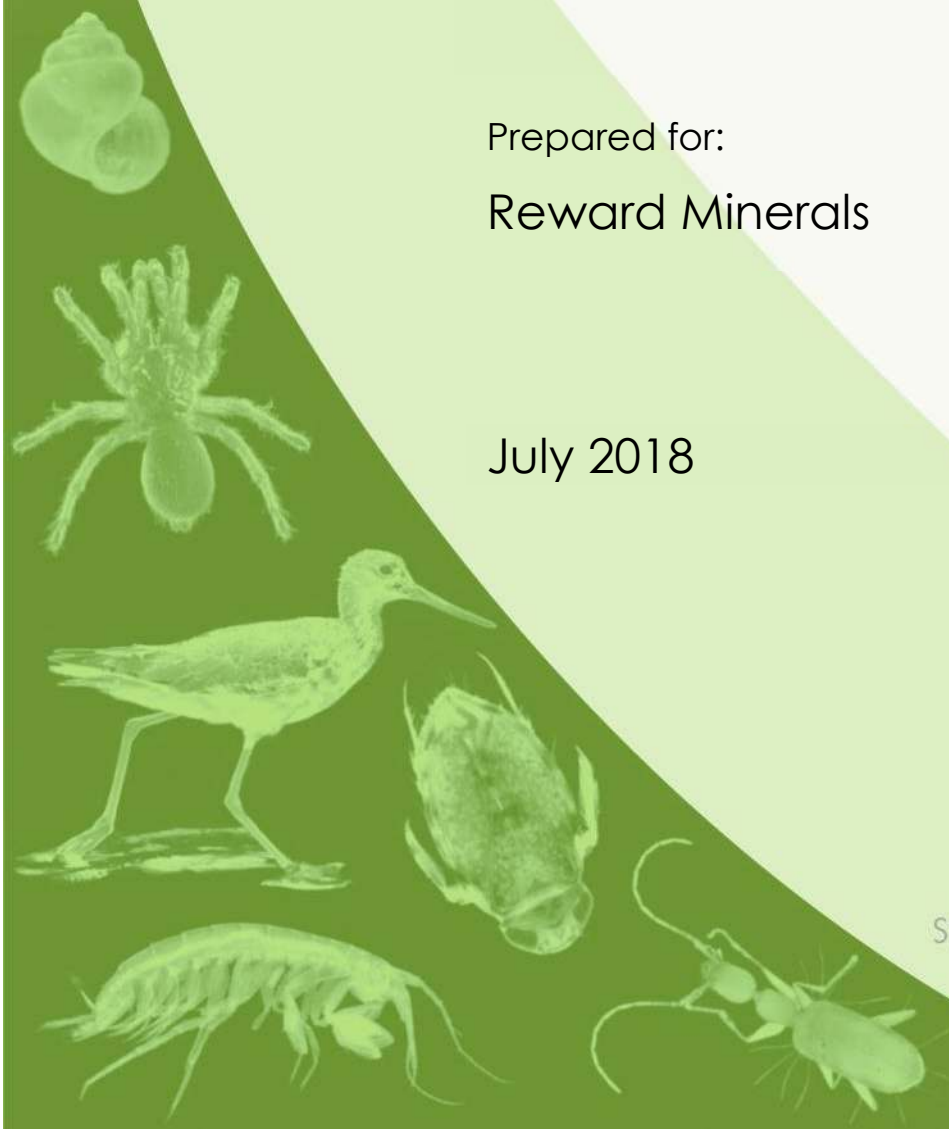
Bennelongia Environmental Consultants

Consolidation report: Short-Range Endemic Invertebrates at Lake Disappointment

Prepared for:

Reward Minerals

July 2018



Short-Range Endemics | Subterranean Fauna

Waterbirds | Wetlands

Consolidation report: short-range endemic invertebrates at Lake Disappointment

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1. INTRODUCTION

Lake Disappointment lies in the Little Sandy Desert of Western Australia, approximately 320km east of Newman, in the north-west of Western Australia. Reward Minerals Ltd (Reward) proposes to harvest potassium, in the form of sulphate of potash (i.e. K_2SO_4), from groundwater brine associated with Lake Disappointment. The sulphate of potash will be harvested in a process involving differential crystallisation of various salts in solar evaporation ponds and the harvested potash will be trucked to a coastal port in the Pilbara. The abstraction and processing of potassium-rich brine and transport of the potash is referred to as the potash project.

Lake Disappointment is approximately 50 km by 40 km in size, covering an area of 120,000 ha (Figure 1). The proposed potash project development envelope is 40,100 ha and the proposed area of disturbance within the envelope is 7,776 ha, of which 408 ha is native vegetation. The proposed development envelope has three components.

- A network of the brine trenches, evaporation ponds and stockpiles of precipitated salt (sodium chloride) within the main saline playa at Lake Disappointment.
- Areas containing a processing plant, bore fields, an accommodation village, an airstrip, a landfill, septic waste treatment facilities, fuel storage facility, a wash down facility and an administration area.
- A transport corridor containing the Talawana and Willjabu Tracks, small sections of which will be realigned.

