



PETRATHERM LIMITED

ACN 106 806 884

ASX: PTR

www.petratherm.com.au
admin@petratherm.com.au

ASX ANNOUNCEMENT

19 August 2022

Successful Bid for Muckanippie Rare Earth Project

- Exploration Licence Application (ELA 2022/00076), located over a prospective rare earth area of the Northern Gawler Craton of South Australia has been secured through a competitive bid process.
- Tenement covers the central zone of a major layered intrusive complex which shows evidence of anomalous rare earths.
- Historical exploration includes numerous occurrences of highly anomalous rare earths and potential rare earth source rocks.
- Adjacent tenement granted over other portions of the layered intrusive complex, placing PTR in a strong ground position.
- Other historical mineral occurrences are associated, including iron-titanium, aluminium, and the historic Malbooma Gold Mine.

Petratherm Limited (ASX: PTR) is pleased to announce that it has been successful through a competitive bid process to be the preferred applicant for ELA 2022/00076 located in the Northern Gawler Craton of South Australia. The tenement covers a 178 km² area over the central portion of a regionally extensive layered intrusive sequence known as the Muckanippie Anorthosite Complex which shows evidence of rare earth (REE) enrichment. The Muckanippie Complex is prospective for both primary REEs in the basement and secondary concentrations of Ionic Clay REEs in the overlying weathering profile.

In addition, PTR has received grant of an adjacent tenement area (EL 6815) covering an area of 80 km² over other portions of the Intrusive Complex. The licences collectively termed the "Muckanippie Project" make up an additional new REE exploration region, following encouraging REE results at PTR's Comet Project Area 40 kilometres to the northeast (refer to PTR ASX releases 20/04/2022 & 08/08/2022).

A large circular magnetic anomaly (diameter > 4 kilometres) with an associated gravity anomaly forms the core of the Muckanippie Complex (Figure 1). This central zone was drill tested by Dampier Mining (drill hole MW5) in 1978 with a single drillhole intersecting mafic intrusive rock from 32 metres to end of hole at 53 metres. Open file geochemical reports of the bottom 3 metre composite sample returned highly anomalous rare earth, cerium (Ce) of 1500 ppm, and related rare earth minerals niobium (Nb) 1350 ppm, and phosphate (P₂O₅) 4.25%.

