ASX CODE: RUM

ABN: 33 122 131 622

REGISTERED OFFICE

20/90 Frances Bay Drive

Stuart Park NT 0820

POSTAL ADDRESS

GPO Box 775

Darwin NT 0801

T +61 8 89420385

F +61 8 89420318

W www.rumjungleresources.com.au

E info@rumjungleresources.com.au

DIRECTORS

Jeff Landels

David Muller

Chris Tziolis, MD

MAJOR PROJECTS

Ammaroo Rock Phosphate

Karinga Lakes Brine Potash

Titleholder:	**Rum Jungle Resources Ltd**
Operator:	**Rum Jungle Resources Ltd**
Tenement Manager:	**Complete Tenement Management**
Tenements:	**EL 5546, EL 5547, EL 5548**
Project Name:	**Lake Frome Potash**
Report Title:	**Group annual technical report for the Lake Frome Brine Potash Project, period ended 04/01/2016**
Authors:	**John Dunster and Juan Carlos Marquez**
Corporate Author:	**Rum Jungle Resources Ltd**
Target Commodity:	**Brine potash**
Date of Report:	**20/02/2015**
Datum/Zone:	**GDA94/Zone 54**
250K map sheets:	**Frome SH5410, Curnamona SH5414**
Address:	**PO Box 775, Darwin NT 0801**
Phone:	**8942 0385**
Fax:	**8942 0318**
Contact Email:	**jdunster@rumjungleresources.com.au**
Key Words:	**potash, brine, water geochemistry, salt lake, land access**

CONTENTS

LIST OF FIGURES AND TABLES

SUMMARY

Rum Jungle Resources holds three contiguous titles that cover the whole of Lake Frome in eastern South Australia. The company intends to explore below the dry lake surface for brines that might be suitable for the production of potash minerals used in fertilisers. Negotiations with the Adnyamathanha Traditional Lands Association who represent the Traditional Owners are progressing well and an agreement should be signed shortly. Literature reviews and an assessment of the work by previous explorers have been undertaken. A work program has been submitted to the relevant authorities and stakeholders.

INTRODUCTION

This report describes the work undertaken during the first year of ELs 5546, 5547 and 5548 which cover the dry salt playa lake, Lake Frome, in eastern South Australia (not to be confused with the smaller coastal lake of the same name). It is hoped to be able to systematically sample deep brines from beneath the salt lake and assess their potential to produce potash minerals which could be used to make fertiliser.

HISTORY

In 1840-41, Edward John Eyre, explored along the western side of the Flinders Ranges, discovering Lake Torrens and Lake Eyre South, which he described as "...one vast, low, and dreary waste". Turning southeast, he also discovered Lakes Blanche, Callabonna and Frome which he didn't actually name since he believed that they were all part of Lake Torrens which appeared to be one vast impassable horseshoe shaped salt lake blocking the way to the north beyond the Flinders Ranges.

After it was realised that there were separate lakes, Edward Charles Frome mapped the area in 1843 and Lake Frome was named after him.

The extensive salt crusts on Lake Frome are regarded as literally whiter then snow and were used to calibrate the "white" in early satellite imagery. These parts of the lake surface are arguably the brightest place on Earth and were accessed by the CSIRO on several occasions to take albedo measurements.

Figure 1. CSIRO staff in December 2000, arranging a blue sheet on the salt of Lake Frome to be spotted by NASA's Hyperion satellite EO-1.

LOCATION, ACCESS AND LAND USE

Location

Figure 2 is a map of Rum Jungle Resources' Lake Frome Project. The lake is 750 km (470 miles) northeast of Adelaide, 134 km east of Leigh Creek in SA and 210 km west northwest of Broken Hill in NSW.

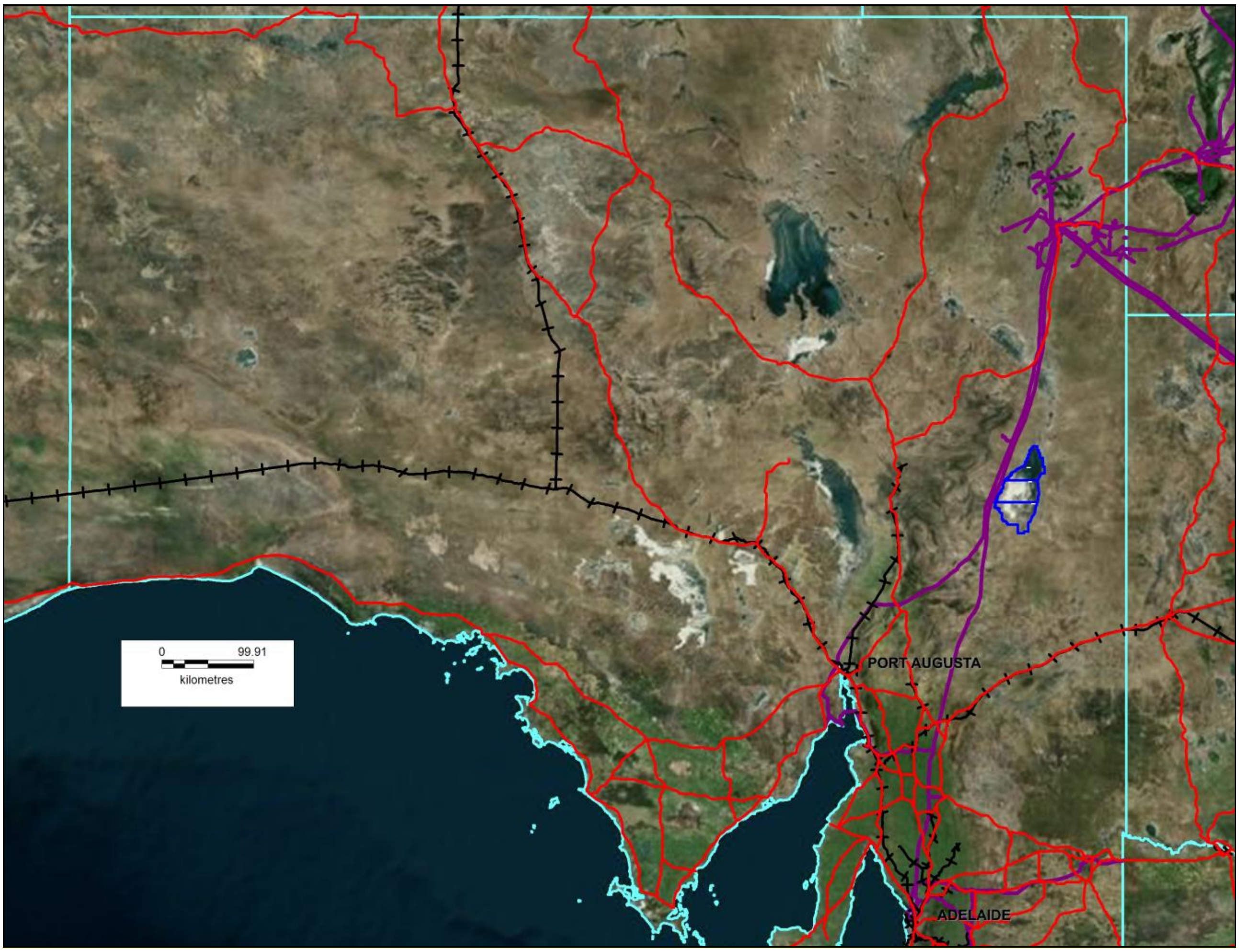

Figure 2. Regional location the Lake Frome Project in SA with titles outlined in blue, showing railways, main roads in red and pipelines in purple.

Climate

Lake Frome is located in one of most arid parts of Australia. Pan evaporation in the Lake Frome region is typically 2,400 mm - 3,700 mm per year which is over ten times the average rainfall. The prevailing winds in the Lake Frome region are mild southerly winds, however stronger westerly winds become more pronounced during the mid-year winter months. There is sufficient difference in albedo and latent heat consumption between the lake salt crusts and the surroundings to generate its own air circulation.

Rainfall

Lake Frome is located close to the boundary between Australian winter (westerlies and cold front related) and summer (monsoonal and ENSO) rainfall zones. The ranges to the west of the lake affect rainfall coming from that direction. Total rainfall at Lake Frome averages around 150-180 mm per year and it falls sporadically. On average, most rain is during the winter months but as shown below, October to February can also be relatively wet depending on any monsoonal influence getting that far south. Rainfall records for the three closest weather stations are incomplete. All available data since 2000 is plotted below. Note the wide variations between the three stations for any given month and year.

Frome Downs

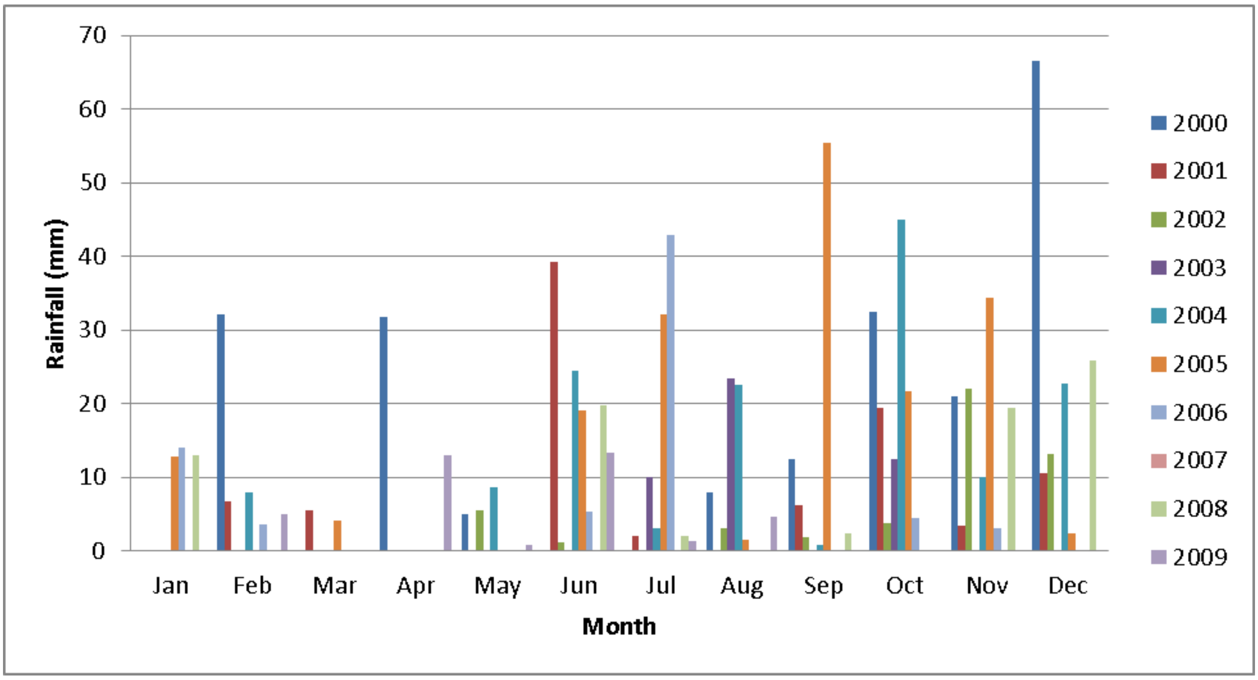

Figure 3a

Wertallona

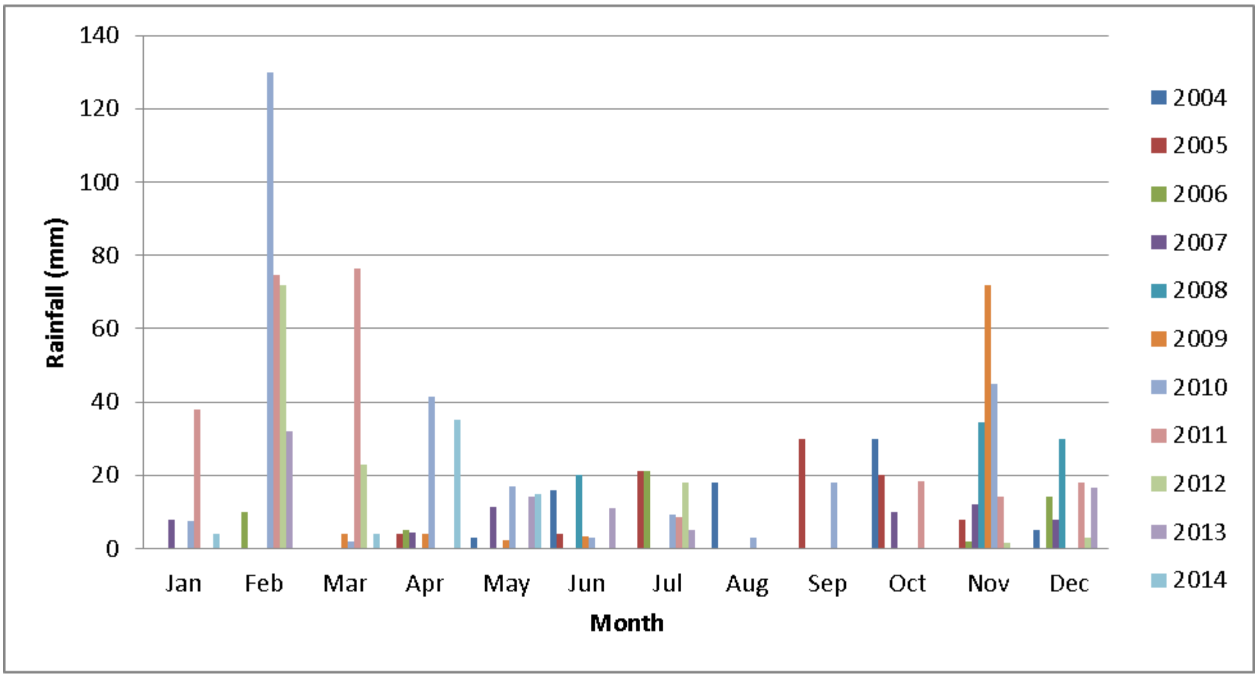

Figure 3b

Arkaroola

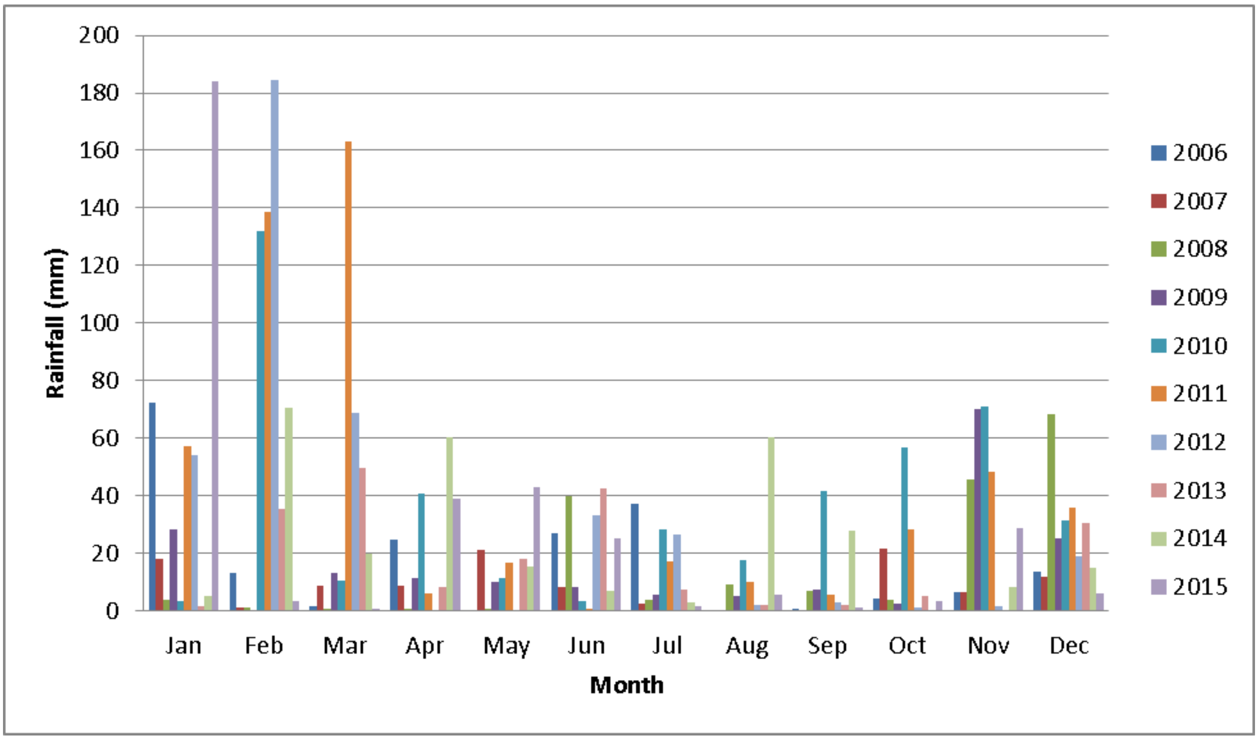

Figure 3c

Figure 3 a,b,c. Average rainfall for the project area recorded at the three closest weather stations.

Humidity

Figure 4 below shows the relatively low all-year-round humidity. Dew and rare frost account for the highest morning readings.

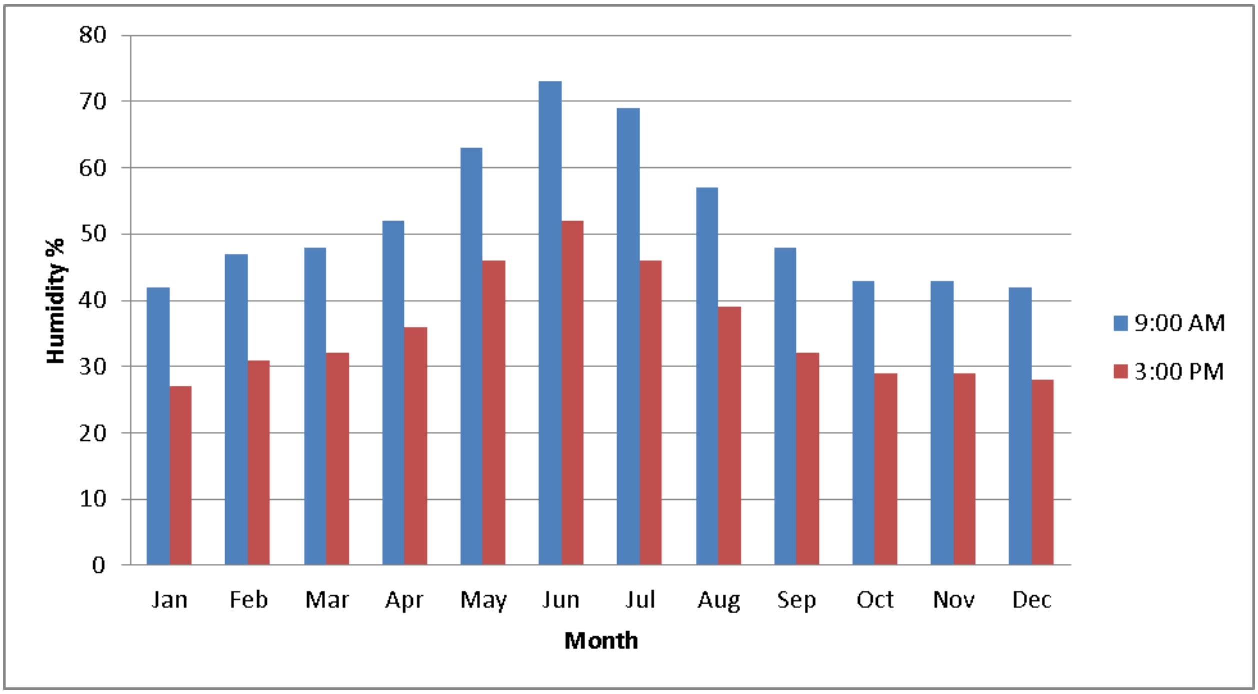

Figure 4. Mean monthly relative humidity (%) at 9am and 3pm recorded at Arkarolla Station.

Temperature

Quoted minimum and maximum temperatures range between 4.5°C and 40°C at Lake Frome. Reflection from the white salt crust can account for several degrees of temperature elevation locally and CSIRO and Comalco personnel working on the lake regularly experienced daytime temperatures in excess of 46°C. Comalco recorded a highest day-time temperature of 48°C at head-height in the shade on the salt crust.

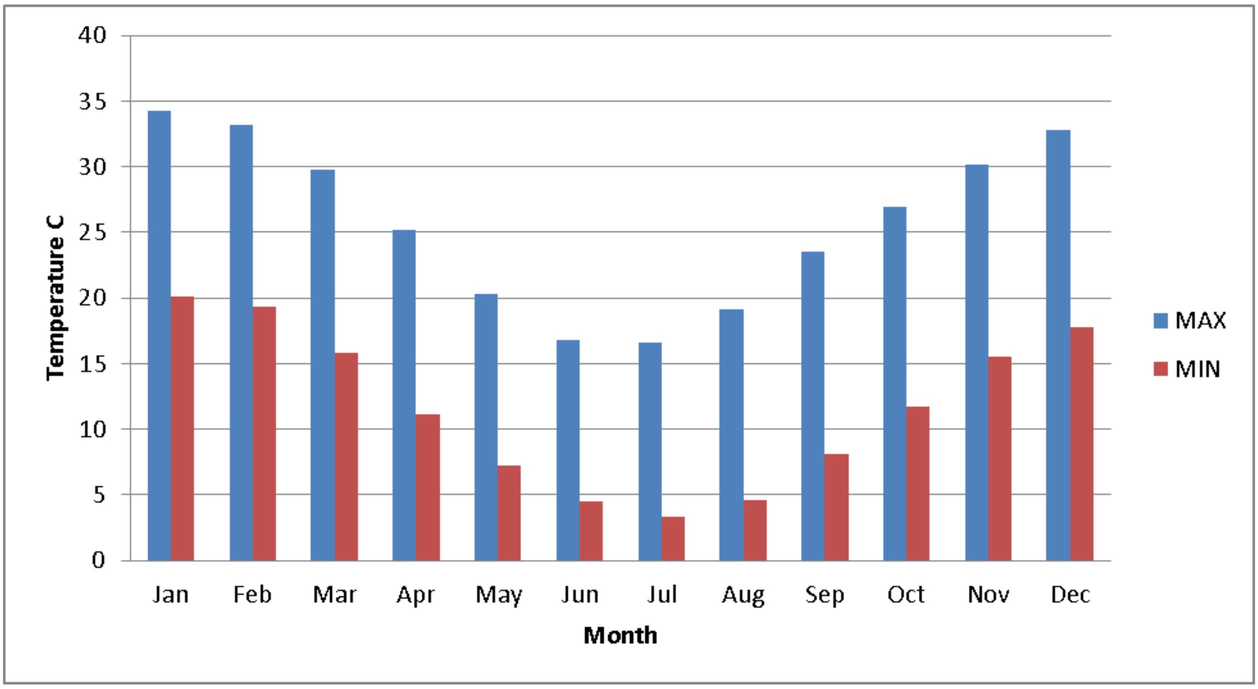

Figure 5. Mean maximum and minimum monthly temperatures (°C) at Arkaroola Station.

Physiography and Topography

Lake Frome has streams feeding in from the west in the northern Flinders Ranges. There are dunefields to the east and south.

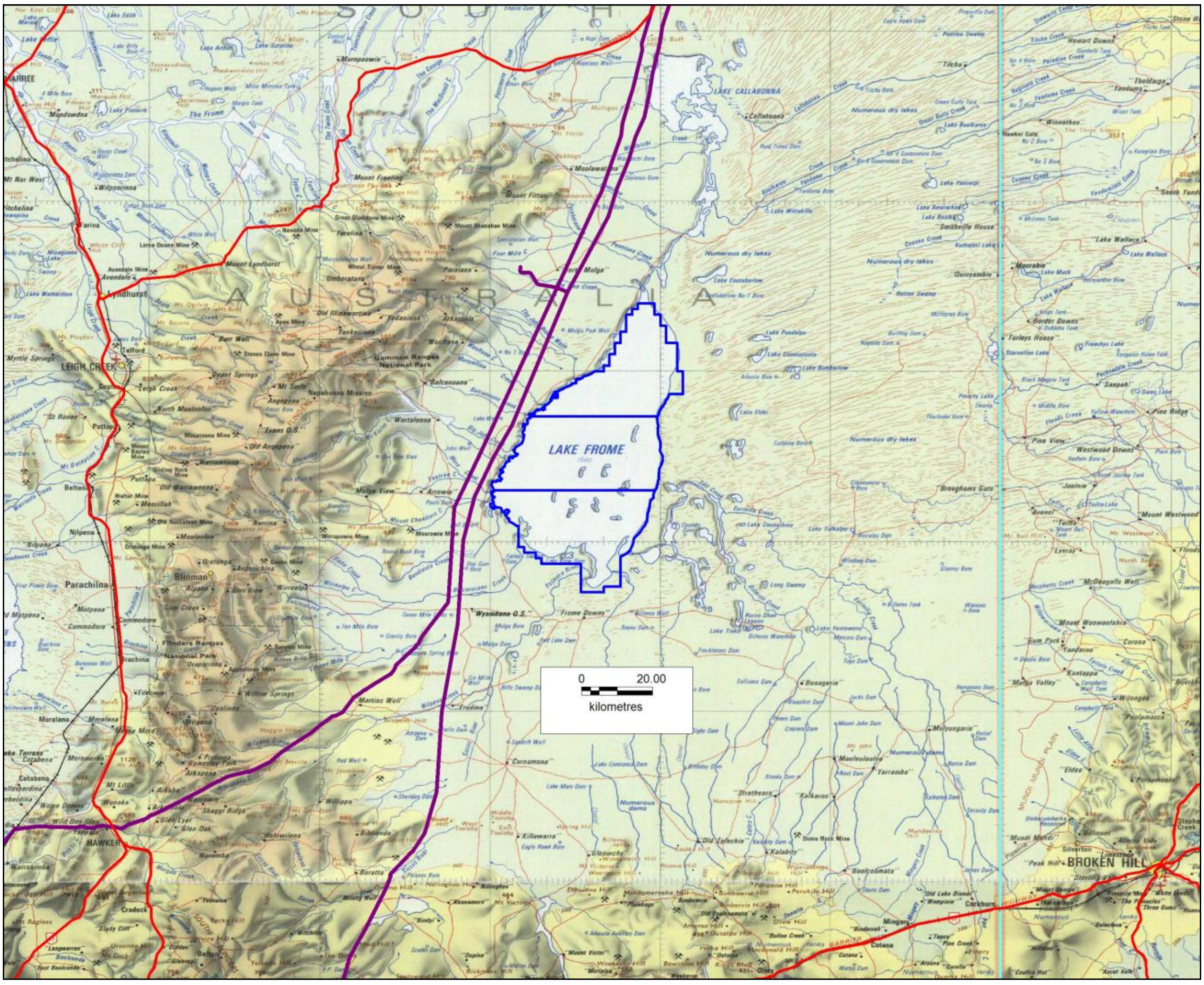

Figure 6. A published topographic map covering the project area.

Regional Hydrology

Lake Frome is part of the modern Lake Eyre Basin. It is the terminal lake within the Callabonna sub-Basin of the Lake Eyre Basin. The Lake Frome catchment makes up the southern and south-western portion of the Lake Eyre Basin. It is connected to Lake Callabonna to the north via a modern, but normally dry, channel. Lake Frome is similarly connected to a chain of much smaller lakes to the southeast. The existence of any palaeo-drainages is yet to be researched because these would be outside the tenement area. The local hydrology of Lake Frome itself is described later in this document.

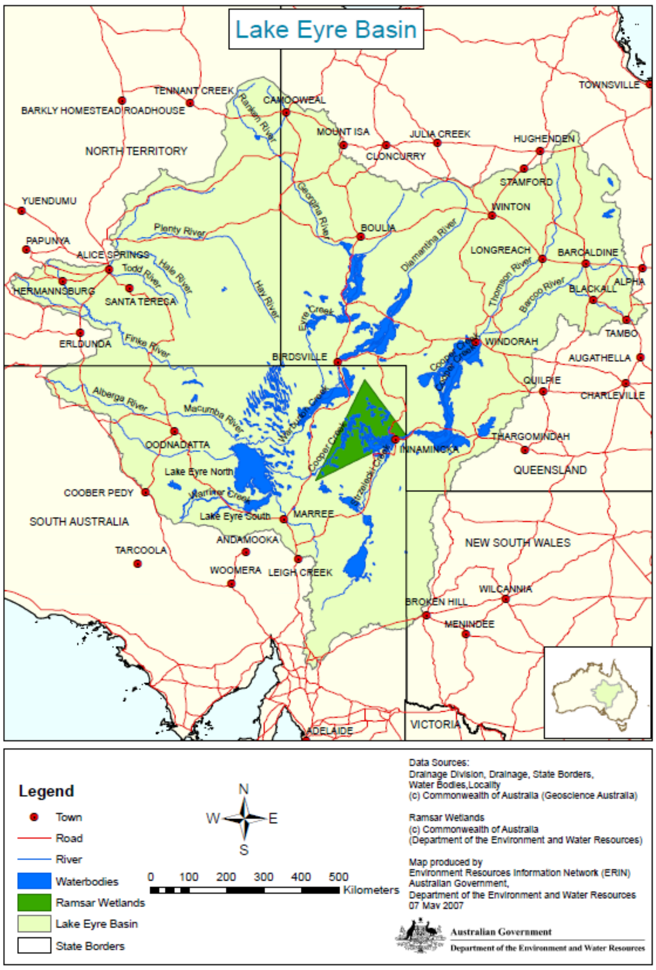

Figure 7. Lake Frome is in the southern quarter of the Lake Eyre Basin.

Land Systems, Flora and Fauna

Lake Frome is included within the IBRA Subregion 7 Strzelecki Desert Bioregion (SSD05). The area to the east of Lake Frome is part of the Simpson-Strzelecki Dunefields Bio sub-region which extends from the southeast of the Northern Territory, through the northeast of South Australia, with small areas in both Queensland and New South Wales.

An EPBC Search into local flora and fauna was undertaken and the report is included in the PEPR but not reproduced here.

Habitation and Land Use

The area is very remote and very sparsely settled. The nearest habitations are the Ranger Station for the National Park, pastoral stations such as Wertaloona and Frome Downs and small Aboriginal communities.

The only non-indigenous land use around the lake is very low density cattle grazing. As described below the main value of the lake itself is for biological and cultural conservation. As shown in figure below, a land corridor connects Lake Frome itself to a National Park to the west.

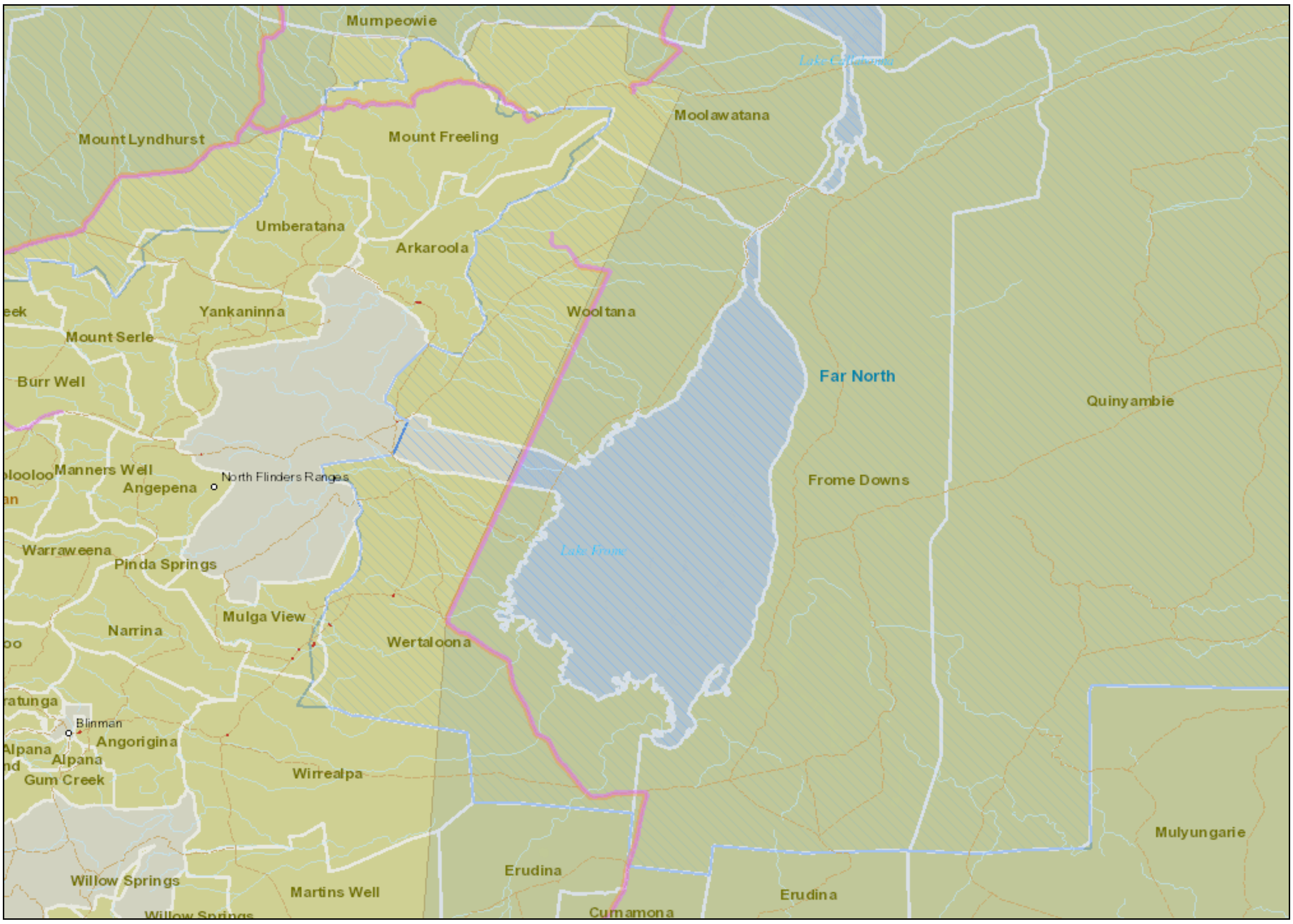

Figure 8. Cadastre of the project area.

Local Access and Logistics

The best access to the lake edge is from the west as shown below.

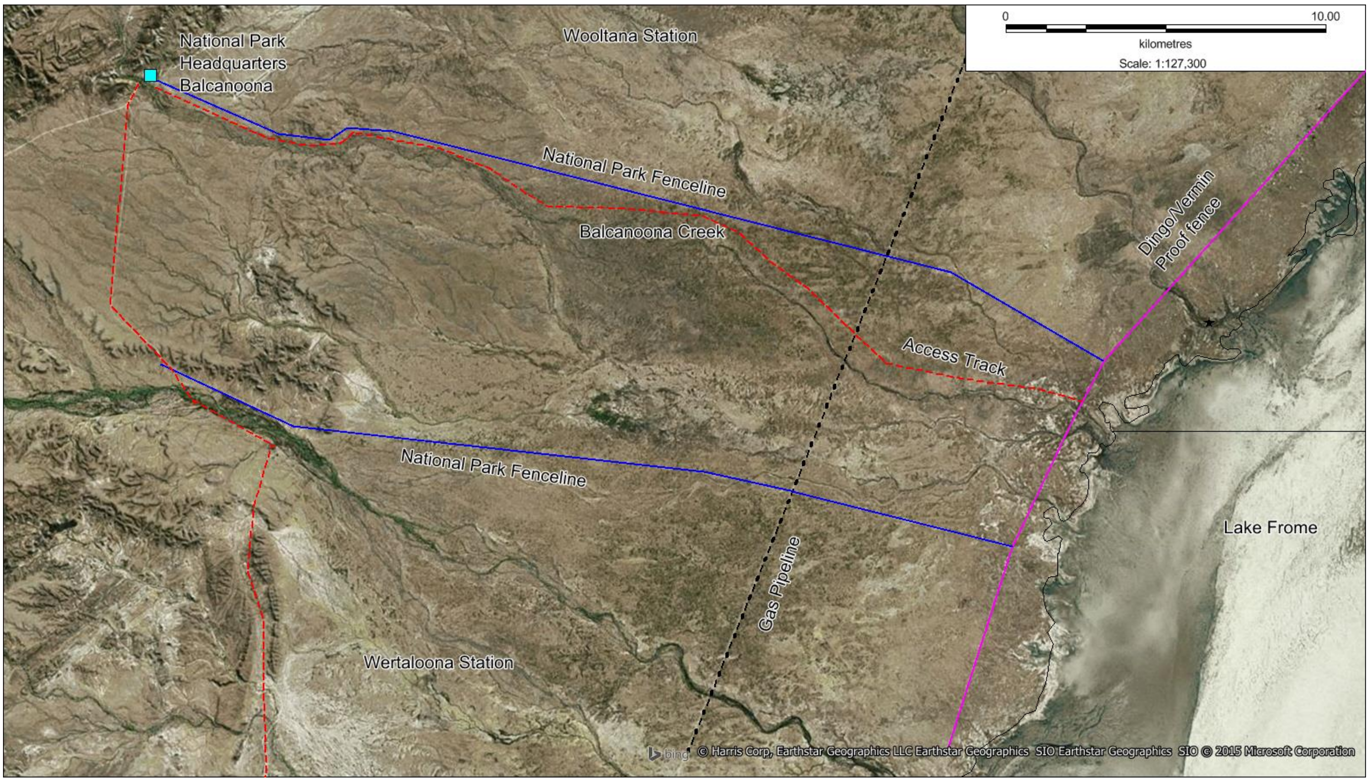

Figure 9. Access to Lake Frome from the west.

Public road access to western Lake Frome is limited to a single, rough four-wheel drive track which commences from the Vulkathunha-Gammon Ranges National Park headquarters at Balcanoona (Virlkundhunha) 30 km west of the lake. The route to Lake Frome traverses flat, stony terrain following Balcanoona Creek. After crossing both the Moomba-Adelaide natural gas pipelines and the dingo fence, the track passes over low sand dunes before arriving at the western shore of Lake Frome (Figure 9).

This main access track from the west also travels through a declared Cultural Use zone used for hunting by the local Adnyamathanha Aboriginal people. Public access is prohibited between 3.00 pm and 5.00 am daily.

Access to other sides of the lake depends on irregularly-maintained station tracks and tracks constructed by other exploration companies.

The lake surface itself varies considerably in hardness, but in general is more clayey and boggy towards the centre. Parts of the clay surface of the apparently dry lake have water less than a decimetre down and cannot support the weight of even a trail bike or a person on foot. In addition, salt crusts can be sitting directly on water or unconsolidated thixotropic sediment and pose a risk in access, making it like working on an ice lake. Doug Sprigg from Arkaroola Wilderness Sanctuary regularly flies over Lake Frome and says, “If there is enough water in it for long enough, the salt crust breaks up (and drifts) like an pack ice." The previous explorer Comalco’s personnel wore life vests when traversing or working on the salt crust and had vehicles and personnel break through. To drill on the southwestern lake, Comalco used purpose-built tracked vehicles (a Mole Mink) and hovercrafts. Monash University and CSIRO have successfully accessed the southeastern part of lake on quad bikes.

Aboriginal Issues and Negotiations for Access

Lake Frome forms part of the local Dreaming story told by the Adnyamathanha people explaining how the region's topography and species originated. According to this Dreaming story, Lake Frome was emptied of its water by the Rainbow Serpent Akurra when he ventured down Arkaroola Creek (which flows onto Lake Frome) to drink. Due to its Dreamtime significance the traditional Adnyamathanha do not venture onto the lake's surface.

On 04 June 2015, Form 27 was sent to Native Title Parties and relevant Government departments. This was followed-up by sending a copy of the PEPR to Native Title legal representatives.

Adnyamathanha Traditional Lands Association (Aboriginal Corporation) RNTBC (ICN 3743) (“ATLA”) is the agent prescribed body corporate/registered native title body corporate on behalf of the Native Title Holders in respect of all the land the subject of the Stages 1, 2 and 3 Adnyamathanha Consent Determinations of Native Title made by the Federal Court in Application SG 6001/98 on 30 March 2009 and 25 February 2014. They act for and on behalf of the Adnyamathanha people.

Meetings were held with representatives of the Traditional Owners of Lake Frome (ATLA) to discuss access. Negotiations used Ninti Kata Consultancy, Finlaysons and Johnston Withers Lawyers. Rum Jungle Resources’ CEO met with the full Board of the Adnyamathanha Traditional Lands Association (ATLA) in Hawker, SA on Friday 9 October 2015. On that day, the Board voted to negotiate an exploration agreement with Rum Jungle Resources. The agreement is in the final stages of negotiation and is expected to be signed within the next month.

Areas of Ecological and Conservation Significance

Due to its "regional geological significance" the lake was proclaimed as the Lake Frome Regional Reserve (IUCN Category VI) in December 1991.

Lake Frome and it surrounds have 26 EPBC-listed mound spring complexes associated with Great Artesian Basin discharge zone. These springs have varying conservation significance; 21 are considered to be at “risk” or “high risk”. Any activity that might affect the feed into, or affect the waterlevel in, these springs must be avoided. Tim Ransley from the Groundwater Group of the Environmental Science Division of Geoscience Australia and Daniel Wohling from the SA Government helped track down the exact mound spring locations within Lake Frome. Rum Jungle Resources has no need to intersect the Great Artesian Basin aquifer anyway and has self-imposed buffers around the mound springs. These are larger than the legislated exclusion zones.

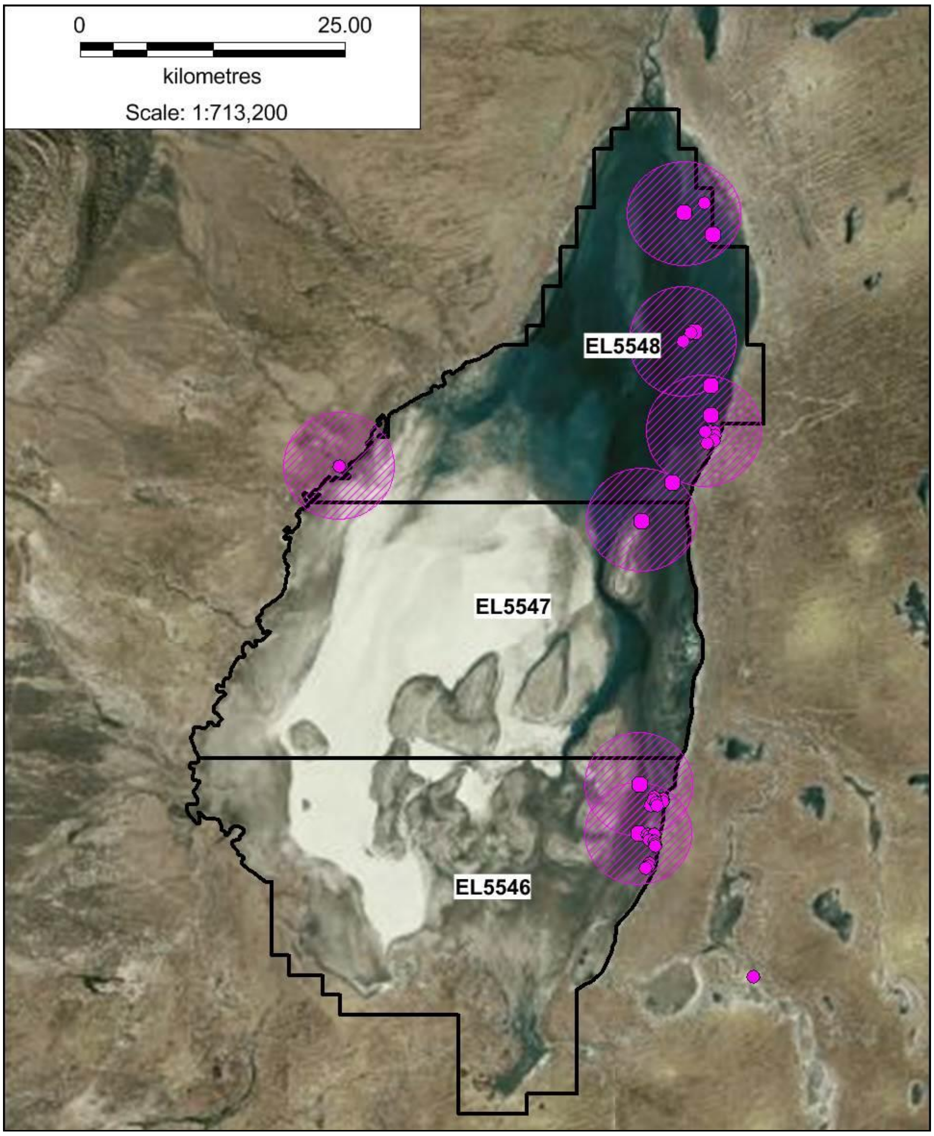

Figure 10. Location of mound springs in and around Lake Frome with self-proclaimed no-go buffers.