The network of trenches in the main saline playa at Lake Disappointment will be approximately 130 km long and will supply brine to a shallow solar pond system of around 4,500 ha in extent. The water will be evaporated to concentrate the salts and form crystal beds on the pond floors. Halite salt (sodium chloride) will be harvested from the ponds and stockpiled on the lake. Crude potash salt will then be precipitated out, harvested and purified through a processing plant by a process of dissolution (washing contaminants, especially magnesium sulphate) from the crude potash salt. It is proposed that approximately 63 million cubic metres of brine will be abstracted annually from groundwater in the floor of the playa to produce approximately 400,000 tonnes of sulphate of potash. No toxic by-products (waste) will be generated.

The Environmental Protection Authority (EPA) determined the level of impact assessment for the potash project as a Public Environmental Review (PER). Terrestrial fauna was among the key factors to be addressed. The EPA objective for terrestrial fauna is to maintain representation, diversity, viability and ecological function at the species, population and assemblage level (EPA 2017). One component of terrestrial fauna is the short-range endemic invertebrate (SRE) fauna, which consists of various ground-dwelling invertebrate groups that contain high proportions of species with small ranges (these are referred to as SRE Groups). Clearing of habitat for project infrastructure may result in impacts on any SRE species present.

The purpose of this report is to summarise the results of six surveys of SREs undertaken to support the PER. Results of the surveys have previously been presented in three reports:

- Phase 1 Level 2 fauna survey (including targeted surveys) at Lake Disappointment and Willjabu Track (May 2013) (Harewood 2016);
- Phase 2 Level 2 fauna survey (including targeted surveys) at Lake Disappointment and Willjabu Track (October 2013) (Harewood 2016);
- Short-range endemic invertebrate fauna survey of the Lake Disappointment Potash Project (May 2013) (Phoenix 2014);
- Dry pit trapping on playa and samphire of the northern area of the lake targeting invertebrates (November 2014) (Harewood 2017);

Figure 1. Locations of survey sites at Lake Disappointment.
GH, Greg Harewood; PES, Phoenix Environmental Sciences.

- Phase 3 Level 2 fauna survey (including targeted surveys) in borefield areas as well as some regional bat surveys (Durba Springs, McKay Range and Desert Queens Baths) (October 2016) (Harewood 2017);
- Phase 4 Level 2 Fauna Survey (including targeted surveys) at borefield areas and Lake Disappointment (March 2017) (Harewood 2017).

Details of species identification of the animals collected by Harewood (2017) are provided in a further three reports:

- Scorpion ID (2016) Taxonomy and short-range endemic assessment of invertebrates from lake disappointment, January 2016, Report ID 15-08.
- Alacran Environmental Science (2016). Taxonomy and short range endemic Assessment of Invertebrates from Lake Disappointment. December 2016, Report No. 1628.
- Alacran Environmental Science (2017). Taxonomy and short range endemic Assessment of Invertebrates from Lake Disappointment, May 2017, Report No. 1705.

Details on the methodology used in the surveys can be found in the appropriate reports. The focus of these surveys was to 1) document the fauna that occur in habitats present within the development envelope of the potash project, and 2) survey similar habitats in adjacent areas outside the development area. The areas surveyed, both inside and outside the development envelope, are collectively referred to as the 'survey area'.

Background information on SREs in the vicinity of Lake Disappointment is provided in Phoenix's (2014) desktop review of the likelihood of SREs occurring at the potash project.

2. SURVEY PROGRAM

Work undertaken in each survey is summarised below and sampling effort is consolidated in Table 1. Sampling sites and habitats are shown in Figures 1-3. Information on SRE and salt lake species is consolidated in Table 2 and potential SREs mapped in Figure 4.

Harewood, G. (2016) Fauna Survey (Level 2) Phase 1 (May 2013) and Phase 2 (October 2013) Lake Disappointment Potash Project, unpublished report for Reward Minerals Ltd, Perth, WA.

> This report provides results of two surveys (May 2013 and October 2013) for an area of 89,130ha (60,886ha is within Lake Disappointment) that included the Talawana Track, the Willjabu Track and the most northern and western sections of Lake Disappointment. There were eight trapping sites (named TS 01 to TS 08) in four fauna habitats (interdunal swale, dune crest, riparian salt-lake edge, minor drainage line). Trapping sites were clustered together near the southern end of the Willjabu Track where it meets Lake Disappointment. For each survey there were 550/560 pit-trap nights. Thirty-five invertebrates were collected opportunistically by hand or incidentally in the pit traps and these provided to Phoenix Environmental Sciences (and included in their 2014 report). Little rainfall was received at Telfer (18.4 mm) prior to this Lake Disappointment survey.

Phoenix Environmental Sciences (2014) Short-range endemic invertebrate fauna survey of the Lake Disappointment Potash Project (May 2013), unpublished report for Reward Minerals Ltd, Perth.