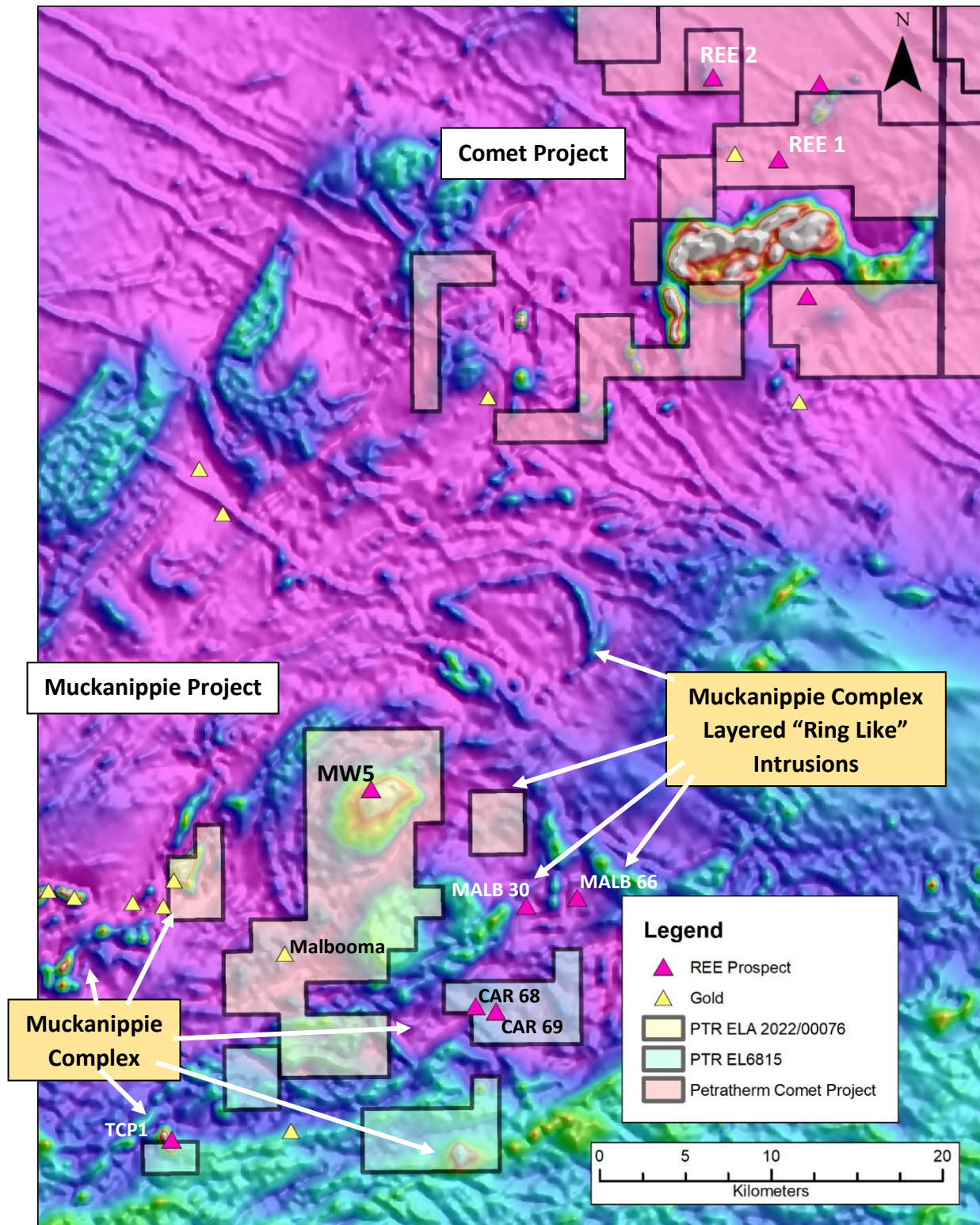


Figure 1 Total Magnetic Intensity Image over the Muckanippie and Comet Project Areas. The prospective Muckanippie Complex is a series of layered intrusions and plugs often forming ring like features in the magnetics. The central main circular intrusion shows a prominent magnetic core at MW5 with outer lesser magnetic concentric rings evident. In detail, other satellite intrusions and layered complexes occur throughout the area such as at TCP1. PTR's Comet REE Project is approximately 40 kilometres northeast of Muckanippie. At Comet, the REE 2 Prospect is similarly associated with an intrusive magnetic complex which may be equivalent to the Muckanippie intrusive event.

Previous exploration in the region has not directly targeted REEs however limited geochemical assays of the light rare earths cerium (Ce) and lanthanum (La) has been undertaken in some instances along with petrological analysis of portions of the Muckanippie Complex. Further evidence for the areas fertility for REEs includes:

- SA Mines and Energy Department Drilling (1991) – RAB drill hole CAR 68 reported a bottom 4 metre composite sample of 400 ppm Ce, 163 ppm La and 85ppm Nb from 12 metres. The adjacent hole CAR 69 drilled 1 kilometre to the east (Figure 1) was described as a dolomite-phlogopite-microcline-tremolite rock of possible carbonatite affinity.
- Aztec Mining – Drill hole TCP1 (1994) testing a prominent magnetic feature of similar magnetic intensity to the central Muckanippie body intersected from 55-90 metres a magnetite-ilmenite rich rock containing on average 5% titanium. Later independent petrological analysis described the host rock as an ilmenite-apatite rock similar to Nelsonite found in Canada, which is noted for its high Ti and REEs. Other shallow vertical RAB drilling for gold in the region by Aztec (1996) included anomalous Ce and La in some drill holes including:
 - MALB 030 – 4m @ 640ppm Ce, 300ppm La, from 20 metres
 - MALB 066 – 4m @ 500ppm Ce, 180 ppm La from 8 metres