HISTORY OF TENURE

The three contiguous titles were granted 05 January 2015. These cover the entire of Lake Frome for 2,718 km^2. The titles were only granted for two years.

Tenement	Area km^2	Grant Date	Expiry	Holder
EL 5546	949	05/01/2015	04/01/2017	RUM
EL 5547	995	05/01/2015	04/01/2017	RUM
EL 5548	774	05/01/2015	04/01/2017	RUM

Table 1. Lake Frome titles.

Plans are currently underway to transfer the titles to a NewCo subsidiary of Rum Jungle Resources to be called Territory Potash Pty Ltd.

EXPLORATION AND PROJECT RATIONALE

The Lake Frome Potash Project is one of many in which Rum Jungle Resources is involved across three Australian jurisdictions (Figure 11). All the projects are targeting salt lakes and sub-surface aquifers that contain potassium- and magnesium-rich sulphate brines. Potash and/or schoenite fertiliser can be produced by simple staged solar evaporation and flotation and /or other onsite treatments.

Australia has no producing potash mines. Around 350,000 tonnes of potash is imported into Australia annually from Canada and is worth around $200 million. Potash of sulphate and schoenite are utilised as high-end fertiliser products globally, as they have a lower salt index than muriate of potash and are often preferred in crops sensitive to chloride or susceptible to fertiliser burn. Sulphate of potash and schoenite attract premium pricing in comparison to the more common muriate of potash.

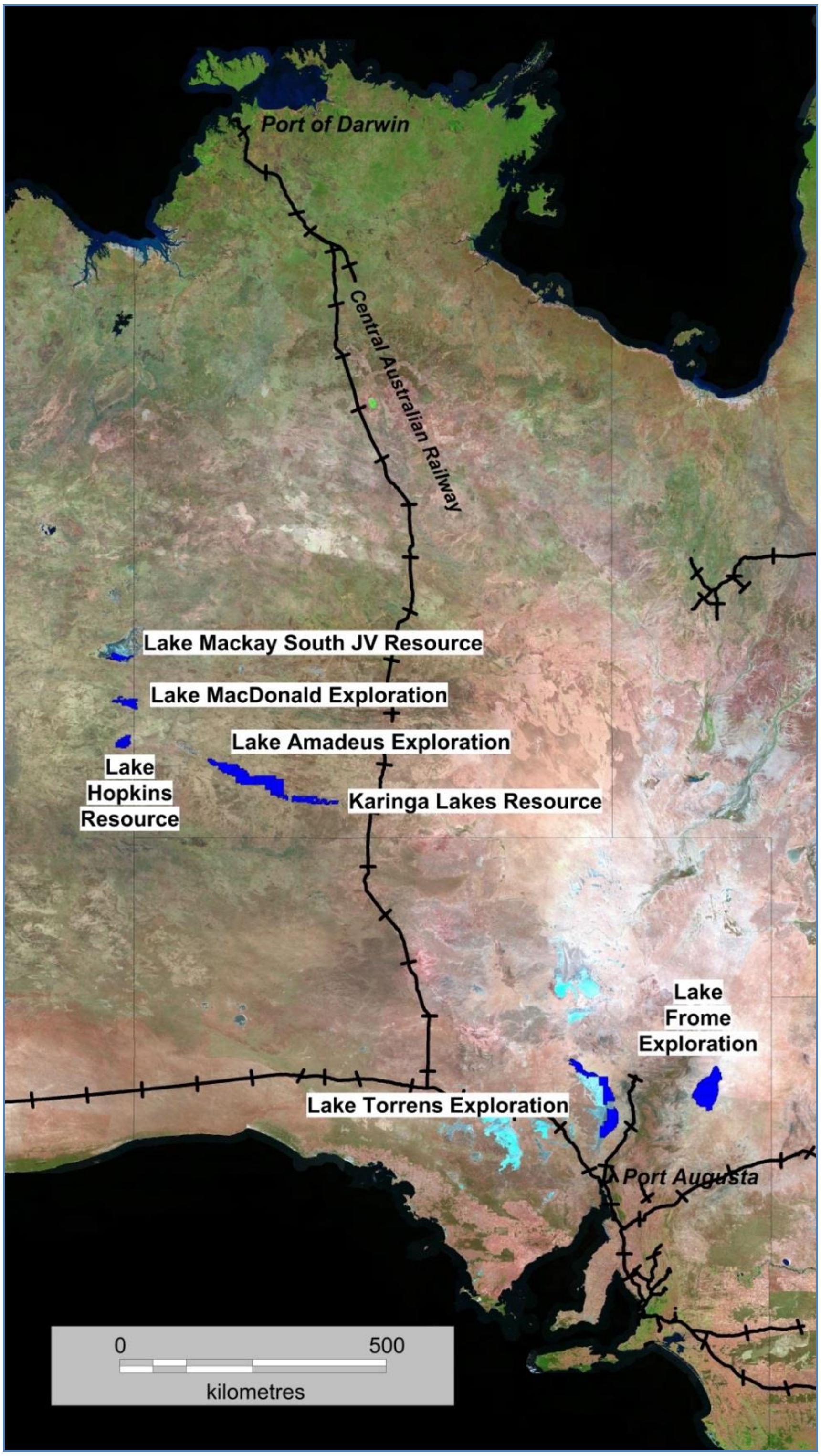

Figure 11. Rum Jungle Resources' sulphate of potash brine projects.

The Lake Frome Project is strategically well located near roads and railways, providing access to ports and proximity to southern to domestic markets.

GEOPHYSICS

The TMI data shown below probably reflect rugosity and differing geology in basement under the lake. It is not known to what extent the basement ridge under the lake might partition the lake stratigraphy itself. Northwest trending faults visible on the data may be conduits for upward migration of fluids, since they are believed to penetrate the great Artesian Basin (see discussion in Geology).

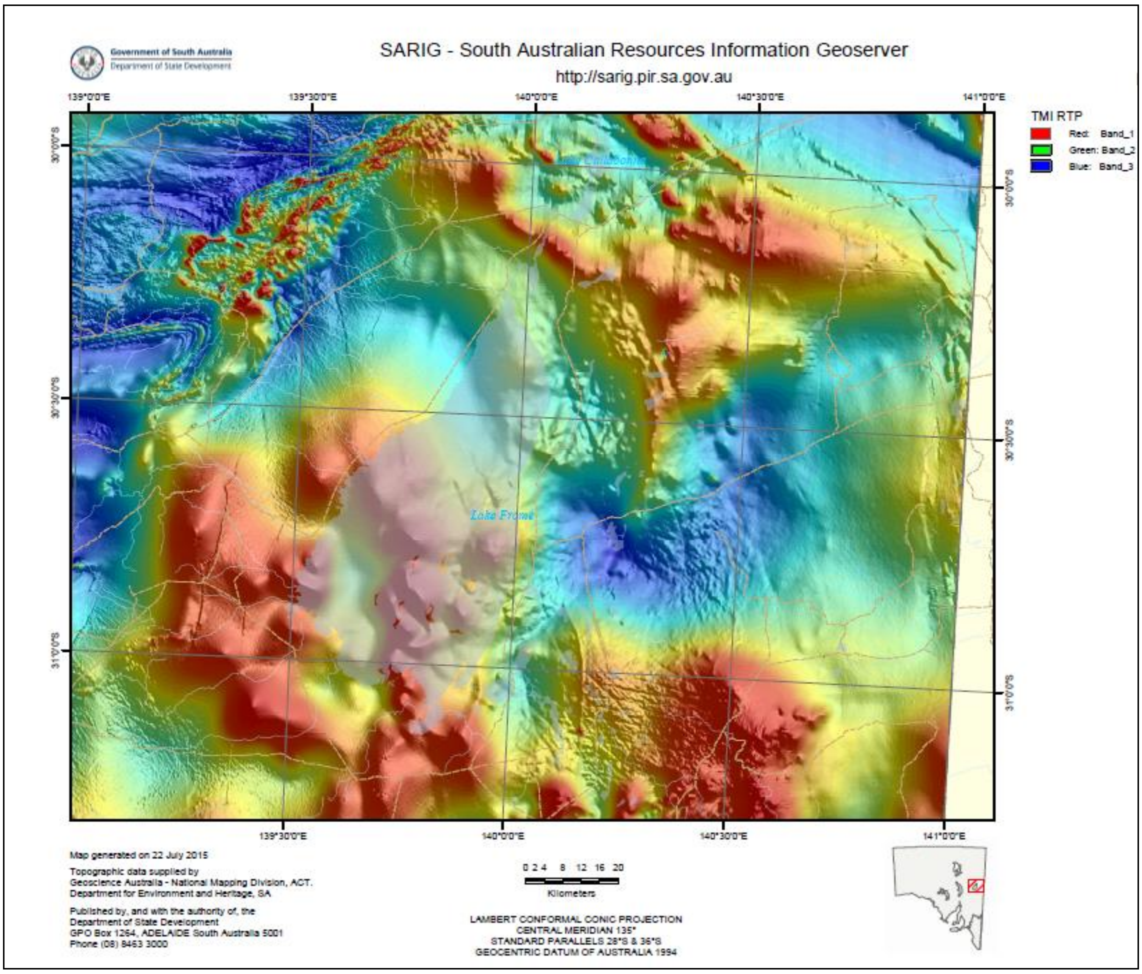

Figure 12. Total magnetic intensity reduced to the pole.

Since it only shows surface conditions, the potassium channel radiometrics data (below) is of less use than might be expected in a potash search. The image in the figure below does however show a marked difference between east and west, reflecting the type of surficial cover around the lake.

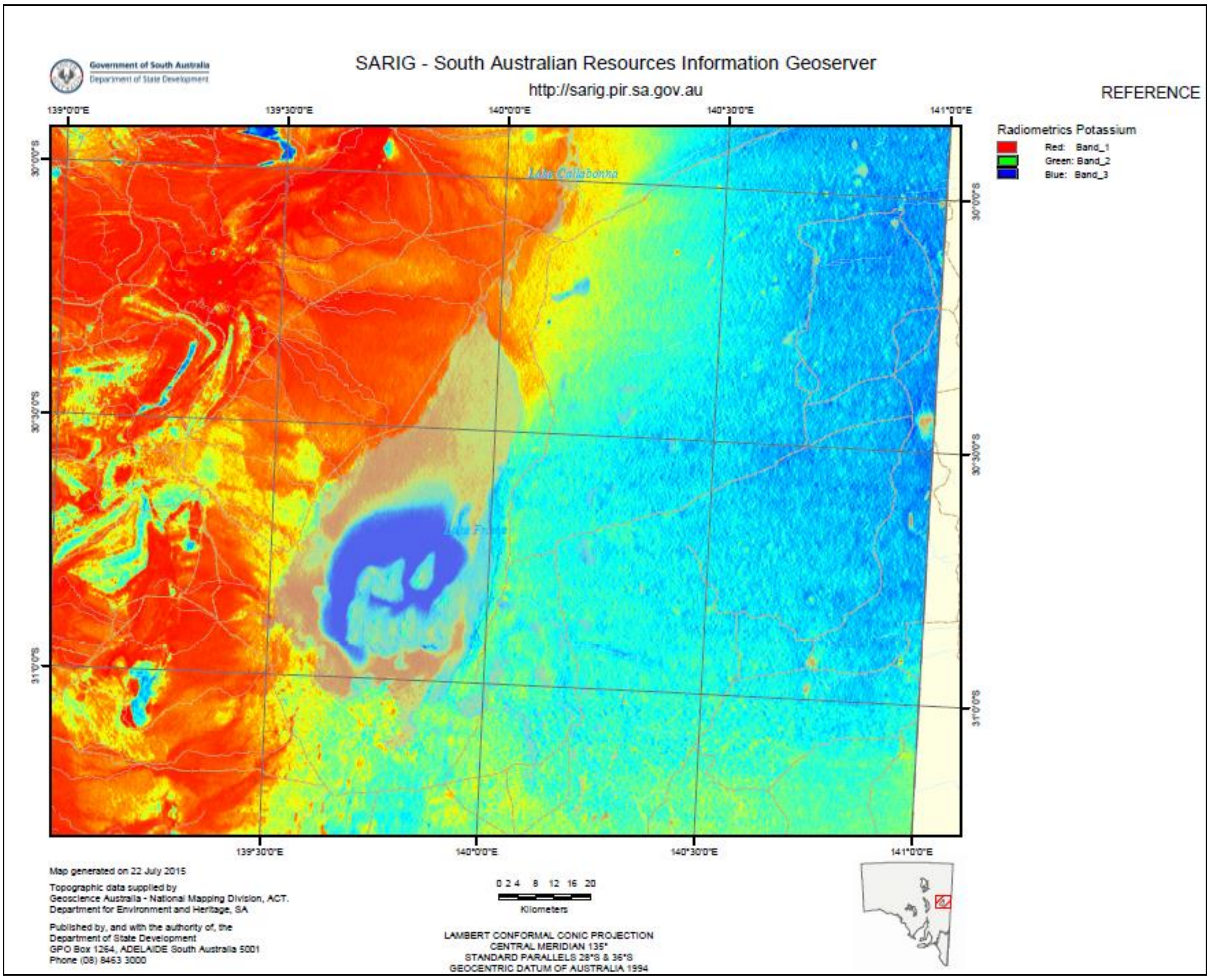

Figure 13. Potassium channel data over Lake Frome and surrounds.

An airborne electromagnetic (AEM) survey of Lake Frome was used by Geoscience Australia to help validate fluid transportation pathways, especially in the near sub-surface. The AEM survey measured the electrical conductivity of the surface and subsurface (potentially up to ~200 m depth below the surface), and has the potential for mapping salinity differences in groundwater in the near-surface. Using the Geoscience Australia layered earth inversion algorithm (GA-LEI), Geoscience Australia prepared conductance maps for a range of depths and elevations, as well as east-west cross-sections of electrical conductivity through Lake Frome. The depth of penetration of the AEM survey, referred to as the depth of investigation (DOI), varied based on the conductance (the summed conductivity of all layers in the inversion) but was highly correlated to the electrical conductivity of the surface layer. Where the surface was highly conductive, such as over the Lake Frome playa, the signal saturated close to the surface and the DOI was much shallower (~60 m). This limited Geoscience Australia's understanding of how deep the brine pool extends, and as a consequence, what stratigraphic units are contributing to Lake Frome's water chemistry.

LOCAL GEOLOGICAL AND HYDROLOGICAL SETTING

Lake Frome is bounded to the west by the Flinders Ranges, which comprise highly deformed Neoproterozoic to Early Cambrian metasedimentary and volcanic rocks of the Adelaide Fold Belt. These are underlain by Mesoproterozoic metasediments and granites, which crop out to the north in the Mt Painter Inlier (Preiss, 1987; Drexel et al., 1993; Sheard, 2009). The drainage into the lake from the west is characterised by bank-attached spits. Playa shoreline features in the west which appear to be beach ridges are actually relict fluvio deltaic units. Bounding Lake Frome's drainage basin to the south is the Olary Spur, which consists of Neoproterozoic metasediments of the Adelaide Fold Belt underlain by Paleo-Mesoproterozoic rocks of the Curnamona Province (Campana, 1957).
Proximal to the lake, the Cenozoic fill consists of Late Paleocene to Eocene fluvial sands and gravels of the Eyre Formation, which underlie Oligocene to Late Miocene fluvio-lacustrine sands and clays of the Namba Formation. Pliocene fluvial and lacustrine deposits of the Willawortina Formation reach greater than 100 m thickness between Lake Frome and the Flinders Ranges (Callen and Tedford, 1976).

Most of the lake is covered with a thin halite crust, with several isolated groups of clastic and carbonate mound springs to the east. Below the halite crust, interstitial discoidal gypsum crystals along with traces of pyrite and carbonates abound within the dark brown clay-rich sediments. Underlying Lake Frome, at depths ranging from 10 cm to greater than 10 m, is a brine pool, characteristically NaCl-enriched, with salinities exceeding 250 g/L.

The edge of the Jurassic Cretaceous-hosted Great Artesian Basin (GAB) underlies the area. The main GAB aquifer, the Cadna-Owie Formation, is overlain by the Cretaceous Bulldog Shale aquitard. A number of faults exist in the Great Artesian Basin sequence under Lake Frome. These result in leakage into any overlying aquifers and discharge as springs. Thus, the Great Artesian Basin aquifers can contribute to both ground and surface water at Lake Frome. The palaeo- and modern lake sediments are believed to be up to 200 m thick and consist of widespread Eyre Formation, the overlying widespread Namba Formation and several other formations of more local extent. The Eyre Formation consists of well rounded gravel and quartz sands in units up to 100 m thick. Following compartmentalisation of the greater Lake Eyre Basin, there was widespread formation of silcrete (locally called “grey billy”), then the Namba Formation was deposited during the Miocene and it lies disconformably over the Eyre Formation in units around 150 m thick. The Namba Formation consists of fine to medium sands, silt, clay, oolitic dolomite and limestone which were deposited in expansive, shallow lacustrine conditions in a warm environment. This formation contains vertebrate fossils in some of the carbonate facies. The Namba Formation is also locally capped by silcrete and what is locally called “puddingstone”. This is overlain by the Willawartina Formation which is probably a fanglomerate and associated braided stream distal facies. Following the deposition of the Willawartina Formation, the Millyera Formation was deposited unconformably over the Namba Formation across the eastern floor and shore of Lake Frome. The Pleistocene Millyera Formation consists of units up to 10 m thick of laminated clays, limestone and sand representing lacustrine deposition in the Lake Frome Basin. It pinches out to the west. Highstand sandy beach ridge facies were also deposited during the Pleistocene lacustrine events. These beach ridge facies, named the Coomb Spring Formation intertongue with the Millyera Formation to the east of Lake Frome, and represent deposition of the coarser sediments at high lake levels. The Late Pleistocene Eurinilla Formation consists of shoreline and channel fill structures of poorly sorted sands and clays in units up to 20 m thick which were deposited along the east and the western margins of Lake Frome and its ephemeral tributaries. The uppermost formation at Lake Frome is the Coonarbine Formation which lies disconformably above the shoreline sections of the Eurinilla Formation and also forms the central facies of the modern dunes around Lake Frome and to the east in the Strzelecki desert. The Coonarbine Formation consists of poorly sorted fluvial and aeolian silt, sands and occasionally gravels deposited during the climatic fluctuations of the Late Pleistocene and Holocene.

Evidence of significant runoff reaching Lake Frome is rare, but it floods more frequently than Lake Torrens. During filling events that produced water depths of greater than 6 m, Lake Frome merges with the three lakes to the north (Lakes Gregory, Blanche and Callabonna) to form a single water body. When filled to over 15 m, this mega lake drains via the Warrawoocara channel to Lake Eyre.

Over the last 100 thousand years, mega-lake phases have occurred at least seven times, with three of those overtopping into Lake Eyre. During such events, any accumulated salts and trace elements were vulnerable to dissolution and flushing from the basin. Two major periods of high volume runoff from the Flinders Ranges occurred between 92-80 ka and 17-11 ka during which lake levels were at a minimum elevation of 4-6m (AHD). However, since 45 ka, palaeohydrological records suggest there has been a progressive shift to more arid conditions, with Lake Frome returning to playa-dominated conditions. A major transition to ephemeral conditions was experienced between 7-6 ka which was followed by the onset of the modern El Niño Southern Oscillation from ~4 ka.

The present strontium isotope ratio (87Sr/86Sr) of Lake Frome brines and modern halite crust (0.71126 - 0.71206) are of similar composition to the shallow Willawortina Formation (0.71171 – 0.71223) (Ullman and Collerson, 1994). This suggests that the major source for Lake Frome brines is from the west, as tributaries and groundwater associated with this Pliocene unit have similar strontium isotope ratios. Strontium isotope ratios increase with depth in preserved gypsum deposits in Lake Frome’s sediment, which reflect either increasing groundwater input from the older Namba Formation, or greater groundwater residence times in the past.

In the most recent few decades, Lake Frome held some water for a considerable time in 1970. Comalco reported some surface water in 1972 and 1973, mainly as a result of spring discharge. After an extreme rain event in 1974, water covered 75% of the lake surface area. That water was not received via Salt Creek and Lake Callabonna in the north despite reports of Lakes Gregory, Blanche and Callabonna receiving water from the Strzelecki Creek at that time. Instead the water that entered Lake Frome during the floods of 1974 has been attributed to a combination of runoff from the Flinders Ranges and particularly large volumes of groundwater discharge. Satellite photos show water in Lake Frome during the floods of April 2010, 2011, and March 2012 but it has not been determined exactly how this water arrived. After rains in the Flinders Ranges during January 2015 (see Arkaroola rainfall graph), a Proba V satellite image from 12 February captured new green vegetation along the creeks to the west of the lake and showed standing water covering the southern portion of the lake.

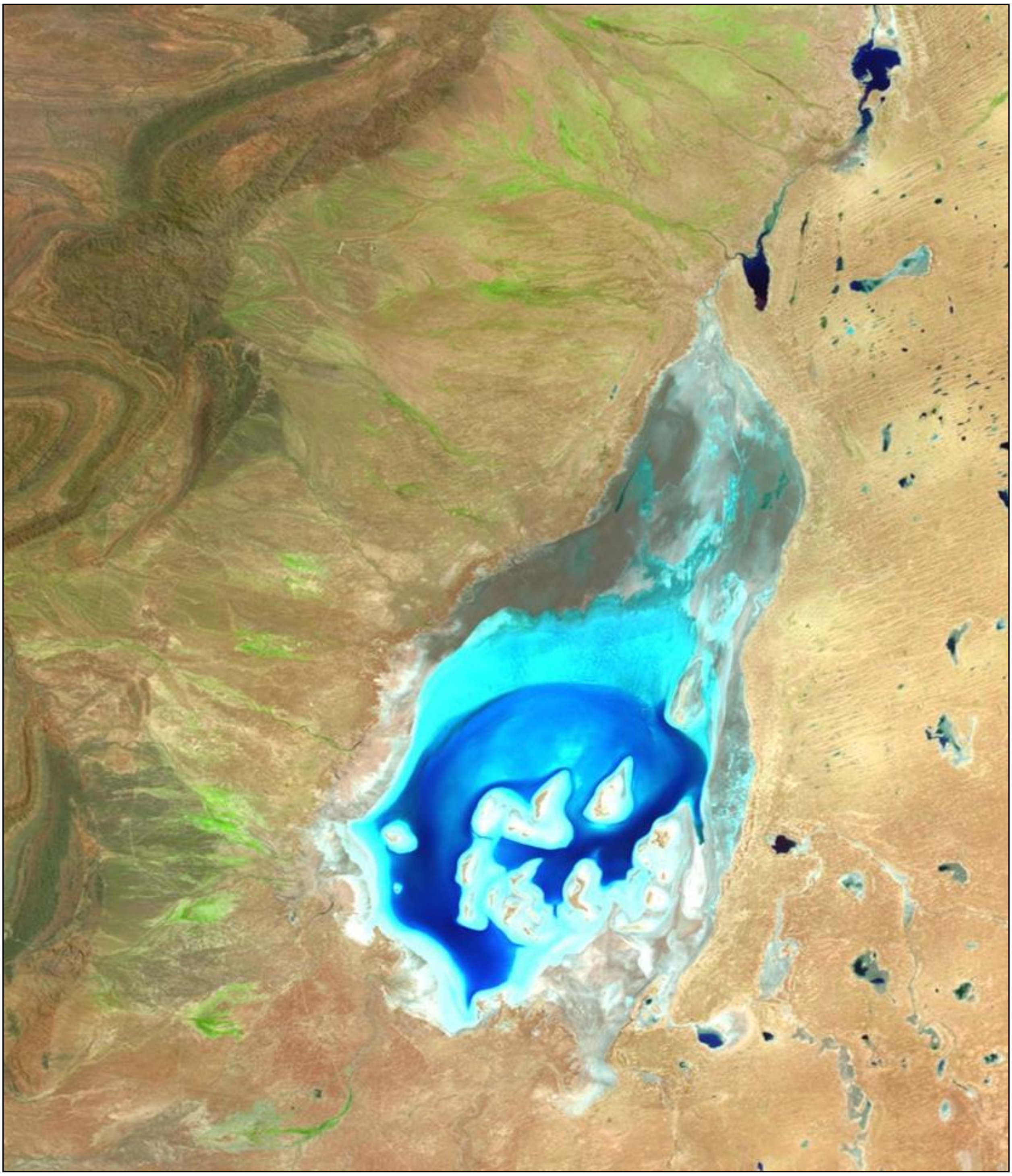

Figure 14. ESA's Proba-V minisatellite captures the rare sight of standing water in Lake Frome, 12 February 2015.

Surface salt crusts can be locally decimetres thick but are ephemeral and their location on the lake shifts between one flooding event and the next.

Organic matter and intimately associated secondary gypsum can be locally extensive and may suggest potential to generate acid sulphate. Photographs taken by CSIRO show a thin layer of black organic matter directly beneath the salt crust in at least one location.

PREVIOUS EXPLORATION AND WORK BY OTHERS

Early Academic Work

Draper and Jensen (1976) took a series of lake sediment cores hand-augured to 4 m, from various locations mainly in the south. Bowler et al (1986) sampled cores to depths of 6 m, taken 8 km in from the western shoreline and about 17 km in from the eastern shoreline as a part of the SLEADS project. While these studies have formed the basis of SARIG's interpretation of the shallow aquifers under Lake Forme, the actual studies were directed more at sediments rather than brines and have only intersected very shallow aquifers.

Rum Jungle Resources has also obtained a copy of Barrett's 2011 Honours Thesis on Lake Frome.

2013 Geoscience Australia Study

A Geosciences Australia study (Record 2013/39) used Lake Frome as a test case of the prospectivity of Australian salt lakes.

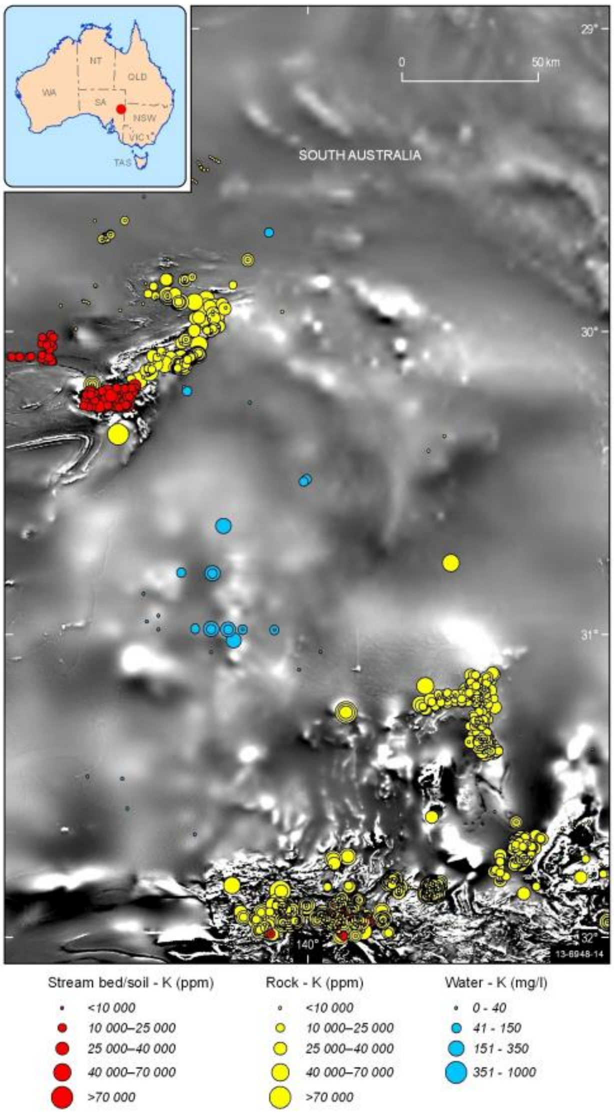

Figure 15. Potassium data used by Geoscience Australia broken into streams and soil, bedrock and water. The background is is the magnetic anomaly map of Australia. Strangely, their figure does not show the lake outline.

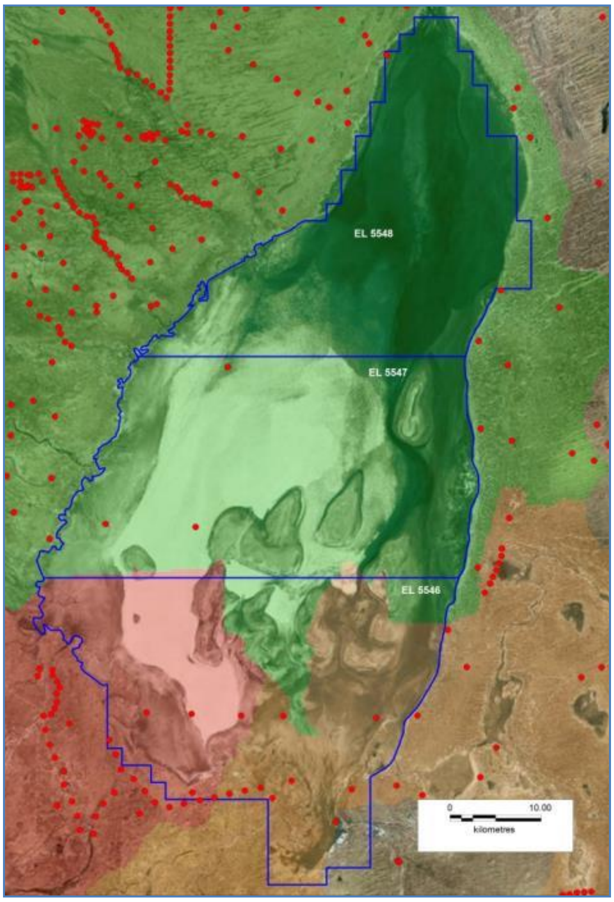

Figure 16. Results of the GA study for potash prospectivity. The catchments shown with a red tint were rated by GA as most prospective for potassium, followed by yellow then green. Historic drillholes are shown as red dots.

Exploration for Alkali Evaporites

The lake was previously explored for bedded alkali evaporites (specifically trona – sodium sesquicarbonate) or equivalent brines by Comalco Aluminium Limited in the late 1970s. They drew on similarities between the Miocene of Lake Frome and that of Wilkins Peak Member in the Green River Basin, US, which is the world's largest trona-producing formation. Specially-made vehicles were used to drill nine RC holes for 576 m. All holes intersected multiple thin aquifers well above the GAB. The major element assays showed all these groundwaters to be chloride-rich, low carbonate and low sulphate. In all but two holes, U was consistently higher in the deeper aquifers. In the opinion of Comalco, all trace values of Li, Sr, Br and B were low in the brines themselves. The Comalco chip samples were collected every 2 m. Assays for 35 trace elements were done on 10 m sediment composites. Comalco felt that these values were within the normal range for sediments of that type and in general agreement with previous academic work at Lake Frome. Some of the rock samples from this work are believed to be still stored at Wertaloona Station and samples from Comalco hole CF2 (and possibly others) are also stored at the SA Government Core Facility. The data from the original water analyses done by AMDEL for Comalco have been re-checked. There is little information on the analytical techniques used, but they are as used by AMDEL for routine waterbore analysis and so seem appropriate providing concentrations were not too high. That does not seem to be the case. The 27 brine K assays average 116 mg/l, with a maximum of 299 mg/l and a minimum of 19 mg/l. There was a high degree of consistency between the same aquifer in adjacent holes.

Lithium Exploration

The maximum Comalco brine Li assays were 0.2 mg/L compared to about 250 mg/L as potentially economic.

However, in an ASX release on 12 October 2010, ERO Mining Ltd described Lake Frome, rather effusively, as a "World-class lithium exploration target". Their concept was entirely based on few relatively high lithium levels (up to 250 ppm) in some of the earlier Comalco *sediment* (not brine) samples. Through their wholly-owned subsidiary South East Energy Ltd, they held EL 4601 and EL 4602 over central and southern Lake Frome specifically to explore for lithium. They also had applications over Lake Torrens. During 2011, a single sonic/diamond cored drill hole, WT2, was drilled by ERO/Tychean Resource on EL 4601 on the southwestern edge of Lake Frome. It was sited just off the lake by a few hundred metres and located near the older Comalco hole CF2 which was on, but near the edge of the lake. In the estimation of ERO, CF2 was the best indication of lithium in the Comalco work.

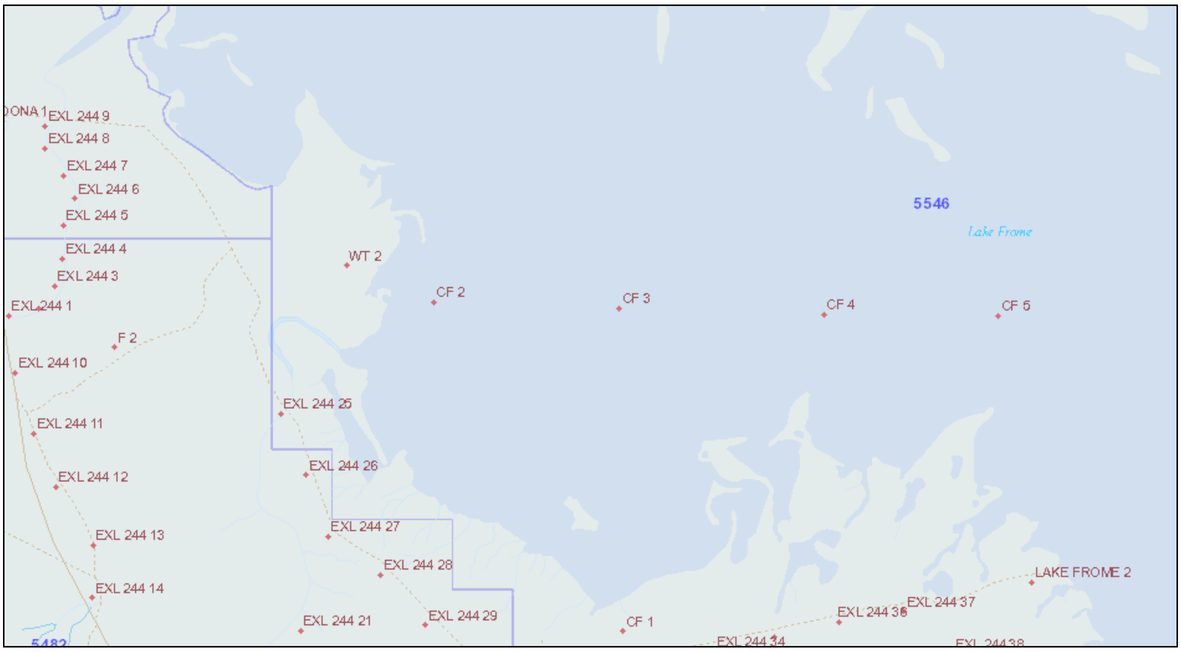

Figure 17. Location of ERO drillhole WT2 hole near the Comalco line CF2 to CF5.

Geology of REO WT2 and Comparison with Re-assay of the Comalco Sediment Samples

Drillhole WT2 went through the modern lake sediments, Namba and Eyre Formation. These were described as interbedded clays and sands with various amounts of carbonaceous matter. The hole was terminated in Cretaceous Bulldog Shale (first intersected at 149 m) to avoid intersecting the underlying Cadna-Owie Formation which is the main Great Artesian Basin aquifer. This aquifer is thin and "patchy" under the south of Lake Frome but ERO were deliberately avoiding the possibility of an artesian flow. The WT2 hole was gamma logged. Samples from depths of 10 m, 19 m, 26 m, 34 m and 63 m were sent for semi-quantitative mineralogy. Illite, muscovite and K-feldspar were identified as the K-bearing minerals. One-metre sediment samples for almost the entire hole were assayed for various elements, specifically lithium. For comparison, sediment samples from those intervals in the Comalco hole with reputedly high lithium were re-assayed using the same technique. Based on the tabulated data given in ERO report itself, most of the values below 20 m from the re-assayed Comalco hole were consistently lower than those originally reported by Comalco, commonly by a factor of 10 times. None of the sediment samples from WT2 exceeded 100 ppm Li. The maximum in the actual data file is 69 ppm. Thus, the 250 ppm Li in the Comalco assays is spuriously high even for sediment and there is no indication that the Li minerals might be soluble.

Hydrology and Brine Assays in ERO Study

ERO sampled five local waterbores to provide a set of background values for comparison with brine assays from six depths in WT2.

The maximum K in the "background" waterbores was 100 mg/l. The best K in brines from WT2 was only 40 mg/l. Thus, the lake brine had less K than waterbores off the lake.

The best three waterbores had 200 µg/l, 233 µg/l and 285 µg/l Li. Note this is micro not milli. The lake brine Li assays, this time reported in mg/l, ranged from 0.04 mg/l to 0.136 mg/l (compare to 250 ppm Li in brine lake projects elsewhere). ERO reported that they had intersected "elevated lithium", but abandoned the project.

ASSESSMENT OF PROSPECTIVITY

Potash Prospectivity

Other than assays mentioned above, there is very little data on the potash prospectivity, but GA (without knowing the results of WT2) rated the southwest as the most prospective. Despite the poor results reported by Comalco and by ERO in WT2, further brine sampling for potash is justified. This needs to be deeper, more comprehensive and systematic than all previous work.

Lithium Prospectivity

Geoscience Australia did not use the most recent ERO analytical Li data for rocks or brines and they did not demonstrate that any lithium in rocks in the catchment was soluble. They did use some spuriously high Li sediment results. None-the-less, Geoscience Australia concluded that Lake Frome is not much more enriched in lithium than seawater. In fact, the actual concentration of Li in seawater is 0.14 to 0.25 ppm so EROs' brines actually have less than half the Li concentration of seawater. Certainly, the brines are well below the target grade for commercial Li brine. Furthermore, as the ratio of lithium to chloride is so low, evaporation modelling suggests that the brine will never reach economic Li concentrations in single stage evaporation. Until it can be demonstrated otherwise, Rum Jungle Resources considers that Lake Frome has next to no lithium brine prospectivity, at least in the brines sampled to date.

Bromine Prospectivity

To be comparable with Dead Sea operations, bromine concentrations would have to be about 5,000 ppm out-of-the-ground, which goes to 10,000 to 12,000 ppm Br after NaCl crystallises out. Geoscience Australia appears to have been unaware that Comalco gave some 28 Br brine assays. However, these had a maximum of only 155 mg/L, meaning there is little Br prospectivity in the brines tested to date.

Boron Prospectivity

The most important and economical, extractable boron minerals are the borax series such as borax itself ($Na_2B_4O_7.10H_2O$), kernite ($Na_2B_4O_7.4H_2O$), tincalconite ($Na_2B_4O_7.5H_2O$), ulextic ($Na_2O.2CaO_5B_2O_3.16H_2O$) and hydroboracits ($CaO.MgO.B_2O_3.6H_2O$). Seawater has 4 to 5 ppm B. Salt lake brines from Olaroz, Cauchari and Salar de Atacama which are used to produce borax chemicals have natural B concentrations many orders of magnitude higher than seawater. Egyptian lakes where borates are produced chemically typically have brines containing >100 ppm boron. The operators of Owens Lake in the US used evaporation to concentrate borax brine from 2.6% to 4%. A suite of Lake Frome B brine assays from Comalco has a maximum of only 9.4 mg/L, only double seawater at best, suggesting little B prospectivity, at least in the brines sampled to date.

WORK IN THE YEAR ENDING 04/01/2016

Literature Search and Desk-Top Studies

Literature searches and desk-top studies were undertaken as described above.

PEPR Preparation and Submission

Lake Frome work programs (PEPR applications) were submitted 19 May 2015. The proposed work program was for brine sample collection from shallow hand-auger holes using small low psi-footprint amphibious ATVs for access. A request for further information was received from DSD, noting that a new template was needed and approvals would take 3-5 months minimum and no approvals would be given until Native Title had been addressed in accordance with Part 9B of the Mining Act. A new PEPR application was submitted 09 September 2015 proposing alternative helicopter access for the hand-auger sampling program. The proposed hand-augering was determined not to be “drilling”.

Land Access Negotiations

As detailed previously, land access negotiations with the Adnyamathanha Traditional Lands Association were conducted during the reporting period and are proceeding towards the signing of a formal access agreement.

EXPENDITURE STATEMENTS

The expenditure breakdown is tabulated below:

EL	6 Months to		Year Ending	Cumulative
	04/07/2015	04/01/2016	04/01/2016	
5546	$14,087.37	$22,229.64	$36,317.01	$36,317.01
5547	$17,412.17	$21,942.38	$39,354.55	$36,354.55
5548	$10,768.98	$18,697.43	$29,466.41	$29,466.41

Table 2. Expenditure details.

PROPOSED WORK FOR YEAR ENDING 04/01/2017

As per the PEPR, heli-sampling will be undertaken after an access agreement is signed and when all permissions have been obtained from all stakeholders.

CONCLUSION AND RECOMMENDATIONS

This group report covers work undertaken on the Lake Frome ELs 5546, 5547 and 5548 for the year ending 04/01/2016. Desk-top studies to assess the prospectivity of subsurface brines have been undertaken. A PEPR has been submitted and land access negotiations are progressing well.

Verdant Minerals Ltd
ABN 33 122 131 622
T +61 8 8942 0385
F +61 8 8942 0318
E info@verdantminerals.com.au
www.verdantminerals.com.au
A 20/90 Frances Bay Drive, Stuart Park NT 0820

Titleholder:	**Verdant Minerals Ltd**
Operator:	**Verdant Minerals Ltd**
Tenement Manager:	**Complete Tenement Management**
Tenements:	**EL 5546, EL 5547, EL 5548**
Project Name:	**Lake Frome Potash**
Report Title:	**Group annual technical report for the Lake Frome Brine Potash Project, period ended 04/01/2017**
Authors:	**John Dunster**
Corporate Author:	**Verdant Minerals Ltd**
Target Commodity:	**Brine potash**
Date of Report:	**18/01/2017**
Datum/Zone:	**GDA94/Zone 54**
250K map sheets:	**Frome SH5410, Curnamona SH5414**
Address:	**PO Box 775, Darwin NT 0801**
Phone:	**08 8942 0385**
Fax:	**08 8942 0318**
Contact Email:	**jdunster@verdantminerals.com.au**

SUMMARY

Verdant Minerals Ltd holds three contiguous titles that cover the whole of Lake Frome in eastern South Australia. The company intends to explore below the dry lake surface for brines that might be suitable for the production of potash minerals used in fertilisers. Negotiations with the Adnyamathanha Traditional Lands Association who represent the Traditional Owners are still underway. The next meeting is scheduled for February 2017 and hopefully an agreement should be signed shortly after that. Literature reviews and an assessment of the work by previous explorers have been undertaken. A work program has been submitted to the relevant authorities and stakeholders.

CONTENTS

LIST OF FIGURES AND TABLES

INTRODUCTION

This report describes the work undertaken during the year ending 04/01/2017 on ELs 5546, 5547 and 5548 which cover the dry salt playa lake, Lake Frome, in eastern South Australia (not to be confused with the smaller coastal lake of the same name). It is hoped to be able to systematically sample deep brines from beneath the salt lake and assess their potential to produce potash minerals which could be used to make fertiliser.

HISTORY

In 1840-41, Edward John Eyre, explored along the western side of the Flinders Ranges, discovering Lake Torrens and Lake Eyre South, which he described as "...one vast, low, and dreary waste". Turning southeast, he also discovered Lakes Blanche, Callabonna and Frome which he didn't actually name since he believed that they were all part of Lake Torrens which appeared to be one vast impassable horseshoe shaped salt lake blocking the way to the north beyond the Flinders Ranges.

After it was realised that there were separate lakes, Edward Charles Frome mapped the area in 1843 and Lake Frome was named after him.

The extensive salt crusts on Lake Frome are regarded as literally whiter then snow and were used to calibrate the "white" in early satellite imagery. These parts of the lake surface are arguably the brightest place on Earth and were accessed by the CSIRO on several occasions to take albedo measurements.