> This report includes a desktop review of SREs and the results of a single phase of sampling of SRE Groups that focussed on the northern area of Lake Disappointment. The desktop review identified three species of SREs and classed them as potential SREs (*Aname* sp., *Lychas mjobergi*, and *Urodacus* `armatus`). Forty-five sites were sampled over five days in May 2013; these were equally divided between three major habitat types – saline playa, riparian samphire and sand dunes (sites 1A, 1B, 1C through to 15A, 15B, 15C). Active searching was conducted at all 45 sites

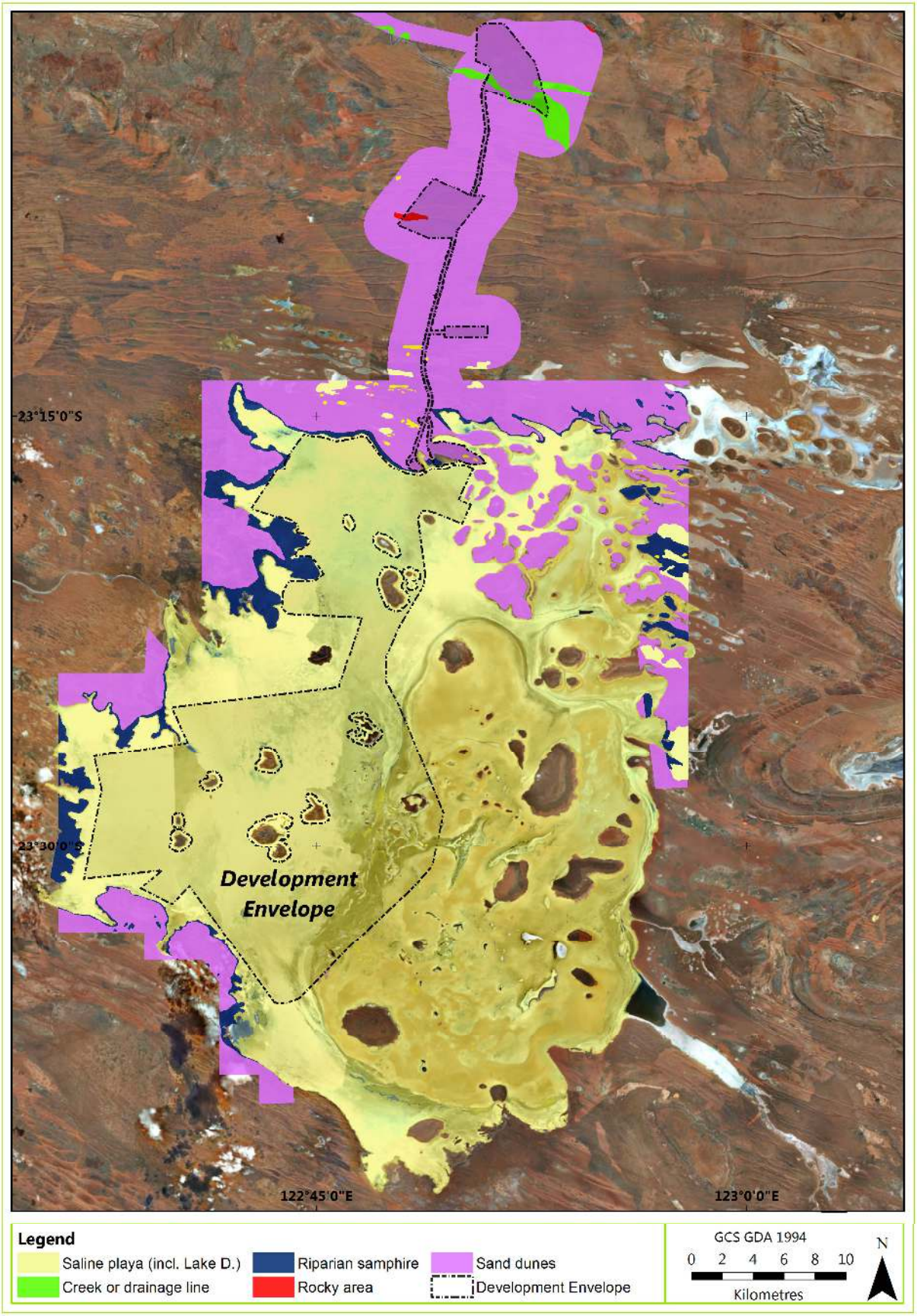

Figure 2. Fauna habitat types in the Lake Disappointment Project area based on work by Terrestrial Ecosystems.

