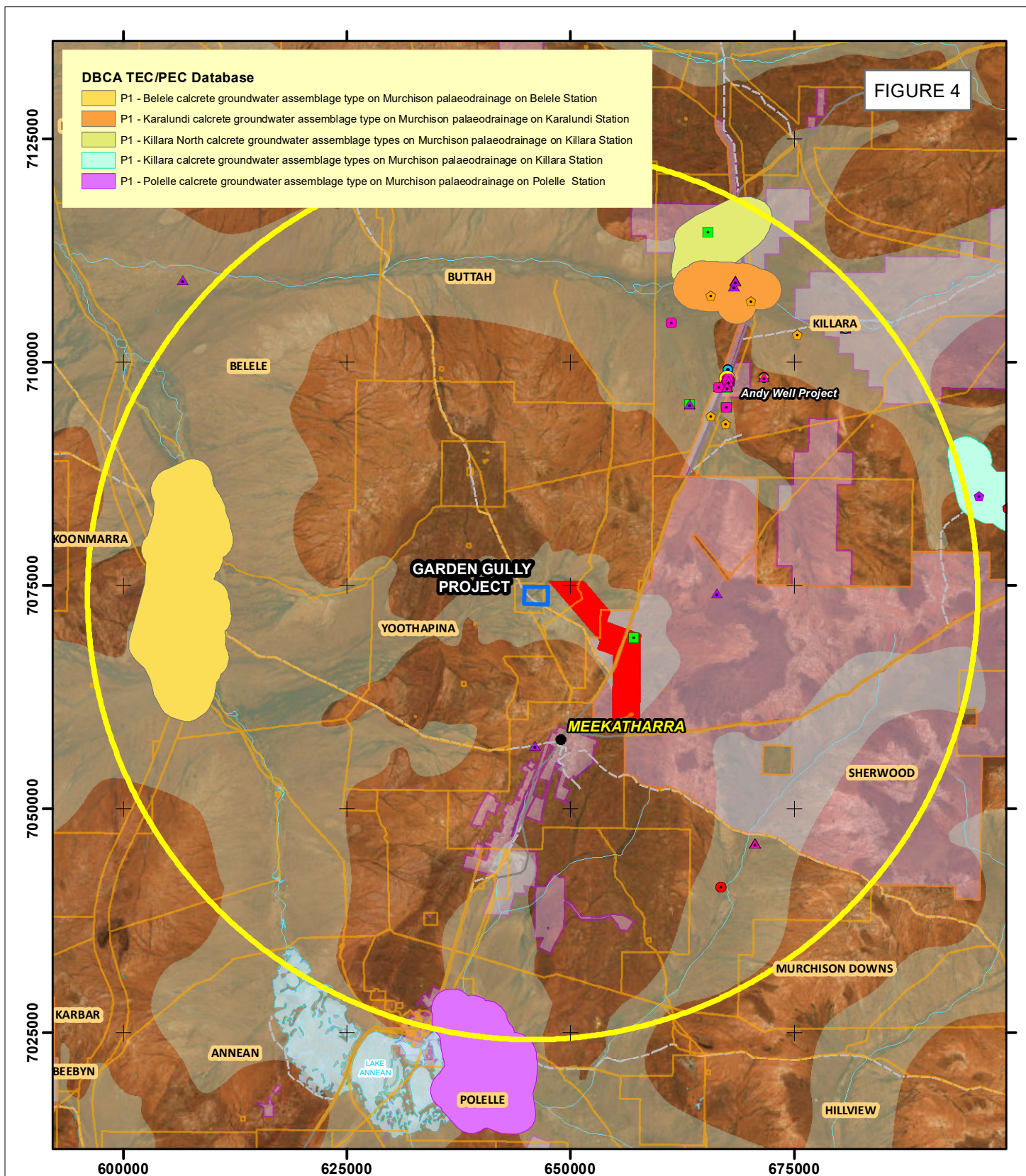


FIGURE 3

- Inspected Diamond Core 0.5 m Drawdown Extent - Drillhole jointed zones - Drillhole traces - Inferred Faults - Paleochannel	- CP Production Bore - Kyarra Shaft - Main Roads Bore - Monitoring Bore - High Yielding Holes - Fault/shear, in drillholes			1:15,000 A4	Grid: MGA 1994 Zone 50	
---	---	--	--	----------------	---------------------------	--