Figure 1. CSIRO staff in December 2000, arranging a blue sheet on the salt of Lake Frome to be spotted by NASA's Hyperion satellite EO-1.

LOCATION, ACCESS AND LAND USE

Location

Figure 2 is a map of Verdant Minerals' Lake Frome Project. The lake is 750 km (470 miles) northeast of Adelaide, 134 km east of Leigh Creek in SA and 210 km west northwest of Broken Hill in NSW.

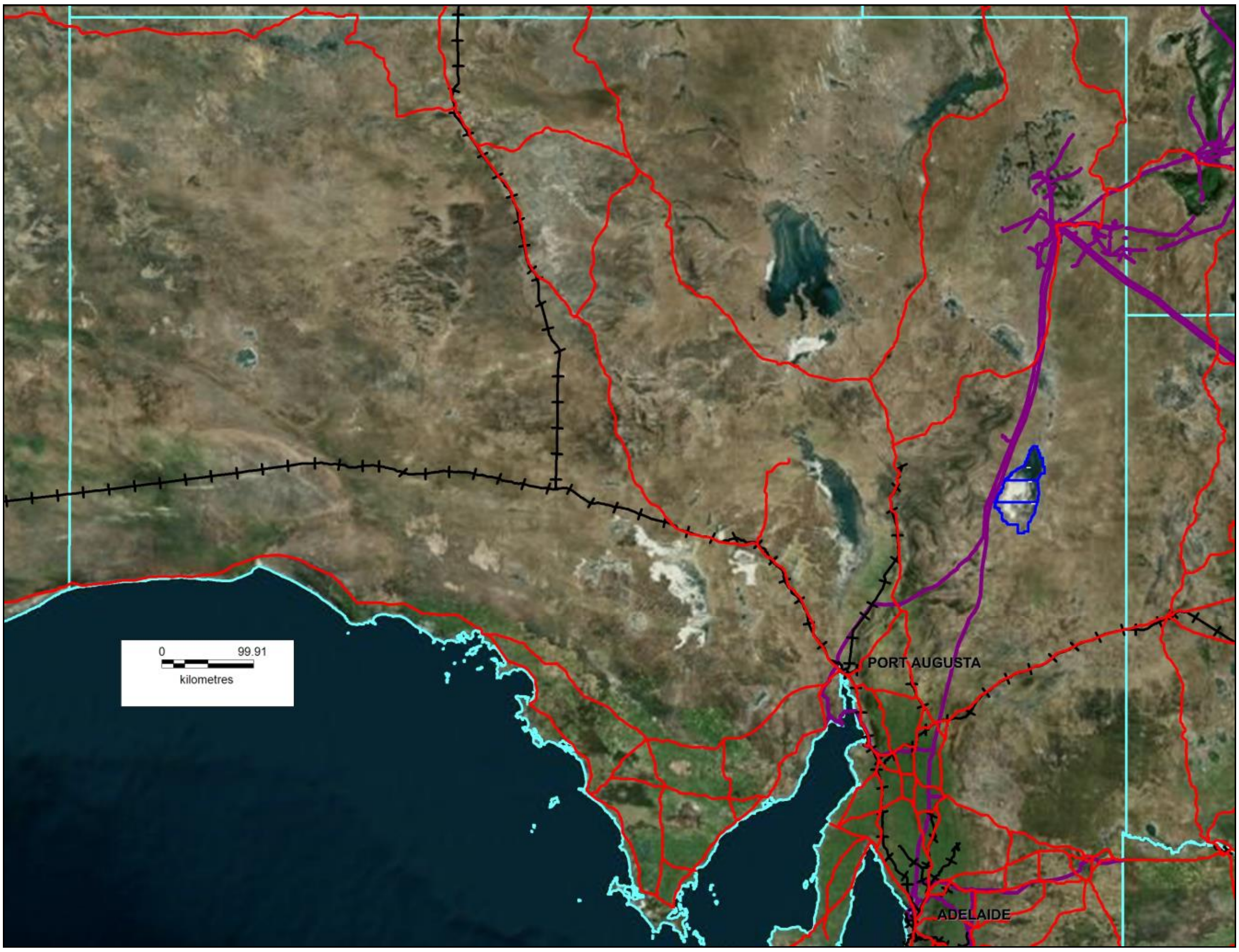

Figure 2. Regional location the Lake Frome Project in SA with titles outlined in blue, showing railways, main roads in red and pipelines in purple.

Climate

Lake Frome is located in one of most arid parts of Australia. Pan evaporation in the Lake Frome region is typically 2,400 mm - 3,700 mm per year which is over ten times the average rainfall. The prevailing winds in the Lake Frome region are mild southerly winds, however stronger westerly winds become more pronounced during the mid-year winter months. There is sufficient difference in albedo and latent heat consumption between the lake salt crusts and the surroundings to generate its own air circulation.

Rainfall

Lake Frome is located close to the boundary between Australian winter (westerlies and cold front related) and summer (monsoonal and ENSO) rainfall zones. The ranges to the west of the lake affect rainfall coming from that direction. Total rainfall at Lake Frome averages around 150-180 mm per year and it falls sporadically. On average, most rain is during the winter months but as shown below, October to February can also be relatively wet depending on any monsoonal influence getting that far south. Rainfall records for the three closest weather stations are incomplete. All available data since 2000 is plotted below. Note the wide variations between the three stations for any given month and year.

Frome Downs

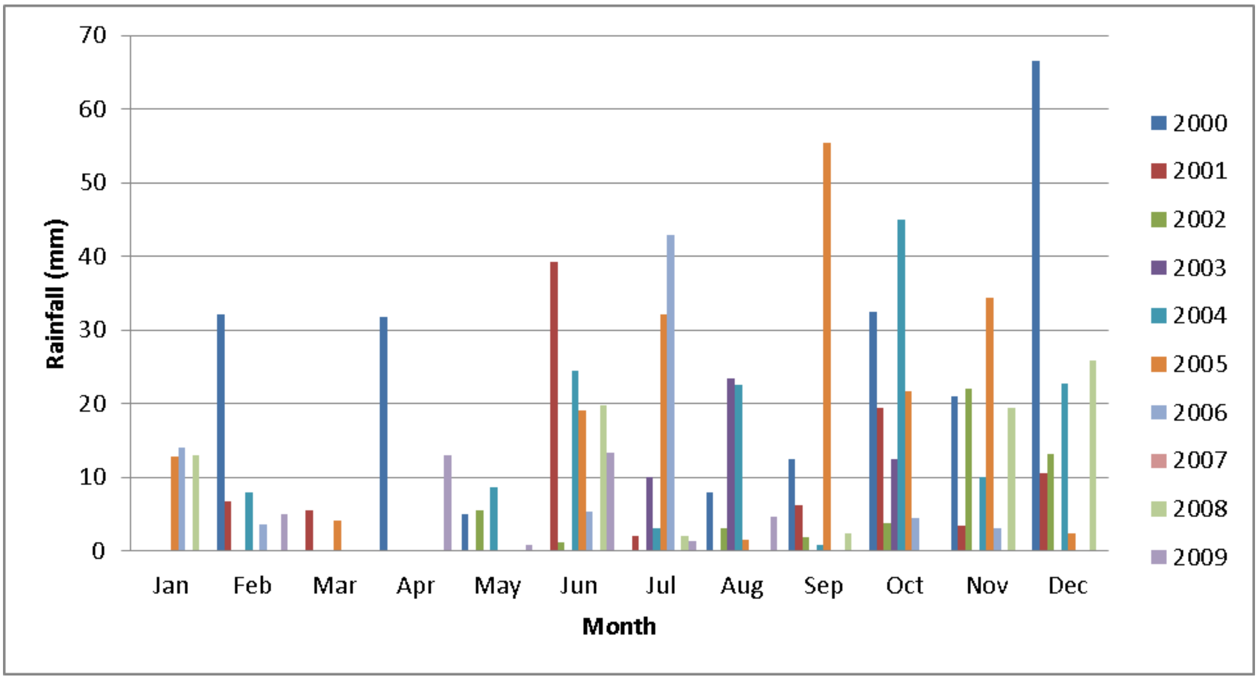

Figure 3a

Wertallona

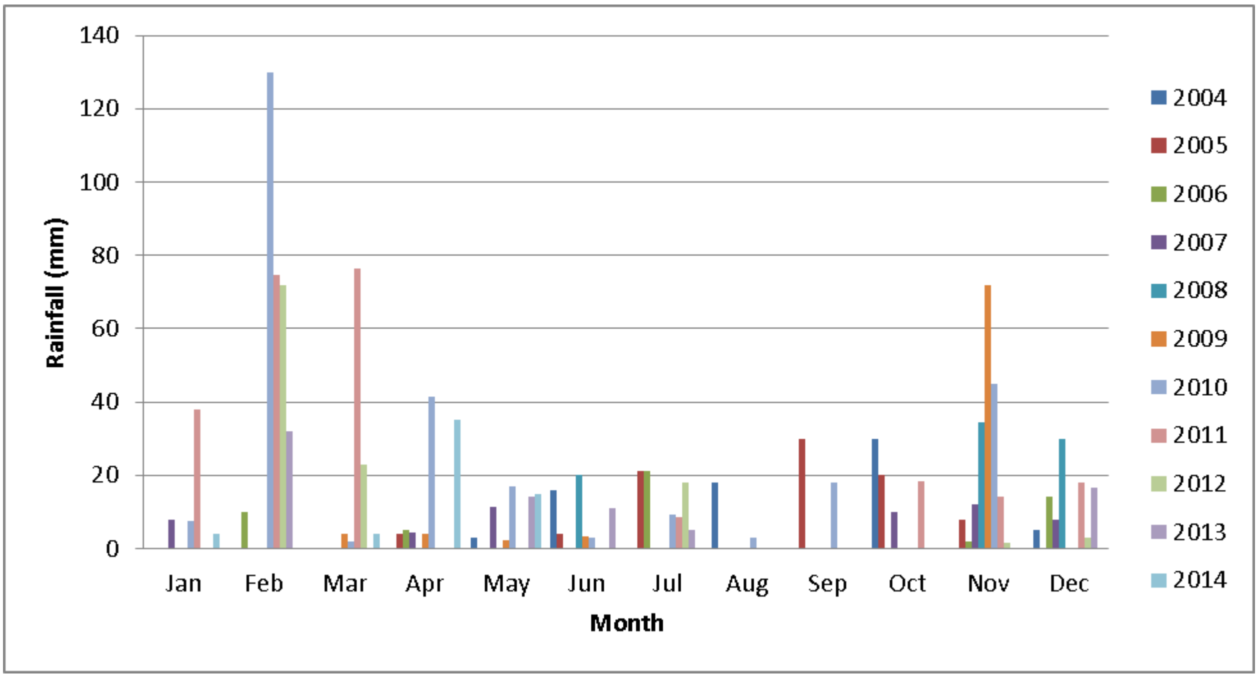

Figure 3b

Arkaroola

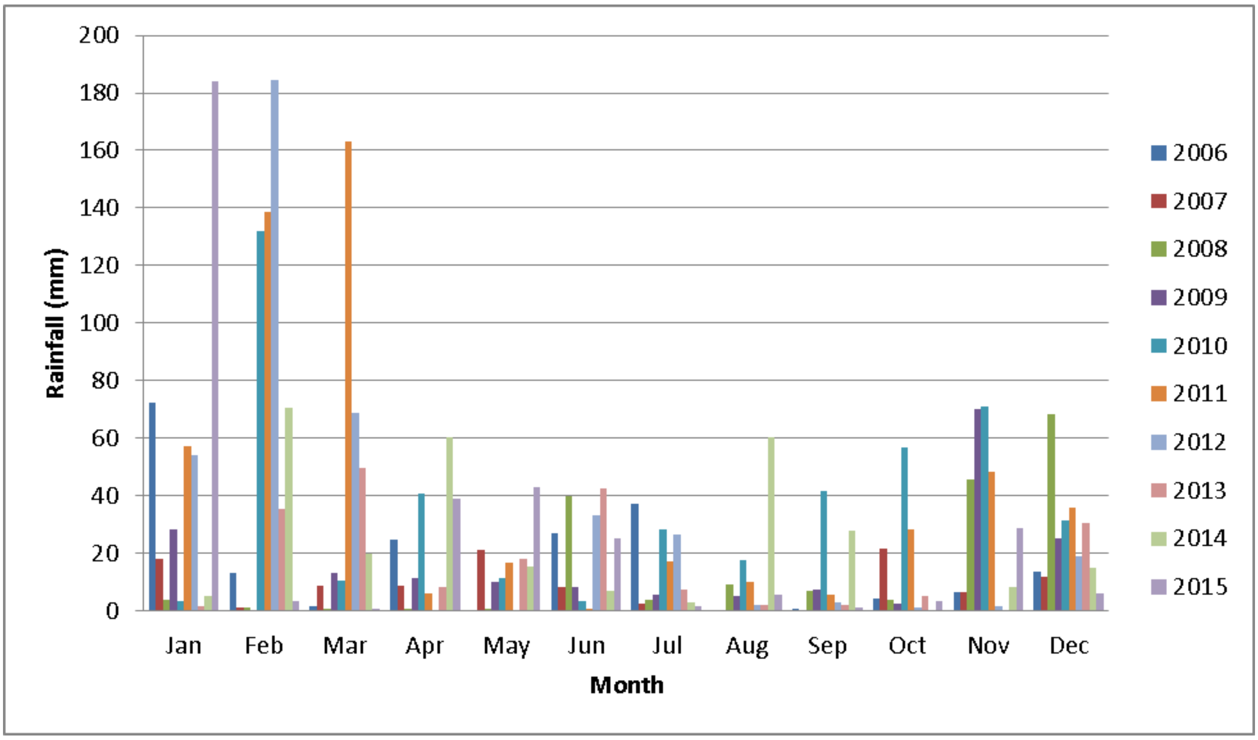

Figure 3c

Figure 3 a,b,c. Average rainfall for the project area recorded at the three closest weather stations.

Humidity

Figure 4 below shows the relatively low all-year-round humidity. Dew and rare frost account for the highest morning readings.

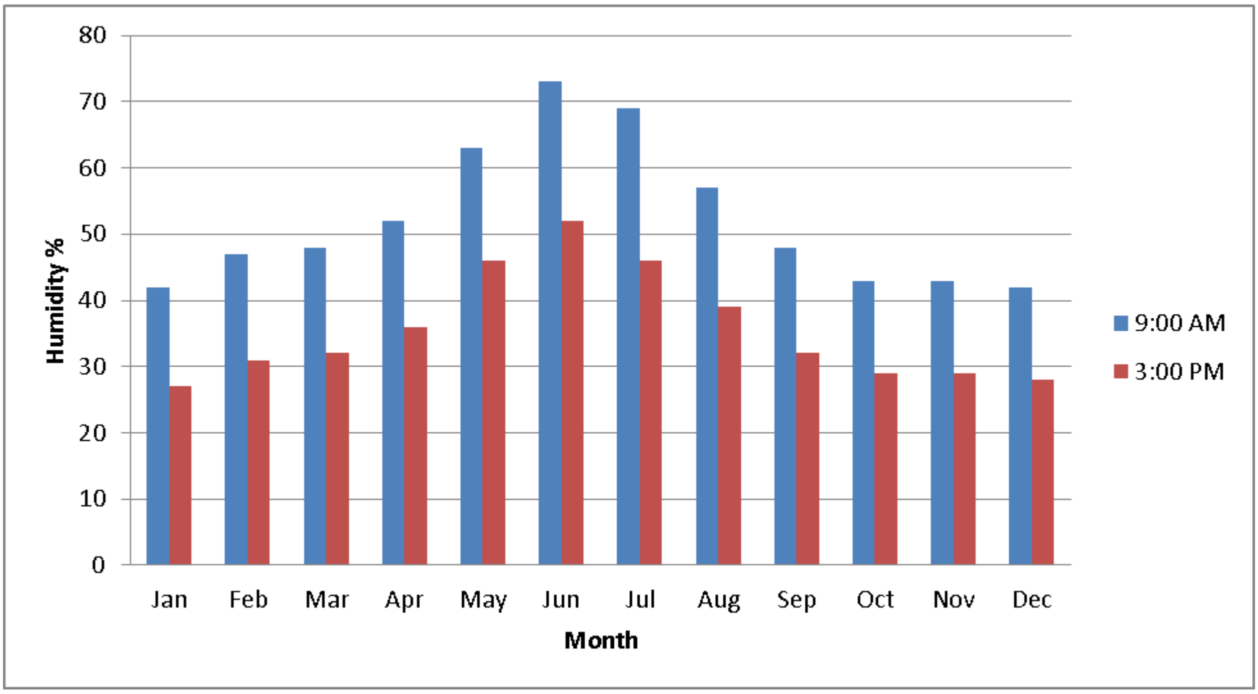

Figure 4. Mean monthly relative humidity (%) at 9am and 3pm recorded at Arkarolla Station.

Temperature

Quoted minimum and maximum temperatures range between 4.5°C and 40°C at Lake Frome. Reflection from the white salt crust can account for several degrees of temperature elevation locally and CSIRO and Comalco personnel working on the lake regularly experienced daytime temperatures in excess of 46°C. Comalco recorded a highest day-time temperature of 48°C at head-height in the shade on the salt crust.

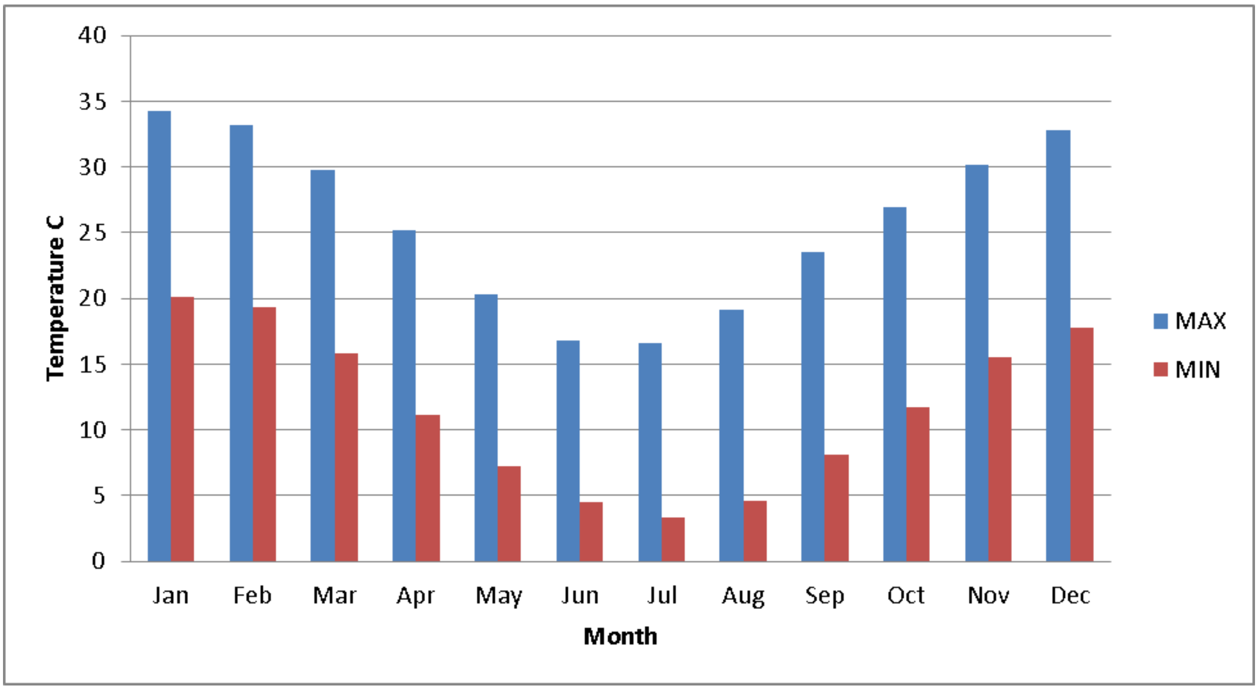

Figure 5. Mean maximum and minimum monthly temperatures (°C) at Arkaroola Station.

Physiography and Topography

Lake Frome has streams feeding in from the west in the northern Flinders Ranges. There are dunefields to the east and south.

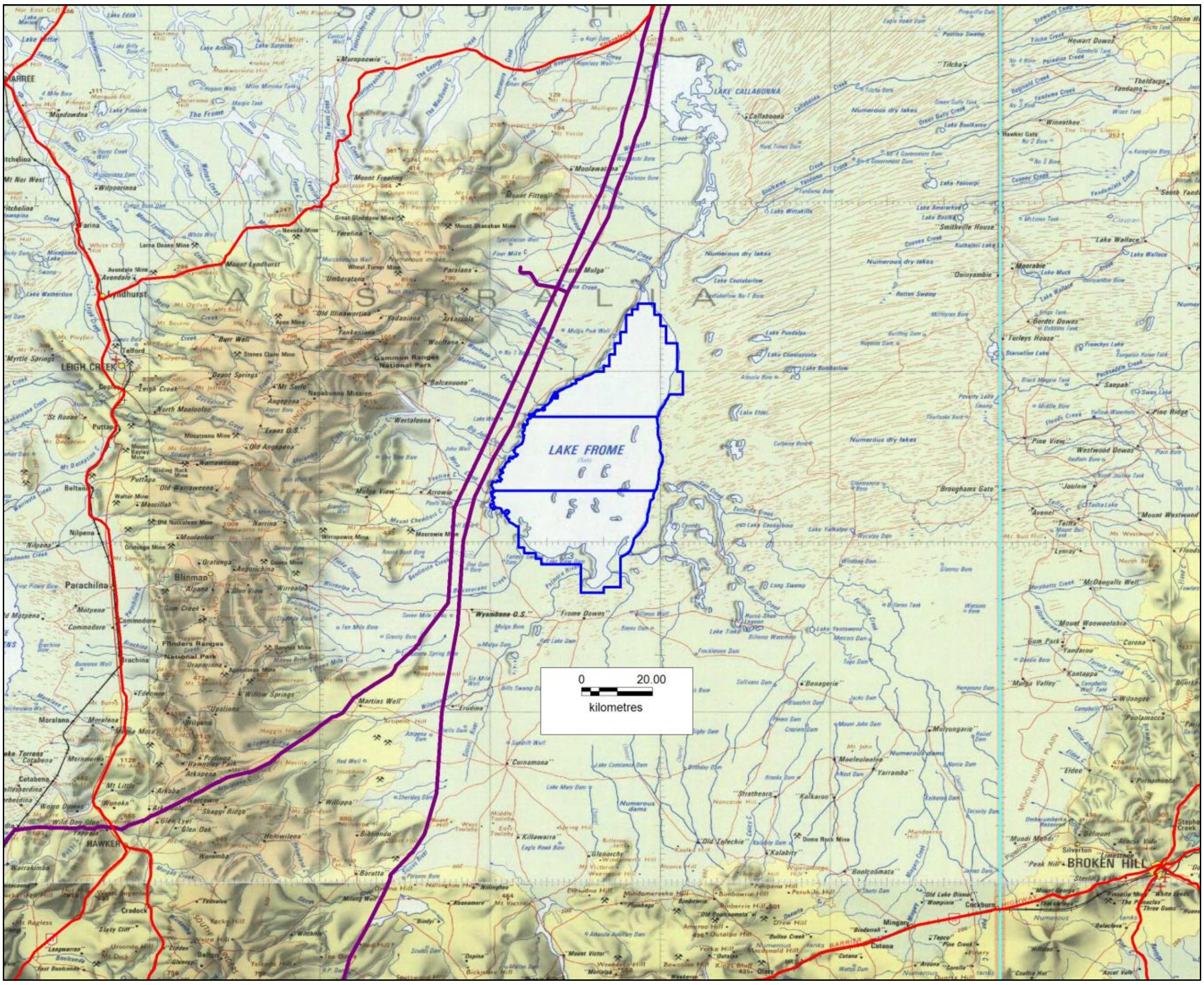

Figure 6. A published topographic map covering the project area.

Regional Hydrology

Lake Frome is part of the modern Lake Eyre Basin. It is the terminal lake within the Callabonna sub-Basin of the Lake Eyre Basin. The Lake Frome catchment makes up the southern and south-western portion of the Lake Eyre Basin. It is connected to Lake Callabonna to the north via a modern, but normally dry, channel. Lake Frome is similarly connected to a chain of much smaller lakes to the southeast. The existence of any palaeo-drainages is yet to be researched because these would be outside the tenement area. The local hydrology of Lake Frome itself is described later in this document.

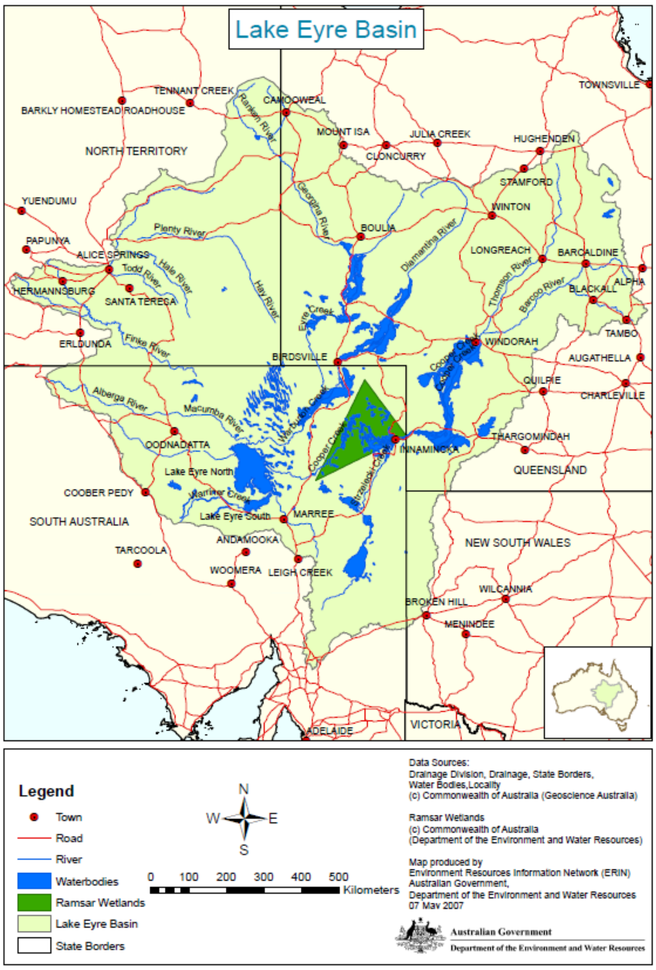

Figure 7. Lake Frome is in the southern quarter of the Lake Eyre Basin.

Land Systems, Flora and Fauna

Lake Frome is included within the IBRA Subregion 7 Strzelecki Desert Bioregion (SSD05). The area to the east of Lake Frome is part of the Simpson-Strzelecki Dunefields Bio sub-region which extends from the southeast of the Northern Territory, through the northeast of South Australia, with small areas in both Queensland and New South Wales.

An EPBC Search into local flora and fauna was undertaken and the report is included in the PEPR but not reproduced here.

Habitation and Land Use

The area is very remote and very sparsely settled. The nearest habitations are the Ranger Station for the National Park, pastoral stations such as Wertaloona and Frome Downs and small Aboriginal communities.

The only non-indigenous land use around the lake is very low density cattle grazing. As described below the main value of the lake itself is for biological and cultural conservation. As shown in figure below, a land corridor connects Lake Frome itself to a National Park to the west.

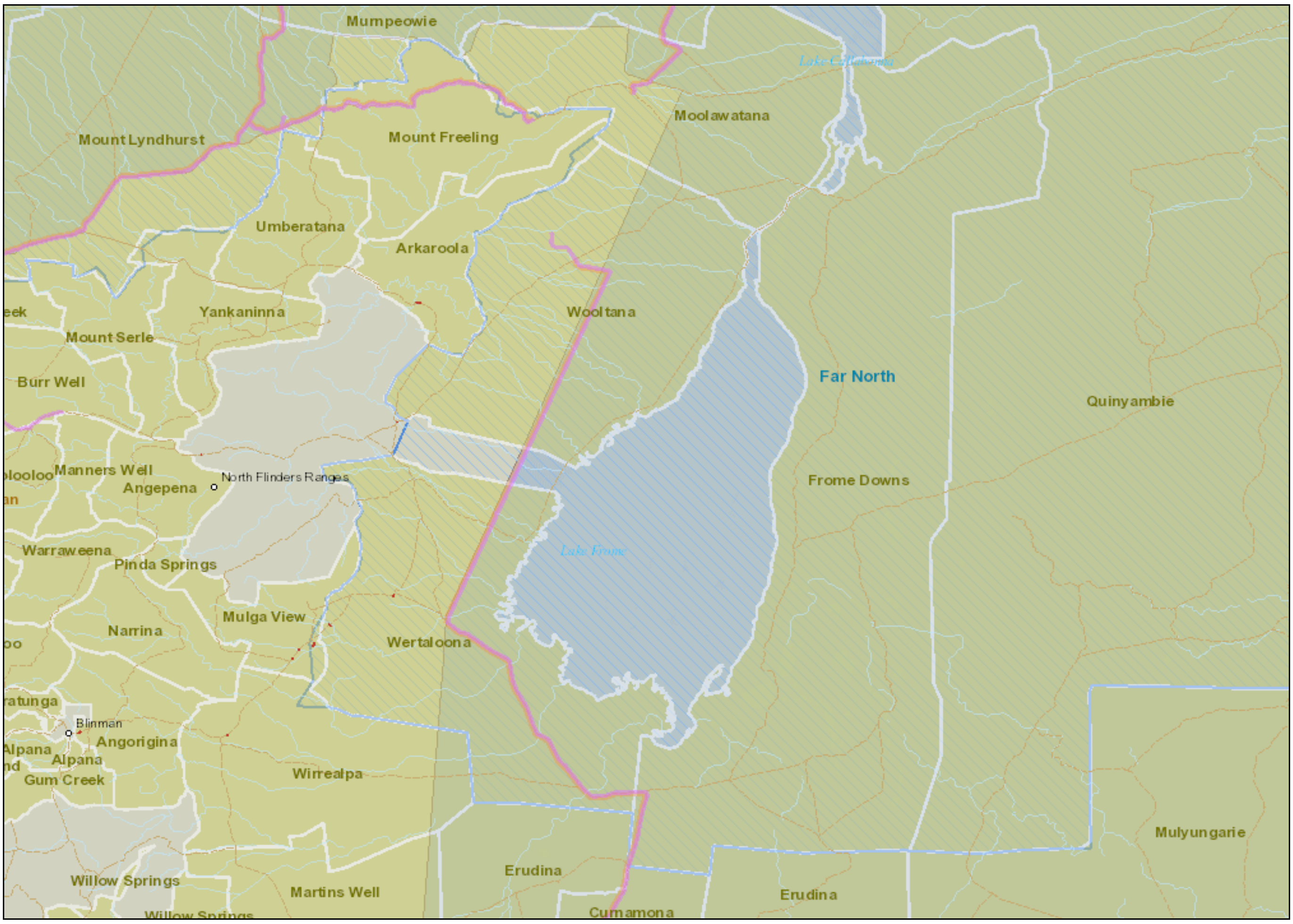

Figure 8. Cadastre of the project area.

Local Access and Logistics

The best access to the lake edge is from the west as shown below.

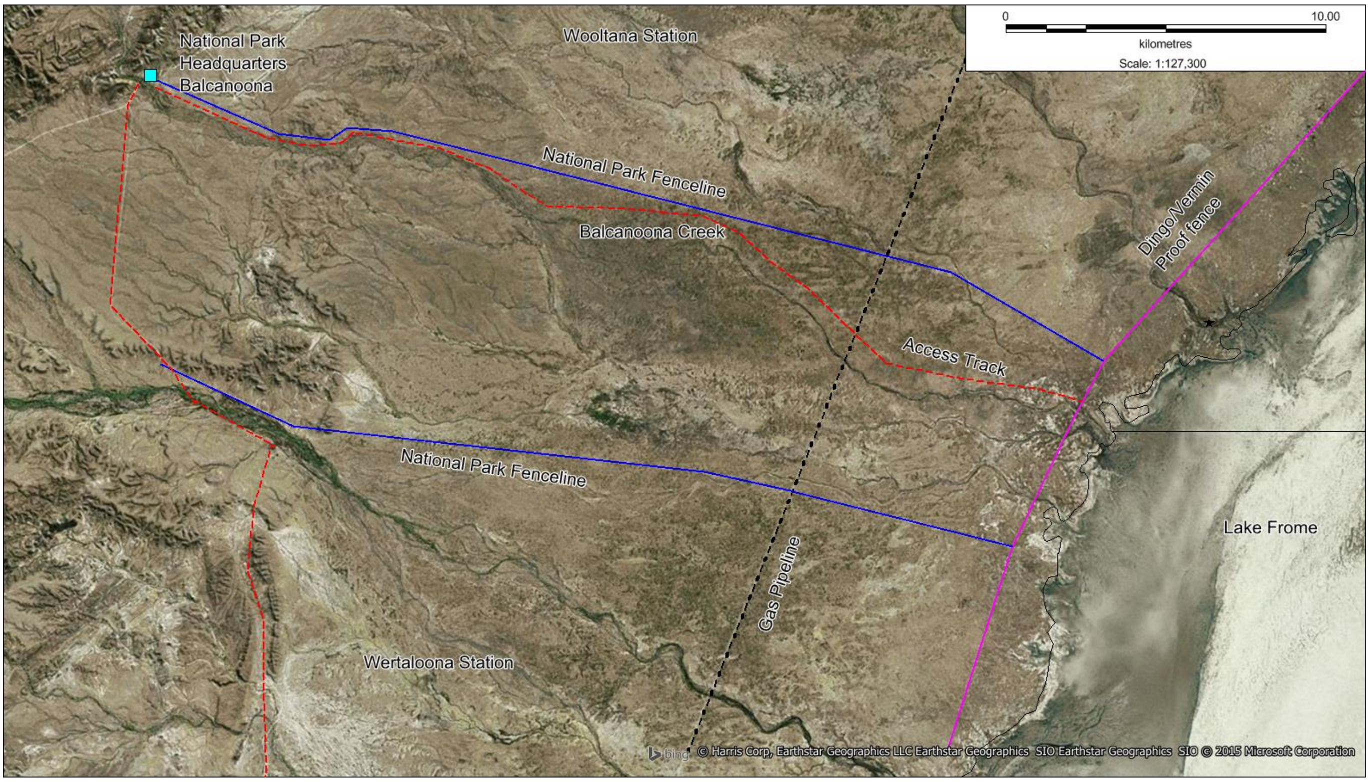

Figure 9. Access to Lake Frome from the west.

Public road access to western Lake Frome is limited to a single, rough four-wheel drive track which commences from the Vulkathunha-Gammon Ranges National Park headquarters at Balcanoona (Virlkundhunha) 30 km west of the lake. The route to Lake Frome traverses flat, stony terrain following Balcanoona Creek. After crossing both the Moomba-Adelaide natural gas pipelines and the dingo fence, the track passes over low sand dunes before arriving at the western shore of Lake Frome (Figure 9).

This main access track from the west also travels through a declared Cultural Use zone used for hunting by the local Adnyamathanha Aboriginal people. Public access is prohibited between 3.00 pm and 5.00 am daily.

Access to other sides of the lake depends on irregularly-maintained station tracks and tracks constructed by other exploration companies.

The lake surface itself varies considerably in hardness, but in general is more clayey and boggy towards the centre. Parts of the clay surface of the apparently dry lake have water less than a decimetre down and cannot support the weight of even a trail bike or a person on foot. In addition, salt crusts can be sitting directly on water or unconsolidated thixotropic sediment and pose a risk in access, making it like working on an ice lake. Doug Sprigg from Arkaroola Wilderness Sanctuary regularly flies over Lake Frome and says, “If there is enough water in it for long enough, the salt crust breaks up (and drifts) like an pack ice." The previous explorer Comalco’s personnel wore life vests when traversing or working on the salt crust and had vehicles and personnel break through. To drill on the southwestern lake, Comalco used purpose-built tracked vehicles (a Mole Mink) and hovercrafts. Monash University and CSIRO have successfully accessed the southeastern part of lake on quad bikes.

Aboriginal Issues and Negotiations for Access

Lake Frome forms part of the local Dreaming story told by the Adnyamathanha people explaining how the region's topography and species originated. According to this Dreaming story, Lake Frome was emptied of its water by the Rainbow Serpent Akurra when he ventured down Arkaroola Creek (which flows onto Lake Frome) to drink. Due to its Dreamtime significance the traditional Adnyamathanha do not venture onto the lake's surface.

On 04 June 2015, Form 27 was sent to Native Title Parties and relevant Government departments. This was followed-up by sending a copy of the PEPR to Native Title legal representatives.

Adnyamathanha Traditional Lands Association (Aboriginal Corporation) RNTBC (ICN 3743) (“ATLA”) is the agent prescribed body corporate/registered native title body corporate on behalf of the Native Title Holders in respect of all the land the subject of the Stages 1, 2 and 3 Adnyamathanha Consent Determinations of Native Title made by the Federal Court in Application SG 6001/98 on 30 March 2009 and 25 February 2014. They act for and on behalf of the Adnyamathanha people.

Meetings were held with representatives of the Traditional Owners of Lake Frome (ATLA) to discuss access. Negotiations used Ninti Kata Consultancy, Finlaysons and Johnston Withers Lawyers. Verdant Minerals’ CEO met with the full Board of the Adnyamathanha Traditional Lands Association (ATLA) in Hawker, SA on Friday 9 October 2015. On that day, the Board voted to negotiate an exploration agreement with Verdant Minerals, but further discussions are necessary before an agreement can be signed.

Further details are given in the “Work in the Year Ending 04/01/2017” later in this document.

Areas of Ecological and Conservation Significance

Due to its "regional geological significance" the lake was proclaimed as the Lake Frome Regional Reserve (IUCN Category VI) in December 1991.

Lake Frome and it surrounds have 26 EPBC-listed mound spring complexes associated with Great Artesian Basin discharge zone. These springs have varying conservation significance; 21 are considered to be at “risk” or “high risk”. Any activity that might affect the feed into, or affect the waterlevel in, these springs must be avoided. Tim Ransley from the Groundwater Group of the Environmental Science Division of Geoscience Australia and Daniel Wohling from the SA Government helped track down the exact mound spring locations within Lake Frome. Verdant Minerals has no need to intersect the Great Artesian Basin aquifer anyway and has self-imposed buffers around the mound springs. These are larger than the legislated exclusion zones.

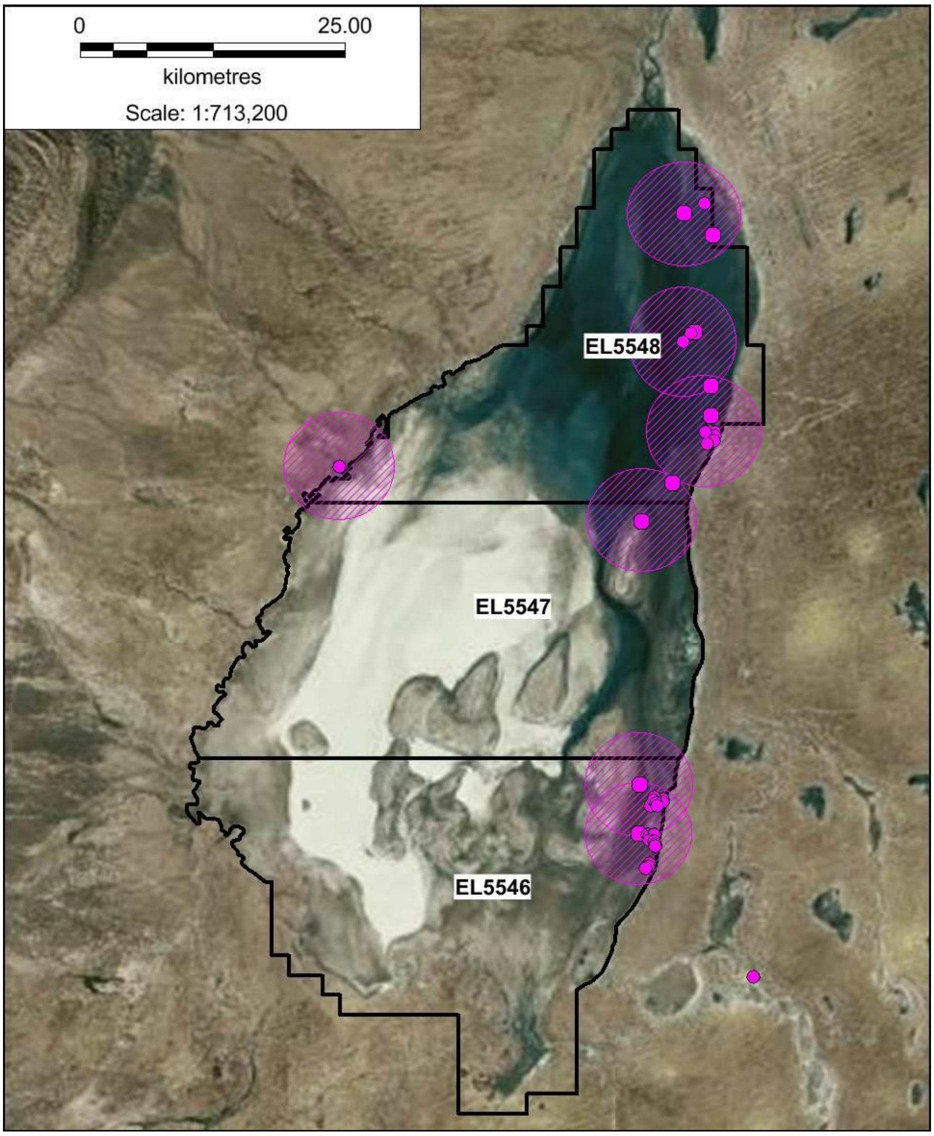

Figure 10. Location of mound springs in and around Lake Frome with self-proclaimed no-go buffers.

HISTORY OF TENURE

The three contiguous titles were granted 05 January 2015. These cover the entire of Lake Frome for 2,718 km^2. The titles were only granted for two years. Renewal has been applied for.

Tenement	Area km^2	Grant Date	Expiry	Holder
EL 5546	949	05/01/2015	04/01/2017	VRM
EL 5547	995	05/01/2015	04/01/2017	VRM
EL 5548	774	05/01/2015	04/01/2017	VRM

Table 1. Lake Frome titles.

Rum Jungle Resources became Verdant Minerals Ltd (VRM) on 05 December 2016 and the titles are now in the name of Verdant Minerals Ltd.

EXPLORATION AND PROJECT RATIONALE

The Lake Frome Potash Project is one of many in which Verdant Minerals is involved across three Australian jurisdictions (Figure 11). All the projects are targeting salt lakes and sub-surface aquifers that contain potassium- and magnesium-rich sulphate brines. Potash and/or schoenite fertiliser can be produced by simple staged solar evaporation and flotation and /or other onsite treatments.

Australia has no producing potash mines. Around 350,000 tonnes of potash is imported into Australia annually from Canada and is worth around $200 million. Potash of sulphate and schoenite are utilised as high-end fertiliser products globally, as they have a lower salt index than muriate of potash and are often preferred in crops sensitive to chloride or susceptible to fertiliser burn. Sulphate of potash and schoenite attract premium pricing in comparison to the more common muriate of potash.