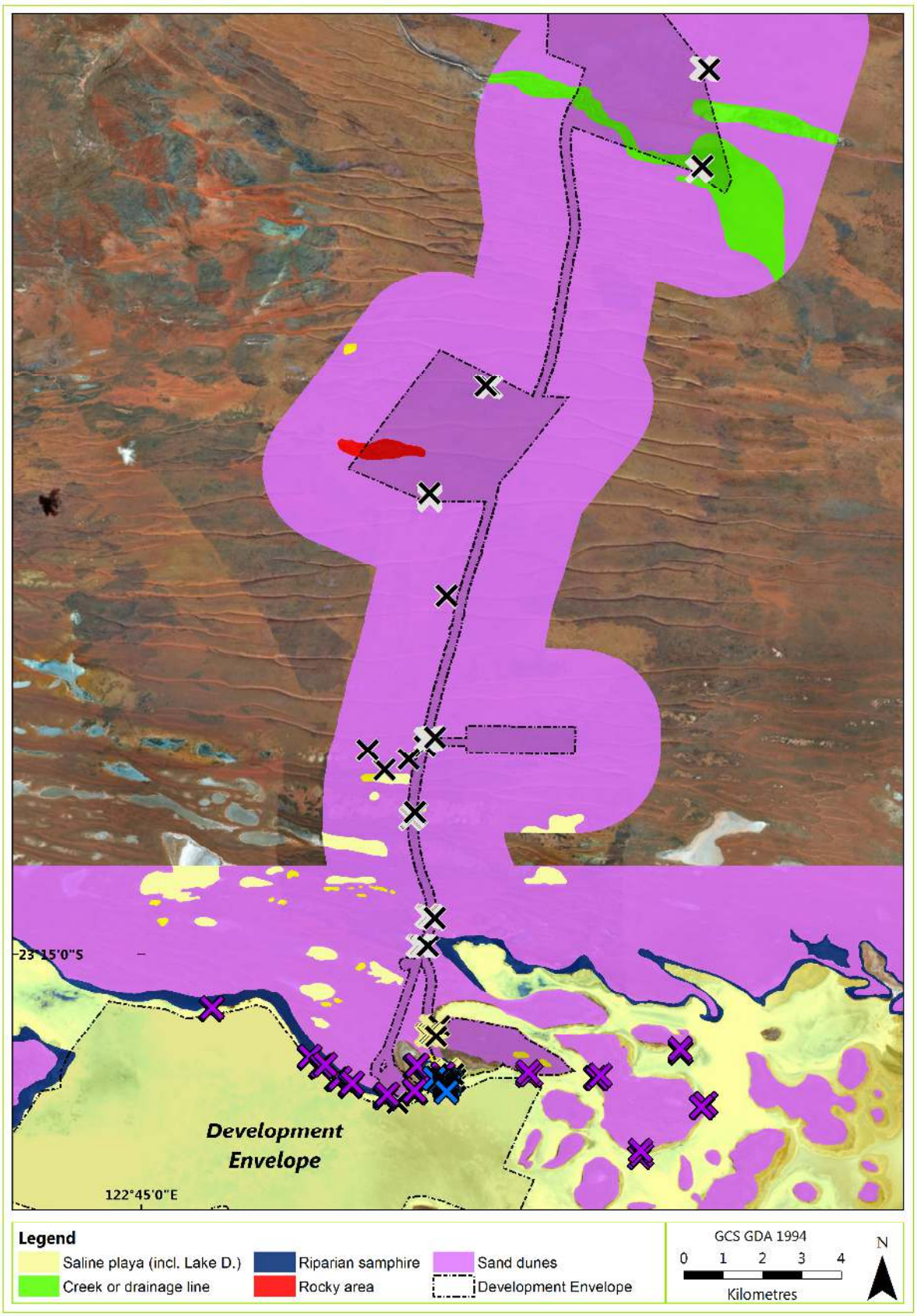

Figure 3. More detail of fauna habitat types and survey sites.

and mixed soil-litter collected at 15 sites. The survey targeted typical SRE taxa and groups containing salt lake specialists (wolf spiders of the genus *Tetralycosa* and tiger beetles of the genus *Rivacindela*, now called *Cicindela*). This survey collected 20 invertebrates and, including the specimens from Harewood (2016), the known fauna comprised 13 species, with two mygalomorphs, two pseudoscorpions, five scorpions, one wolf spider, one pupillid snail, one beetle and one isopod. All species, except the beetle, were collected only from sand dunes; the beetle was also collected from the saline playa. Five of these species were classed as potential SREs owing to deficient data – *Aname* sp. indet., *Kwonkan* `disappointment`, *Urodacus* `disappointment`, *Urodacus* `princess pea` and *Buddelundia* `10LD`. The lycosids, although juvenile, did not appear to be salt lake specialists, and the beetles belonged to the genus *Megacephala* (now called *Pseudotetracha*), which comprises widespread species that are not SREs.

Harewood, G. (2017) Fauna Survey Report Lake Disappointment Potash Project, unpublished report for Reward Minerals Ltd, Perth.

This report summarises the results of numerous surveys and only those in which SRE Group taxa were targeted or were opportunistically collected are listed below (excluding phases 1 and 2 that were summarised by Harewood 2016):

- Dry pit trapping on playa and samphire of the northern area of the lake targeting invertebrates (November 2014);
- Phase 3 Level 2 Fauna Survey (including targeted surveys) (October 2016) – Borefield areas;
- Phase 4 Level 2 Fauna Survey (including targeted surveys) (March 2017) - Borefield areas and Lake Disappointment;