CLIENT: Ora Gold Ltd PROJECT: Garden Gully Project Subterranean Fauna Assessment DATE: October 2024 DWG NO: 586-1/24/01-3	GARDEN GULLY PROJECT SITE LAYOUT
---	---



ALA_Database class - Insecta - Malacostraca - Maxillopoda	Dandjoo Database - Arachnida - Collembolla - Entognatha - Insecta - Malacostraca - Oligochaeta	Roads/Tracks - Principal Road - Minor Road - Pastoral_Stations_DPLH_083	Public Drinking Water Source Areas (DWTR-033) GWTR_ATLAS - Protection Area-P1 - Protection Area-P2 - Protection Area-P3 - Protection Area-P3* - Protection Area-NA - Paleovalleys - Active GWL			Scale: 1:600,000 A4	Grid: MGA 1994 Zone 50
---	---	---	--	--	--	----------------------------	-------------------------------

CLIENT: Ora Gold Ltd PROJECT: Garden Gully Project Subterranean Fauna Assessment DATE: October 2024 DWG NO: 586-1/24/01-4	GARDEN GULLY PROJECT DATABASE SEARCHES
---	---

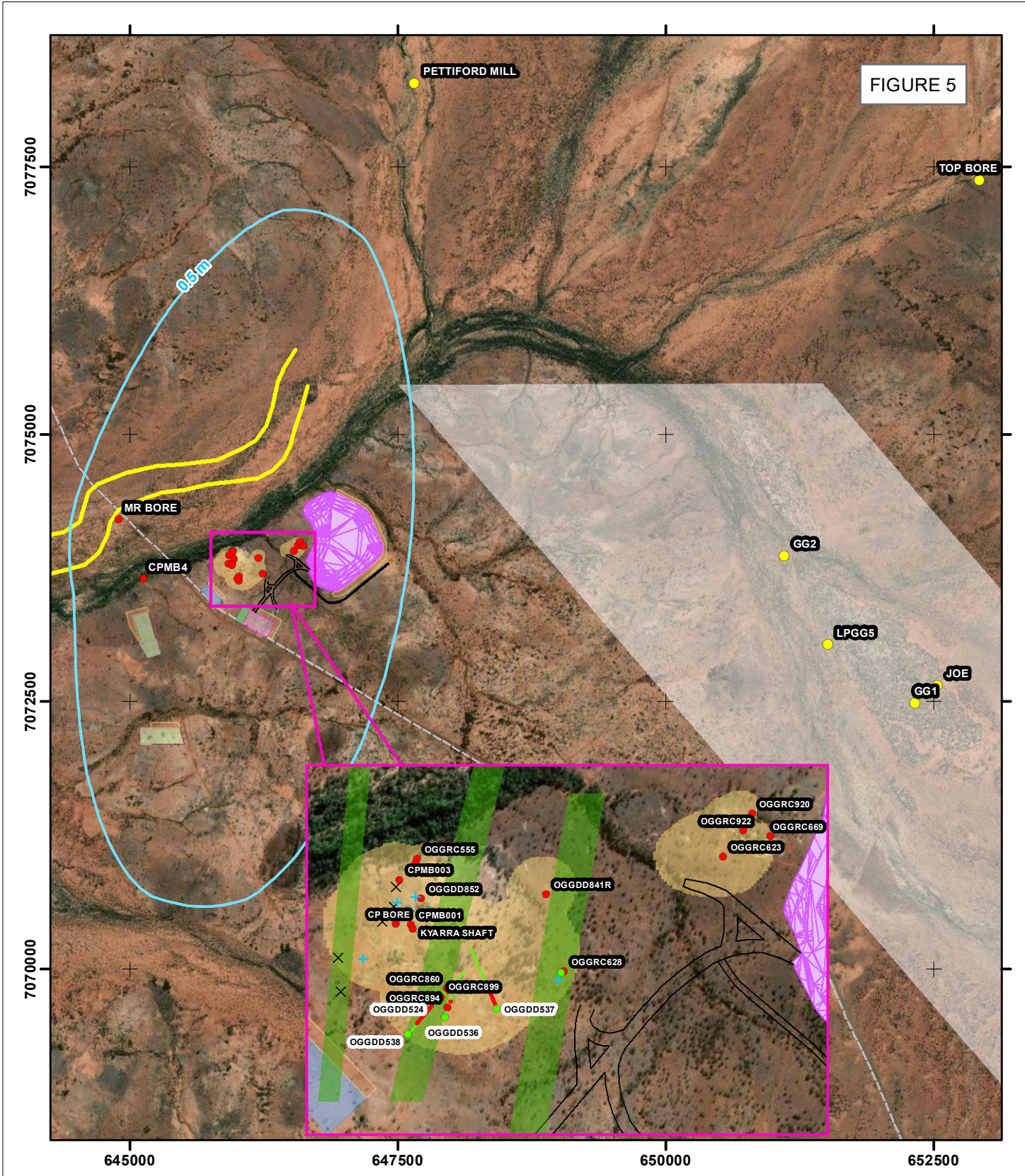


FIGURE 5

- Inferred Faults - Drillhole traces - Drillhole jointed zones 0.5 m Drawdown Extent - Water Reserve - Public Drinking Water P1 - Palaeochannel	- Inspected Diamond Core - High Yielding Holes - Fault/shear, in drillholes Stygofauna Sampled_Sites - Impact - Reference			1:50,000 A4	Grid: MGA 1994 Zone 50	
--	--	--	--	------------------------	-----------------------------------	--