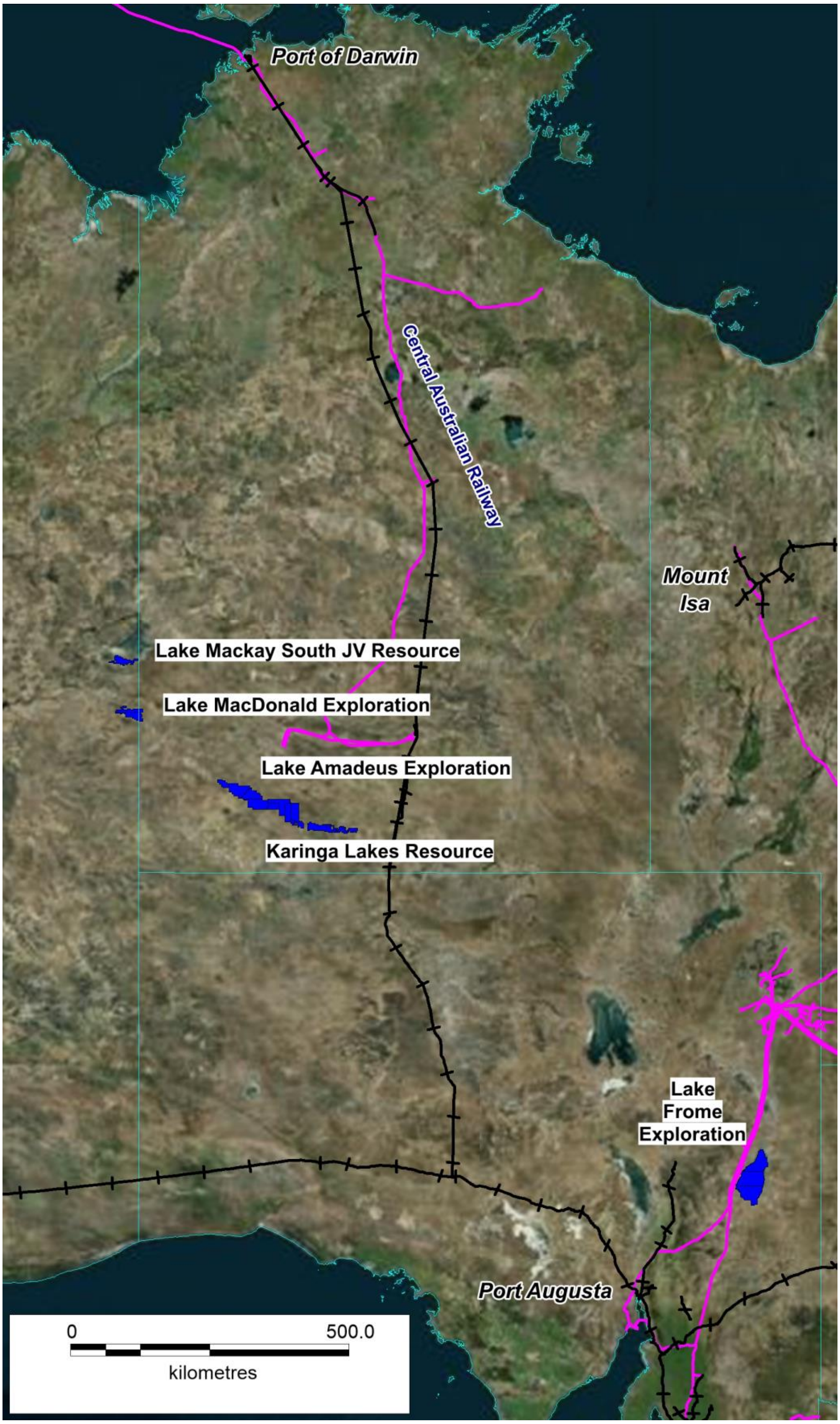

Figure 11. Verdant Minerals' sulphate of potash brine projects.

The Lake Frome Project is strategically well located near roads and railways, providing access to ports and proximity to southern to domestic markets.

GEOPHYSICS

The TMI data shown below probably reflect rugosity and differing geology in basement under the lake. It is not known to what extent the basement ridge under the lake might partition the lake stratigraphy itself. Northwest trending faults visible on the data may be conduits for upward migration of fluids, since they are believed to penetrate the great Artesian Basin (see discussion in Geology).

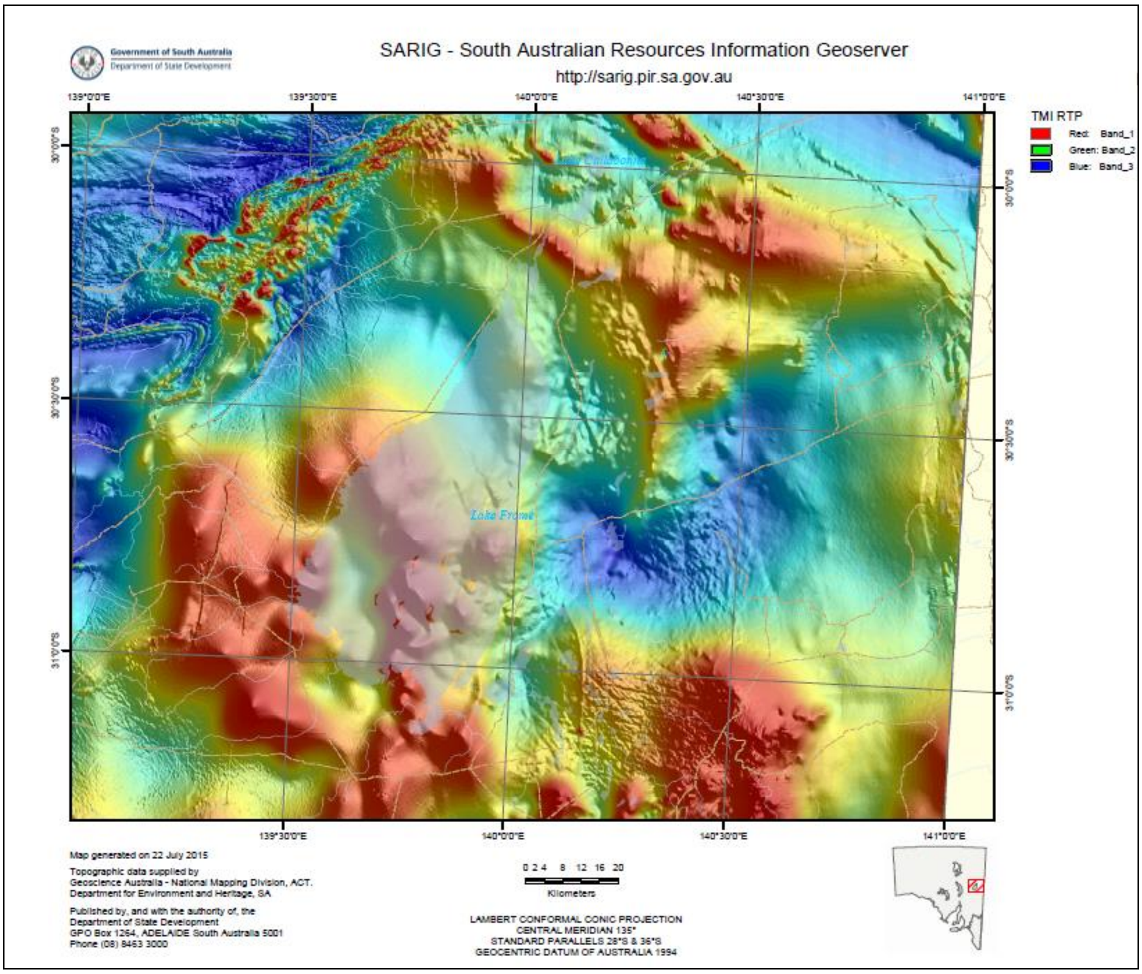

Figure 12. Total magnetic intensity reduced to the pole.

Since it only shows surface conditions, the potassium channel radiometrics data (below) is of less use than might be expected in a potash search. The image in the figure below does, however, show a marked difference between east and west, reflecting the type of surficial cover around the lake.

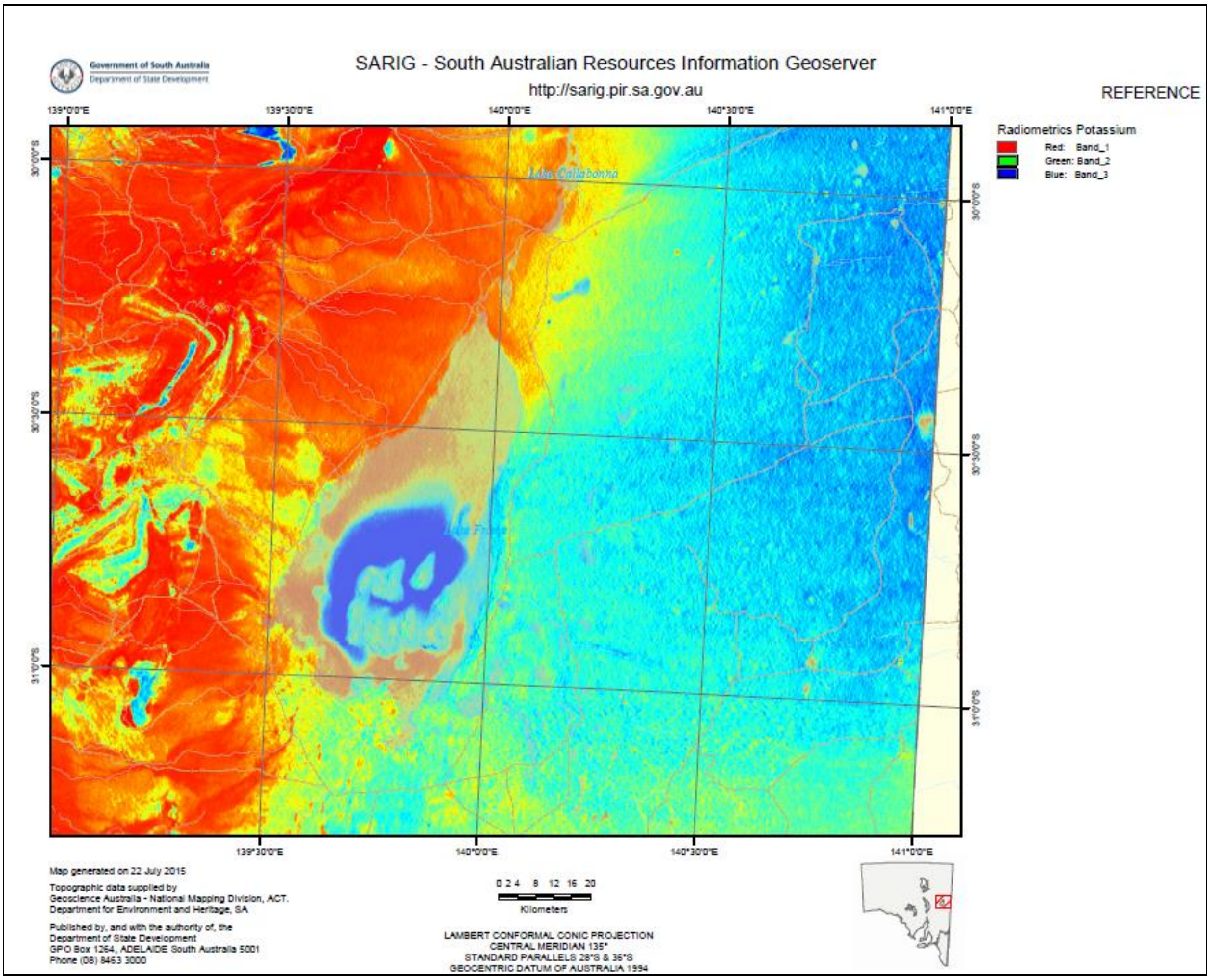

Figure 13. Potassium channel data over Lake Frome and surrounds.

An airborne electromagnetic (AEM) survey of Lake Frome was used by Geoscience Australia to help validate fluid transportation pathways, especially in the near sub-surface. The AEM survey measured the electrical conductivity of the surface and subsurface (potentially up to ~200 m depth below the surface), and has the potential for mapping salinity differences in groundwater in the near-surface. Using the Geoscience Australia layered earth inversion algorithm (GA-LEI), Geoscience Australia prepared conductance maps for a range of depths and elevations, as well as east-west cross-sections of electrical conductivity through Lake Frome. The depth of penetration of the AEM survey, referred to as the depth of investigation (DOI), varied based on the conductance (the summed conductivity of all layers in the inversion) but was highly correlated to the electrical conductivity of the surface layer. Where the surface was highly conductive, such as over the Lake Frome playa, the signal saturated close to the surface and the DOI was much shallower (~60 m). This limited Geoscience Australia's understanding of how deep the brine pool extends, and as a consequence, what stratigraphic units are contributing to Lake Frome's water chemistry.

LOCAL GEOLOGICAL AND HYDROLOGICAL SETTING

Lake Frome is bounded to the west by the Flinders Ranges, which comprise highly deformed Neoproterozoic to Early Cambrian metasedimentary and volcanic rocks of the Adelaide Fold Belt. These are underlain by Mesoproterozoic metasediments and granites, which crop out to the north in the Mt Painter Inlier (Preiss, 1987; Drexel et al., 1993; Sheard, 2009). The drainage into the lake from the west is characterised by bank-attached spits. Playa shoreline features in the west which appear to be beach ridges are actually relict fluvio deltaic units. Bounding Lake Frome's drainage basin to the south is the Olary Spur, which consists of Neoproterozoic metasediments of the Adelaide Fold Belt underlain by Paleo-Mesoproterozoic rocks of the Curnamona Province (Campana, 1957). Proximal to the lake, the Cenozoic fill consists of Late Paleocene to Eocene fluvial sands and gravels of the Eyre Formation, which underlie Oligocene to Late Miocene fluvio-lacustrine sands and clays of the Namba Formation. Pliocene fluvial and lacustrine deposits of the Willawortina Formation reach greater than 100 m thickness between Lake Frome and the Flinders Ranges (Callen and Tedford, 1976).

Most of the lake is covered with a thin halite crust, with several isolated groups of clastic and carbonate mound springs to the east. Below the halite crust, interstitial discoidal gypsum crystals along with traces of pyrite and

carbonates abound within the dark brown clay-rich sediments. Underlying Lake Frome, at depths ranging from 10 cm to greater than 10 m, is a brine pool, characteristically NaCl-enriched, with salinities exceeding 250 g/L.

The edge of the Jurassic Cretaceous-hosted Great Artesian Basin (GAB) underlies the area. The main GAB aquifer, the Cadna-Owie Formation, is overlain by the Cretaceous Bulldog Shale aquitard. A number of faults exist in the Great Artesian Basin sequence under Lake Frome. These result in leakage into any overlying aquifers and discharge as springs. Thus, the Great Artesian Basin aquifers can contribute to both ground and surface water at Lake Frome. The palaeo- and modern lake sediments are believed to be up to 200 m thick and consist of widespread Eyre Formation, the overlying widespread Namba Formation and several other formations of more local extent. The Eyre Formation consists of well rounded gravel and quartz sands in units up to 100 m thick. Following compartmentalisation of the greater Lake Eyre Basin, there was widespread formation of silcrete (locally called “grey billy”), then the Namba Formation was deposited during the Miocene and it lies disconformably over the Eyre Formation in units around 150 m thick. The Namba Formation consists of fine to medium sands, silt, clay, oolitic dolomite and limestone which were deposited in expansive, shallow lacustrine conditions in a warm environment. This formation contains vertebrate fossils in some of the carbonate facies. The Namba Formation is also locally capped by silcrete and what is locally called “puddingstone”. This is overlain by the Willawartina Formation which is probably a fanglomerate and associated braided stream distal facies. Following the deposition of the Willawartina Formation, the Millyera Formation was deposited unconformably over the Namba Formation across the eastern floor and shore of Lake Frome. The Pleistocene Millyera Formation consists of units up to 10 m thick of laminated clays, limestone and sand representing lacustrine deposition in the Lake Frome Basin. It pinches out to the west. Highstand sandy beach ridge facies were also deposited during the Pleistocene lacustrine events. These beach ridge facies, named the Coomb Spring Formation intertongue with the Millyera Formation to the east of Lake Frome, and represent deposition of the coarser sediments at high lake levels. The Late Pleistocene Eurinilla Formation consists of shoreline and channel fill structures of poorly sorted sands and clays in units up to 20 m thick which were deposited along the east and the western margins of Lake Frome and its ephemeral tributaries. The uppermost formation at Lake Frome is the Coonarbine Formation which lies disconformably above the shoreline sections of the Eurinilla Formation and also forms the central facies of the modern dunes around Lake Frome and to the east in the Strzelecki desert. The Coonarbine Formation consists of poorly sorted fluvial and aeolian silt, sands and occasionally gravels deposited during the climatic fluctuations of the Late Pleistocene and Holocene.

Evidence of significant runoff reaching Lake Frome is rare, but it floods more frequently than Lake Torrens. During filling events that produced water depths of greater than 6 m, Lake Frome merges with the three lakes to the north (Lakes Gregory, Blanche and Callabonna) to form a single water body. When filled to over 15 m, this mega lake drains via the Warrawoocara channel to Lake Eyre.

Over the last 100 thousand years, mega-lake phases have occurred at least seven times, with three of those overtopping into Lake Eyre. During such events, any accumulated salts and trace elements were vulnerable to dissolution and flushing from the basin. Two major periods of high volume runoff from the Flinders Ranges occurred between 92-80 ka and 17-11 ka during which lake levels were at a minimum elevation of 4-6m (AHD). However, since 45 ka, palaeohydrological records suggest there has been a progressive shift to more arid conditions, with Lake Frome returning to playa-dominated conditions. A major transition to ephemeral conditions was experienced between 7-6 ka which was followed by the onset of the modern El Niño Southern Oscillation from ~4 ka.

The present strontium isotope ratio (87Sr/86Sr) of Lake Frome brines and modern halite crust (0.71126 - 0.71206) are of similar composition to the shallow Willawortina Formation (0.71171 – 0.71223) (Ullman and Collerson, 1994). This suggests that the major source for Lake Frome brines is from the west, as tributaries and groundwater associated with this Pliocene unit have similar strontium isotope ratios. Strontium isotope ratios increase with depth in preserved gypsum deposits in Lake Frome’s sediment, which reflect either increasing groundwater input from the older Namba Formation, or greater groundwater residence times in the past.

In the most recent few decades, Lake Frome held some water for a considerable time in 1970. Comalco reported some surface water in 1972 and 1973, mainly as a result of spring discharge. After an extreme rain event in 1974, water covered 75% of the lake surface area. That water was not received via Salt Creek and Lake Callabonna in the north despite reports of Lakes Gregory, Blanche and Callabonna receiving water from the Strzelecki Creek at that time. Instead the water that entered Lake Frome during the floods of 1974 has been attributed to a combination of runoff from the Flinders Ranges and particularly large volumes of groundwater discharge. Satellite photos show water in Lake Frome during the floods of April 2010, 2011, and March 2012 but it has not been determined exactly how this water arrived. After rains in the Flinders Ranges during January 2015 (see Arkaroola rainfall graph), a Proba V satellite image from 12 February captured new green vegetation along the creeks to the west of the lake and showed standing water covering the southern portion of the lake.

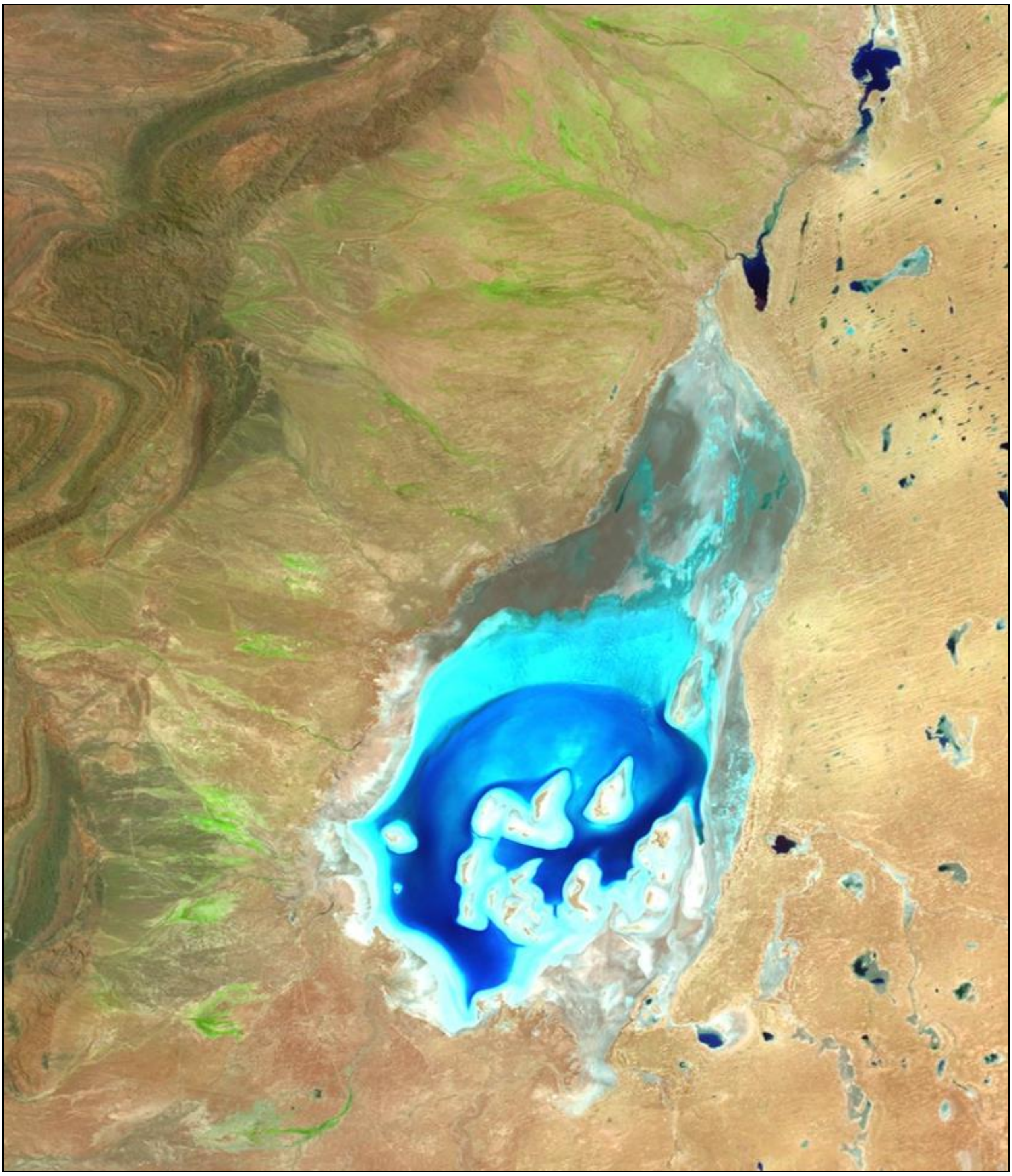

Figure 14. ESA's Proba-V minisatellite captures the rare sight of standing water in Lake Frome, 12 February 2015.

Surface salt crusts can be locally decimetres thick but are ephemeral and their location on the lake shifts between one flooding event and the next.

Organic matter and intimately associated secondary gypsum can be locally extensive and may suggest potential to generate acid sulphate. Photographs taken by CSIRO show a thin layer of black organic matter directly beneath the salt crust in at least one location.

PREVIOUS EXPLORATION AND WORK BY OTHERS

Early Academic Work

Draper and Jensen (1976) took a series of lake sediment cores hand-augured to 4 m, from various locations mainly in the south. Bowler et al (1986) sampled cores to depths of 6 m, taken 8 km in from the western shoreline and about 17 km in from the eastern shoreline as a part of the SLEADS project. While these studies have formed the basis of

SARIG's interpretation of the shallow aquifers under Lake Forme, the actual studies were directed more at sediments rather than brines and have only intersected very shallow aquifers.

Verdant Minerals has also obtained a copy of Barrett's 2011 Honours Thesis on Lake Frome.

2013 Geoscience Australia Study

A Geosciences Australia study (Record 2013/39) used Lake Frome as a test case of the prospectivity of Australian salt lakes.

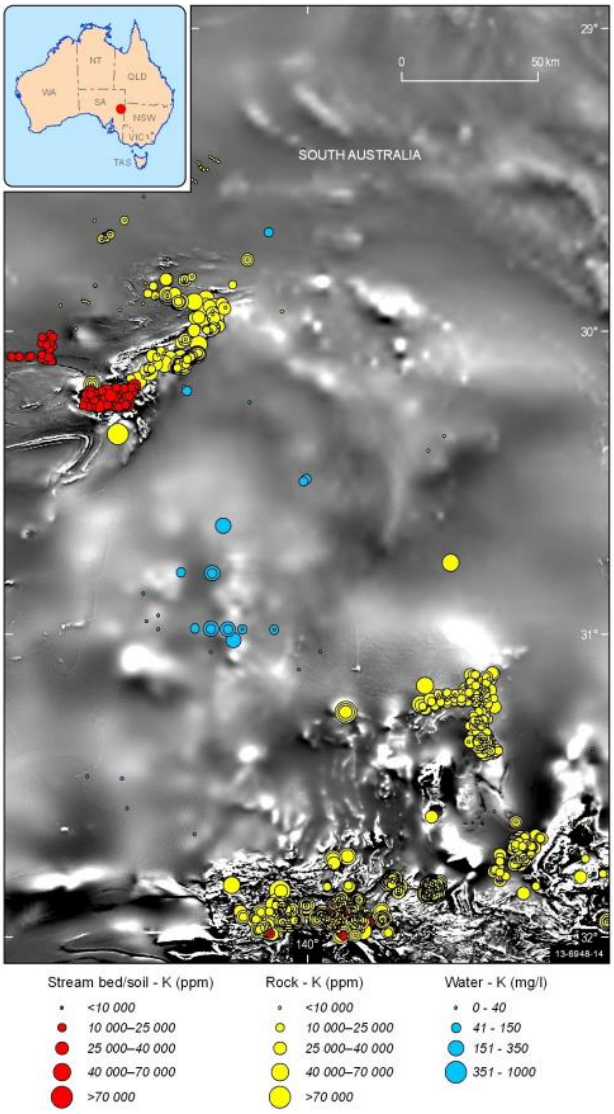

Figure 15. Potassium data used by Geoscience Australia broken into streams and soil, bedrock and water. The background is is the magnetic anomaly map of Australia. Strangely, their figure does not show the lake outline.

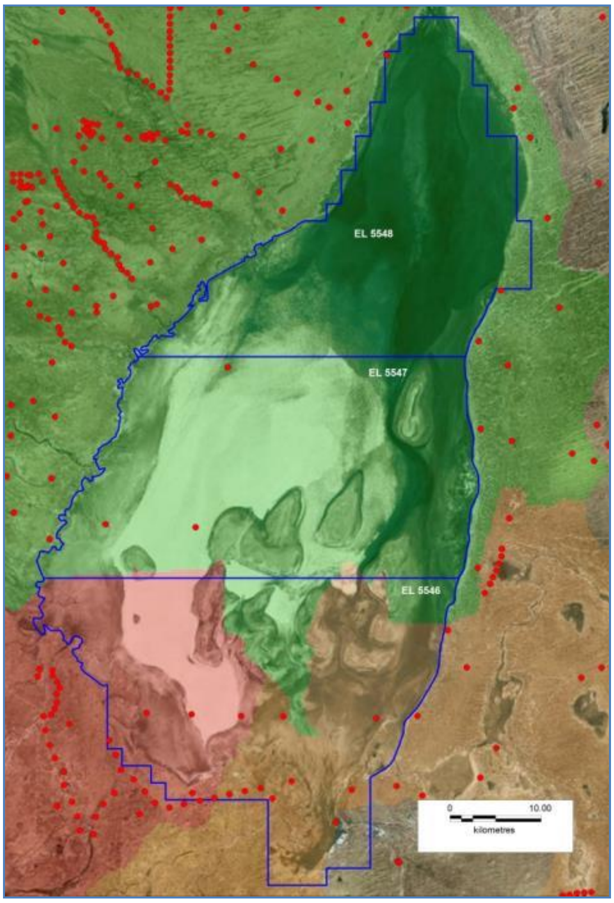

Figure 16. Results of the GA study for potash prospectivity. The catchments shown with a red tint were rated by GA as most prospective for potassium, followed by yellow then green. Historic drillholes are shown as red dots.

Exploration for Alkali Evaporites

The lake was previously explored for bedded alkali evaporites (specifically trona – sodium sesquicarbonate) or equivalent brines by Comalco Aluminium Limited in the late 1970s. They drew on similarities between the Miocene of Lake Frome and that of Wilkins Peak Member in the Green River Basin, US, which is the world's largest trona-producing formation. Specially-made vehicles were used to drill nine RC holes for 576 m. All holes intersected multiple thin aquifers well above the GAB. The major element assays showed all these groundwaters to be chloride-rich, low carbonate and low sulphate. In all but two holes, U was consistently higher in the deeper aquifers. In the opinion of Comalco, all trace values of Li, Sr, Br and B were low in the brines themselves. The Comalco chip samples were collected every 2 m. Assays for 35 trace elements were done on 10 m sediment composites. Comalco felt that these values were within the normal range for sediments of that type and in general agreement with previous academic work at Lake Frome. Some of the rock samples from this work are believed to be still stored at Wertaloona Station and samples from Comalco hole CF2 (and possibly others) are also stored at the SA Government Core Facility. The data from the original water analyses done by AMDEL for Comalco have been re-checked. There is little information on the analytical techniques used, but they are as used by AMDEL for routine waterbore analysis and so seem appropriate providing concentrations were not too high. That does not seem to be the case. The 27 brine K assays average 116 mg/l, with a maximum of 299 mg/l and a minimum of 19 mg/l. There was a high degree of consistency between the same aquifer in adjacent holes.

Lithium Exploration

The maximum Comalco brine Li assays were 0.2 mg/L compared to about 250 mg/L as potentially economic.

However, in an ASX release on 12 October 2010, ERO Mining Ltd described Lake Frome, rather effusively, as a "World-class lithium exploration target". Their concept was entirely based on few relatively high lithium levels (up to 250 ppm) in some of the earlier Comalco ***sediment*** (not brine) samples. Through their wholly-owned subsidiary South East Energy Ltd, they held EL 4601 and EL 4602 over central and southern Lake Frome specifically to explore for lithium. They also had applications over Lake Torrens. During 2011, a single sonic/diamond cored drill hole, WT2, was drilled by ERO/Tychean Resource on EL 4601 on the southwestern edge of Lake Frome. It was sited just off the lake by a few hundred metres and located near the older Comalco hole CF2 which was on, but near the edge of the lake. In the estimation of ERO, CF2 was the best indication of lithium in the Comalco work.

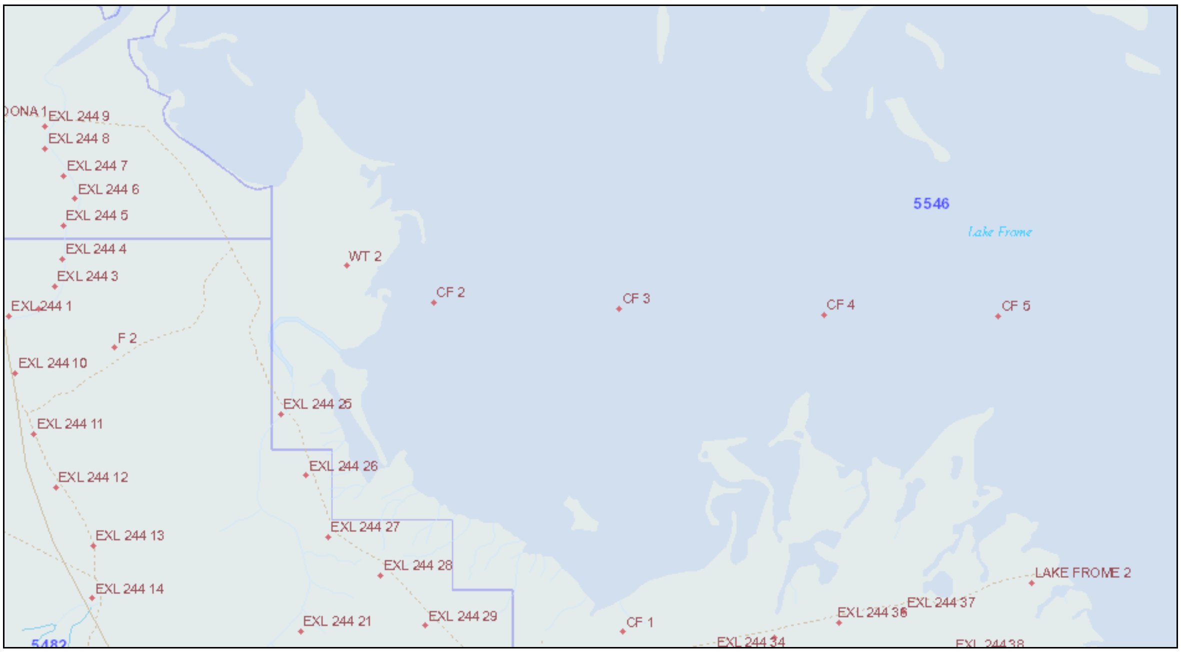

Figure 17. Location of ERO drillhole WT2 hole near the Comalco line CF2 to CF5.

Geology of REO WT2 and Comparison with Re-assay of the Comalco Sediment Samples

Drillhole WT2 went through the modern lake sediments, Namba and Eyre Formation. These were described as interbedded clays and sands with various amounts of carbonaceous matter. The hole was terminated in Cretaceous Bulldog Shale (first intersected at 149 m) to avoid intersecting the underlying Cadna-Owie Formation which is the main Great Artesian Basin aquifer. This aquifer is thin and "patchy" under the south of Lake Frome but ERO were deliberately avoiding the possibility of an artesian flow. The WT2 hole was gamma logged. Samples from depths of 10 m, 19 m, 26 m, 34 m and 63 m were sent for semi-quantitative mineralogy. Illite, muscovite and K-feldspar were identified as the K-bearing minerals. One-metre sediment samples for almost the entire hole were assayed for various elements, specifically lithium. For comparison, sediment samples from those intervals in the Comalco hole with reputedly high lithium were re-assayed using the same technique. Based on the tabulated data given in ERO report itself, most of the values below 20 m from the re-assayed Comalco hole were consistently lower than those originally reported by Comalco, commonly by a factor of 10 times. None of the sediment samples from WT2 exceeded 100 ppm Li. The maximum in the actual data file is 69 ppm. Thus, **the 250 ppm Li in the Comalco assays is spuriously high even for sediment and there is no indication that the Li minerals might be soluble**.

Hydrology and Brine Assays in ERO Study

ERO sampled five local waterbores to provide a set of background values for comparison with brine assays from six depths in WT2.

The maximum K in the "background" waterbores was 100 mg/l. **The best K in brines from WT2 was only 40 mg/l**. Thus, the lake brine had less K than waterbores off the lake.

The best three waterbores had 200 µg/l, 233 µg/l and 285 µg/l Li. Note this is micro not milli. The lake brine Li assays, this time reported in mg/l, ranged from 0.04 mg/l to 0.136 mg/l (compare to 250 ppm Li in brine lake projects elsewhere). ERO reported that they had intersected "elevated lithium", but abandoned the project.

ASSESSMENT OF PROSPECTIVITY

Potash Prospectivity

Other than assays mentioned above, there is very little data on the potash prospectivity, but GA (without knowing the results of WT2) rated the southwest as the most prospective. Despite the poor results reported by Comalco and by ERO in WT2, further brine sampling for potash is justified. This needs to be deeper, more comprehensive and systematic than all previous work.

Lithium Prospectivity

Geoscience Australia did not use the most recent ERO analytical Li data for rocks or brines and they did not demonstrate that any lithium in rocks in the catchment was soluble. They did use some spuriously high Li sediment results. None-the-less, Geoscience Australia concluded that Lake Frome is not much more enriched in lithium than seawater. In fact, the actual concentration of Li in seawater is 0.14 to 0.25 ppm so EROs' brines actually have less than half the Li concentration of seawater. Certainly, the brines are well below the target grade for commercial Li brine. Furthermore, as the ratio of lithium to chloride is so low, evaporation modelling suggests that the brine will never reach economic Li concentrations in single stage evaporation. Until it can be demonstrated otherwise, Verdant Minerals considers that Lake Frome has next to no lithium brine prospectivity, at least in the brines sampled to date.

Bromine Prospectivity

To be comparable with Dead Sea operations, bromine concentrations would have to be about 5,000 ppm out-of-the-ground, which goes to 10,000 to 12,000 ppm Br after NaCl crystallises out. Geoscience Australia appears to have been unaware that Comalco gave some 28 Br brine assays. However, these had a maximum of only 155 mg/L, meaning there is little Br prospectivity in the brines tested to date.

Boron Prospectivity

The most important and economical, extractable boron minerals are the borax series such as borax itself ($Na_2B_4O_7.10H_2O$), kernite ($Na_2B_4O_7.4H_2O$), tincalconite ($Na_2B_4O_7.5H_2O$), ulextic ($Na_2O.2CaO_5B_2O_3.16H_2O$) and hydroboracits ($CaO.MgO.B_2O_3.6H_2O$). Seawater has 4 to 5 ppm B. Salt lake brines from Olaroz, Cauchari and Salar de Atacama which are used to produce borax chemicals have natural B concentrations many orders of magnitude higher than seawater. Egyptian lakes where borates are produced chemically typically have brines containing >100 ppm boron. The operators of Owens Lake in the US used evaporation to concentrate borax brine from 2.6% to 4%. A suite of Lake Frome B brine assays from Comalco has a maximum of only 9.4 mg/L, only double seawater at best, suggesting little B prospectivity, at least in the brines sampled to date.

WORK IN THE YEAR ENDING 04/01/2016

Literature Search and Desk-Top Studies

Literature searches and desk-top studies were undertaken as described above.

PEPR Preparation and Submission

Lake Frome work programs (PEPR applications) were submitted 19 May 2015. The proposed work program was for brine sample collection from shallow hand-auger holes using small low psi-footprint amphibious ATVs for access. A request for further information was received from DSD, noting that a new template was needed and approvals would take 3-5 months minimum and no approvals would be given until Native Title had been addressed in accordance with Part 9B of the Mining Act. A new PEPR application was submitted 09 September 2015 proposing alternative helicopter access for the hand-auger sampling program. The proposed hand-augering was determined not to be "drilling".

Land Access Negotiations

As detailed previously, land access negotiations with the Adnyamathanha Traditional Lands Association were conducted during the reporting period. The company sought advice from Ninti Kata Consultancy, Finlaysons and Johnston Withers Lawyers. Initial discussions were held with representatives of the Traditional Owners of Lake Frome to discuss access. These discussions and negotiations used Ninti Kata Consultancy and Finlaysons. The company's CEO met with the full Board of the Adnyamathanha Traditional Lands Association (ATLA) in Hawker, SA on Friday 9 October 2015. The Board voted to negotiate an exploration agreement with Rum Jungle Resources (now Verdant Minerals Ltd) on that day. A formal written agreement was drafted and sent to both parties for review.

WORK IN THE YEAR ENDING 04/01/2017

No work on-ground was possible without an agreement with the Traditional Owners.

Over the period of a year, there was apparently less willingness on the part of the Traditional Owners to enter into an agreement. It has emerged that there is an unresolved conflict among the various Traditional Owners about access to Lake Frome. The company has been asked by ATLA to come and speak to the whole Board again, effectively re-starting the entire process. This is scheduled to take place during late February 2017.

EXPENDITURE STATEMENTS

The cumulative expenditure breakdown is tabulated below:

EL	Cumulative Expenditure to		
	04/01/2016	04/07/2016	04/01/2017
5546	36,317.01	37,753.25	39,690.02
5547	39,354.55	41,350.81	43,287.58
5548	29,466.41	30,902.65	32,839.42

Table 2. Expenditure details.

PROPOSED WORK FOR YEAR ENDING 04/01/2018

As per the PEPR, heli-sampling will be undertaken after an access agreement is signed and when all permissions have been obtained from all stakeholders.

CONCLUSION AND RECOMMENDATIONS

This group report covers work undertaken on the Lake Frome ELs 5546, 5547 and 5548 for the year ending 04/01/2017. Land access negotiations are still underway.

Verdant Minerals Ltd
ABN 33 122 131 622
T +61 8 8942 0385
F +61 8 8942 0318
E info@verdantminerals.com.au
www.verdantminerals.com.au
A 20/90 Frances Bay Drive, Stuart Park NT 0820

Titleholder:	**Verdant Minerals Ltd**
Operator:	**Verdant Minerals Ltd**
Tenement Manager:	**Complete Tenement Management**
Tenements:	**EL 5546, EL 5547, EL 5548**
Project Name:	**Lake Frome Potash**
Report Title:	**Group annual technical report for the Lake Frome Brine Potash Project, period ended 04/01/2018**
Authors:	**John Dunster**
Corporate Author:	**Verdant Minerals Ltd**
Target Commodity:	**Brine potash**
Date of Report:	**30/01/2018**
Datum/Zone:	**GDA94/Zone 54**
250K map sheets:	**Frome SH5410, Curnamona SH5414**
Address:	**PO Box 775, Darwin NT 0801**
Phone:	**08 8942 0385**
Fax:	**08 8942 0318**
Contact Email:	**jdunster@verdantminerals.com.au**

SUMMARY

Verdant Minerals Ltd holds three contiguous titles that cover the whole of Lake Frome in eastern South Australia. The company intends to explore below the dry lake surface for brines that might be suitable for the production of potash minerals used in fertilisers. Literature reviews and an assessment of the work by previous explorers have been undertaken. A work program has been submitted to the relevant authorities and stakeholders. Negotiations with the Adnyamathanha Traditional Lands Association who represent the Traditional Owners are still underway and no on-ground work can proceed until an agreement is finalised. The future of the project depends entirely on a timely and satisfactory resolution of these issues. If this is not forthcoming, Verdant Minerals will reconsider the potential viability of the project.

CONTENTS

LIST OF FIGURES AND TABLES

INTRODUCTION

This report describes the work undertaken during the year ending 04/01/2018 on ELs 5546, 5547 and 5548 which cover the dry salt playa lake, Lake Frome, in eastern South Australia (not to be confused with the smaller coastal lake of the same name). It is hoped to be able to systematically sample deep brines from beneath the salt lake and assess their potential to produce potash minerals which could be used to make fertiliser.

HISTORY

In 1840-41, Edward John Eyre, explored along the western side of the Flinders Ranges, discovering Lake Torrens and Lake Eyre South, which he described as "...one vast, low, and dreary waste". Turning southeast, he also discovered Lakes Blanche, Callabonna and Frome which he didn't actually name since he believed that they were all part of Lake Torrens which appeared to be one vast impassable horseshoe shaped salt lake blocking the way to the north beyond the Flinders Ranges.

After it was realised that there were separate lakes, Edward Charles Frome mapped the area in 1843 and Lake Frome was named after him.

The extensive salt crusts on Lake Frome are regarded as literally whiter then snow and were used to calibrate the "white" in early satellite imagery. These parts of the lake surface are arguably the brightest place on Earth and were accessed by the CSIRO on several occasions to take albedo measurements.

Figure 1. CSIRO staff in December 2000, arranging a blue sheet on the salt of Lake Frome to be spotted by NASA's Hyperion satellite EO-1.

LOCATION, ACCESS AND LAND USE

Location

Figure 2 is a location map of Verdant Minerals' Lake Frome Project. The lake is 750 km (470 miles) northeast of Adelaide, 134 km east of Leigh Creek in SA and 210 km west northwest of Broken Hill in NSW.