The targeted invertebrate pit-trapping comprised 210 pit-trap nights in November 2014 (at sites named BU 01 to BU 30). Telfer recorded 15.2 mm of rain in November 2014. Surveys in Phases 3 and 4 added two fauna habitats - sand plain and a creek line - to the list of fauna habitats surveyed. Each survey comprised 400 pit-trap nights at four sites (named TS 09 to TS 12) and invertebrates were collected incidentally from the traps or opportunistically by hand. Invertebrates from the three surveys (between 2014 and 2017) were submitted to Erich Volschenk for identification. Prior to Phase 3 there was nearly no rain recorded at Telfer but relatively heavy rainfall was recorded prior to Phase 4 (178 mm in January and February 2017). The targeted pit-trapping collected 79 invertebrates but only 29 belonged to typical SRE or salt lake groups. These invertebrates comprised five species, all regarded as potential SREs – *Indolpium* `lake disappointment`, *Lychas* `lake disappointment`, *Pseudotetracha murchisona*, Lycosidae sp. and Lepismatidae sp.; the latter is a silverfish and does not belong to an accepted SRE group (ScorpionID 2016). Phase 3 collected 18 invertebrates (all belonging to SRE groups) and Phase 4 collected 38 (including one non-SRE modern spider), which together comprised thirteen species (Alacran 2016, 2017). The species consisted of three widespread species and ten potential SREs - *Buddelundia* `10LD`, *Idiosoma* `LD1`, *Idiosoma* `LD2`, *Kwonkan* `LD1`, *Lychas* `099`, *Lychas* `annulatus complex`, *Lychas* `multipunctatus group`, *Lychas* `telfer`, *Synothele* `LD1`, and *Urodacus* `yaschenkoi complex`. Please note that the genus *Aganippe* is no longer valid and has been sunk into *Idiosoma*.

A report, subsequent to those above, on the potential impacts of the project on terrestrial fauna not including SREs (Bennelongia and Terrestrial Ecosystems 2017) identified a fifth habitat – rocky outcrop – occurring within the development envelope (Figures 2 and 3). Approximately 168 ha of this habitat type occurs within the development envelope although all of it occurs outside the areas proposed to be disturbed.

2.1. Sampling effort

In summary, five habitat types have been identified as occurring in the development envelope (Table 1) but two habitats dominate - sand dunes and saline playa - with very small areas of riparian samphire and creek line. The fifth habitat type, a rocky outcrop, was identified post SRE surveys and was not sampled. The habitat type 'sand dune' includes both swales and dune crests, and some areas of sand plains to the north. The creek line habitat includes what is referred to as drainage line in some reports. The four surveyed habitat types all appear to be highly exposed, widespread, interconnected and therefore not prospective for SREs. Although rocky outcrops can be prospective for SREs, the 168 ha isolate in the development envelope is probably too small to support most SRE species over long time periods. Furthermore, it is planned to avoid any disturbance in the area. This means that not only are SRE species unlikely to be present but if species do occur they will persist.

SRE Group and salt lake species were the targets of survey only during the work done by Phoenix (2014) and during the dry pit trapping on the lake in November 2014 (Figures 1 and 2). Although the vertebrate fauna surveys (Harewood 2016, 2017) contributed the majority SRE Group taxa, these were incidental collections and not the focus of his surveys. The survey conducted by Phoenix (2014) in May 2013 coincided with the first part of Phase 1 of the terrestrial fauna survey (Harewood 2016). Six opportunistic collections were also made in May 2013 by Harewood, one on the playa and five in sand dune habitat.

Most of the effort on collecting SRE Group taxa was spent dry pit trapping. It occurred over multiple seasons and was focussed on the sand dune habitat, although it included a small amount of sampling of the saline playa and riparian samphire. Hand foraging or active searching occurred at 45 sites spread evenly between sand dune, playa and samphire (creek line was not recognized as a habitat at this stage and so no sites within it were selected) and mixed soil-litter sampling was conducted only in habitat where litter was available (sand dune). The creek line was sampled only via dry pit trapping, with sites retrospectively assigned to this habitat after sampling was completed.

It should be noted that several SRE Group species may be collected from a site without any of them being SRE species. SRE Groups contain relatively high proportions of SRE species but many species in these groups will have wide ranges. The fact species possess wide ranges is often indicated by occurrence in multiple habitats or in habitats that are extensive and well connected. SRE species typically occur in fragmented, specialised habitats or have aspects of their biology that limit dispersal.

Table 1. Sampling effort at the Lake Disappointment Project relating to species in SRE Groups.
VERT = vertebrates. Sampling effort in each sampling event shown as no. of samples from within the development envelope / no. of samples from outside.

	Target	Sampling	Sampling Events					
Habitat	**Fauna**	**Method**	May-13	Oct-13	Nov-14	Oct-16	Mar-17	**Total**
Saline playa	SRE	Hand foraging	0 / 15					15
		Dry pitfall			8 / 21			29
Riparian samphire	SRE	Hand foraging	1 / 14					15
		Dry pitfall			1 / 0			1
Sand dunes	SRE	Hand foraging	3 / 12					15
		Leaf litter	3 / 12					15
	VERT	Dry pitfall	75 / 5	75 / 5		20 / 10	20 / 10	220
Creek line	VERT	Dry pitfall				10 / 0	10 / 0	20

2.2. Survey results

Three 'species' belonging to SRE Groups were known from the vicinity of Lake Disappointment prior to surveys. The 'species' comprised multiple records of higher order mygalomorph spiders from the genus *Aname* near the lake (treated as one species) and records of two scorpion species recorded between 40 and 80 km north/northwest of the lake. Surveys by Phoenix and Greg Harewood collected 25 species,

increasing the overall richness of the area to 27 species (higher order *Aname* were collected again and are not counted as an additional species).

Twenty of the 27 species were classed in the reports of Phoenix (2014) and Harewood (2016, 2017) as potential SREs and seven as widespread or not SREs. This excludes three higher order records that were not recognised as species because they are likely congeneric with one of the 27 species already known or collected. The high proportion of potential SREs is the result of a precautionary approach being applied in situation where there is very little information on which to base assignment (or not) to SRE status. It does not mean any of the species collected are likely to be SREs.