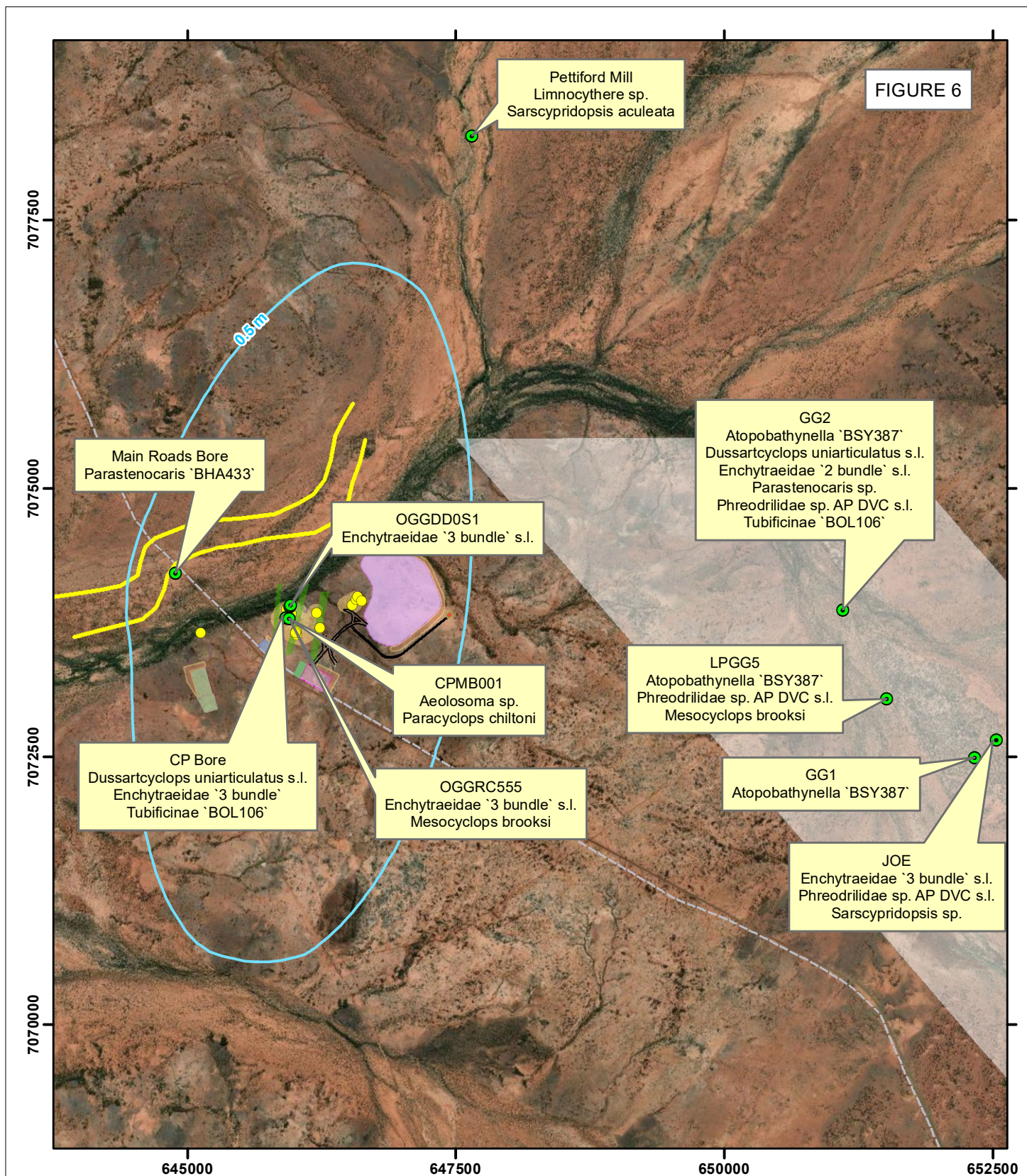
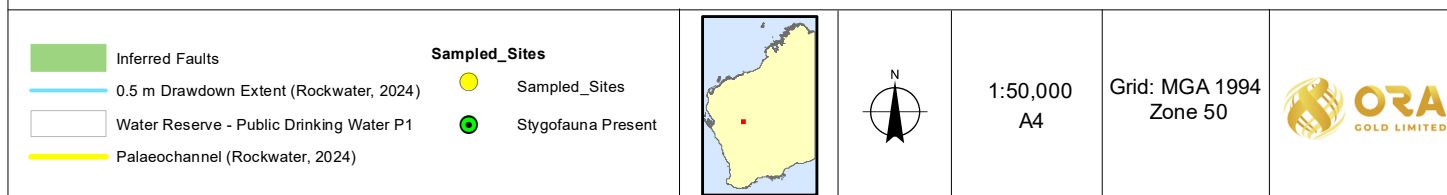


FIGURE 6



CLIENT:	Ora Gold Ltd	GARDEN GULLY PROJECT STYGOFAUNA SAMPLING RESULTS
PROJECT:	Garden Gully Project Subterranean Fauna Assessment	
DATE:	October 2024	
DWG NO:	586-1/24/01-6	