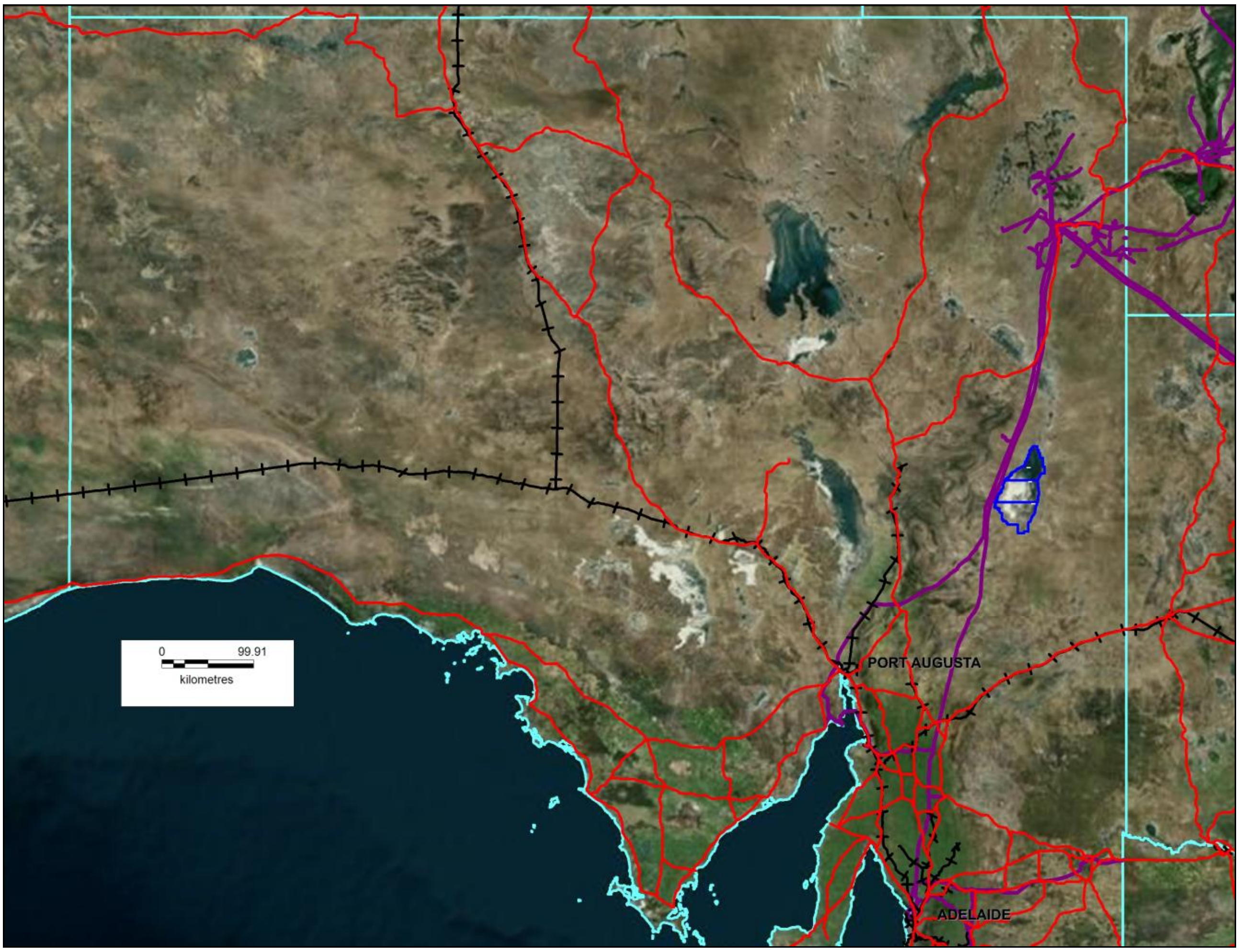

Figure 2. Regional location the Lake Frome Project in SA with titles outlined in blue, showing railways, main roads in red and pipelines in purple.

Climate

Lake Frome is located in one of most arid parts of Australia. Pan evaporation in the Lake Frome region is typically 2,400 mm - 3,700 mm per year which is over ten times the average rainfall. The prevailing winds in the Lake Frome region are mild southerly winds, however stronger westerly winds become more pronounced during the mid-year winter months. There is sufficient difference in albedo and latent heat consumption between the lake salt crusts and the surroundings to generate its own air circulation.

Rainfall

Lake Frome is located close to the boundary between Australian winter (westerlies and cold front related) and summer (monsoonal and ENSO) rainfall zones. The ranges to the west of the lake affect rainfall coming from that direction. Total rainfall at Lake Frome averages around 150-180 mm per year and it falls sporadically. On average, most rain is during the winter months but as shown below, October to February can also be relatively wet depending on any monsoonal influence getting that far south. Rainfall records for the three closest weather stations are incomplete. All available data since 2000 is plotted below. Note the wide variations between the three stations for any given month and year.

Frome Downs

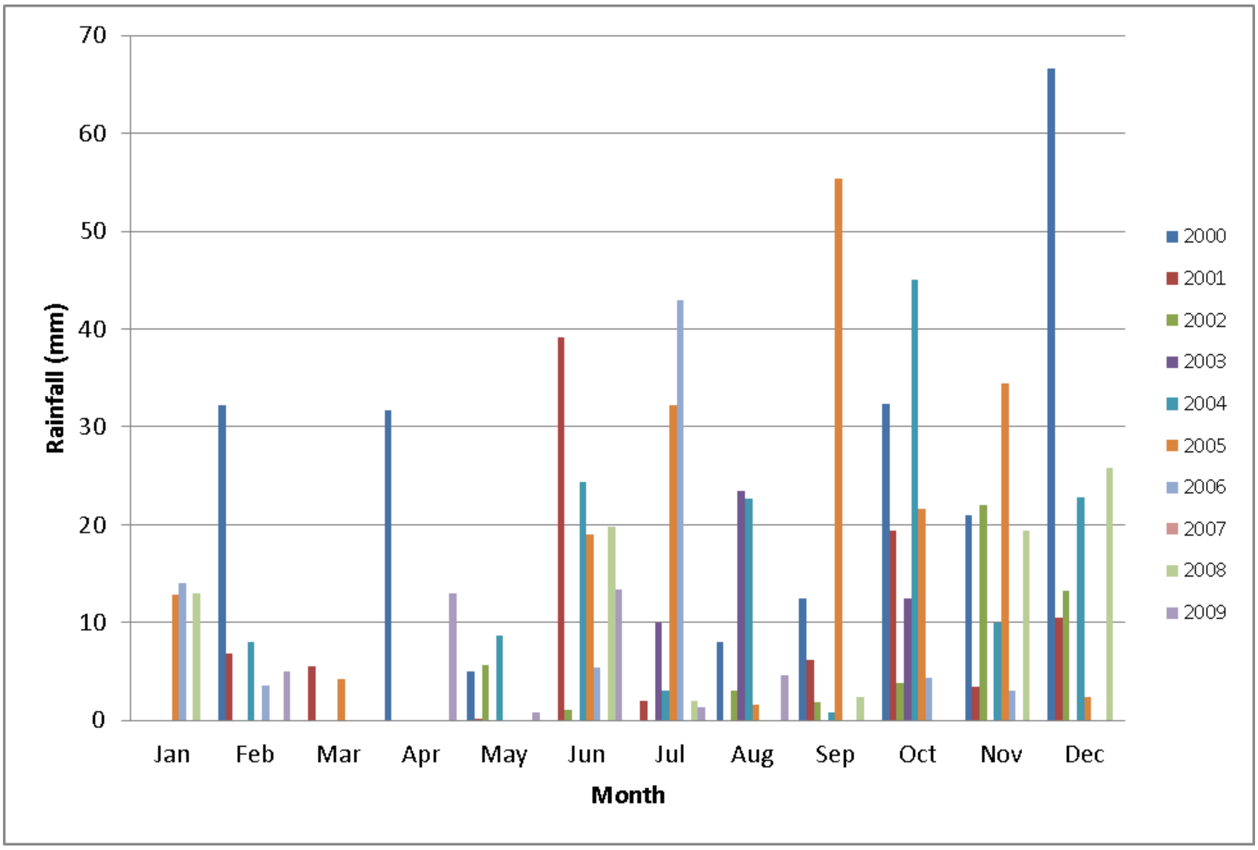

Figure 3a

Wertallona

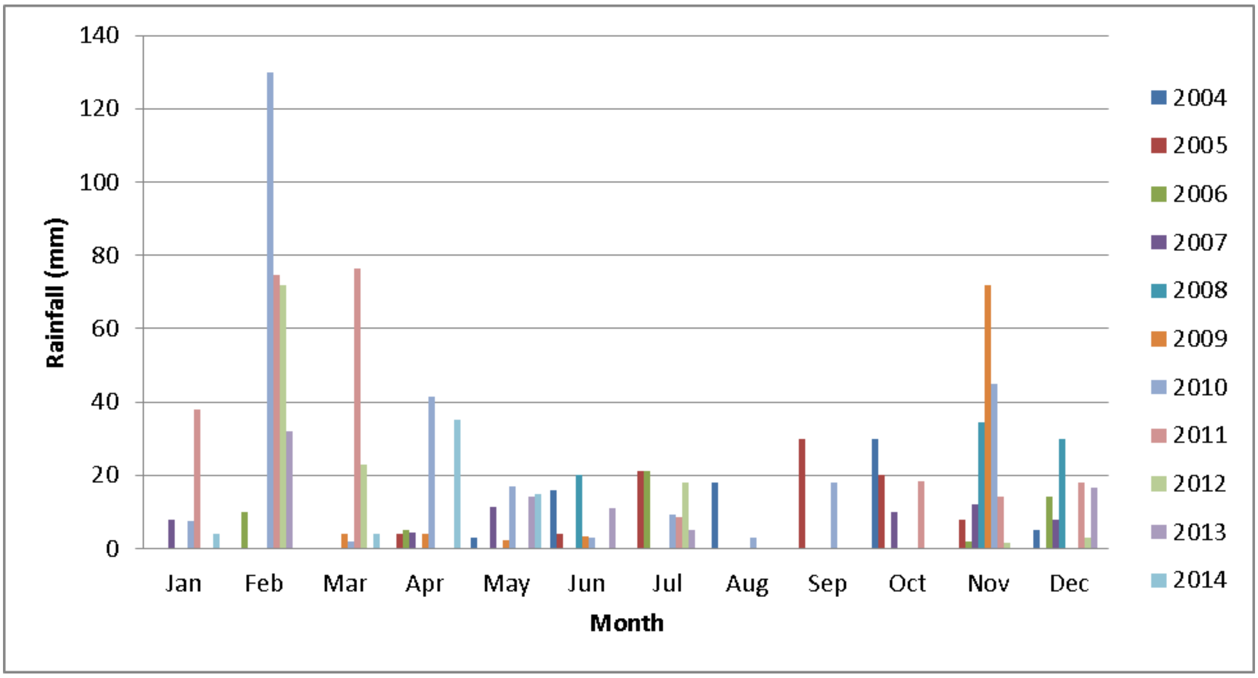

Figure 3b

Arkaroola

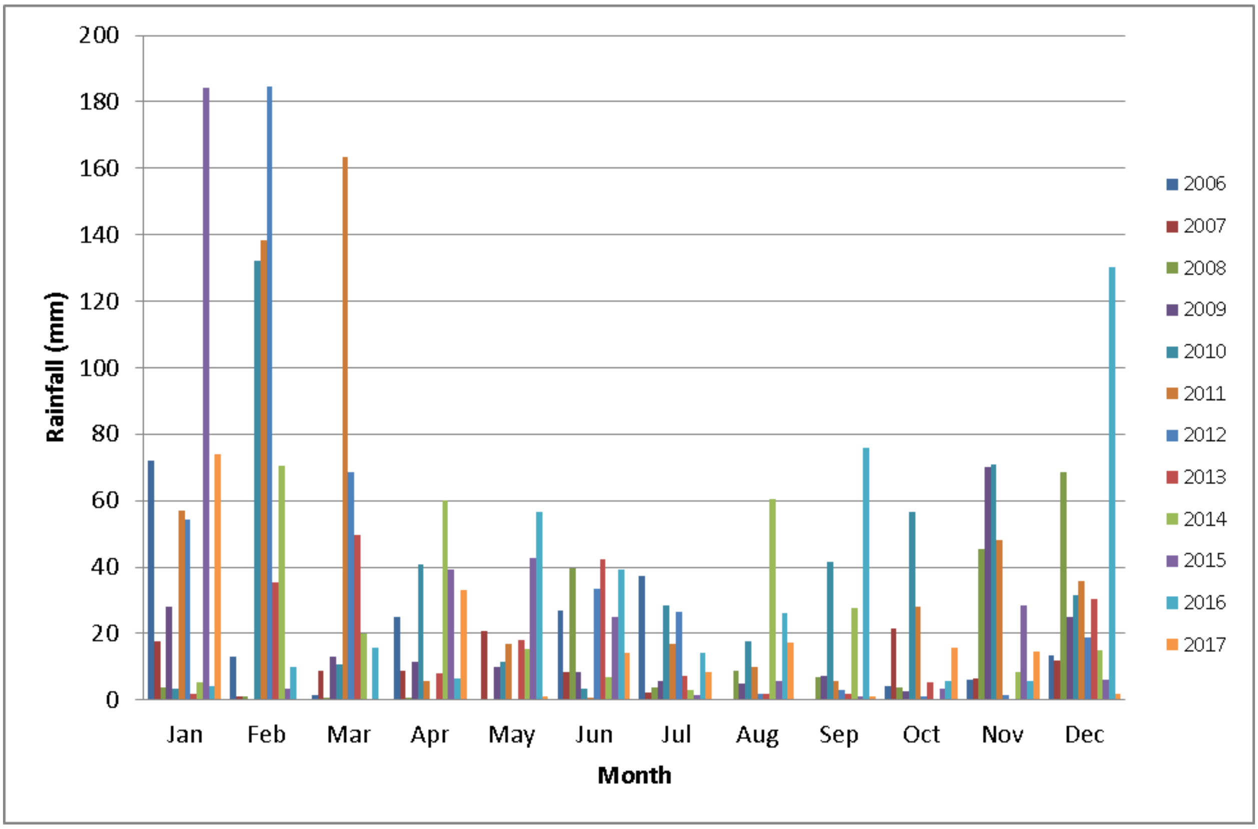

Figure 3c

Figure 3 a,b,c. Average rainfall for the project area recorded at the three closest weather stations.

Humidity

Figure 4 below shows the relatively low all-year-round humidity. Dew and rare frost account for the highest morning readings.

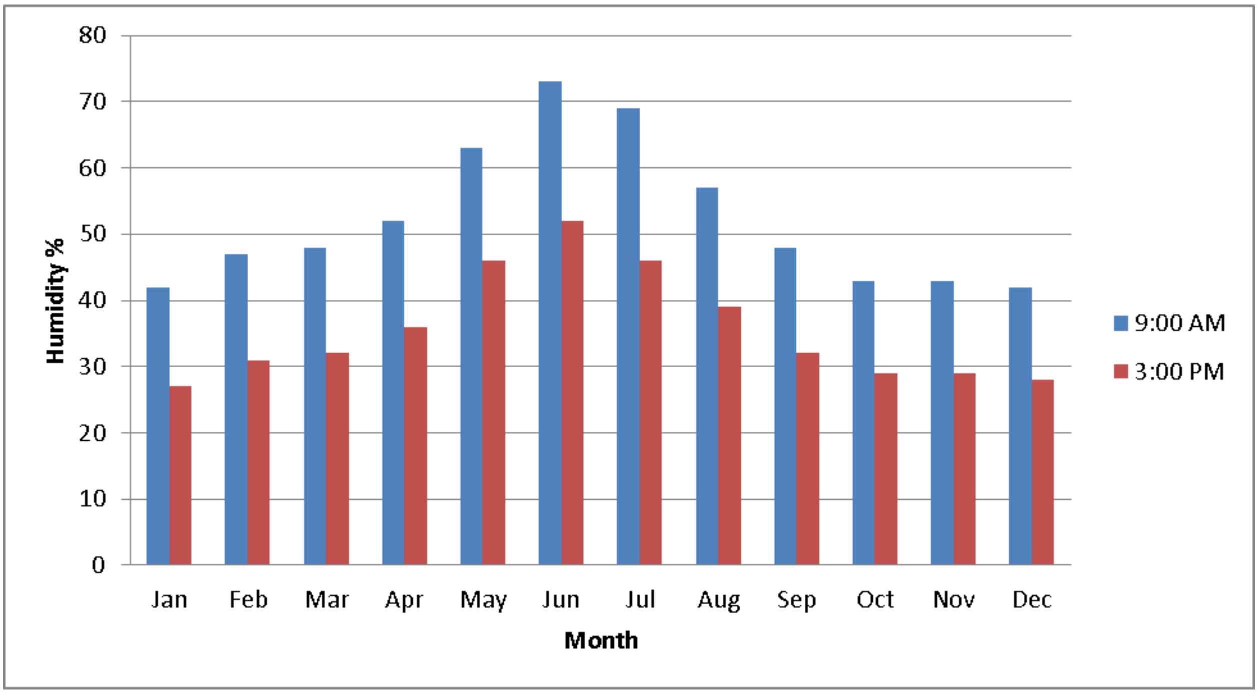

Figure 4. Mean monthly relative humidity (%) at 9am and 3pm recorded at Arkarolla Station.

Temperature

Quoted minimum and maximum temperatures range between 4.5°C and 40°C at Lake Frome. Reflection from the white salt crust can account for several degrees of temperature elevation locally and CSIRO and Comalco personnel working on the lake regularly experienced daytime temperatures in excess of 46°C. Comalco recorded a highest daytime temperature of 48°C at head-height in the shade on the salt crust.

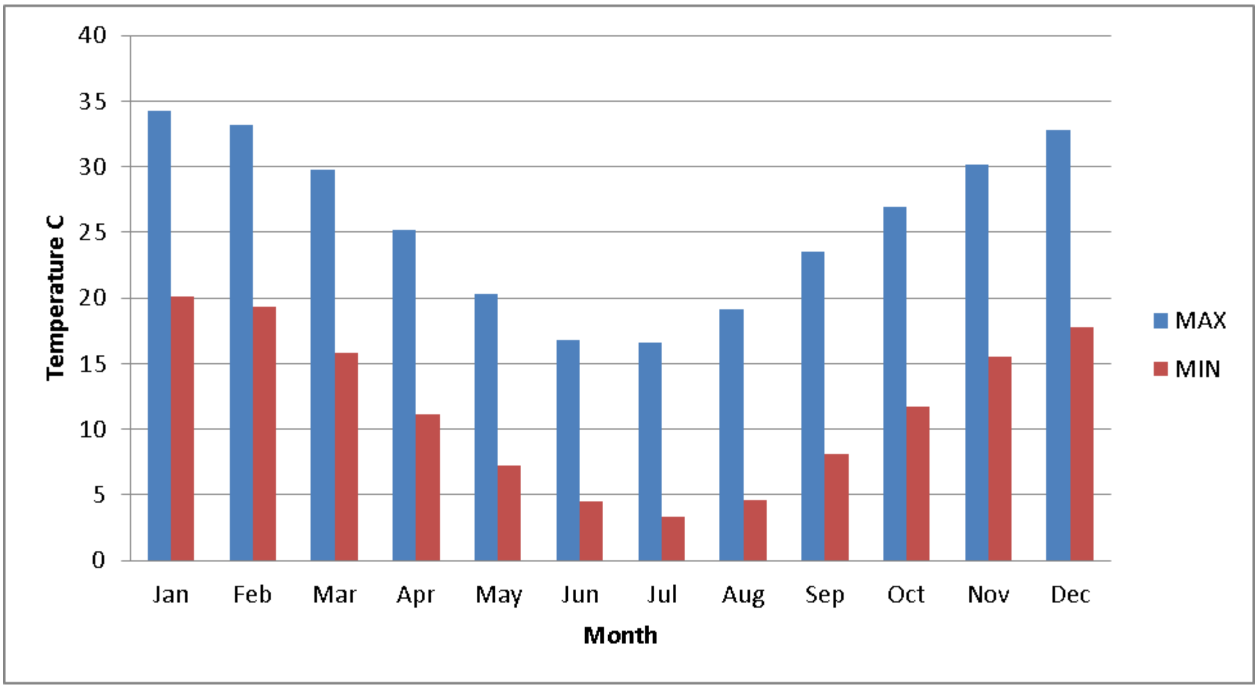

Figure 5. Mean maximum and minimum temperatures at (°C) at Arkaroola Station.

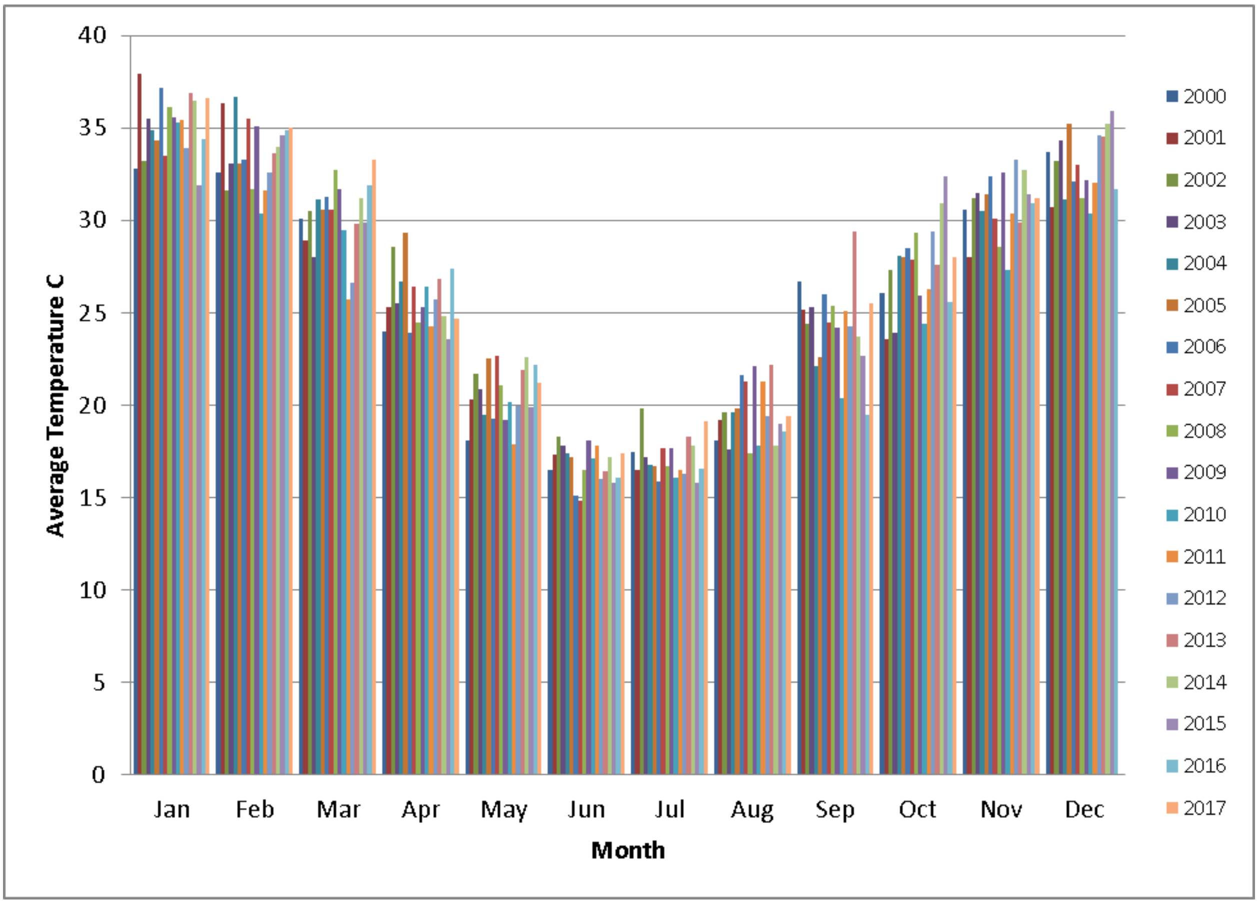

Figure 6. Average monthly temperatures (°C) at Arkaroola Station.

Physiography and Topography

Lake Frome has streams feeding in from the west in the northern Flinders Ranges. There are dunefields to the east and south.

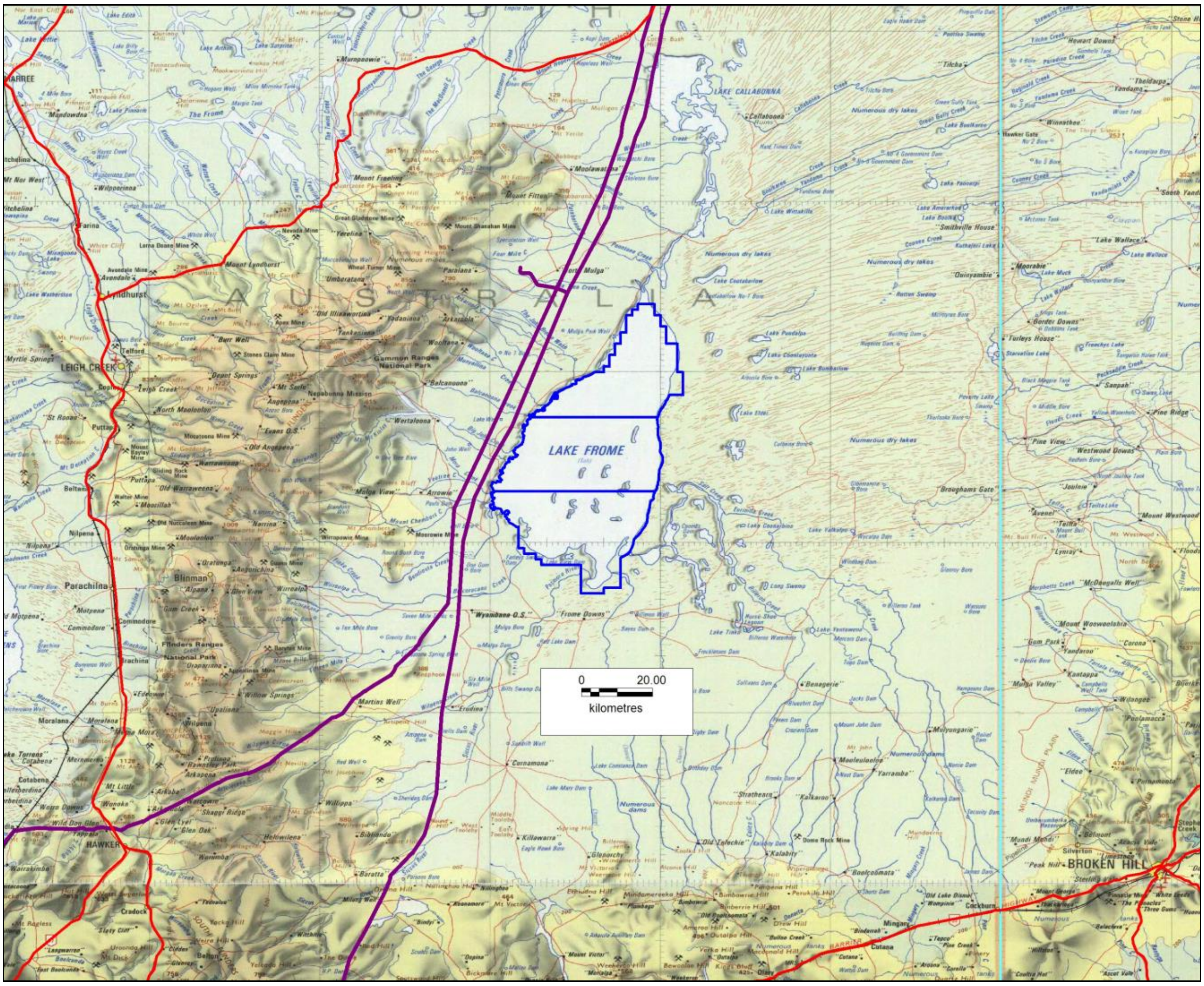

Figure 7. A published topographic map covering the project area.

Regional Hydrology

Lake Frome is part of the modern Lake Eyre Basin. It is the terminal lake within the Callabonna sub-Basin of the Lake Eyre Basin. The Lake Frome catchment makes up the southern and south-western portion of the Lake Eyre Basin. It is connected to Lake Callabonna to the north via a modern, but normally dry, channel. Lake Frome is similarly connected to a chain of much smaller lakes to the southeast. The existence of any palaeo-drainages is yet to be researched because these would be outside the tenement area. The local hydrology of Lake Frome itself is described later in this document.

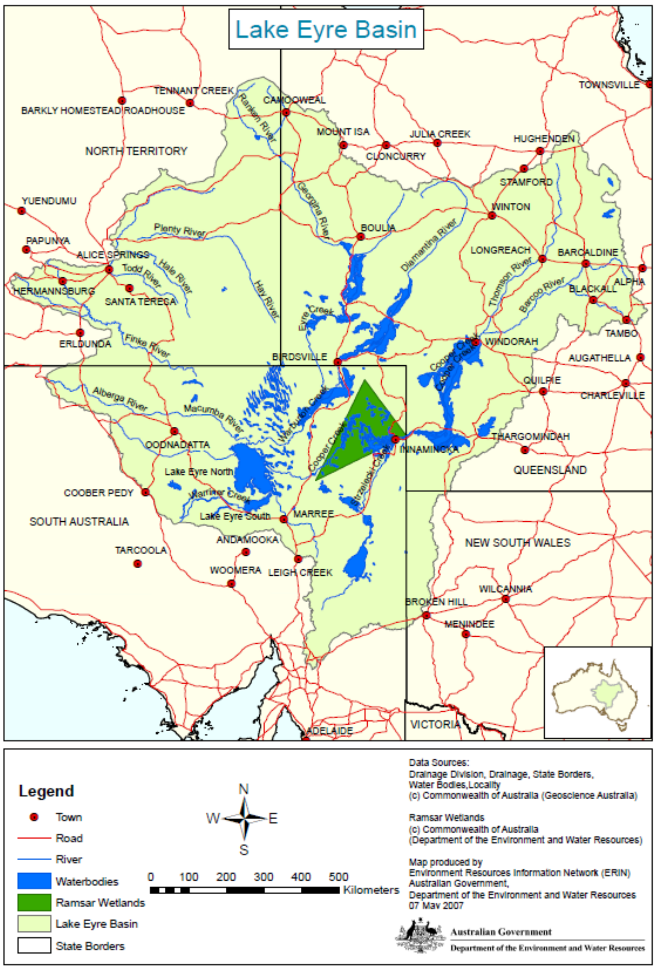

Figure 8. Lake Frome is in the southern quarter of the Lake Eyre Basin.

Land Systems, Flora and Fauna

Lake Frome is included within the IBRA Subregion 7 Strzelecki Desert Bioregion (SSD05). The area to the east of Lake Frome is part of the Simpson-Strzelecki Dunefields Bio sub-region which extends from the southeast of the Northern Territory, through the northeast of South Australia, with small areas in both Queensland and New South Wales.

An EPBC Search into local flora and fauna was undertaken and the report is included in the PEPR but not reproduced here.

Habitation and Land Use

The area is very remote and very sparsely settled. The nearest habitations are the Ranger Station for the National Park, pastoral stations such as Wertaloona and Frome Downs and small Aboriginal communities.

The only non-indigenous land use around the lake is very low density cattle grazing. As described below the main value of the lake itself is for biological and cultural conservation. As shown in figure below, a land corridor connects Lake Frome itself to a National Park to the west.

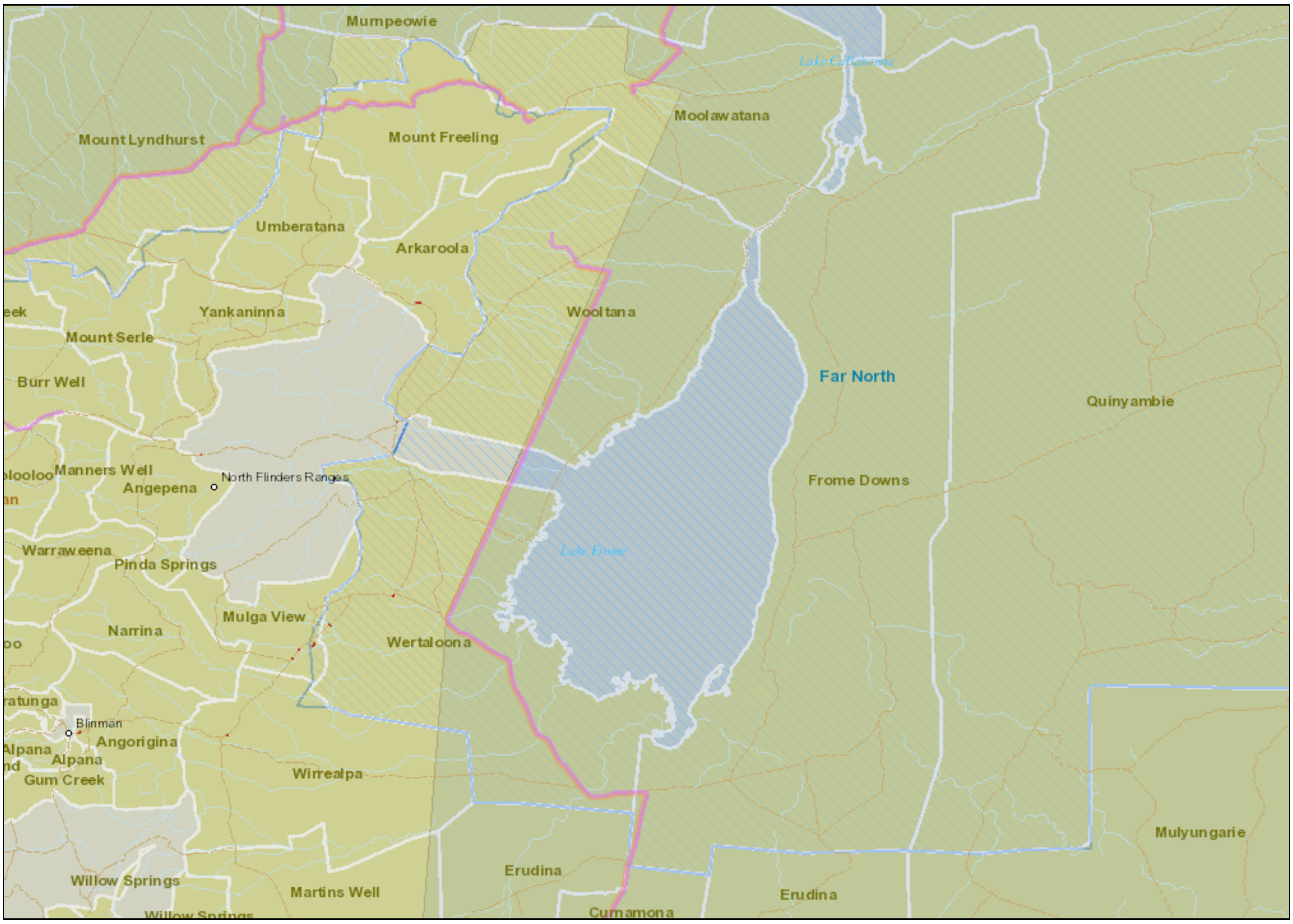

Figure 9. Cadastre of the project area.

Local Access and Logistics

The best access to the lake edge is from the west as shown below.

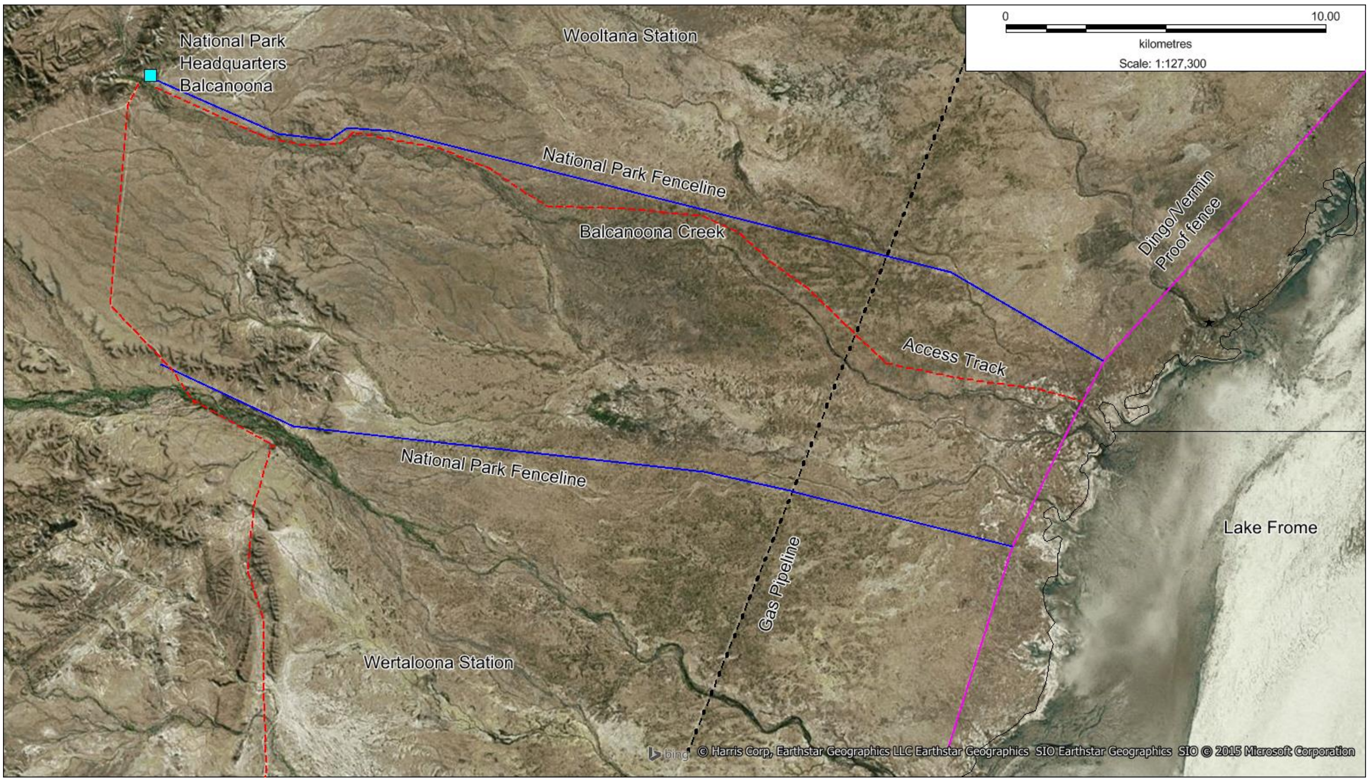

Figure 10. Access to Lake Frome from the west.

Public road access to western Lake Frome is limited to a single, rough four-wheel drive track which commences from the Vulkathunha-Gammon Ranges National Park headquarters at Balcanoona (Virlkundhunha) 30 km west of the lake. The route to Lake Frome traverses flat, stony terrain following Balcanoona Creek. After crossing both the Moomba-Adelaide natural gas pipelines and the dingo fence, the track passes over low sand dunes before arriving at the western shore of Lake Frome (Figure 10).

This main access track from the west also travels through a declared Cultural Use zone used for hunting by the local Adnyamathanha Aboriginal people. Public access is prohibited between 3.00 pm and 5.00 am daily.

Access to other sides of the lake depends on irregularly-maintained station tracks and tracks constructed by other exploration companies.

The lake surface itself varies considerably in hardness, but in general is more clayey and boggy towards the centre. Parts of the clay surface of the apparently-dry lake have water less than a decimetre down and cannot support the weight of even a trail bike or a person on foot. In addition, salt crusts can be sitting directly on water or unconsolidated thixotropic sediment and pose a risk in access, making it like working on an ice lake. Doug Sprigg from Arkaroola Wilderness Sanctuary regularly flies over Lake Frome and says, “If there is enough water in it for long enough, the salt crust breaks up (and drifts) like an pack ice." The previous explorer Comalco’s personnel wore life vests when traversing or working on the salt crust and had vehicles and personnel break through. To drill on the southwestern lake, Comalco used purpose-built tracked vehicles (a Mole Mink) and hovercrafts. Monash University and CSIRO have successfully accessed the southeastern part of lake on quad bikes.

Aboriginal Issues and Negotiations for Access

Lake Frome forms part of the local Dreaming story told by the Adnyamathanha people explaining how the region's topography and species originated. According to this Dreaming story, Lake Frome was emptied of its water by the Rainbow Serpent Akurra when he ventured down Arkaroola Creek (which flows onto Lake Frome) to drink. Due to its Dreamtime significance the traditional Adnyamathanha do not venture onto the lake's surface.

On 04 June 2015, Form 27 was sent to Native Title Parties and relevant Government departments. This was followed-up by sending a copy of the PEPR to Native Title legal representatives.

Adnyamathanha Traditional Lands Association (Aboriginal Corporation) RNTBC (ICN 3743) (“ATLA”) is the agent prescribed body corporate/registered native title body corporate on behalf of the Native Title Holders in respect of all the land the subject of the Stages 1, 2 and 3 Adnyamathanha Consent Determinations of Native Title made by the Federal Court in Application SG 6001/98 on 30 March 2009 and 25 February 2014. They act for and on behalf of the Adnyamathanha people.

Meetings were held with representatives of the Traditional Owners of Lake Frome (ATLA) to discuss access. Negotiations used Ninti Kata Consultancy, Finlaysons and Johnston Withers Lawyers. Verdant Minerals’ CEO met with the full Board of the Adnyamathanha Traditional Lands Association (ATLA) in Hawker, SA on Friday 9 October 2015. On that day, the Board voted to negotiate an exploration agreement with Verdant Minerals, but further discussions are necessary before an agreement can be signed. Further details are given in the “Work in the Year Ending 04/01/2017” later in this document.

Another meeting with the full Board of the Adnyamathanha Traditional Lands Association (ATLA) was held during the reporting period.

Areas of Ecological and Conservation Significance

Due to its "regional geological significance" the lake was proclaimed as the Lake Frome Regional Reserve (IUCN Category VI) in December 1991.

Lake Frome and it surrounds have 26 EPBC-listed mound spring complexes associated with Great Artesian Basin discharge zone. These springs have varying conservation significance; 21 are considered to be at “risk” or “high risk”. Any activity that might affect the feed into, or affect the waterlevel in, these springs must be avoided. Tim Ransley from the Groundwater Group of the Environmental Science Division of Geoscience Australia and Daniel Wohling from the SA Government helped track down the exact mound spring locations within Lake Frome. Verdant Minerals has no need to intersect the Great Artesian Basin aquifer anyway and has self-imposed buffers around the mound springs. These are larger than the legislated exclusion zones.

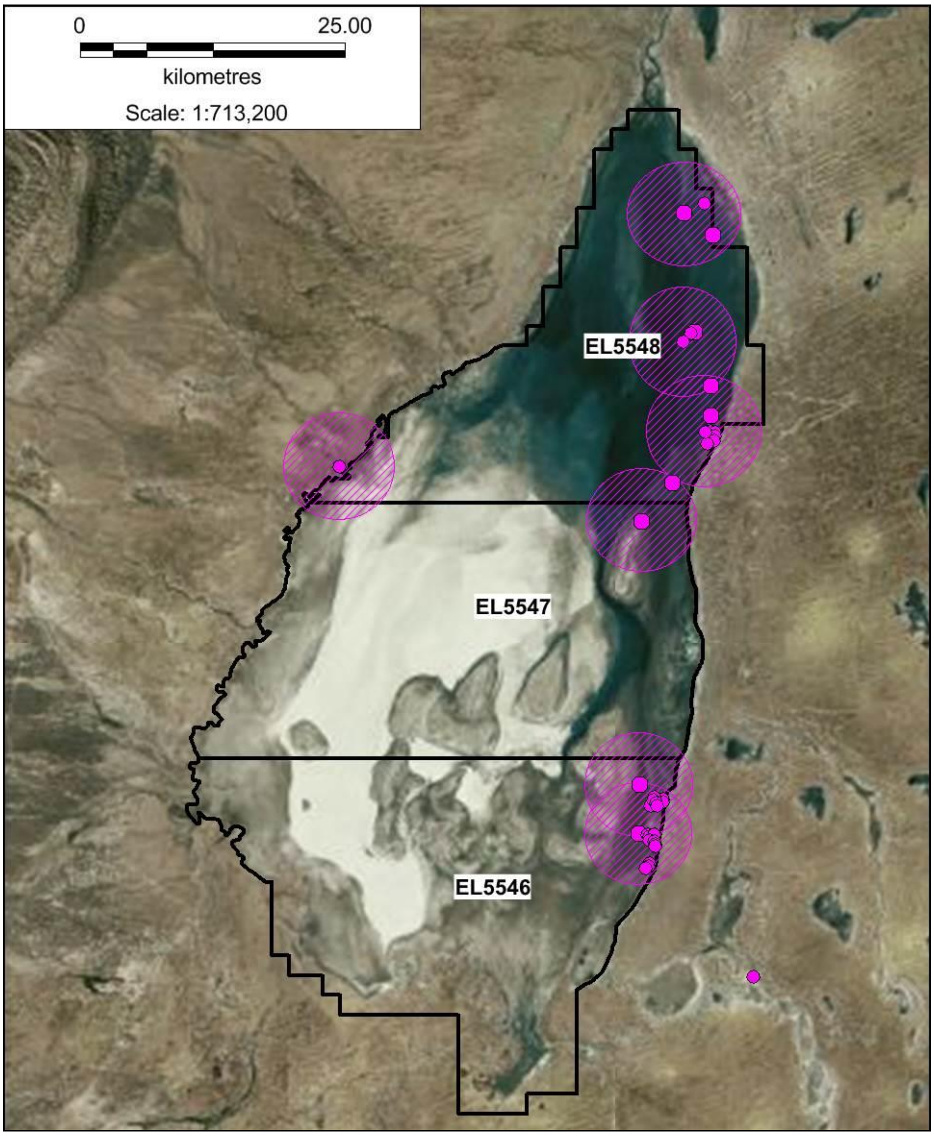

Figure 11. Location of mound springs in and around Lake Frome with self-proclaimed no-go buffers.