Of the SRE groups collected, scorpions were most abundant with 10 species collected in surveys and two species previously known from the area, albeit well north of Lake Disappointment. Two of the scorpions were regarded as widespread and 10 were classed as potential SREs. Spiders were somewhat diverse and comprised one higher-order wolf spider species (not a SRE) and seven mygalomorph species, of which six were classed as potential SREs (including high order *Aname)*. The remaining species comprised three pseudoscorpions (two classed as potential SREs), one isopod (a potential SRE), one beetle (not a SRE), one snail (not a SRE) and one higher-order silverfish (a potential SRE).

When grouping higher level identifications with the species they probably represent, e.g. *Beierolpium* sp. with *Beierolpium* 8/2 sp. and *Pseudotetracha* sp./Scarabidae sp with *Pseudotetracha murchisona*, the number of species is reduced to 25. Most of this fauna (22 of the 25 species) were recorded in sand dunes (Figure 6). Nineteen species were recorded only in sand dunes (14 classed as potential SREs), three from sand dunes and playa and/or samphire (all potential SREs) and three only from saline playa and riparian samphire (all potential SREs). The higher richness in the sand dunes is possibly an artefact of sampling bias, as most sampling effort was expended in this habitat type.

The section below reviews project information and the species collected with regard to their status as potential SRE or salt lake taxa. The information is also summarised in Table 2.

3. CONSERVATION SIGNIFICANCE

The potash project is situated in the Little Sandy Desert, which is a very remote part of WA that experiences climate typical of deserts and inland Australia – extreme temperature variation and low (mostly summer) rainfall. A desktop review of the potash project and its vicinity (see Section 4.1 of Phoenix 2014) identified that almost no sampling for SREs had occurred in the region prior the surveys conducted by Phoenix (2014) and Harewood (2016, 2017). The paucity of regional sampling means there is insufficient information to assess the status of any species using collecting records. However, because none of the species (including salt lake specialists) collected from this area by Phoenix (2014), Harewood (2016, 2017) or museum collectors have been found in typical SRE habitats, they are very unlikely to be SREs. Habitats in the Little Sandy Desert are, in general, well connected and unlikely to support SREs.

Furthermore, the 27 species from SRE Groups or salt lake specialist taxa that occur in the survey area, based on both the desktop and survey results, represents a relatively low species richness and is primarily comprised of arid-adapted scorpions. Two of the scorpions were only recorded in museum databases from well north of the survey area and, although both were classed as potential SREs, they were not collected near the potash project.

Eighteen of the 23 clearly distinct species identified from the surveys were classed as potential SREs because of insufficient data to infer a wide range confidently. However, 15 of the potential SREs were collected from sand dunes (one also on the salt lake) and on this basis are unlikely to be SREs. The remaining three potential SREs, a silverfish (Lepismatidae sp.), a scorpion (*Lychas* `lake disappointment`) and pseudoscorpion (*Indolpium* `lake disappointment`), were collected only from playa and samphire habitats and include locations both within and immediately adjacent the development envelope.

Regarding the silverfish, no surface species from this family are currently known to be SREs, whether ordinary terrestrial species or salt lake specialists. The species collected at Lake Disappointment is even less likely to be an SRE than most other species because of the open, arid habitat in which it was collected. The only SRE silverfish in WA are troglobites in the family Nicoletiidae.

The potential SRE scorpion and pseudoscorpion did not exhibit any salt lake specialist morphology despite being collected from playa and samphire habitats. These genera are not known to contain salt lake specialists. The scorpion *Lychas* `lake disappointment` bears a close resemblance to *Lychas* `annulatus complex`, which has been recorded throughout WA. Furthermore, species of the genus *Lychas* are typically not SREs because they actively forage at night and have large ranges, which gives them dispersal capacity that does not fit with having a small range.

The pseudoscorpion *Indolpium* `lake disappointment` belongs to the arid-adapted family Olpiidae, a group that occasionally contains species regarded as perhaps SREs when collected from typical SRE habitat, e.g. deep shaded gullies in the Pilbara or banded-ironstone ranges (akin to islands) in the Goldfields. *Indolpium* `lake disappointment` bears a close resemblance to an un-named species of *Indolpium* from the Pilbara and the two are possibly conspecific. Both the scorpion and the pseudscorpion are unlikely to be SREs.

4. CONCLUSION

None of the habitats at the potash project appear to be prospective for SREs. Five habitat types were identified and all appear to be highly exposed or arid. Four of the habitats are widespread and interconnected and the fifth (a rocky outcrop), although isolated, is unlikely to be of insufficient size to support species populations that are viable in the long-term.

The playa system of Lake Disappointment is vast and interconnected, and any salt lake specialist present would be very likely to occur across the entire area and also in the numerous neighbouring playas and pans. The proposed area of disturbance on the lake occupies less than 6% of the playa area defined as Lake Disappointment. This strongly suggests the conservation status of any salt lake specialist would not be affected by the proposed development.