APPENDIX



APP I: Site and Sampling Details, Crown Prince deposit

Site Details												Bore Construction			Sampling Details			Water Quality						
Site id	Zone	Easting	Northing	RL	Type	Prelim Status	Depth	Measured WL (m)	Collar Height	Water Level (m RL)	Water Level (m RL)	Dip	Construction Date	Slotted Section	Diameter (mm)	Sampled Date	Sampled For	Method	Temperature (degrees)	TDS (mg/L)	EC (mS/cm)	pH	DO (mg/L)	DO (% Sat)
CP BORE	MGA94 50	645,918	7,073,789		Production Bore	Impact						-90	-	-	100	3/10/2024	S	Pumped	23.2	2036.8	3.04	7.85	5.86	68.3
CPMB001		645,946	7,073,788	490	Monitoring Bore	Impact	73	10.06	0.5	9.6	480.44	-90	2024	18-72	50	3/10/2024	S	Net	25.6	2559.4	3.82	7.35	1.83	22.2
CPMB003		645,925	7,073,871	489	Monitoring Bore	Impact	73	9.74	0.5	9.2	479.76	-90	2024	18-72	50	3/10/2024	S	Net	24.8	2056.9	3.07	7.28	7.07	85.3
GGMB4		645,123	7,073,650	486	Monitoring Bore	Impact	27	5.92	0.5	5.4	480.58	-90	2024	6-24	50	2/10/2024	S	Net	25.9	1721.9	2.57	7.25	1.51	18.3
KYARRA SHAFT		645,950	7,073,780	490	Old Shaft	Impact		9.3	0	9.3	480.7	-	-	-	-	3/10/2024	S	Net	22.9	2063.6	3.08	7.36	2.74	31.7
MAIN ROADS BORE		644,887	7,074,209	487	Production Bore	Impact		6.3		6.3	480.7	-90	-	-	-	3/10/2024	S	Net	26.4	1373.5	2.05	7.69	6.11	75.5
OGGDD0S1		645,955	7,073,902	488	Diamond Hole	Impact		5.88	0	5.9	482.12	-90	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGDD841R		646,199	7,073,845	488	Diamond Hole	Impact	80	8.75	0.2	7.4	479.45	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGDD852		645,965	7,073,836	490	Diamond Hole	Impact	99.4	8.95	0.1	7.7	481.15	-65.1	-	-	-	2/10/2024	S	Net	25.8	5942.9	8.87	7.35	2.5	30.7
OGGRC555		645,957	7,073,910	488	RC Hole	Impact	126					-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGRC623		646,529	7,073,914	489	RC Hole	Impact	120	9.27	0.2	7.8	479.93	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGRC628		646,232	7,073,700	490	RC Hole	Impact	94	10.43	0.2	8.8	479.77	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGRC669		646,618	7,073,953	490	RC Hole	Impact		9.52	0.45	7.8	480.93	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGRC860		646,013	7,073,668	490	RC Hole	Impact	71	12.3	0.3	10.4	478	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGRC894		646,015	7,073,632	491	RC Hole	Impact	126	13.4	0.3	11.3	477.9	-60	-	-	-	3/10/2024	S	Net	23.1	1943	2.9	7.45	6.54	78.8
OGGRC899		646,002	7,073,653	490	RC Hole	Impact	138	12.42	0.3	10.5	477.88	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGRC920		646,583	7,073,995	489	RC Hole	Impact	119	9.25	0.3	7.7	480.05	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
OGGRC922		646,567	7,073,963	489	RC Hole	Impact		9.23	0.3	7.7	480.07	-60	-	-	-	3/10/2024	S	Net	-	-	-	-	-	-
GG1		652,326	7,072,487	498	Water Exploration Hole	Reference	17.9	6.19	0.4	5.8	492.21	-90	-	-	-	4/10/2024	S	Net	24.4	1283.05	1.915	7.53	6.05	72.5
GG2		651,105	7,073,869	495	Water Exploration Hole	Reference	19	3.9	0.25	3.7	491.35	-90	-	Uncased	-	4/10/2024	S	Net	25.9	1269.65	1.895	7.45	5.33	65.2
JOE		652,532	7,072,652	500	Stock Bore w Windmill	Reference	5.9	5.9	0.6	5.3	494.7	-90	-	-	-	4/10/2024	S	Pumped	25.1	1339.33	1.999	7.59	6.99	85.1
LPGG5		651,511	7,073,036	499	Water Exploration Hole	Reference	16.7	4.25	0.2	4.1	494.95	-90	-	-	-	4/10/2024	S	Net	25.4	1228.78	1.834	7.64	6.2	75.6
PETTIFORD MILL		647,648	7,078,284	497	Stock Bore w Windmill	Reference		-	-	-	-	-90	-	-	-	3/10/2024	S	Pumped	24.9	1179.87	1.761	7.28	8.25	91.6
TOP BORE		652,927	7,077,377	500	Stock Bore w Windmill	Reference	-	-	-	-	-	-90	-	-	-	125	4/10/2024	S	Pumped	27.1	1487.4	2.22	7.38	6.35