HISTORY OF TENURE

The three contiguous titles were granted 05 January 2015. These cover the entire of Lake Frome for 2,718 km^2. The titles were only granted for two years and have been renewed once.

Tenement	Area km^2	Grant Date	Expiry	Holder
EL 5546	949	05/01/2015	04/01/2019	VRM
EL 5547	995	05/01/2015	04/01/2019	VRM
EL 5548	774	05/01/2015	04/01/2019	VRM

Table 1. Lake Frome titles.

Rum Jungle Resources became Verdant Minerals Ltd (VRM) on 05 December 2016 and the titles are now in the name of Verdant Minerals Ltd.

EXPLORATION AND PROJECT RATIONALE

The Lake Frome Potash Project is one of two project areas held by Verdant Minerals for salt lake brine potash. The Karinga Lakes project in the Northern Territory has a JORC brine resource.

Australia has no producing potash mines. Around 350,000 tonnes of potash is imported into Australia annually from Canada and is worth around $200 million. Potash of sulphate and schoenite are utilised as high-end fertiliser products globally, as they have a lower salt index than muriate of potash and are often preferred in crops sensitive to chloride or susceptible to fertiliser burn. Sulphate of potash and schoenite attract premium pricing in comparison to the more common muriate of potash.

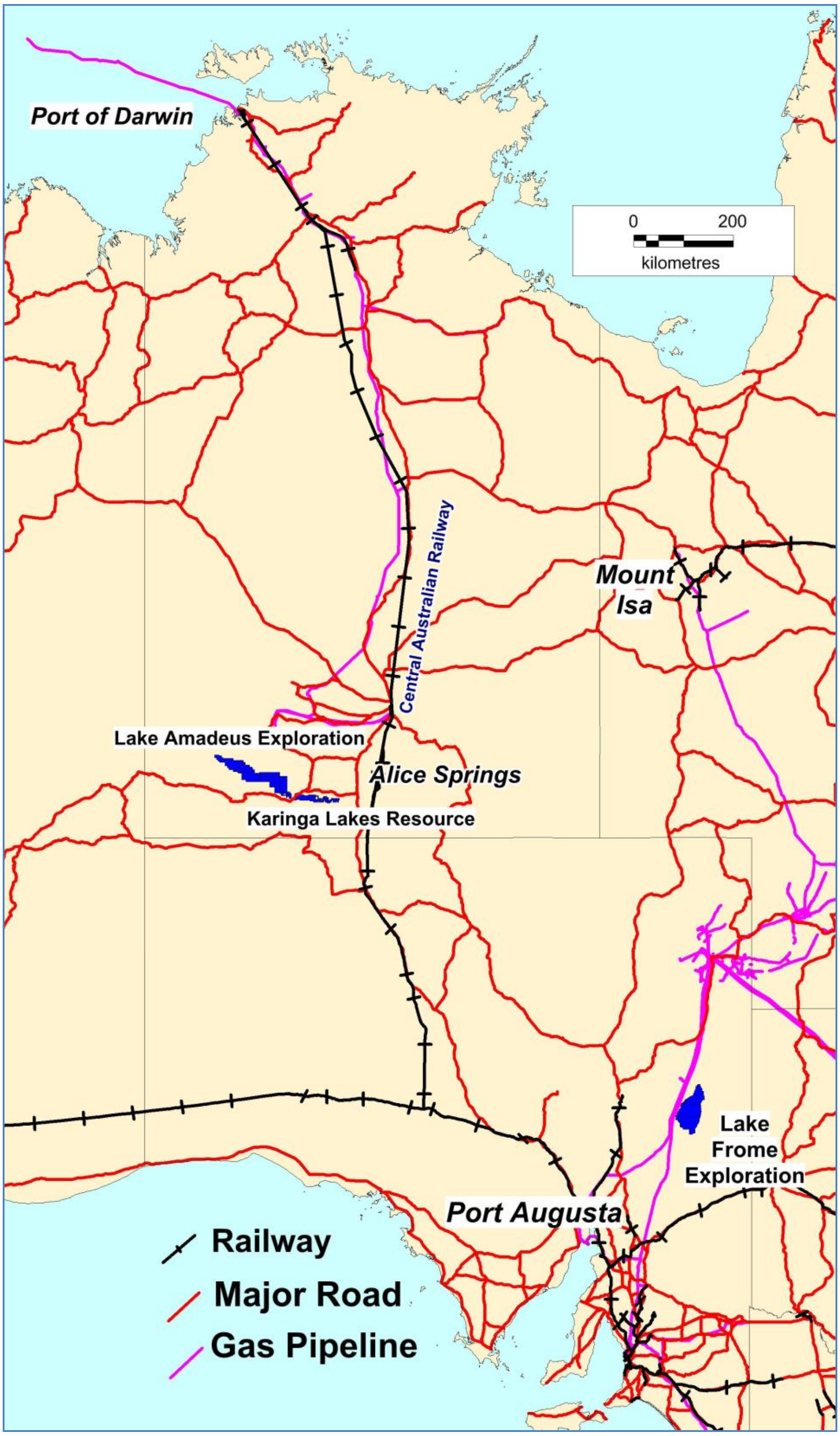

Figure 12. Verdant Minerals' sulphate of potash brine projects.

The Lake Frome Project is strategically well located near roads and railways, providing access to ports and proximity to southern to domestic markets.

GEOPHYSICS

The TMI data shown below probably reflect rugosity and differing geology in basement under the lake. It is not known to what extent the basement ridge under the lake might partition the lake stratigraphy itself. Northwest trending faults visible on the data may be conduits for upward migration of fluids, since they are believed to penetrate the great Artesian Basin (see discussion in Geology).

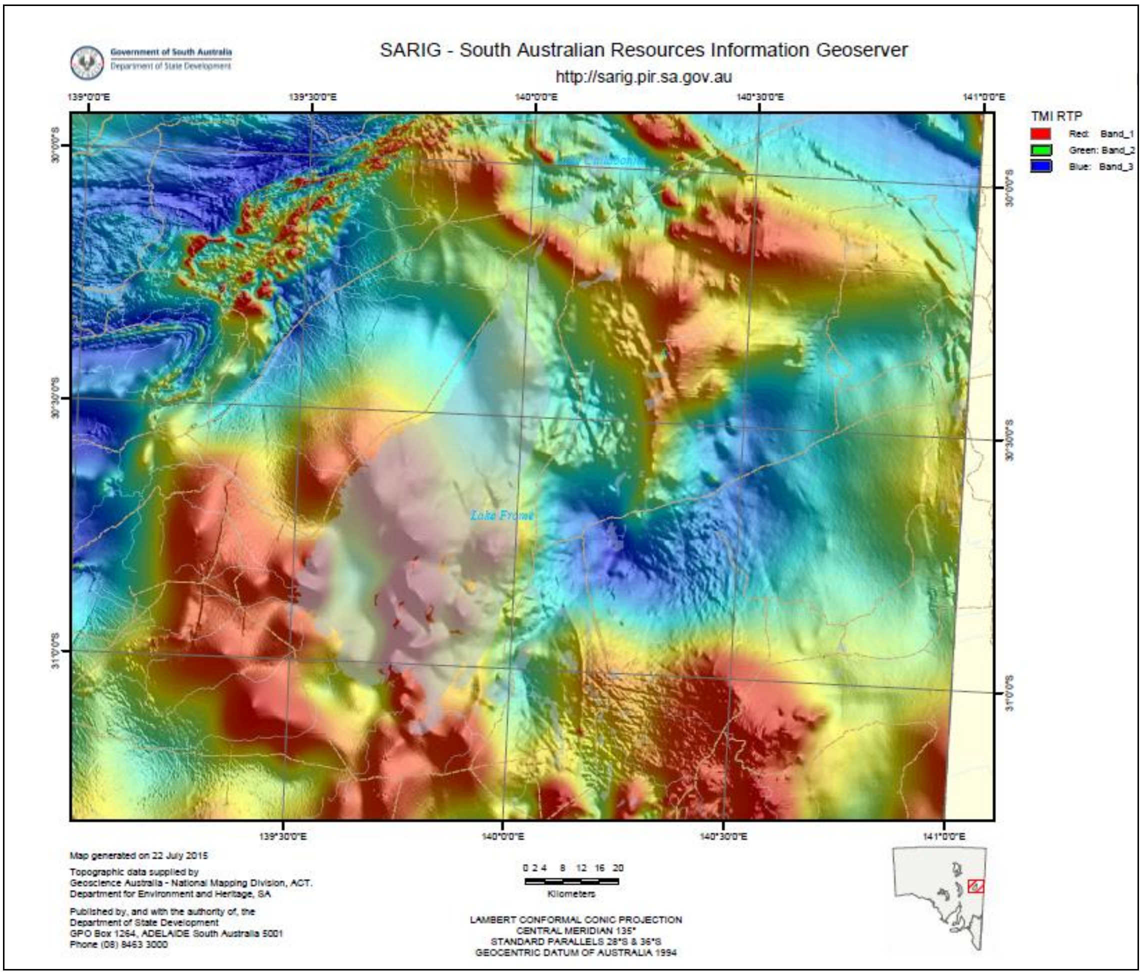

Figure 13. Total magnetic intensity reduced to the pole.

Since it only shows surface conditions, the potassium channel radiometrics data (below) is of less use than might be expected in a potash search. The image in the figure below does, however, show a marked difference between east and west, reflecting the type of surficial cover around the lake.

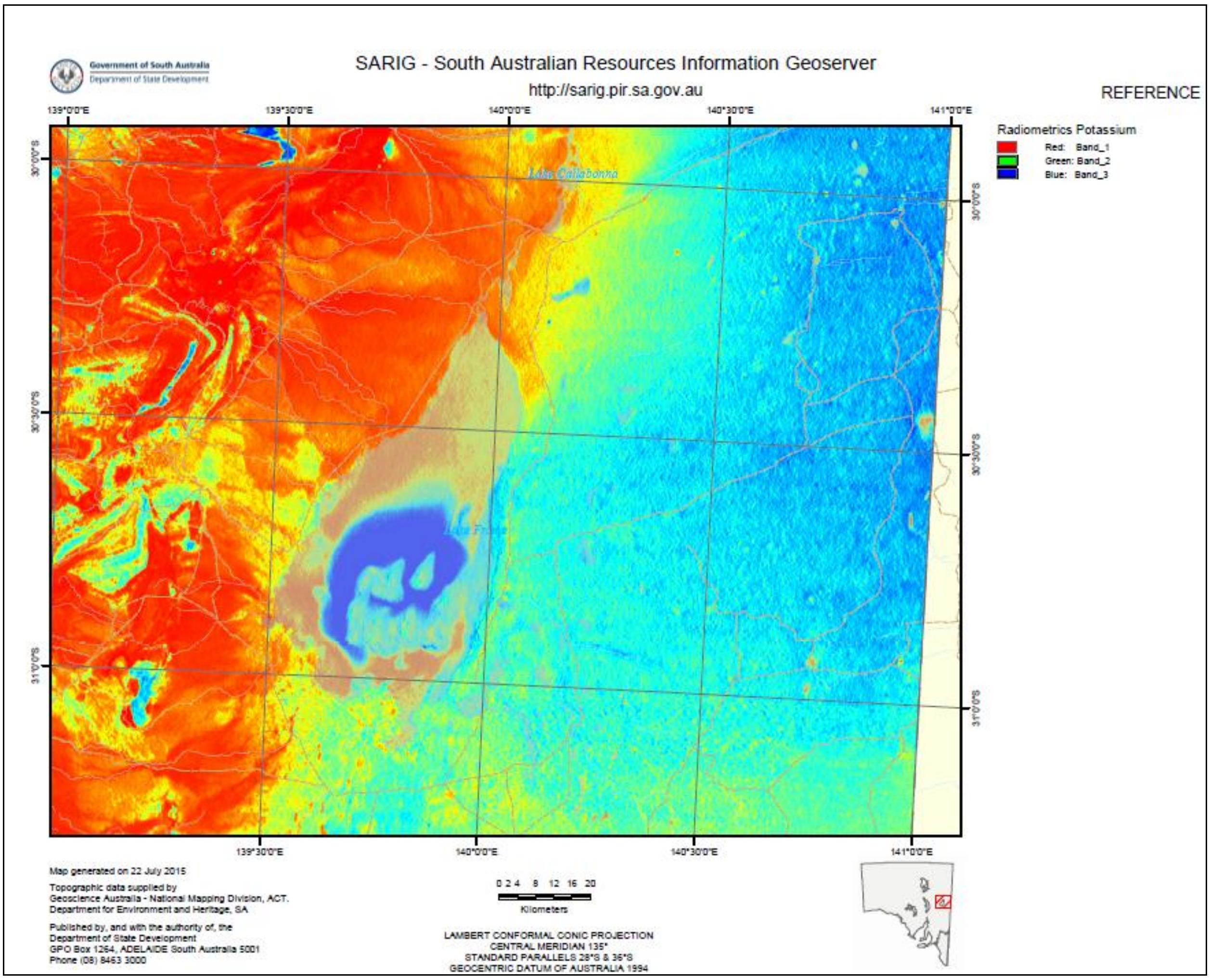

Figure 14. Potassium channel data over Lake Frome and surrounds.

An airborne electromagnetic (AEM) survey of Lake Frome was used by Geoscience Australia to help validate fluid transportation pathways, especially in the near sub-surface. The AEM survey measured the electrical conductivity of the surface and subsurface (potentially up to ~200 m depth below the surface), and has the potential for mapping salinity differences in groundwater in the near-surface. Using the Geoscience Australia layered earth inversion algorithm (GA-LEI), Geoscience Australia prepared conductance maps for a range of depths and elevations, as well as east-west cross-sections of electrical conductivity through Lake Frome. The depth of penetration of the AEM survey, referred to as the depth of investigation (DOI), varied based on the conductance (the summed conductivity of all layers in the inversion) but was highly correlated to the electrical conductivity of the surface layer. Where the surface was highly conductive, such as over the Lake Frome playa, the signal saturated close to the surface and the DOI was much shallower (~60 m). This limited Geoscience Australia's understanding of how deep the brine pool extends, and as a consequence, what stratigraphic units are contributing to Lake Frome's water chemistry.

LOCAL GEOLOGICAL AND HYDROLOGICAL SETTING

Lake Frome is bounded to the west by the Flinders Ranges, which comprise highly deformed Neoproterozoic to Early Cambrian metasedimentary and volcanic rocks of the Adelaide Fold Belt. These are underlain by Mesoproterozoic metasediments and granites, which crop out to the north in the Mt Painter Inlier (Preiss, 1987; Drexel et al., 1993; Sheard, 2009). The drainage into the lake from the west is characterised by bank-attached spits. Playa shoreline features in the west which appear to be beach ridges are actually relict fluvio deltaic units. Bounding Lake Frome's drainage basin to the south is the Olary Spur, which consists of Neoproterozoic metasediments of the Adelaide Fold Belt underlain by Paleo-Mesoproterozoic rocks of the Curnamona Province (Campana, 1957). Proximal to the lake, the Cenozoic fill consists of Late Paleocene to Eocene fluvial sands and gravels of the Eyre Formation, which underlie Oligocene to Late Miocene fluvio-lacustrine sands and clays of the Namba Formation. Pliocene fluvial and lacustrine deposits of the Willawortina Formation reach greater than 100 m thickness between Lake Frome and the Flinders Ranges (Callen and Tedford, 1976).

Most of the lake is covered with a thin halite crust, with several isolated groups of clastic and carbonate mound springs to the east. Below the halite crust, interstitial discoidal gypsum crystals along with traces of pyrite and

carbonates abound within the dark brown clay-rich sediments. Underlying Lake Frome, at depths ranging from 10 cm to greater than 10 m, is a brine pool, characteristically NaCl-enriched, with salinities exceeding 250 g/L.

The edge of the Jurassic Cretaceous-hosted Great Artesian Basin (GAB) underlies the area. The main GAB aquifer, the Cadna-Owie Formation, is overlain by the Cretaceous Bulldog Shale aquitard. A number of faults exist in the Great Artesian Basin sequence under Lake Frome. These result in leakage into any overlying aquifers and discharge as springs. Thus, the Great Artesian Basin aquifers can contribute to both ground and surface water at Lake Frome. The palaeo- and modern lake sediments are believed to be up to 200 m thick and consist of widespread Eyre Formation, the overlying widespread Namba Formation and several other formations of more local extent. The Eyre Formation consists of well rounded gravel and quartz sands in units up to 100 m thick. Following compartmentalisation of the greater Lake Eyre Basin, there was widespread formation of silcrete (locally called “grey billy”), then the Namba Formation was deposited during the Miocene and it lies disconformably over the Eyre Formation in units around 150 m thick. The Namba Formation consists of fine to medium sands, silt, clay, oolitic dolomite and limestone which were deposited in expansive, shallow lacustrine conditions in a warm environment. This formation contains vertebrate fossils in some of the carbonate facies. The Namba Formation is also locally capped by silcrete and what is locally called “puddingstone”. This is overlain by the Willawartina Formation which is probably a fanglomerate and associated braided stream distal facies. Following the deposition of the Willawartina Formation, the Millyera Formation was deposited unconformably over the Namba Formation across the eastern floor and shore of Lake Frome. The Pleistocene Millyera Formation consists of units up to 10 m thick of laminated clays, limestone and sand representing lacustrine deposition in the Lake Frome Basin. It pinches out to the west. Highstand sandy beach ridge facies were also deposited during the Pleistocene lacustrine events. These beach ridge facies, named the Coomb Spring Formation intertongue with the Millyera Formation to the east of Lake Frome, and represent deposition of the coarser sediments at high lake levels. The Late Pleistocene Eurinilla Formation consists of shoreline and channel fill structures of poorly sorted sands and clays in units up to 20 m thick which were deposited along the east and the western margins of Lake Frome and its ephemeral tributaries. The uppermost formation at Lake Frome is the Coonarbine Formation which lies disconformably above the shoreline sections of the Eurinilla Formation and also forms the central facies of the modern dunes around Lake Frome and to the east in the Strzelecki desert. The Coonarbine Formation consists of poorly sorted fluvial and aeolian silt, sands and occasionally gravels deposited during the climatic fluctuations of the Late Pleistocene and Holocene.

Evidence of significant runoff reaching Lake Frome is rare, but it floods more frequently than Lake Torrens. During filling events that produced water depths of greater than 6 m, Lake Frome merges with the three lakes to the north (Lakes Gregory, Blanche and Callabonna) to form a single water body. When filled to over 15 m, this mega lake drains via the Warrawoocara channel to Lake Eyre.

Over the last 100 thousand years, mega-lake phases have occurred at least seven times, with three of those overtopping into Lake Eyre. During such events, any accumulated salts and trace elements were vulnerable to dissolution and flushing from the basin. Two major periods of high volume runoff from the Flinders Ranges occurred between 92-80 ka and 17-11 ka during which lake levels were at a minimum elevation of 4-6m (AHD). However, since 45 ka, palaeohydrological records suggest there has been a progressive shift to more arid conditions, with Lake Frome returning to playa-dominated conditions. A major transition to ephemeral conditions was experienced between 7-6 ka which was followed by the onset of the modern El Niño Southern Oscillation from ~4 ka.

The present strontium isotope ratio (87Sr/86Sr) of Lake Frome brines and modern halite crust (0.71126 - 0.71206) are of similar composition to the shallow Willawortina Formation (0.71171 – 0.71223) (Ullman and Collerson, 1994). This suggests that the major source for Lake Frome brines is from the west, as tributaries and groundwater associated with this Pliocene unit have similar strontium isotope ratios. Strontium isotope ratios increase with depth in preserved gypsum deposits in Lake Frome’s sediment, which reflect either increasing groundwater input from the older Namba Formation, or greater groundwater residence times in the past.

In the most recent few decades, Lake Frome held some water for a considerable time in 1970. Comalco reported some surface water in 1972 and 1973, mainly as a result of spring discharge. After an extreme rain event in 1974, water covered 75% of the lake surface area. That water was not received via Salt Creek and Lake Callabonna in the north despite reports of Lakes Gregory, Blanche and Callabonna receiving water from the Strzelecki Creek at that time. Instead the water that entered Lake Frome during the floods of 1974 has been attributed to a combination of runoff from the Flinders Ranges and particularly large volumes of groundwater discharge. Satellite photos show water in Lake Frome during the floods of April 2010, 2011, and March 2012 but it has not been determined exactly how this water arrived. After rains in the Flinders Ranges during January 2015 (see Arkaroola rainfall graph), a Proba V satellite image from 12 February captured new green vegetation along the creeks to the west of the lake and showed standing water covering the southern portion of the lake.

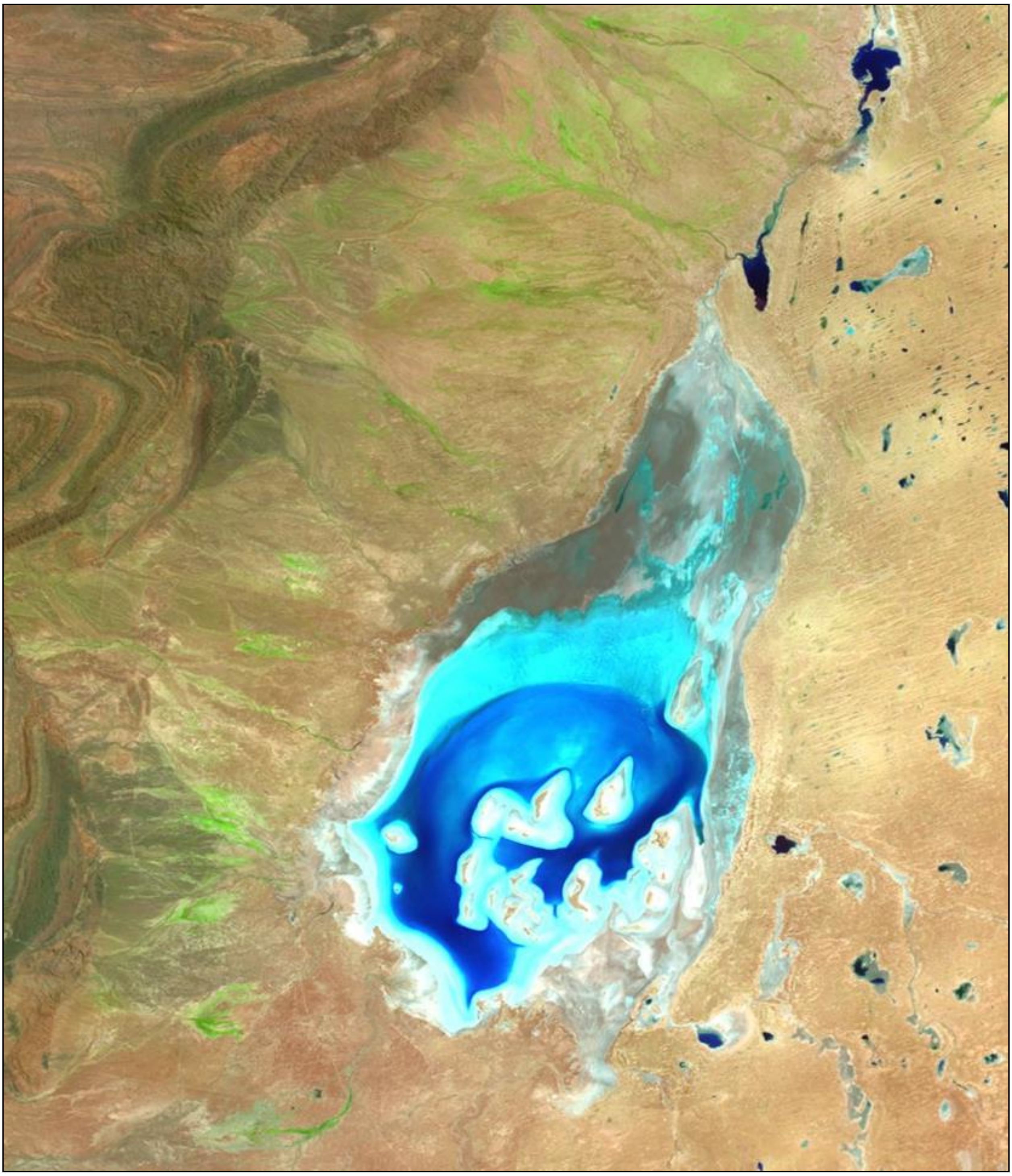

Figure 15. ESA's Proba-V minisatellite captures the rare sight of standing water in Lake Frome, 12 February 2015.

Surface salt crusts can be locally decimetres thick but are ephemeral and their location on the lake shifts between one flooding event and the next.

Organic matter and intimately associated secondary gypsum can be locally extensive and may suggest potential to generate acid sulphate. Photographs taken by CSIRO show a thin layer of black organic matter directly beneath the salt crust in at least one location.

PREVIOUS EXPLORATION AND WORK BY OTHERS

Early Academic Work

Draper and Jensen (1976) took a series of lake sediment cores hand-augured to 4 m, from various locations mainly in the south. Bowler et al (1986) sampled cores to depths of 6 m, taken 8 km in from the western shoreline and about 17 km in from the eastern shoreline as a part of the SLEADS project. While these studies have formed the basis of

SARIG's interpretation of the shallow aquifers under Lake Forme, the actual studies were directed more at sediments rather than brines and have only intersected very shallow aquifers.

Verdant Minerals has also obtained a copy of Barrett's 2011 Honours Thesis on Lake Frome.

2013 Geoscience Australia Study

A Geosciences Australia study (Record 2013/39) used Lake Frome as a test case of the prospectivity of Australian salt lakes.

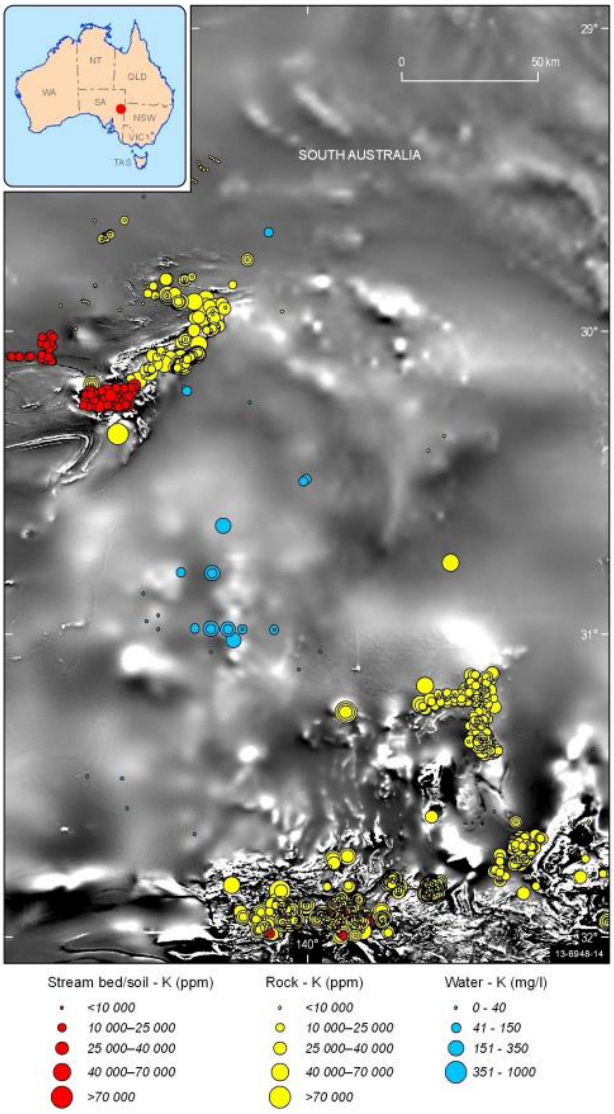

Figure 16. Potassium data used by Geoscience Australia broken into streams and soil, bedrock and water. The background is is the magnetic anomaly map of Australia. Strangely, their figure does not show the lake outline.

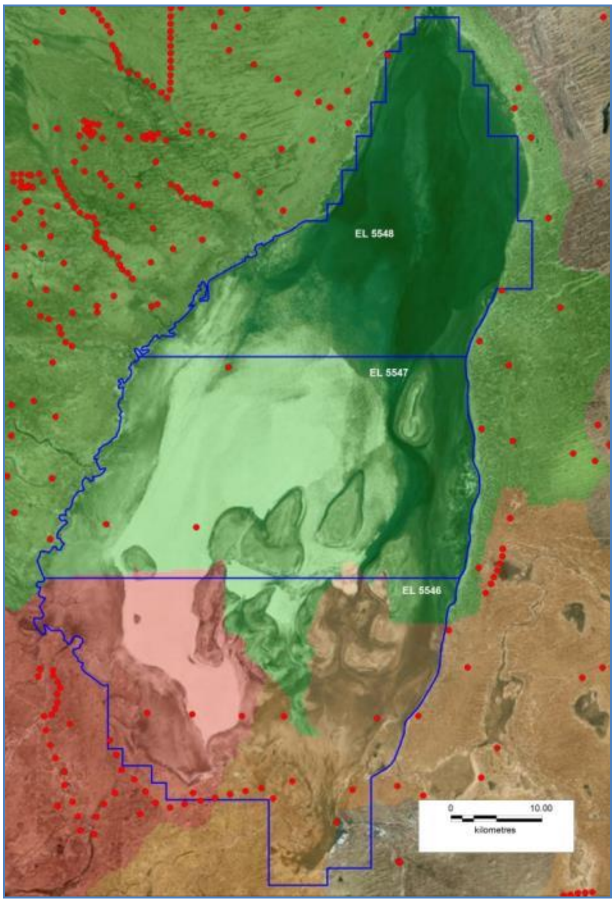

Figure 17. Results of the GA study for potash prospectivity. The catchments shown with a red tint were rated by GA as most prospective for potassium, followed by yellow then green. Historic drillholes are shown as red dots.

Exploration for Alkali Evaporites

The lake was previously explored for bedded alkali evaporites (specifically trona – sodium sesquicarbonate) or equivalent brines by Comalco Aluminium Limited in the late 1970s. They drew on similarities between the Miocene of Lake Frome and that of Wilkins Peak Member in the Green River Basin, US, which is the world's largest trona-producing formation. Specially-made/modified vehicles were used to drill nine RC holes for 576 m. All holes intersected multiple thin aquifers well above the GAB. The major element assays showed all these groundwaters to be chloride-rich, low carbonate and low sulphate. In all but two holes, U was consistently higher in the deeper aquifers. In the opinion of Comalco, all trace values of Li, Sr, Br and B were low in the brines themselves. The Comalco chip samples were collected every 2 m. Assays for 35 trace elements were done on 10 m sediment composites. Comalco felt that these values were within the normal range for sediments of that type and in general agreement with previous academic work at Lake Frome. Some of the rock samples from this work are believed to be still stored at Wertaloona Station and samples from Comalco hole CF2 (and possibly others) are also stored at the SA Government Core Facility. The data from the original water analyses done by AMDEL for Comalco have been re-checked. There is little information on the analytical techniques used, but they are as used by AMDEL for routine waterbore analysis and so seem appropriate providing concentrations were not too high. Prohibitively high concentration does not seem to be the case. The 27 brine K assays average 116 mg/l, with a maximum of 299 mg/l and a minimum of 19 mg/l. There was a high degree of consistency between the same aquifer in adjacent holes.

Lithium Exploration

The maximum Comalco brine Li assays were 0.2 mg/L compared to about 250 mg/L as potentially economic.

However, in an ASX release on 12 October 2010, ERO Mining Ltd described Lake Frome, rather effusively, as a "World-class lithium exploration target". Their concept was entirely based on few relatively high lithium levels (up to 250 ppm) in some of the earlier Comalco ***sediment*** (not brine) samples. Through their wholly-owned subsidiary South East Energy Ltd, they held EL 4601 and EL 4602 over central and southern Lake Frome specifically to explore for lithium. They also had applications over Lake Torrens. During 2011, a single sonic/diamond cored drill hole, WT2, was drilled by ERO/Tychean Resource on EL 4601 on the southwestern edge of Lake Frome. It was sited just off the lake by a few hundred metres and located near the older Comalco hole CF2 which was on, but near the edge of the lake. In the estimation of ERO, CF2 was the best indication of lithium in the Comalco work.

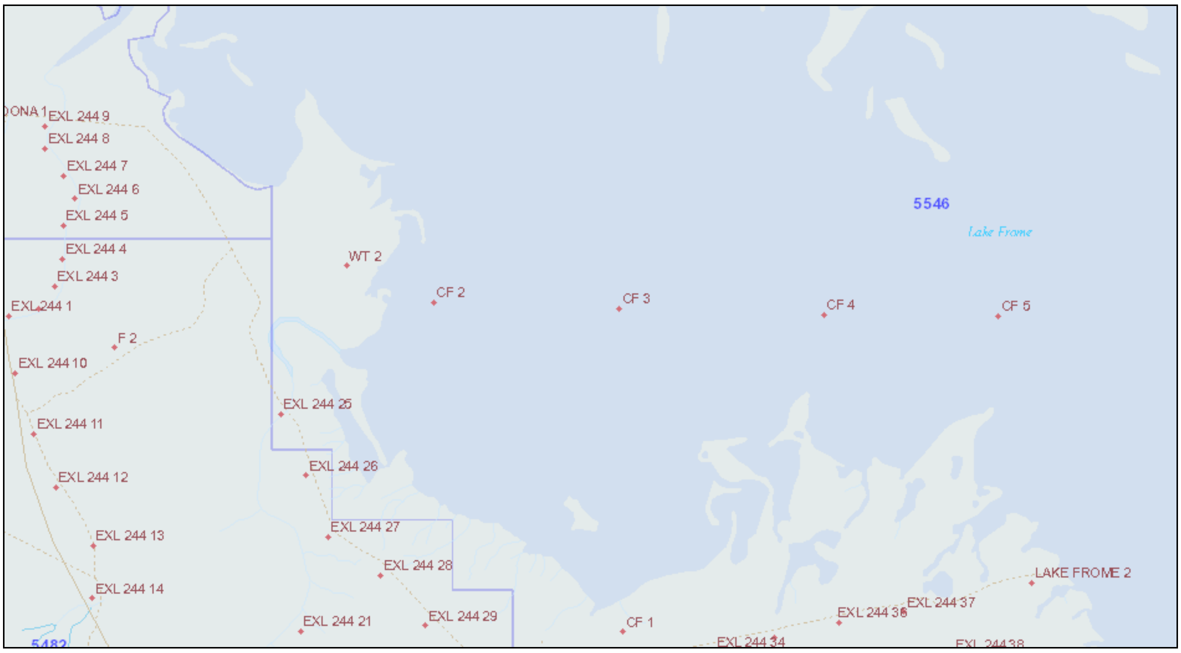

Figure 18. Location of ERO drillhole WT2 hole near the Comalco line CF2 to CF5.

Geology of REO WT2 and Comparison with Re-assay of the Comalco Sediment Samples

Drillhole WT2 went through the modern lake sediments, Namba and Eyre Formation. These were described as interbedded clays and sands with various amounts of carbonaceous matter. The hole was terminated in Cretaceous Bulldog Shale (first intersected at 149 m) to avoid intersecting the underlying Cadna-Owie Formation which is the main Great Artesian Basin aquifer. This aquifer is thin and “patchy” under the south of Lake Frome but ERO were deliberately avoiding the possibility of an artesian flow. The WT2 hole was gamma logged. Samples from depths of 10 m, 19 m, 26 m, 34 m and 63 m were sent for semi-quantitative mineralogy. Illite, muscovite and K-feldspar were identified as the K-bearing minerals. One-metre sediment samples for almost the entire hole were assayed for various elements, specifically lithium. For comparison, sediment samples from those intervals in the Comalco hole with reputedly high lithium were re-assayed using the same technique. Based on the tabulated data given in ERO report itself, most of the values below 20 m from the re-assayed Comalco hole were consistently lower than those originally reported by Comalco, commonly by a factor of 10 times. None of the sediment samples from WT2 exceeded 100 ppm Li. The maximum in the actual data file is 69 ppm. Thus, **the 250 ppm Li in the Comalco assays is spuriously high even for sediment and there is no indication that the Li minerals might be soluble**.

Hydrology and Brine Assays in ERO Study

ERO sampled five local waterbores to provide a set of background values for comparison with brine assays from six depths in WT2.

The maximum K in the “background” waterbores was 100 mg/l. **The best K in brines from WT2 was only 40 mg/l**. Thus, the lake brine had less K than waterbores further off the lake.

The best three waterbores had 200 µg/l, 233 µg/l and 285 µg/l Li. Note this is micro not milli. The lake brine Li assays, this time reported in mg/l, ranged from 0.04 mg/l to 0.136 mg/l (compare to 250 ppm Li in brine lake projects elsewhere). ERO reported that they had intersected “elevated lithium”, but abandoned the project.

ASSESSMENT OF PROSPECTIVITY

Potash Prospectivity

Other than assays mentioned above, there is very little data on the potash prospectivity, but GA (without knowing the results of WT2) rated the southwest as the most prospective. Despite the poor results reported by Comalco and by ERO in WT2, further brine sampling for potash is justified. This needs to be deeper, more comprehensive and systematic than all previous work.

Lithium Prospectivity

Geoscience Australia did not use the most recent ERO analytical Li data for rocks or brines and they did not demonstrate that any lithium in rocks in the catchment was soluble. They did use some spuriously high Li sediment results. None-the-less, Geoscience Australia concluded that Lake Frome is not much more enriched in lithium than seawater. In fact, the actual concentration of Li in seawater is 0.14 to 0.25 ppm so EROs' brines actually have less than half the Li concentration of seawater. Certainly, the brines are well below the target grade for commercial Li brine. Furthermore, as the ratio of lithium to chloride is so low, evaporation modelling suggests that the brine will never reach economic Li concentrations in single stage evaporation. **Until it can be demonstrated otherwise, Verdant Minerals considers that Lake Frome has next to no lithium brine prospectivity, at least in the brines sampled to date.**

Bromine Prospectivity

To be comparable with Dead Sea operations, bromine concentrations would have to be about 5,000 ppm out-of-the-ground, which goes to 10,000 to 12,000 ppm Br after NaCl crystallises out. Geoscience Australia appears to have been unaware that Comalco gave some 28 Br brine assays. However, these had a maximum of only 155 mg/L, meaning there is little Br prospectivity in the brines tested to date.

Boron Prospectivity

The most important and economical, extractable boron minerals are the borax series such as borax itself ($Na_2B_4O_7.10H_2O$), kernite ($Na_2B_4O_7.4H_2O$), tincalconite ($Na_2B_4O_7.5H_2O$), ulextic ($Na_2O.2CaO_5B_2O_3.16H_2O$) and hydroboracits ($CaO.MgO.B_2O_3.6H_2O$). Seawater has 4 to 5 ppm B. Salt lake brines from Olaroz, Cauchari and Salar de Atacama which are used to produce borax chemicals have natural B concentrations many orders of magnitude higher than seawater. Egyptian lakes where borates are produced chemically typically have brines containing >100 ppm boron. The operators of Owens Lake in the US used evaporation to concentrate borax brine from 2.6% to 4%. A suite of Lake Frome B brine assays from Comalco has a maximum of only 9.4 mg/L, only double seawater at best, suggesting little B prospectivity, at least in the brines sampled to date.

WORK IN THE YEAR ENDING 04/01/2016

Literature Search and Desk-Top Studies

Literature searches and desk-top studies were undertaken as described above.

PEPR Preparation and Submission

Lake Frome work programs (PEPR applications) were submitted 19 May 2015. The proposed work program was for brine sample collection from shallow hand-auger holes using small low psi-footprint amphibious ATVs for access. A request for further information was received from DSD, noting that a new template was needed and approvals would take 3-5 months minimum and no approvals would be given until Native Title had been addressed in accordance with Part 9B of the Mining Act. A new PEPR application was submitted 09 September 2015 proposing alternative helicopter access for the hand-auger sampling program. The proposed hand-augering was determined not to be "drilling".

Land Access Negotiations 2016

As detailed previously, land access negotiations with the Adnyamathanha Traditional Lands Association were conducted during the reporting period. The company sought advice from Ninti Kata Consultancy, Finlaysons and Johnston Withers Lawyers. Initial discussions were held with representatives of the Traditional Owners of Lake Frome to discuss access. These discussions and negotiations used Ninti Kata Consultancy and Finlaysons. The company's CEO met with the full Board of the Adnyamathanha Traditional Lands Association (ATLA) in Hawker, SA on Friday 9 October 2015. The Board voted to negotiate an exploration agreement with Rum Jungle Resources (now Verdant Minerals Ltd) on that day. A formal written agreement was drafted and sent to both parties for review.

WORK IN THE YEAR ENDING 04/01/2017

Over the period of a year, there was apparently less willingness on the part of the Traditional Owners to enter into an agreement. It emerged that there is an unresolved conflict among the various Traditional Owners about access to Lake Frome. The company was asked by ATLA to come and speak to the whole Board again, effectively re-starting the entire process.

No work on-ground was possible without an agreement with the Traditional Owners.

WORK IN THE YEAR ENDING 04/01/2018

The land access meeting originally planned for February had to be re-scheduled to the beginning of May. On 01/05/2017, Verdant Minerals CEO, Chris Tziolis, again met with the board of the Adnyamathanha Traditional Lands Association who are the representatives of the TO's associated with Lake Frome. The meeting was held in Port

Augusta. Despite that meeting and follow-up communications, land access issues are yet to be resolved. No on-ground work was possible in 2017 because an agreement with Traditional Owners has still not been negotiated.

EXPENDITURE STATEMENTS

The cumulative admissible expenditure breakdown is tabulated below:

EL	Cumulative Expenditure to			
	04/01/2016	04/07/2016	04/01/2017	04/01/2018
5546	$36,317.01	$37,753.25	$39,690.02	**$60,943.94**
5547	$39,354.55	$41,350.81	$43,287.58	**$65,143.64**
5548	$29,466.41	$30,902.65	$32,839.42	**$51,802.50**

Table 2. Expenditure details. Six-monthly expendiure reporting is no longer required.

PROPOSED WORK FOR YEAR ENDING 04/01/2019

As per the PEPR, heli-sampling will be undertaken after an access agreement is signed and when all permissions have been obtained from all stakeholders.

Irrespective of the results of any heli-surface / near surface sampling, Lake Frome's brine potential can only be tested by drilling. Multiple holes would need to be systematically located to test the postulated east-west variation in lake stratigraphy and probably >100 m deep but not penetrate the Great Artesian Basin aquifer. The soft lake surface almost certainly dictates a specialist drill rig with a very low psi footprint that must be capable of drilling to, and lifting brine samples from, the required depths.

CONCLUSION AND RECOMMENDATIONS

This group report covers work undertaken on the Lake Frome ELs 5546, 5547 and 5548 for the year ending 04/01/2018. Land access negotiations are still underway. However, the future of the project depends entirely on a timely and satisfactory resolution of these issues. If this is not forthcoming, Verdant Minerals will reconsider the potential viability of the project.

Verdant Minerals Ltd
ABN 33 122 131 622
T +61 8 8942 0385
F +61 8 8942 0318
E info@verdantminerals.com.au
www.verdantminerals.com.au
A 20/90 Frances Bay Drive, Stuart Park NT 0820

Titleholder:	**Verdant Minerals Ltd**
Operator:	**Verdant Minerals Ltd**
Tenement Manager:	**Complete Tenement Management**
Tenements:	**EL 5546, EL 5547, EL 5548**
Project Name:	**Lake Frome Potash**
Report Title:	**Partial annual and final surrender report for the Lake Frome Brine Potash Project, from 05/01/2018 until 27/04/2018**
Authors:	**John Dunster**
Corporate Author:	**Verdant Minerals Ltd**
Target Commodity:	**Brine potash**
Date of Report:	**30/04/2018**
Datum/Zone:	**GDA94/Zone 54**
250K map sheets:	**Frome SH5410, Curnamona SH5414**
Address:	**PO Box 775, Darwin NT 0801**
Phone:	**08 8942 0385**
Fax:	**08 8942 0318**
Contact Email:	**jdunster@verdantminerals.com.au**

SUMMARY

Verdant Minerals Ltd held three contiguous titles that covered the whole of Lake Frome in eastern South Australia. The company intended to explore below the dry lake surface for brines that might be suitable for the production of potash minerals used in fertilisers. Literature reviews and an assessment of the work by previous explorers were undertaken. A low-impact, basic reconnaissance work program was submitted to the relevant authorities and stakeholders. Protracted unsuccessful access negotiations with the Adnyamathanha Traditional Lands Association who represent the Traditional Owners were an initial factor in the decision to surrender the titles. Secondly, Verdant Minerals determined that to fully test the brine potential of the lake stratigraphy would necessitate multiple holes systematically located over the postulated east-west variation in lake stratigraphy and probably >100 m deep but not penetrating the Great Artesian Basin aquifer. The soft lake surface almost certainly dictates a specialist drill rig with a very low psi footprint that must be capable of drilling to, and lifting brine samples from, the required depths. Such drilling was beyond the funds available for this project. No on-ground work could be undertaken and Verdant Minerals surrendered the titles with no opinion as to the potash brine prospectivity.