The richness of the potash project for species in SRE Groups is relatively low (27 or 25 species, depending whether higher order identifications are treated as separate species). Although the majority of species (18) were classed as potential SREs because of insufficient data (i.e. they are not confidently known to have been collected or occur elsewhere), all were found in habitats that are not prospective for SRE species (including the widespread playa) and on the basis of the habitat associations are unlikely to be SREs. The assignments of SRE status in the baseline reports were precautionary.

While no species are considered likely to be SREs, three potential SRE species are currently known only from the saline playa and riparian samphire habitats within close proximity to the development envelope. These are the pseudoscorpion *Indolpium* `lake disappointment`, scorpion *Lychas* `lake disappointment` and silverfish Lepismatidae sp. As discussed above, based on general life history information and common practice regarding the definition of SRE Groups, silverfish belonging to the family Lepismatidae should not have been treated as a potential SRE or salt lake specialist in the baseline reports. They were not recognised by Harvey (2002) as having small ranges. The two arachnids should also not be treated as SREs because their collection from the playa area, combined with a lack of traits common to salt lake specialists and close resemblance to widespread species, strongly suggest they are quite wide ranging, robust species that will occur widely around Lake Disappointment and its surrounds. Therefore, all three species known only from the area of disturbance are highly likely to occur outside the development envelope and more widely in the region. Their conservation status will not be impacted by the proposed development.

5. REFERENCES

Alacran Environmental Science (2016) Taxonomy and short range endemic Assessment of Invertebrates from Lake Disappointment. December 2016, Report No. 1628.

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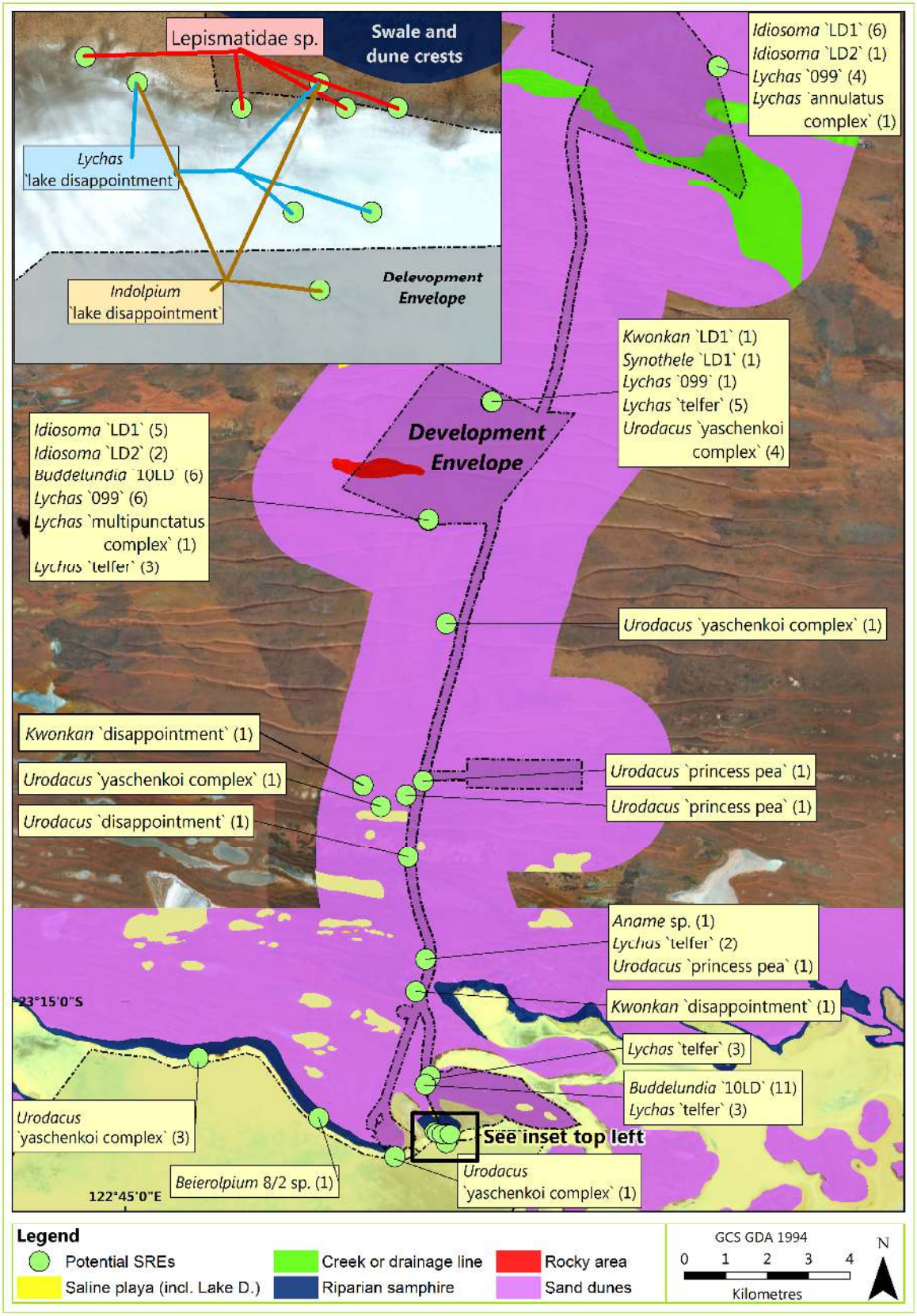

Figure 4. The development envelope, habitat types and potential SREs recorded in surveys from the Lake Disappointment Project

Table 2. The number of animals (and collection sites) of species in SRE or salt lake taxa collected from the Project between 2013 and 2017.