CONTENTS

LIST OF FIGURES AND TABLES

INTRODUCTION

This report describes the work undertaken during the life of tenure of ELs 5546, 5547 and 5548 which covered the dry playa salt lake, Lake Frome, in eastern South Australia (not to be confused with the smaller coastal lake of the same name). It had been hoped to be able to systematically sample deep brines from beneath the salt lake and assess their potential to produce potash minerals which could be used to make fertiliser.

HISTORY

In 1840-41, Edward John Eyre, explored along the western side of the Flinders Ranges, discovering Lake Torrens and Lake Eyre South, which he described as "...one vast, low, and dreary waste". Turning southeast, he also discovered Lakes Blanche, Callabonna and Frome which he didn't actually name since he believed that they were all part of Lake Torrens which appeared to him to be one vast impassable horseshoe shaped salt lake blocking the way to the north beyond the Flinders Ranges.

After it was realised that there were separate lakes, Edward Charles Frome mapped the area in 1843 and Lake Frome was named after him.

The extensive salt crusts on Lake Frome are regarded as literally whiter then snow and were used to calibrate the "white" in early satellite imagery. These parts of the lake surface are arguably the brightest place on Earth and were accessed by the CSIRO on several occasions to take albedo measurements.

Figure 1. CSIRO staff in December 2000, arranging a blue sheet on the salt of Lake Frome to be spotted by NASA's Hyperion satellite EO-1.

LOCATION, ACCESS AND LAND USE

Location

Figure 2 is a location map of Verdant Minerals' Lake Frome Project. The lake is 750 km (470 miles) northeast of Adelaide, 134 km east of Leigh Creek in SA and 210 km west northwest of Broken Hill in NSW.

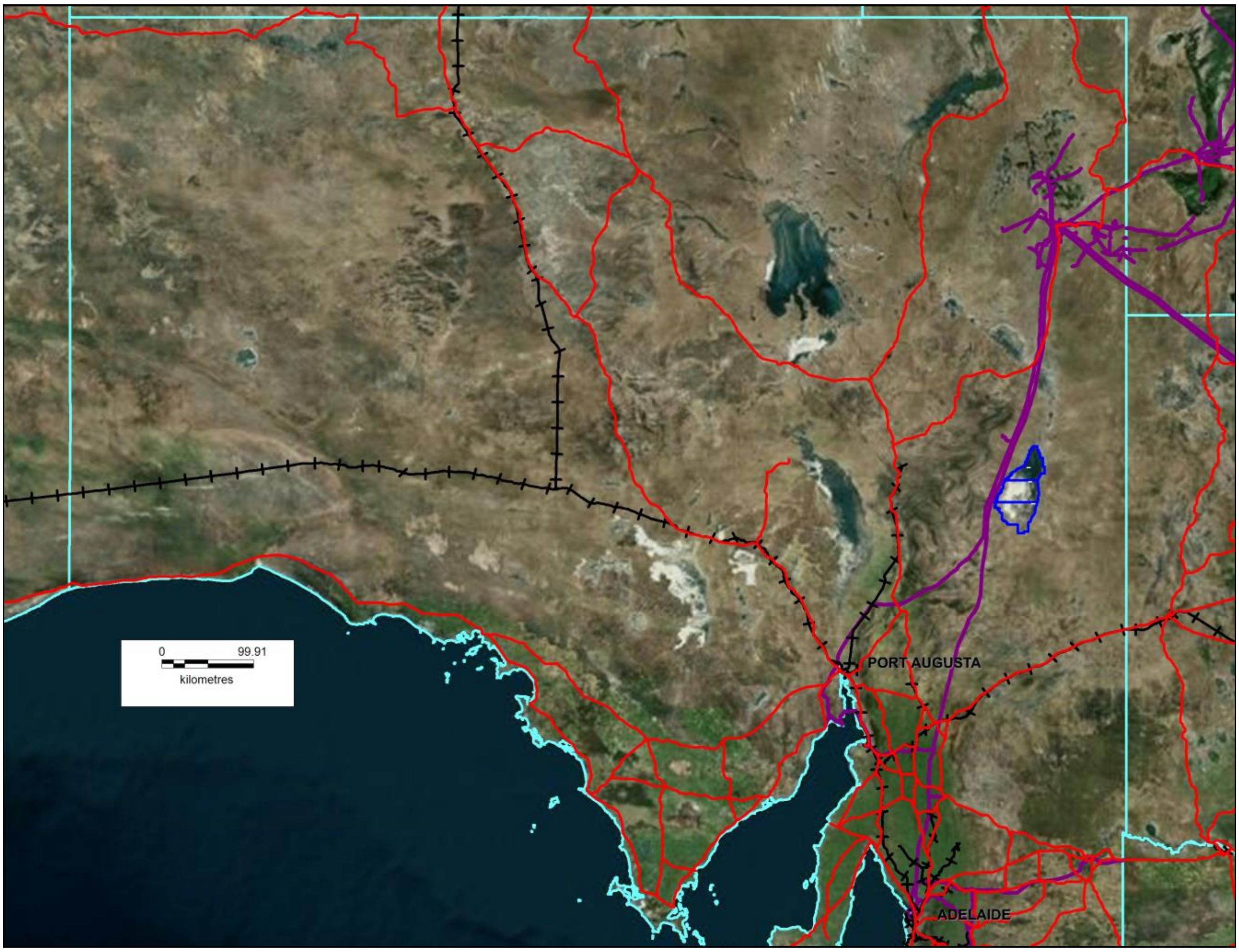

Figure 2. Regional location the Lake Frome Project in SA with titles outlined in blue, showing railways, main roads in red and pipelines in purple.

Climate

Lake Frome is located in one of most arid parts of Australia. Pan evaporation in the Lake Frome region is typically 2,400 mm - 3,700 mm per year which is over ten times the average rainfall. The prevailing winds in the Lake Frome region are mild southerly winds, however stronger westerly winds become more pronounced during the mid-year winter months. There is sufficient difference in albedo and latent heat consumption between the lake salt crusts and the surroundings to generate its own air circulation.

Rainfall

Lake Frome is located close to the boundary between Australian winter (westerlies and cold front related) and summer (monsoonal and ENSO) rainfall zones. The ranges to the west of the lake affect rainfall coming from that direction. Total rainfall at Lake Frome averages around 150-180 mm per year and it falls sporadically. On average, most rain is during the winter months but as shown below, October to February can also be relatively wet depending on any monsoonal influence getting that far south. Rainfall records for the three closest weather stations are incomplete. All available data since 2000 is plotted below. Note the wide variations between the three stations for any given month and year.

Frome Downs

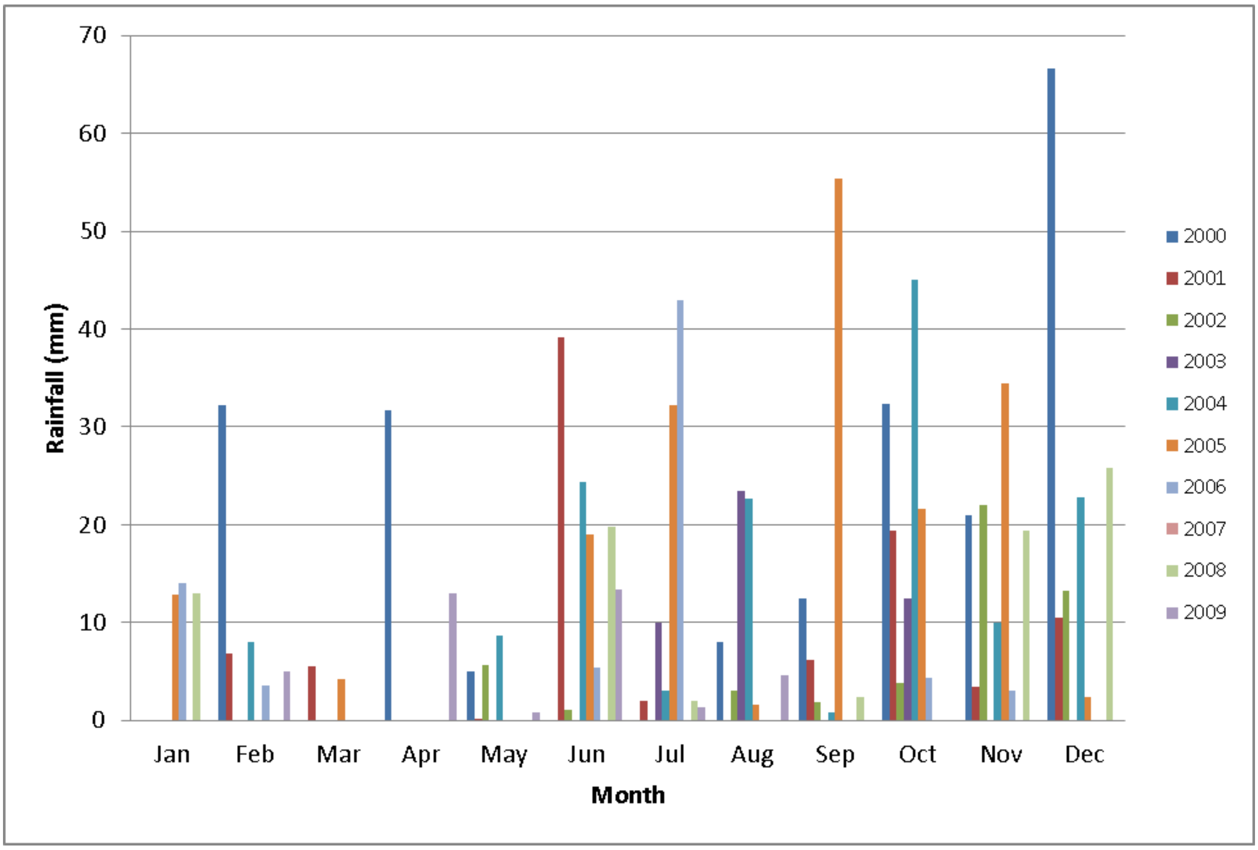

Figure 3a

Wertallona

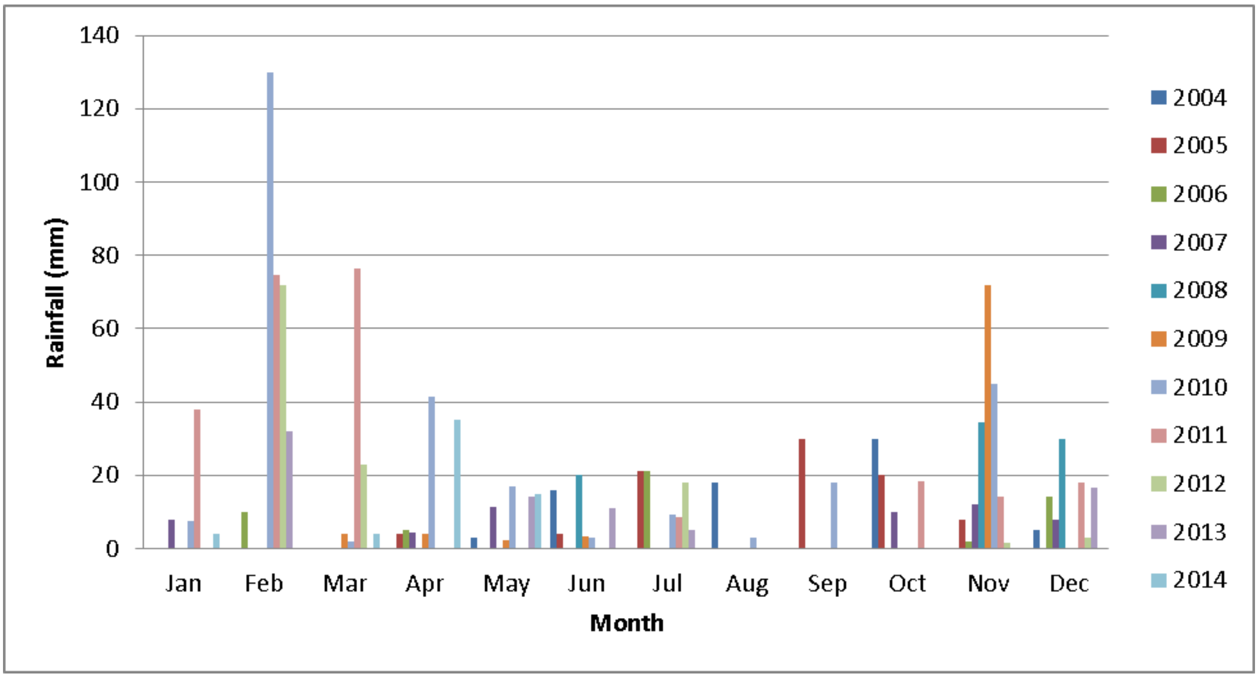

Figure 3b

Arkaroola

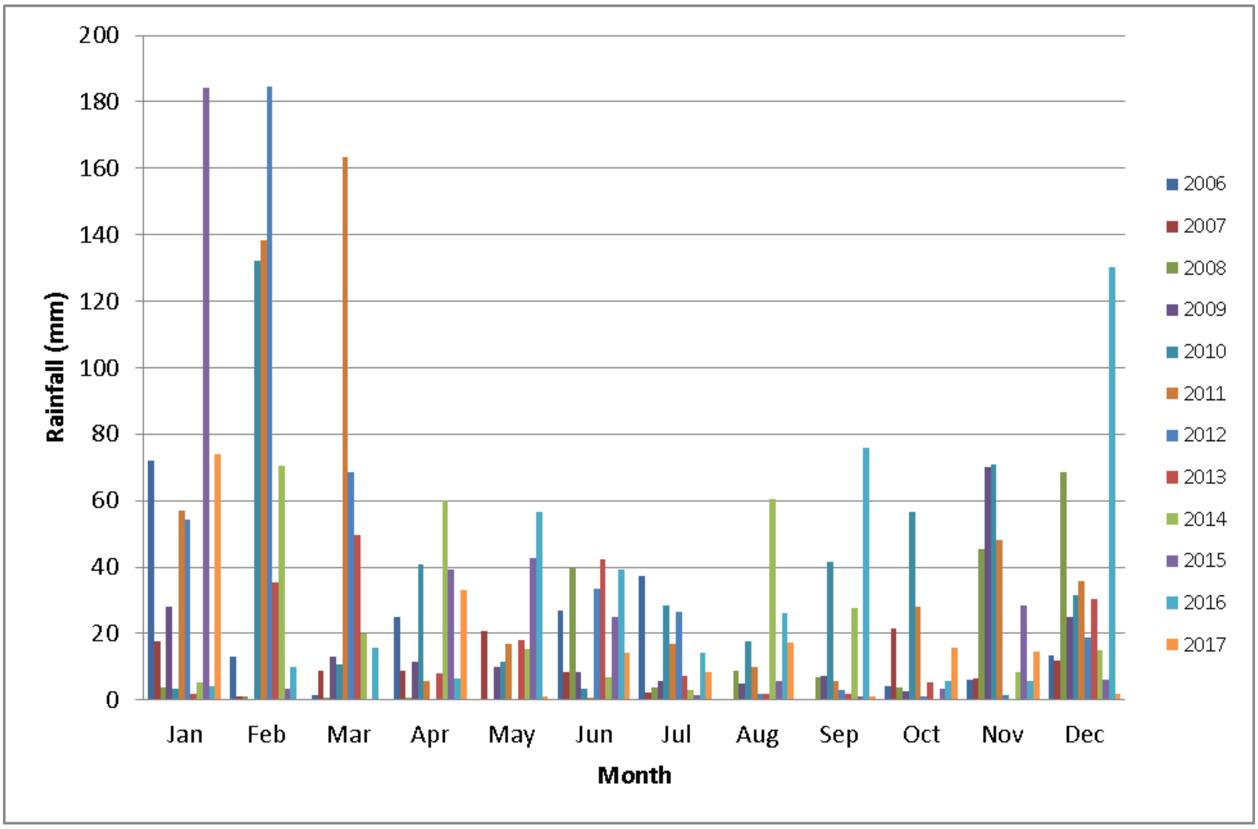

Figure 3c

Figure 3 a,b,c. Average rainfall for the project area recorded at the three closest weather stations.

Humidity

Figure 4 below shows the relatively low all-year-round humidity. Dew and rare frost account for the highest morning readings.

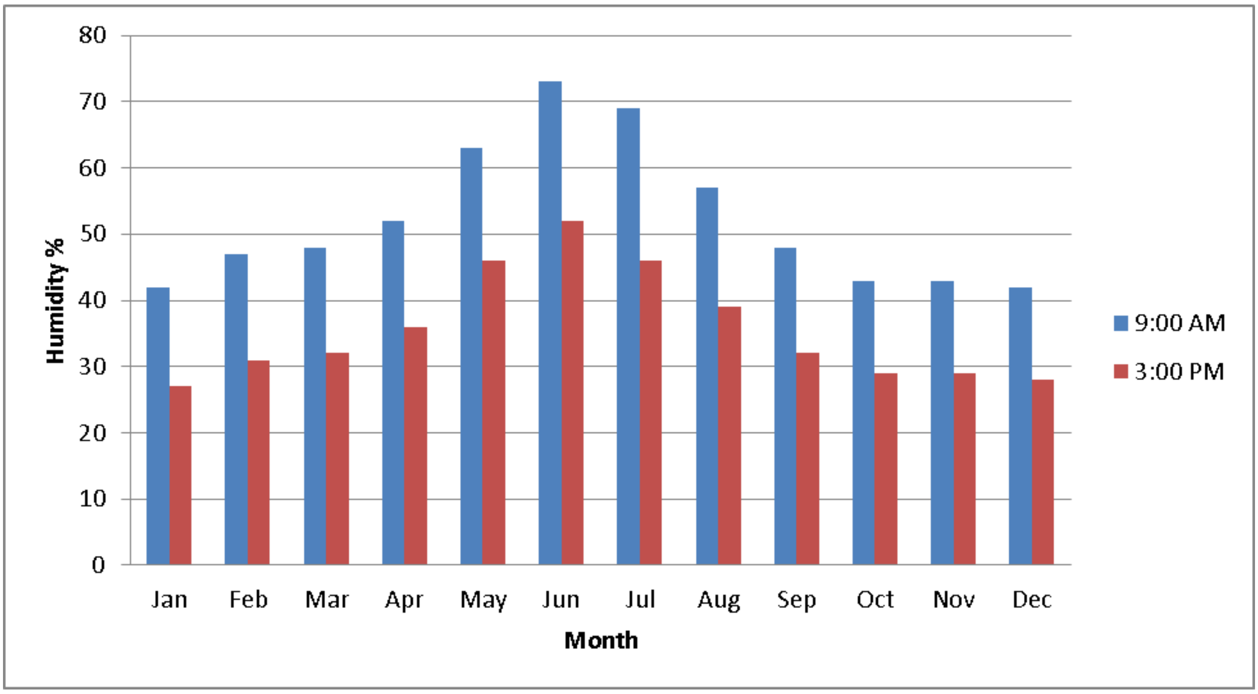

Figure 4. Mean monthly relative humidity (%) at 9am and 3pm recorded at Arkarolla Station.

Temperature

Quoted minimum and maximum temperatures range between 4.5°C and 40°C at Lake Frome. Reflection from the white salt crust can account for several degrees of temperature elevation locally and CSIRO and Comalco personnel working on the lake regularly experienced daytime temperatures in excess of 46°C. Comalco recorded a highest day-time temperature of 48°C at head-height in the shade on the salt crust.

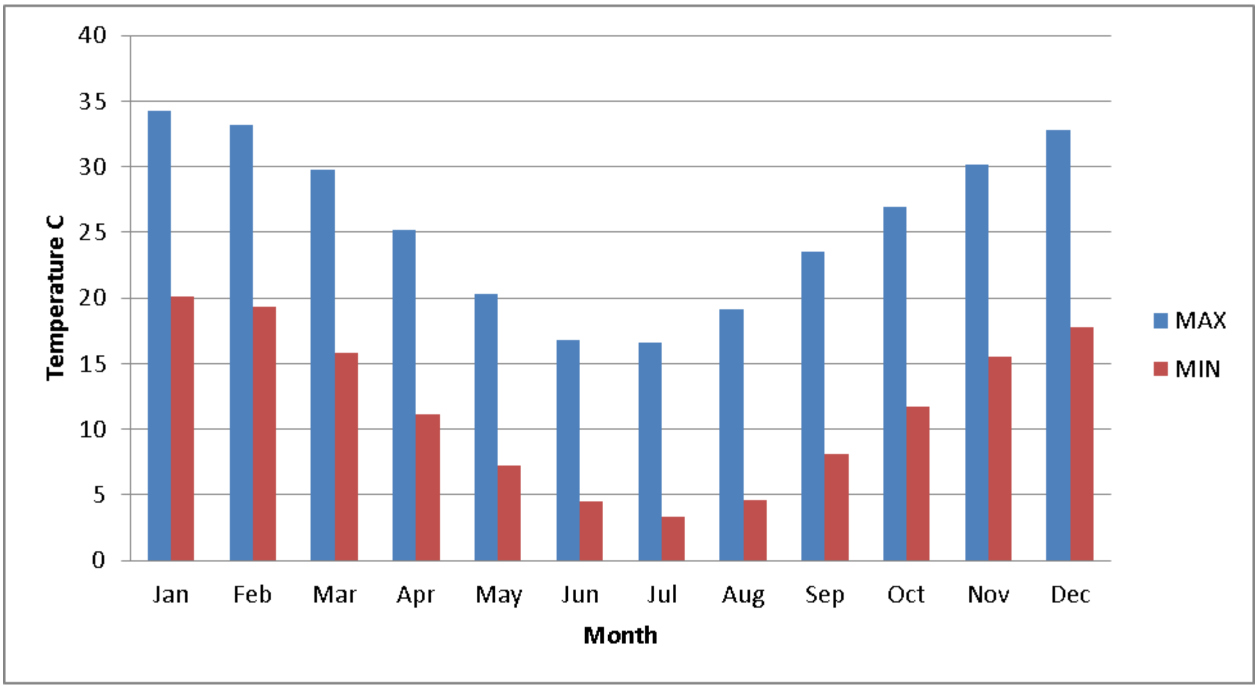

Figure 5. Mean maximum and minimum temperatures at (°C) at Arkaroola Station.

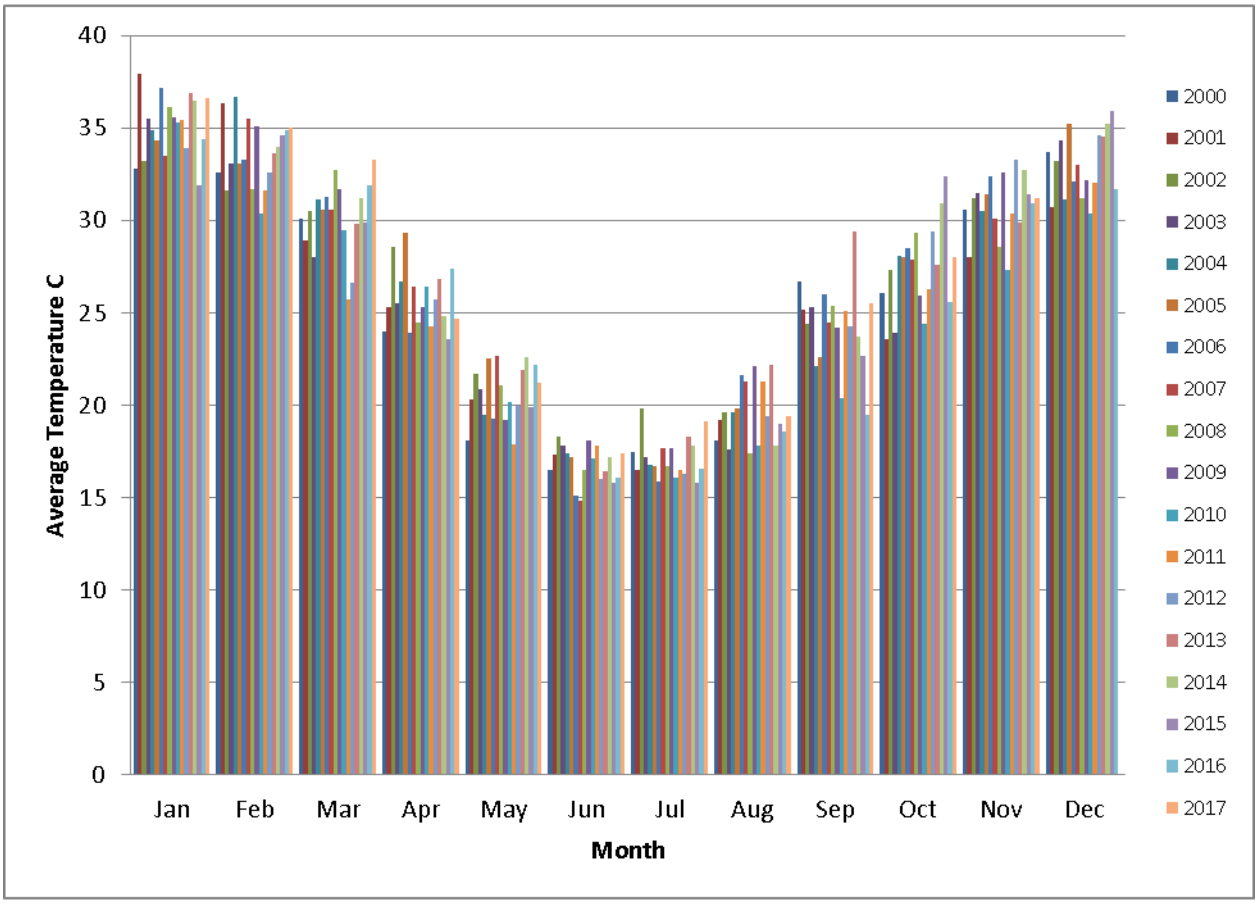

Figure 6. Average monthly temperatures (°C) at Arkaroola Station.

Physiography and Topography

Lake Frome has streams feeding in from the west in the northern Flinders Ranges. There are dunefields to the east and south.

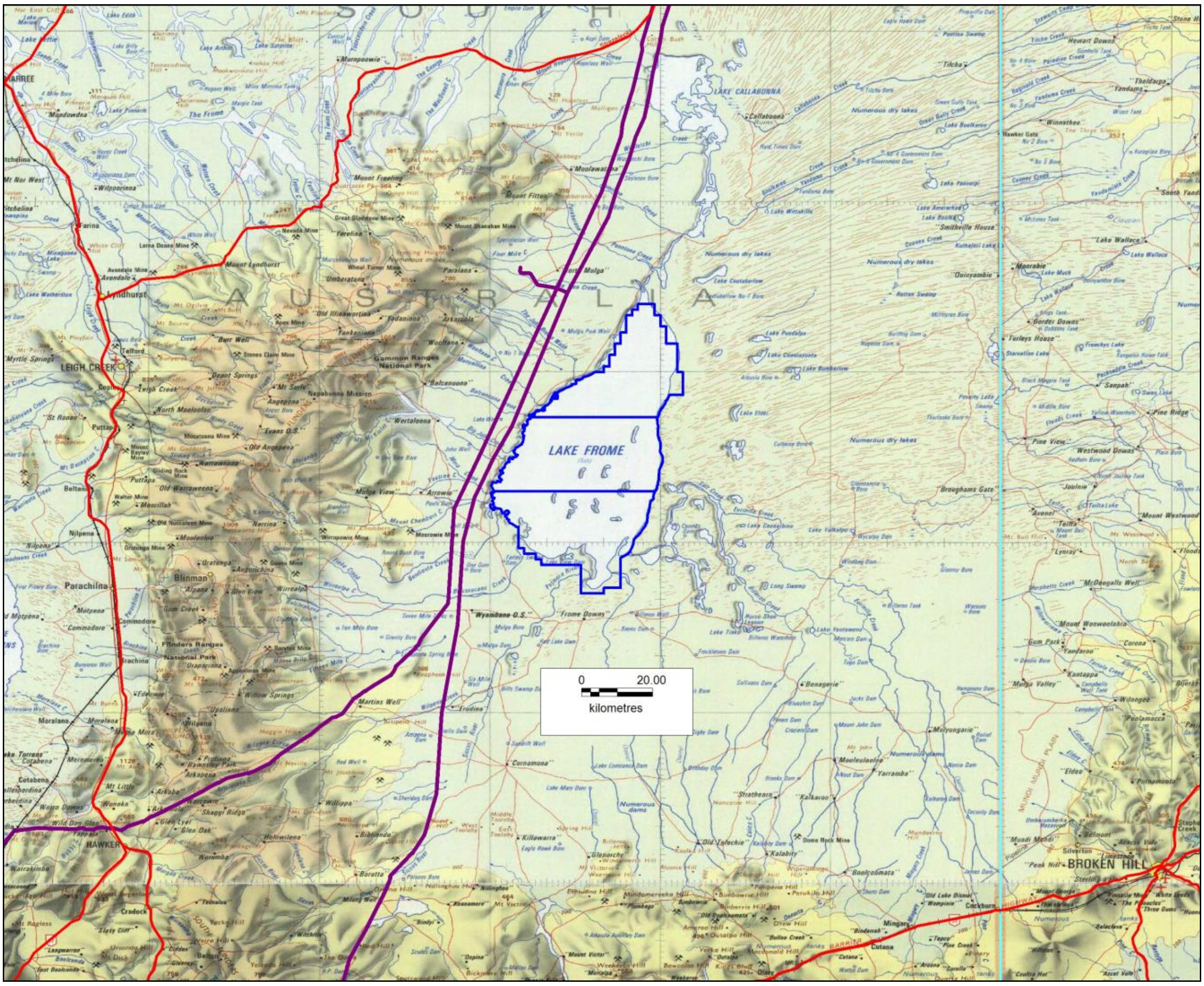

Figure 7. A published topographic map covering the project area.

Regional Hydrology

Lake Frome is part of the modern Lake Eyre Basin. It is the terminal lake within the Callabonna sub-Basin of the Lake Eyre Basin. The Lake Frome catchment makes up the southern and south-western portion of the Lake Eyre Basin. It is connected to Lake Callabonna to the north via a modern, but normally dry, channel. Lake Frome is similarly connected to a chain of much smaller lakes to the southeast. The existence of any palaeo-drainages is yet to be researched because these would be outside the tenement area. The local hydrology of Lake Frome itself is described later in this document.

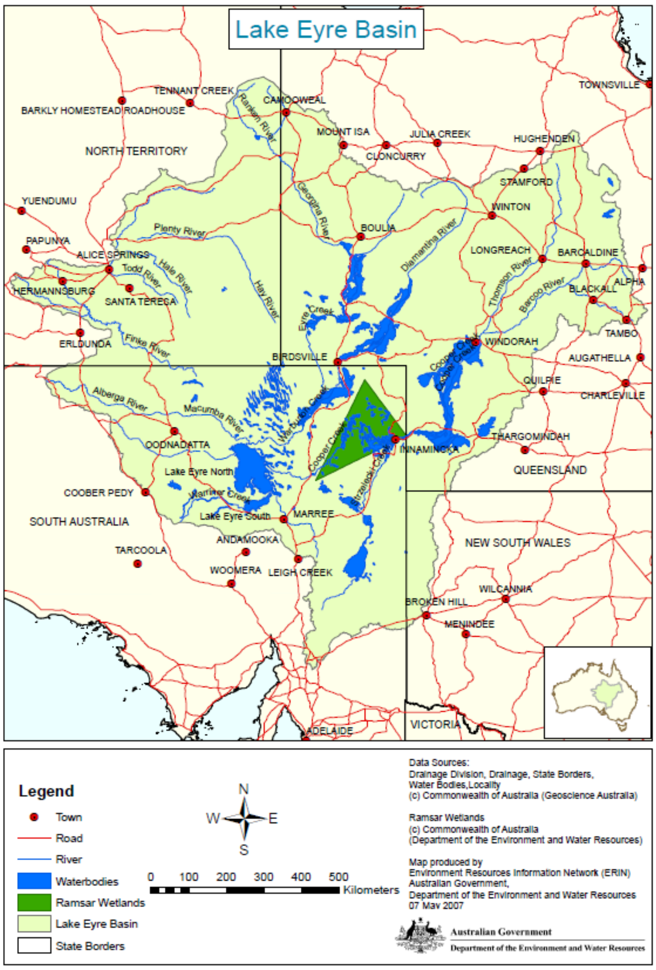

Figure 8. Lake Frome is in the southern quarter of the Lake Eyre Basin.

Land Systems, Flora and Fauna

Lake Frome is included within the IBRA Subregion 7 Strzelecki Desert Bioregion (SSD05). The area to the east of Lake Frome is part of the Simpson-Strzelecki Dunefields Bio sub-region which extends from the southeast of the Northern Territory, through the northeast of South Australia, with small areas in both Queensland and New South Wales.

An EPBC Search into local flora and fauna was undertaken and the report is included in the PEPR but not reproduced here.

Habitation and Land Use

The area is very remote and very sparsely settled. The nearest habitations are the Ranger Station for the National Park, pastoral stations such as Wertaloona and Frome Downs and small Aboriginal communities.

The only non-indigenous land use around the lake is very low density cattle grazing. As described below the main value of the lake itself is for biological and cultural conservation. As shown in figure below, a land corridor connects Lake Frome itself to a National Park to the west.

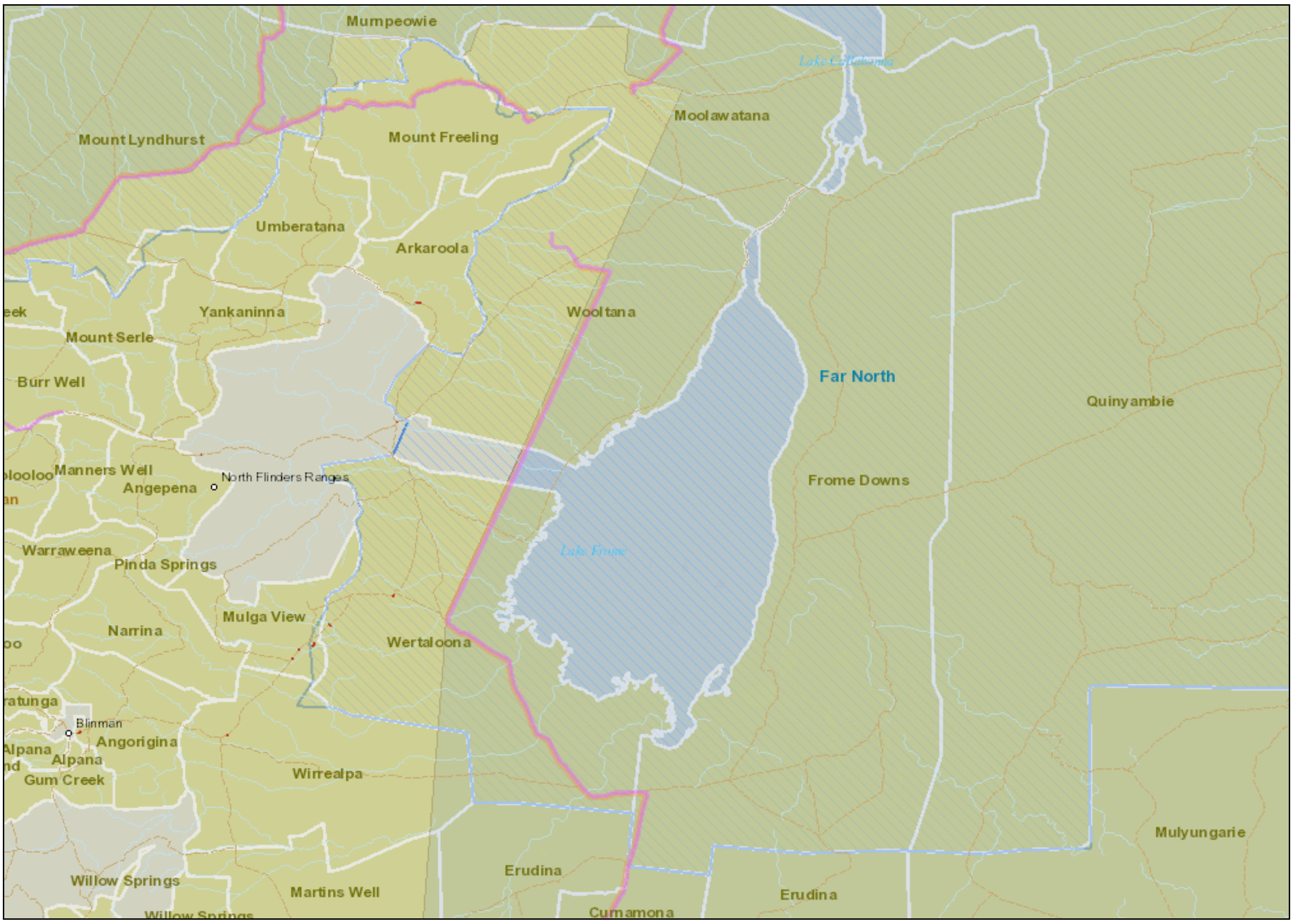

Figure 9. Cadastre of the project area.

Local Access and Logistics

The best access to the lake edge is from the west as shown below.

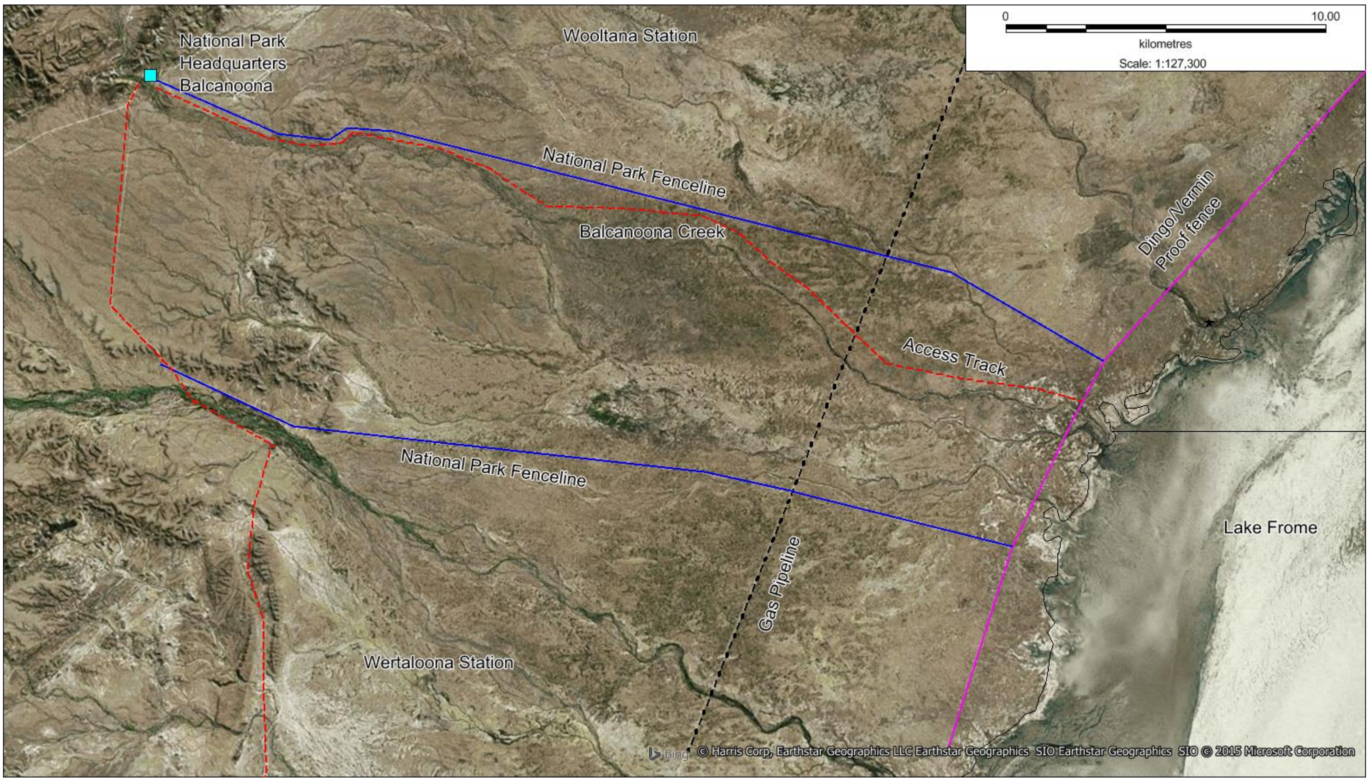

Figure 10. Access to Lake Frome from the west.

Public road access to western Lake Frome is limited to a single, rough four-wheel drive track which commences from the Vulkathunha-Gammon Ranges National Park headquarters at Balcanoona (Virlkundhunha) 30 km west of the lake. The route to Lake Frome traverses flat, stony terrain following Balcanoona Creek. After crossing both the Moomba-Adelaide natural gas pipelines and the dingo fence, the track passes over low sand dunes before arriving at the western shore of Lake Frome (Figure 10).

This main access track from the west also travels through a declared Cultural Use zone used for hunting by the local Adnyamathanha Aboriginal people. Public access is prohibited between 3.00 pm and 5.00 am daily.

Access to other sides of the lake depends on irregularly-maintained station tracks and tracks constructed by other exploration companies.

The lake surface itself varies considerably in hardness, but in general is more clayey and boggy towards the centre. Parts of the clay surface of the apparently-dry lake have water less than a decimetre down and cannot support the weight of even a trail bike or a person on foot. In addition, salt crusts can be sitting directly on water or unconsolidated thixotropic sediment and pose a risk in access, making it like working on an ice lake. Doug Sprigg from Arkaroola Wilderness Sanctuary regularly flies over Lake Frome and says, “If there is enough water in it for long enough, the salt crust breaks up (and drifts) like an pack ice." The previous explorer Comalco’s personnel wore life vests when traversing or working on the salt crust and had vehicles and personnel break through. To drill on the southwestern lake, Comalco used purpose-built tracked vehicles (a Mole Mink) and hovercrafts. Monash University and CSIRO have successfully accessed the southeastern part of lake on quad bikes.

Aboriginal Issues and Negotiations for Access

Lake Frome forms part of the local Dreaming story told by the Adnyamathanha people explaining how the region's topography and species originated. According to this Dreaming story, Lake Frome was emptied of its water by the Rainbow Serpent Akurra when he ventured down Arkaroola Creek (which flows onto Lake Frome) to drink. Due to its Dreamtime significance the traditional Adnyamathanha reputedly do not venture onto the lake's surface.

On 04 June 2015, Form 27 was sent to Native Title Parties and relevant Government departments. This was followed-up by sending a copy of the PEPR to Native Title legal representatives.

Adnyamathanha Traditional Lands Association (Aboriginal Corporation) RNTBC (ICN 3743) (“ATLA”) is the agent prescribed body corporate/registered native title body corporate on behalf of the Native Title Holders in respect of all the land the subject of the Stages 1, 2 and 3 Adnyamathanha Consent Determinations of Native Title made by the Federal Court in Application SG 6001/98 on 30 March 2009 and 25 February 2014. They act for and on behalf of the Adnyamathanha people.

Meetings were held with representatives of the Traditional Owners of Lake Frome (ATLA) to discuss access. Initial negotiations used Ninti Kata Consultancy, Finlaysons and Johnston Withers Lawyers. Verdant Minerals’ CEO met with the full Board of the Adnyamathanha Traditional Lands Association (ATLA) in Hawker, SA on Friday 9 October 2015. On that day, the Board voted to negotiate an exploration agreement with Verdant Minerals, but further discussions were necessary with the Traditional Owners before an agreement could be signed. Over the period of a year, there was apparently less willingness on the part of the Traditional Owners to enter into an agreement. It emerged that there is an unresolved conflict among the various Traditional Owners about access to Lake Frome. The company was asked by ATLA to come and speak to the whole Board again, effectively re-starting the entire process.