I, within the development envelope; R, outside the development envelope. Grey highlighted records are higher-order identifications that are not treated as a species as they are most likely congeneric with other species collected. Species only known from the lake area (saline playa and samphire) are highlighted orange.

		Playa		Samphire		Dunes		Creek	Species	
Higher Taxonomy	Lowest Identification	I	R	I	R	I	R	I	Status	Species Notes and Review of SRE Status
Arthropoda										
Arachnida										
Araneae										
Araneomoprhae										
	Lycosidae sp.		2 (2)			4 (2)			indet.	Higher-order identification. Not a salt lake specialist.
Mygalomoprhae										
Barychelidae	*Synothele* `LD1`					1 (1)			new	New species. Collected in sand dunes. Not a SRE.
	Synothele meadhunteri					2 (1)			described	Known from across WA. Not a SRE.
Idiopidae	*Idiosoma* `LD1`					5 (1)	6 (1)		new	New species. Collected in sand dunes. Not a SRE.
	Idiosoma `LD2`					2 (1)	1 (1)		new	New species. Collected in sand dunes. Not a SRE.
Nemesiidae	*Aname* sp.					1 (1)			indet.	Higher-order identification. Collected in sand dunes. Not a SRE.
	Kwonkan `disappointment`					1 (1)	1 (1)		new	New species. Collected in sand dunes. Not a SRE.
	Kwonkan `LD1`					1 (1)			new	New species. Collected in sand dunes. Not a SRE.
Pseudoscorpiones										
Garypidae	*Synsphyronus callus*						1 (1)		described	Known from across WA. Not a SRE.
Olpiidae	*Beierolpium* 8/2 sp.						1 (1)		indet.	Higher-order identification. Members of this family in the Pilbara are not typically SREs. Collected in sand dunes. Not a SRE.
	Beierolpium sp.						2 (2)		N/A	Higher-order identification, likely congeneric with *Beierolpium* 8/2.
	Indolpium `lake disappointment`	1 (1)	1 (1)	1 (1)					new/ complex	A new species, although it closely resembles a Pilbara morphospecies and the two are possibly congeneric. Found in playa & samphire habitat but lacks salt lake specialist morphology suggesting it is probably a wide ranging species. Members of this family from non-typical SRE habitat in the Pilbara are not typically SREs. Should not be a SRE.
Scorpiones										
Buthidae	*Lychas* `099`					7 (3)	4 (1)		new/ complex	New species that has a close relationship with *Lychas* `annulatus complex`, which is known from throughout WA. Collected in sand dunes. Should not be a SRE.
	Lychas `adonis` ms					4 (2)			complex	Found in Pilbara and South Coast. Not a SRE.
	Lychas `annulatus complex`						1 (1)		complex	Known from across WA. Should not be a SRE.
	Lychas `lake disappointment`		5 (3)	1 (1)					new/ complex	New species that has a close relationship with *Lychas* `annulatus complex`, which is known from throughout WA. Collected in playa and samphire but lacks salt lake specialist morphology suggesting it is probably a wide ranging species. Should not be a SRE.
	Lychas `multipunctatus group`					3 (1)			complex	Known from across WA. Not a SRE.
	Lychas `telfer`					12 (6)			complex	Collected from sand dunes and known from Telfer area. Not a SRE.
Urodacidae	*Urodacus* `disappointment`					1 (1)			new	New species. Sand dunes are not SRE habitat, although many taxa from SRE groups (especially scorpions) will occur in this desert habitat. Should not be a SRE.
	Urodacus `princess pea`					2 (2)	1 (1)		new	As previous (U. `disappointment`).

		Playa		Samphire		Dunes		Creek	Species	
	Urodacus `yaschenkoi complex`		4 (2)			4 (1)	2 (2)		complex	Although four species may exist within *yaschenkoi,* it was collected from sand dunes and saline playa and should not be a SRE.
	Urodacus hoplurus					3 (2)			described	Known from across WA. Not a SRE.
Crustacea										
Isopoda										
Armadillidae	*Buddelundia* `10LD`					17 (2)			new/ complex	Collected in sand dunes. This species bears a close resemblance to a Pilbara morphospecies (B. `10`) and the two are possibly congeneric. Not a SRE.
Hexapoda										
Insecta										
Coleoptera										
Scarabidae	*Pseudotetracha murchisona*	2 (2)	6 (6)	2 (1)					described	Known from across WA. Most likely includes the higher-order beetles below. Not a SRE.
	Pseudotetracha sp./Scarabidae sp.		4 (3)			3 (1)			N/A	Higher-order identifications that do not represent a species and are likely congeneric with *P. murchisona*.
Thysanura										
Lepismatidae	Lepismatidae sp.	1 (1)	5 (4)	1 (1)					indet.	Higher-order identification. No lepismatids are SREs in Australia. The family Nictoletiidae comprises many troglobitic SREs.
Mollusca										
Pupillidae	*Pupoides adelaidae*						10 (3)		described	Known from across WA. Not a SRE.