The next land access meeting originally planned for February 2017 had to be re-scheduled to the beginning of May. On 01 May 2017, Verdant Minerals CEO, Chris Tziolis, again met with the board of the Adnyamathanha Traditional Lands Association who are the representatives of the TO’s associated with Lake Frome. The meeting was held in Port Augusta. Despite that meeting and follow-up communications, land access issues were not resolved.

Areas of Ecological and Conservation Significance

Due to its "regional geological significance" the lake was proclaimed as the Lake Frome Regional Reserve (IUCN Category VI) in December 1991.

Lake Frome and it surrounds have 26 EPBC-listed mound spring complexes associated with Great Artesian Basin discharge zone. These springs have varying conservation significance; 21 are considered to be at “risk” or “high risk”. Any activity that might affect the feed into, or affect the waterlevel in, these springs must be avoided. Tim Ransley from the Groundwater Group of the Environmental Science Division of Geoscience Australia and Daniel Wohling from the SA Government helped track down the exact mound spring locations within Lake Frome. Verdant Minerals had no need to intersect the Great Artesian Basin aquifer anyway and had self-imposed buffers around the mound springs. These were larger than the legislated exclusion zones.

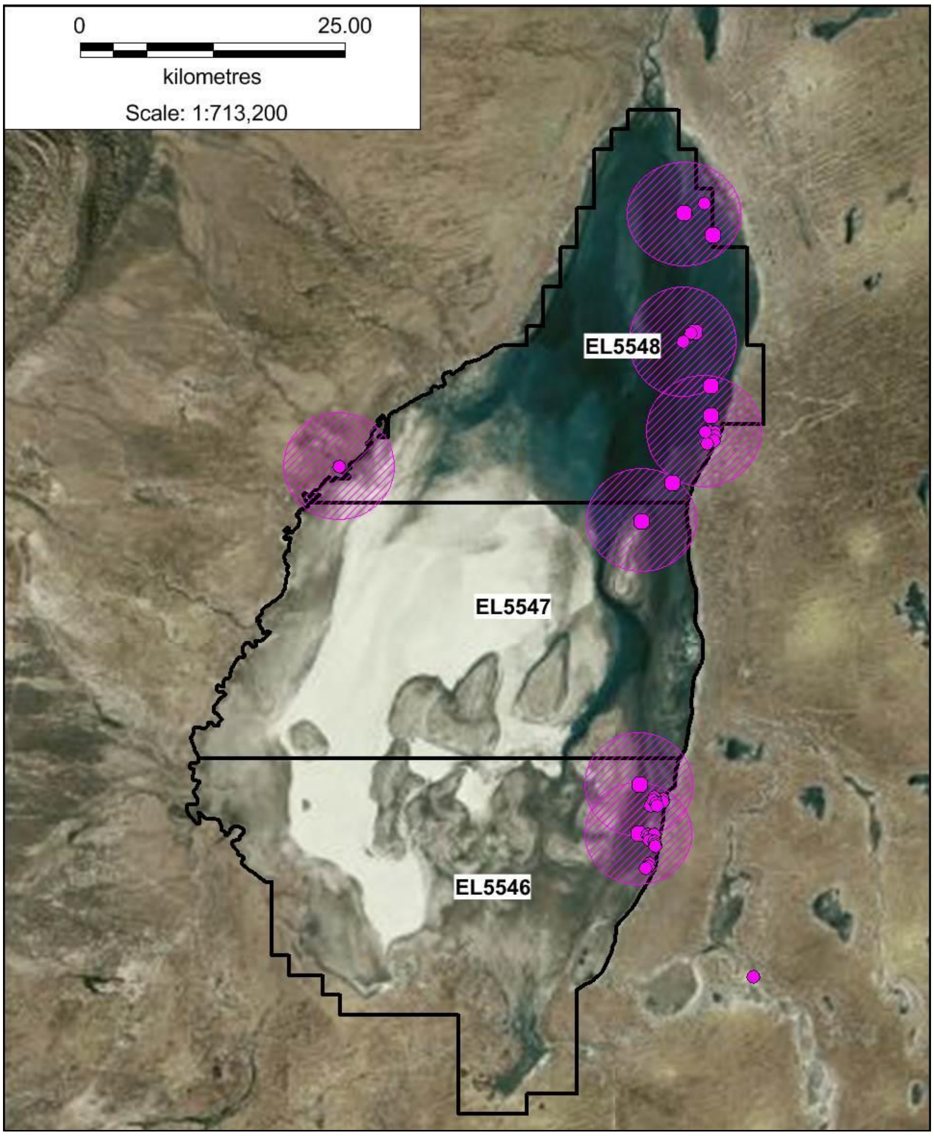

Figure 11. Location of mound springs in and around Lake Frome with self-proclaimed no-go buffers.

HISTORY OF TENURE

The three contiguous titles were granted 05 January 2015. These covered the entire of Lake Frome for 2,718 km^2. The titles were only granted for two years and were renewed once.

Tenement	Area km^2	Grant Date	Expiry	Holder
EL 5546	949	05/01/2015	04/01/2019	VRM
EL 5547	995	05/01/2015	04/01/2019	VRM
EL 5548	774	05/01/2015	04/01/2019	VRM

Table 1. Lake Frome titles.

Rum Jungle Resources became Verdant Minerals Ltd (VRM) on 05 December 2016 and the titles were then in the name of Verdant Minerals Ltd. Notification of surrender was sent to the SA Govt on 23 February 2018, but the titles did not show as surrendered on the Govt tenement mapping system until 27 April 2018.

EXPLORATION AND PROJECT RATIONALE

The Lake Frome Potash Project was one of two project areas held by Verdant Minerals for salt lake brine potash. The Karinga Lakes project in the Northern Territory has a JORC brine resource.

Australia has no producing potash mines. Around 350,000 tonnes of potash is imported into Australia annually from Canada and is worth around $200 million. Potash of sulphate and schoenite are utilised as high-end fertiliser products globally, as they have a lower salt index than muriate of potash and are often preferred in crops sensitive to chloride or susceptible to fertiliser burn. Sulphate of potash and schoenite attract premium pricing in comparison to the more common muriate of potash.

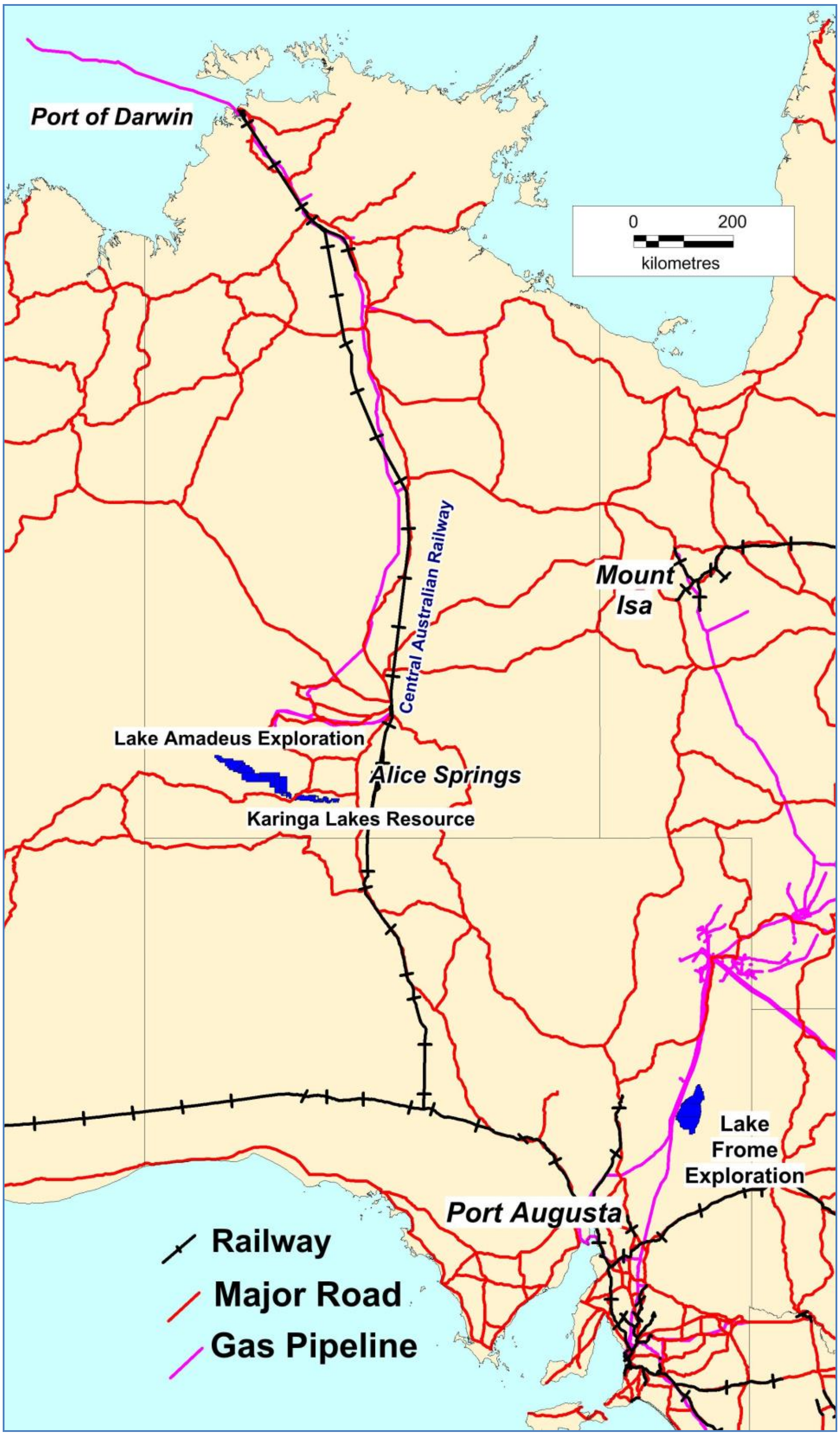

Figure 12. Verdant Minerals' sulphate of potash brine projects.

The Lake Frome Project was strategically well located near roads and railways, providing access to ports and proximity to southern to domestic markets.

GEOPHYSICS

The TMI data shown below probably reflect rugosity and differing geology in basement under the lake. It is not known to what extent the basement ridge under the lake might partition the lake stratigraphy itself. Northwest trending faults visible on the data may be conduits for upward migration of fluids, since they are believed to penetrate the great Artesian Basin (see discussion in Geology).

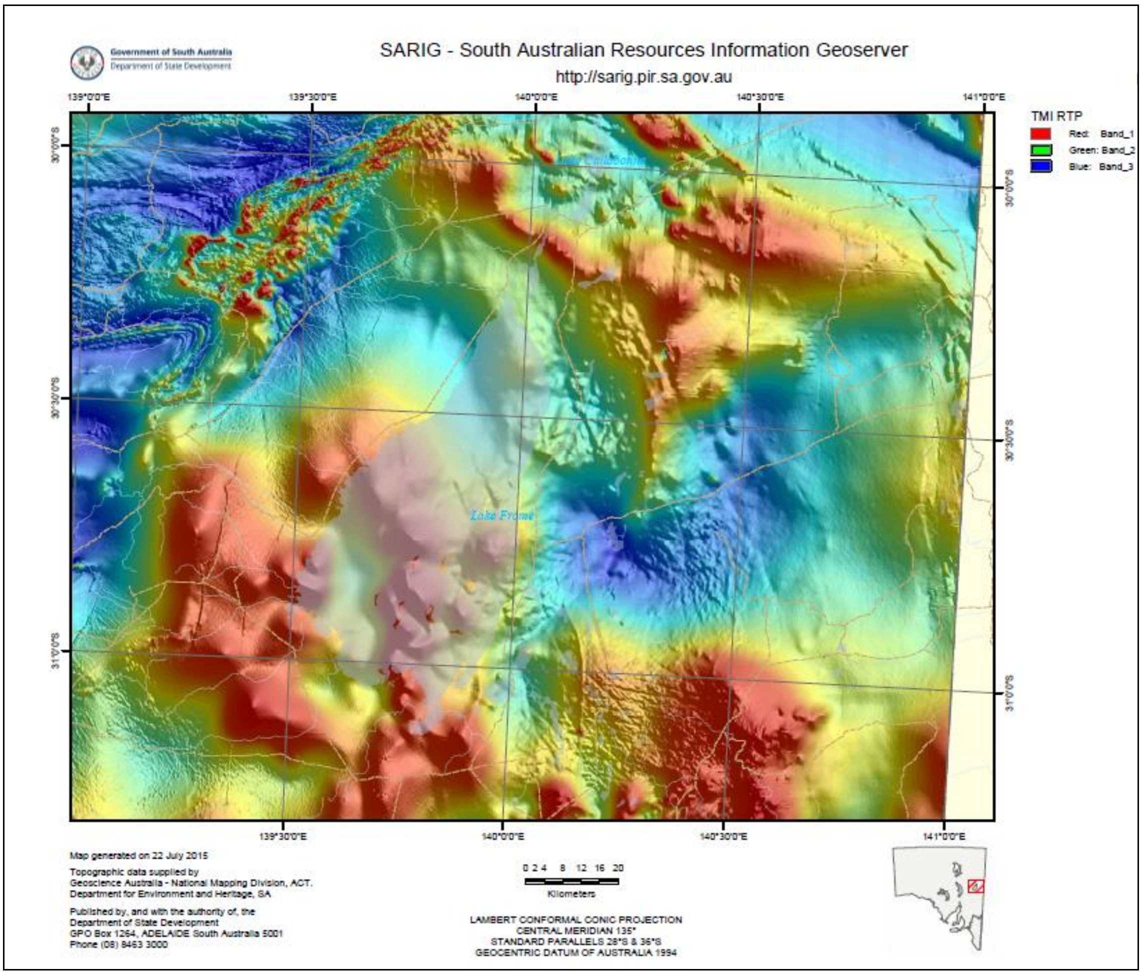

Figure 13. Total magnetic intensity reduced to the pole.

Since it only shows surface conditions, the potassium channel radiometrics data (below) is of less use than might be expected in a potash search. The image below does, however, show a marked difference between east and west, reflecting the type of surficial cover around the lake.

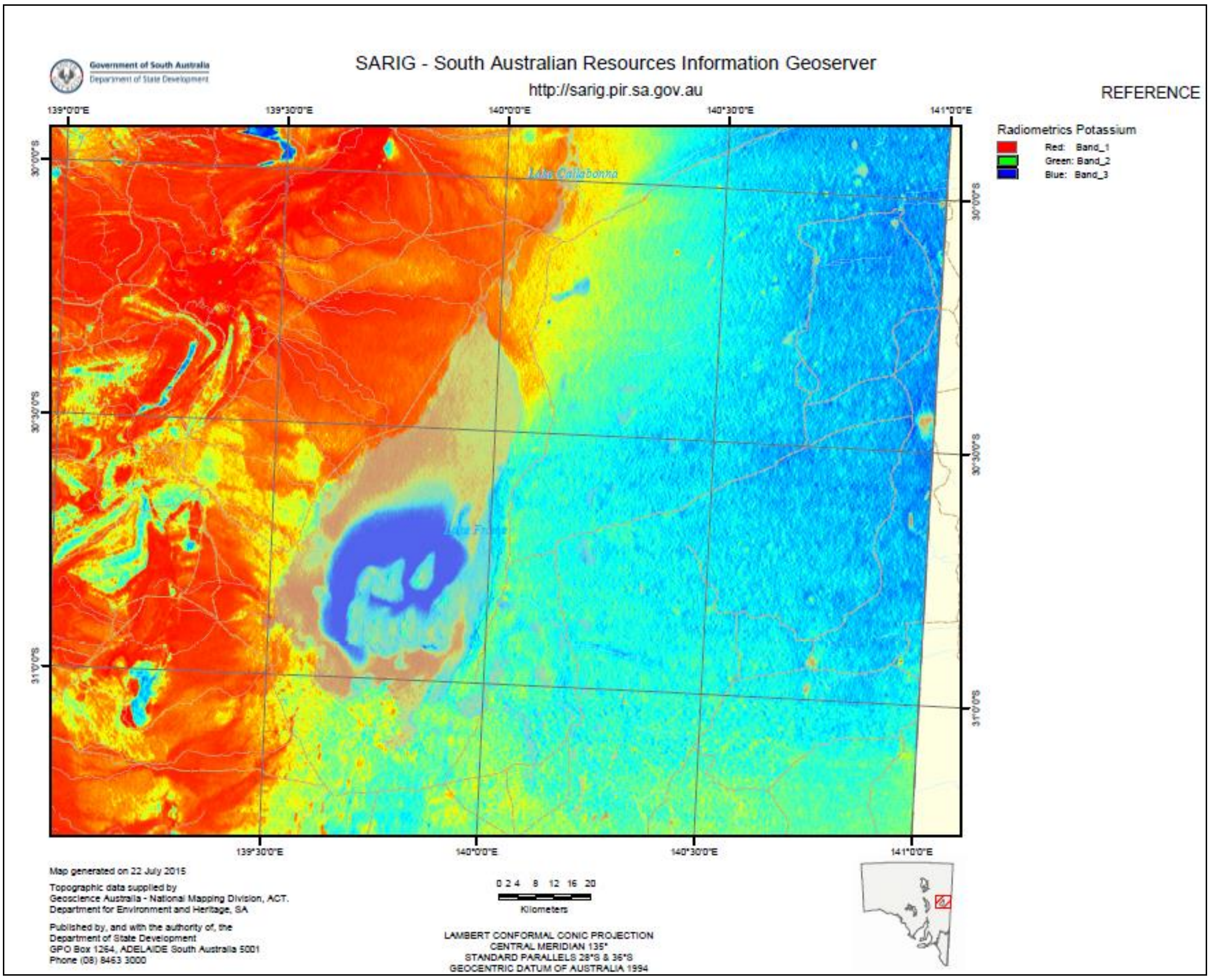

Figure 14. Potassium channel data over Lake Frome and surrounds.

An airborne electromagnetic (AEM) survey of Lake Frome was used by Geoscience Australia to help validate fluid transportation pathways, especially in the near sub-surface. The AEM survey measured the electrical conductivity of the surface and subsurface (potentially up to ~200 m depth below the surface), and has the potential for mapping salinity differences in groundwater in the near-surface. Using the Geoscience Australia layered earth inversion algorithm (GA-LEI), Geoscience Australia prepared conductance maps for a range of depths and elevations, as well as east-west cross-sections of electrical conductivity through Lake Frome. The depth of penetration of the AEM survey, referred to as the depth of investigation (DOI), varied based on the conductance (the summed conductivity of all layers in the inversion) but was highly correlated to the electrical conductivity of the surface layer. Where the surface was highly conductive, such as over the Lake Frome playa, the signal saturated close to the surface and the DOI was much shallower (~60 m). This limited Geoscience Australia's understanding of how deep the brine pool extends, and as a consequence, what stratigraphic units are contributing to Lake Frome's water chemistry.

LOCAL GEOLOGICAL AND HYDROLOGICAL SETTING

Lake Frome is bounded to the west by the Flinders Ranges, which comprise highly deformed Neoproterozoic to Early Cambrian metasedimentary and volcanic rocks of the Adelaide Fold Belt. These are underlain by Mesoproterozoic metasediments and granites, which crop out to the north in the Mt Painter Inlier (Preiss, 1987; Drexel et al., 1993; Sheard, 2009). The drainage into the lake from the west is characterised by bank-attached spits. Playa shoreline features in the west which appear to be beach ridges are actually relict fluvio deltaic units. Bounding Lake Frome's drainage basin to the south is the Olary Spur, which consists of Neoproterozoic metasediments of the Adelaide Fold Belt underlain by Paleo-Mesoproterozoic rocks of the Curnamona Province (Campana, 1957). Proximal to the lake, the Cenozoic fill consists of Late Paleocene to Eocene fluvial sands and gravels of the Eyre Formation, which underlie Oligocene to Late Miocene fluvio-lacustrine sands and clays of the Namba Formation. Pliocene fluvial and lacustrine deposits of the Willawortina Formation reach greater than 100 m thickness between Lake Frome and the Flinders Ranges (Callen and Tedford, 1976).

Most of the lake is covered with a thin halite crust, with several isolated groups of clastic and carbonate mound springs to the east. Below the halite crust, interstitial discoidal gypsum crystals along with traces of pyrite and

carbonates abound within the dark brown clay-rich sediments. Underlying Lake Frome, at depths ranging from 10 cm to greater than 10 m, is a brine pool, characteristically NaCl-enriched, with salinities exceeding 250 g/L.

The edge of the Jurassic Cretaceous-hosted Great Artesian Basin (GAB) underlies the area. The main GAB aquifer, the Cadna-Owie Formation, is overlain by the Cretaceous Bulldog Shale aquitard. A number of faults exist in the Great Artesian Basin sequence under Lake Frome. These result in leakage into any overlying aquifers and discharge as springs. Thus, the Great Artesian Basin aquifers can contribute to both ground and surface water at Lake Frome. The palaeo- and modern lake sediments are believed to be up to 200 m thick and consist of widespread Eyre Formation, the overlying widespread Namba Formation and several other formations of more local extent. The Eyre Formation consists of well rounded gravel and quartz sands in units up to 100 m thick. Following compartmentalisation of the greater Lake Eyre Basin, there was widespread formation of silcrete (locally called “grey billy”), then the Namba Formation was deposited during the Miocene and it lies disconformably over the Eyre Formation in units around 150 m thick. The Namba Formation consists of fine to medium sands, silt, clay, oolitic dolomite and limestone which were deposited in expansive, shallow lacustrine conditions in a warm environment. This formation contains vertebrate fossils in some of the carbonate facies. The Namba Formation is also locally capped by silcrete and what is locally called “puddingstone”. This is overlain by the Willawartina Formation which is probably a fanglomerate and associated distal braided stream facies. Following the deposition of the Willawartina Formation, the Millyera Formation was deposited unconformably over the Namba Formation across the eastern floor and shore of Lake Frome. The Pleistocene Millyera Formation consists of units up to 10 m thick of laminated clays, limestone and sand representing lacustrine deposition in the Lake Frome Basin. It pinches out to the west. Highstand sandy beach ridge facies were also deposited during the Pleistocene lacustrine events. These beach ridge facies, named the Coomb Spring Formation intertongue with the Millyera Formation to the east of Lake Frome, and represent deposition of the coarser sediments at high lake levels. The Late Pleistocene Eurinilla Formation consists of shoreline and channel fill structures of poorly sorted sands and clays in units up to 20 m thick which were deposited along the east and the western margins of Lake Frome and its ephemeral tributaries. The uppermost formation at Lake Frome is the Coonarbine Formation which lies disconformably above the shoreline sections of the Eurinilla Formation and also forms the central facies of the modern dunes around Lake Frome and to the east in the Strzelecki desert. The Coonarbine Formation consists of poorly sorted fluvial and aeolian silt, sands and occasionally gravels deposited during the climatic fluctuations of the Late Pleistocene and Holocene.

Evidence of significant runoff reaching Lake Frome is rare, but it floods more frequently than Lake Torrens. During filling events that produced water depths of greater than 6 m, Lake Frome merges with the three lakes to the north (Lakes Gregory, Blanche and Callabonna) to form a single water body. When filled to over 15 m, this mega lake drains via the Warrawoocara channel to Lake Eyre.

Over the last 100 thousand years, mega-lake phases have occurred at least seven times, with three of those overtopping into Lake Eyre. During such events, any accumulated salts and trace elements were vulnerable to dissolution and flushing from the basin. Two major periods of high volume runoff from the Flinders Ranges occurred between 92-80 ka and 17-11 ka during which lake levels were at a minimum elevation of 4-6m (AHD). However, since 45 ka, palaeohydrological records suggest there has been a progressive shift to more arid conditions, with Lake Frome returning to playa-dominated conditions. A major transition to ephemeral conditions was experienced between 7-6 ka which was followed by the onset of the modern El Niño Southern Oscillation from ~4 ka.

The present strontium isotope ratio (87Sr/86Sr) of Lake Frome brines and modern halite crust (0.71126 - 0.71206) are of similar composition to the shallow Willawortina Formation (0.71171 – 0.71223) (Ullman and Collerson, 1994). This suggests that the major source for shallow Lake Frome brines is from the west, as tributaries and groundwater associated with this Pliocene unit have similar strontium isotope ratios. Strontium isotope ratios increase with depth in preserved gypsum deposits in Lake Frome’s sediment, which reflect either increasing groundwater input from the older Namba Formation, or greater groundwater residence times in the past.

In the most recent few decades, Lake Frome held some water for a considerable time in 1970. Comalco reported some surface water in 1972 and 1973, mainly as a result of spring discharge. After an extreme rain event in 1974, water covered 75% of the lake surface area. That water was not received via Salt Creek and Lake Callabonna in the north despite reports of Lakes Gregory, Blanche and Callabonna receiving water from the Strzelecki Creek at that time. Instead the water that entered Lake Frome during the floods of 1974 has been attributed to a combination of runoff from the Flinders Ranges and particularly large volumes of groundwater discharge. Satellite photos show water in Lake Frome during the floods of April 2010, 2011, and March 2012 but it has not been determined exactly how this water arrived. After rains in the Flinders Ranges during January 2015 (see Arkaroola rainfall graph), a Proba V satellite image from 12 February captured new green vegetation along the creeks to the west of the lake and showed standing water covering the southern portion of the lake.

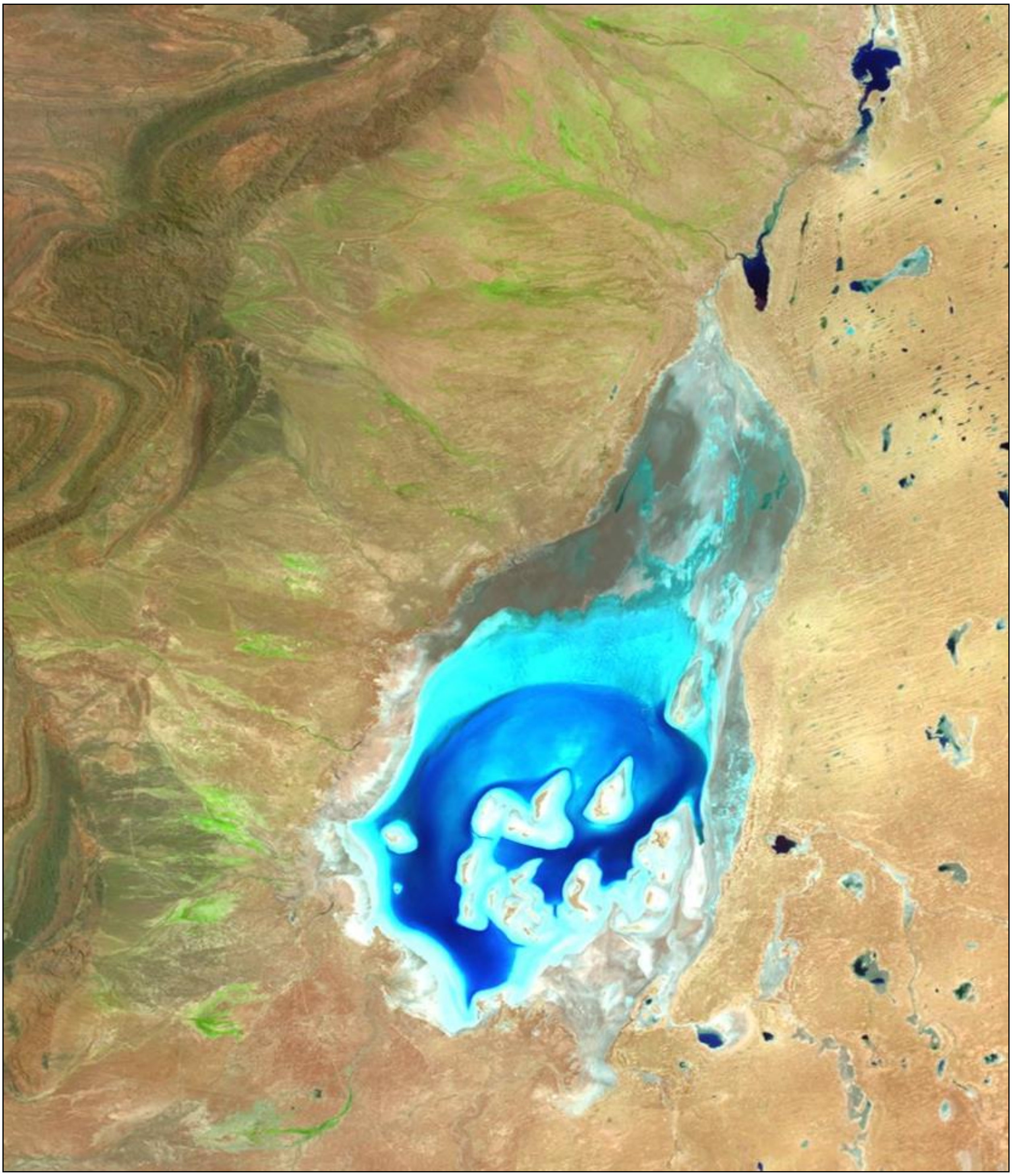

Figure 15. ESA's Proba-V minisatellite captures the rare sight of standing water in Lake Frome, 12 February 2015.

Surface salt crusts can be locally decimetres thick but are ephemeral and their location on the lake shifts between one flooding event and the next.

Organic matter and intimately associated secondary gypsum can be locally extensive and may suggest potential to generate acid sulphate. Photographs taken by CSIRO show a thin layer of black organic matter directly beneath the salt crust in at least one location.

PREVIOUS EXPLORATION AND WORK BY OTHERS

Early Academic Work

Draper and Jensen (1976) took a series of lake sediment cores hand-augured to 4 m, from various locations mainly in the south. Bowler et al (1986) sampled cores to depths of 6 m, taken 8 km in from the western shoreline and about 17 km in from the eastern shoreline as a part of the SLEADS project. While these studies have formed the basis of

SARIG's interpretation of the shallow aquifers under Lake Forme, the actual studies were directed more at sediments rather than brines and have only intersected very shallow aquifers.

Verdant Minerals has also obtained a copy of Barrett's 2011 Honours Thesis on Lake Frome.

2013 Geoscience Australia Study

A Geosciences Australia study (Record 2013/39) used Lake Frome as a test case of the prospectivity of Australian salt lakes.

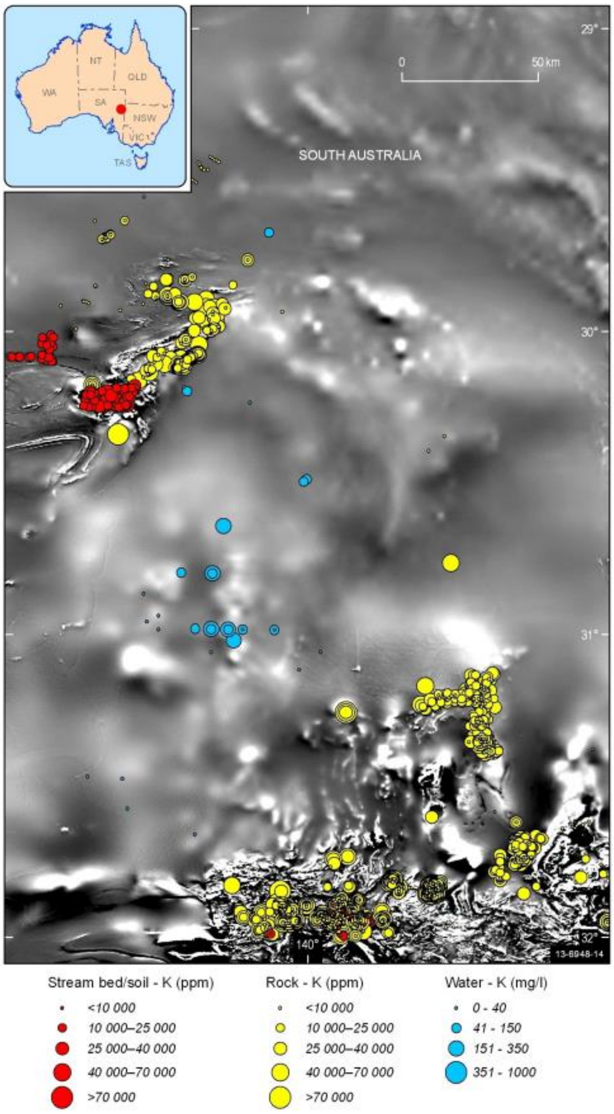

Figure 16. Potassium data used by Geoscience Australia broken into streams and soil, bedrock and water. The background is is the magnetic anomaly map of Australia. Strangely, their figure does not show the lake outline.

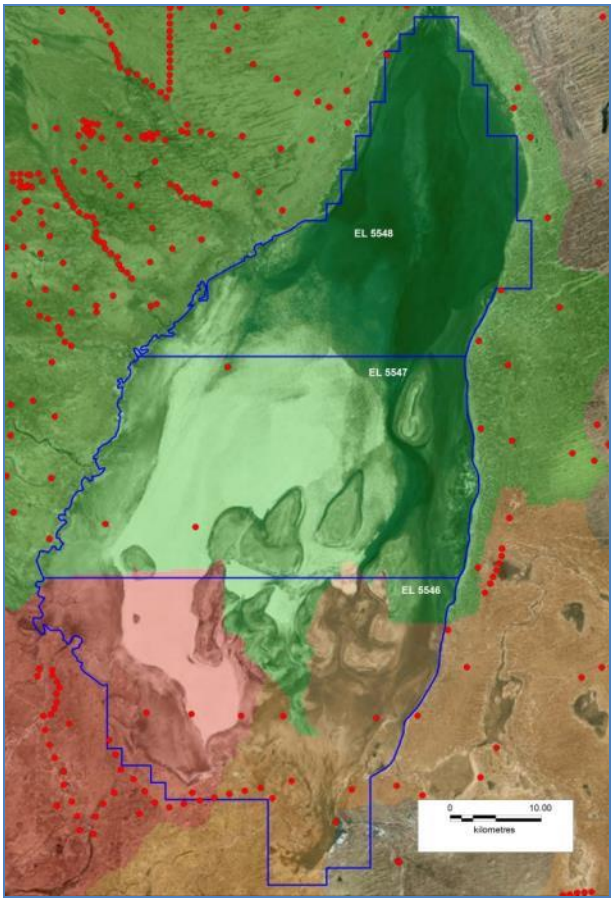

Figure 17. Results of the GA study for potash prospectivity. The catchments shown with a red tint were rated by GA as most prospective for potassium, followed by yellow then green. Historic drillholes are shown as red dots.

Exploration for Alkali Evaporites

The lake was previously explored for bedded alkali evaporites (specifically trona – sodium sesquicarbonate) or equivalent brines by Comalco Aluminium Limited in the late 1970s. They drew on similarities between the Miocene of Lake Frome and that of Wilkins Peak Member in the Green River Basin, USA, which is the world's largest trona-producing formation. Specially-made/modified vehicles were used to drill nine RC holes for 576 m. All holes intersected multiple thin aquifers well above the GAB. The major element assays showed all these groundwaters to be chloride-rich, low carbonate and low sulphate. In all but two holes, U was consistently higher in the deeper aquifers. In the opinion of Comalco, all trace values of Li, Sr, Br and B were low in the brines themselves. The Comalco chip samples were collected every 2 m. Assays for 35 trace elements were done on 10 m sediment composites. Comalco felt that these values were within the normal range for sediments of that type and in general agreement with previous academic work at Lake Frome. Some of the rock samples from this work are believed to be still stored at Wertaloona Station and samples from Comalco hole CF2 (and possibly others) are also stored at the SA Government Core Facility. The data from the original water analyses done by AMDEL for Comalco have been re-checked. There is little information on the analytical techniques used, but they are the same as used by AMDEL for routine waterbore analysis and so seem appropriate providing concentrations were not too high. Prohibitively high concentration does not seem to be the case. The 27 brine K assays average 116 mg/l, with a maximum of 299 mg/l and a minimum of 19 mg/l. There was a high degree of consistency between the same aquifer in adjacent holes.

Lithium Exploration

The maximum Comalco brine Li assays were 0.2 mg/L compared to about 250 mg/L as potentially economic.

However, in an ASX release on 12 October 2010, ERO Mining Ltd described Lake Frome, rather effusively, as a "World-class lithium exploration target". Their concept was entirely based on few relatively high lithium levels (up to 250 ppm) in some of the earlier Comalco ***sediment*** (not brine) samples. Through their wholly-owned subsidiary South East Energy Ltd, they held EL 4601 and EL 4602 over central and southern Lake Frome specifically to explore for lithium. They also had applications over Lake Torrens. During 2011, a single sonic/diamond cored drill hole, WT2, was drilled by ERO/Tychean Resource on EL 4601 on the southwestern edge of Lake Frome. It was sited just off the lake by a few hundred metres and located near the older Comalco hole CF2 which was on, but near the edge of the lake. In the estimation of ERO, CF2 was the best indication of lithium in the Comalco work.

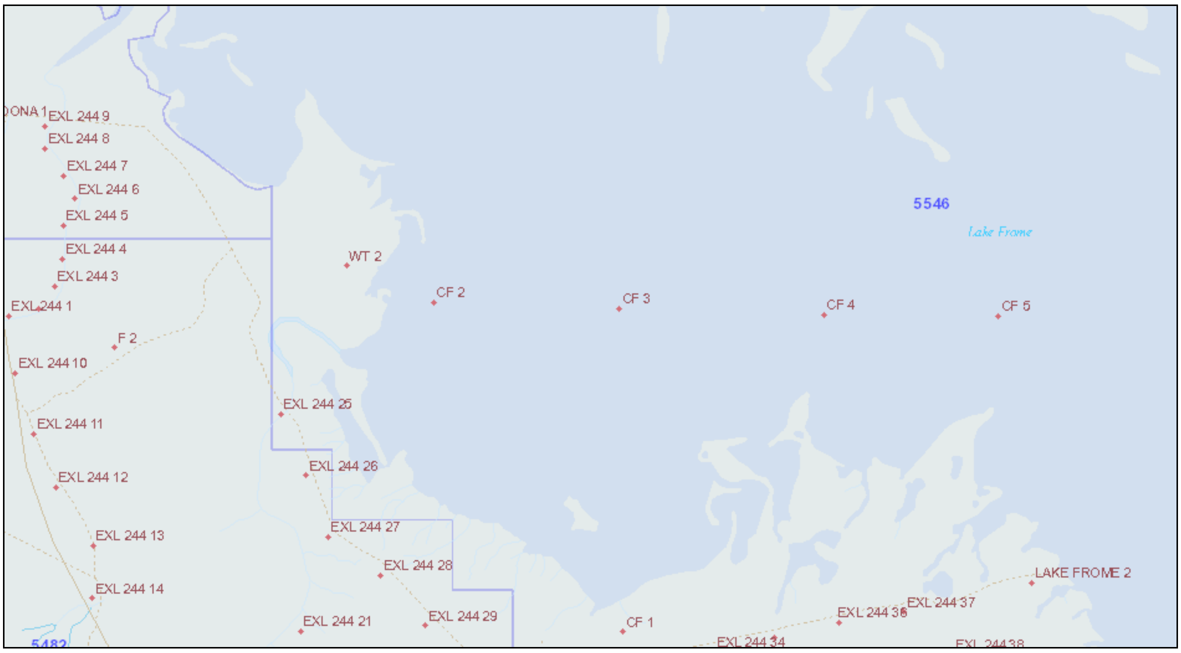

Figure 18. Location of ERO drillhole WT2 hole near the Comalco line CF2 to CF5.

Geology of REO WT2 and Comparison with Re-assay of the Comalco Sediment Samples

Drillhole WT2 went through the modern lake sediments, Namba and Eyre Formation. These were described as interbedded clays and sands with various amounts of carbonaceous matter. The hole was terminated in Cretaceous Bulldog Shale (first intersected at 149 m) to avoid intersecting the underlying Cadna-Owie Formation which is the main Great Artesian Basin aquifer. This aquifer is thin and "patchy" under the south of Lake Frome but ERO were deliberately avoiding the possibility of an artesian flow. The WT2 hole was gamma logged. Samples from depths of 10 m, 19 m, 26 m, 34 m and 63 m were sent for semi-quantitative mineralogy. Illite, muscovite and K-feldspar were identified as the K-bearing minerals. One-metre sediment samples for almost the entire hole were assayed for various elements, specifically lithium. For comparison, sediment samples from those intervals in the Comalco hole with reputedly high lithium were re-assayed using the same technique. Based on the tabulated data given in ERO report itself, most of the values below 20 m from the re-assayed Comalco hole were consistently lower than those originally reported by Comalco, commonly by a factor of 10 times. None of the sediment samples from WT2 exceeded 100 ppm Li. The maximum in the actual data file is 69 ppm. Thus, **the 250 ppm Li in the Comalco assays is spuriously high even for sediment and there is no indication that the Li minerals might be soluble**. In comparison, explorers targeting vein spodumene lithium would want over one percent.

Hydrology and Brine Assays in ERO Study

ERO sampled five local waterbores to provide a set of background values for comparison with brine assays from six depths in WT2.

The maximum K in the "background" waterbores was 100 mg/l. **The best K in brines from WT2 was only 40 mg/l. Thus, the lake brine had less K than waterbores further off the lake.**

The best three waterbores had 200 µg/l, 233 µg/l and 285 µg/l Li. Note this is micro not milli. The lake brine Li assays, this time reported in mg/l, ranged from 0.04 mg/l to 0.136 mg/l (compare to 250 ppm Li in brine lake projects elsewhere). ERO reported that they had intersected "elevated lithium", but abandoned the project.

ASSESSMENT OF PROSPECTIVITY

Potash Prospectivity

Other than assays mentioned above, there is very little data on the potash prospectivity, but GA (without knowing the results of WT2) rated the southwest as the most prospective. Despite the poor results reported by Comalco and by ERO in WT2, further brine sampling for potash is justified. This needs to be deeper, more comprehensive and more systematic than all previous work.

Lithium Prospectivity

Geoscience Australia did not use the most recent ERO analytical Li data for rocks or brines and they did not demonstrate that any lithium in rocks in the catchment was soluble. They did use some spuriously high Li sediment results. None-the-less, Geoscience Australia concluded that Lake Frome is not much more enriched in lithium than seawater. In fact, the actual concentration of Li in seawater is 0.14 to 0.25 ppm so EROs' brines actually have less than half the Li concentration of seawater. Certainly, the brines are well below the target grade for commercial Li brine. Furthermore, as the ratio of lithium to chloride is so low, evaporation modelling suggests that the brine will never reach economic Li concentrations in single stage evaporation. **Until it can be demonstrated otherwise, Verdant Minerals considers that Lake Frome has next to no lithium brine prospectivity, at least in the brines sampled to date.**

Bromine Prospectivity

To be comparable with Dead Sea operations, bromine concentrations would have to be about 5,000 ppm out-of-the-ground, which goes to 10,000 to 12,000 ppm Br after NaCl crystallises out. Geoscience Australia appears to have been unaware that Comalco gave some 28 Br brine assays. However, these had a maximum of only 155 mg/L, meaning there is little Br prospectivity in the brines tested to date.

Boron Prospectivity

The most important and economical, extractable boron minerals are the borax series such as borax itself ($Na_2B_4O_7.10H_2O$), kernite ($Na_2B_4O_7.4H_2O$), tincalconite ($Na_2B_4O_7.5H_2O$), ulextic ($Na_2O.2CaO_5B_2O_3.16H_2O$) and hydroboracits ($CaO.MgO.B_2O_3.6H_2O$). Seawater has 4 to 5 ppm B. Salt lake brines from Olaroz, Cauchari and Salar de Atacama which are used to produce borax chemicals have natural B concentrations many orders of magnitude higher than seawater. Egyptian lakes where borates are produced chemically typically have brines containing >100 ppm boron. The operators of Owens Lake in the US used evaporation to concentrate borax brine from 2.6% to 4%. A suite of Lake Frome B brine assays from Comalco has a maximum of only 9.4 mg/L, only double seawater at best, suggesting little B prospectivity, at least in the brines sampled to date.

WORK IN THE PART 05/01/2017 TO SURRENDER

No work on-ground was possible without an agreement with the Traditional Owners.

EXPENDITURE STATEMENTS

There was no admissible expenditure from 05/01/2017 until surrender.

CONCLUSION AND RECOMMENDATIONS

Verdant Minerals has reconsidered the potential viability of the Lake Frome project and decided to surrender all titles, having done no on-ground work.