The Muckanippie Project includes the historic Malbooma Gold Mine (Figure 1) which was first reported in 1908 by Government geologists. Limited surface and shallow shaft mining of a quartz iron-oxide lode rock has occurred. No production records were recorded however mine spoil samples of the ore rock taken by Normandy Exploration in 1997 reported samples between 2 to 11 g/t Au. At Malbooma, the host Muckanippie Anorthosite is exceptionally high in aluminium with chemical analyses returning aluminium values ranging between 25-30% Al₂O₃. High aluminium and titanium is a regional characteristic of the intrusive complex and warrants further follow up work.

Granting of the tenement is likely to occur late in 2022 calendar period. PTR intends to undertake regional shallow air core drill traverses across the Muckanippie Complex exploring for horizons where REE enrichment may be occurring. PTR has in place an existing Native Title Mining Agreement with the Traditional Owners and as a result ground exploration could begin soon after grant.

This ASX announcement has been approved by Petratherm's Board of Directors and authorised for release by Petratherm's Chairman Derek Carter.

For further information please contact :

Peter Reid (Exploration Manager) Tel: 0435 181 705 E: preid@petratherm.com.au

Competent Persons Statement: The information in this report that relates to Exploration Targets and Exploration Results is based on information compiled by Mr Peter Reid, who is a Competent Person, and a Member of the Australian Institute of Geoscientists. Mr Reid is not aware of any new information or data that materially affects the historical exploration results included in this report. Mr Reid is an employee of Petratherm Ltd. Mr Reid has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Reid consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

ELA2022/00076 & EL6815 (Muckanippie Project) JORC Table 1

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	<ul style="list-style-type: none"> Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling. Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse Au that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information. 	<ul style="list-style-type: none"> No drilling or sampling has been undertaken by Petratherrm, although limited historical drilling and sampling exists. Historical sampling was undertaken using standard industry practices. Historic drill hole information has been sourced from South Australian Government SARIG database records and from open file historic Company reporting. Additional details from historic drilling are unknown. Mineralised intersections were encountered but have not been reported as true widths due to insufficient data spacing and orientation relationship knowledge.
Drilling techniques	<ul style="list-style-type: none"> Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.). 	<ul style="list-style-type: none"> Historic exploration drilling reported includes RAB, RC and 1 single bottom hole core sample. Additional details from historic drilling are unknown.
Drill sample recovery	<ul style="list-style-type: none"> Method of recording and assessing core and chip sample recoveries and results assessed. Measures taken to maximise sample recovery and ensure representative nature of the samples. Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material. 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherrm although limited historical drilling exists. Additional details from historic drilling are unknown.
Logging	<ul style="list-style-type: none"> Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography. The total length and percentage of the relevant intersections logged. 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherrm although limited historical drilling exists. Additional details from historic drilling are unknown.
Sub-sampling techniques	<ul style="list-style-type: none"> If core, whether cut or sawn and whether quarter, half or all core taken. If non-core, whether riffled, tube sampled, rotary split, 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherrm although limited historical

Criteria	JORC Code explanation	Commentary
<i>and sample preparation</i>	<p><i>etc. and whether sampled wet or dry.</i></p> <ul style="list-style-type: none"> <i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i> <i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i> <i>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</i> <i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i> 	<p>drilling exists.</p> <ul style="list-style-type: none"> Additional details from historic drilling are unknown.
<i>Quality of assay data and laboratory tests</i>	<ul style="list-style-type: none"> <i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i> <i>For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i> <i>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherrm although limited historical drilling exists. Additional details from historic drilling are unknown.
<i>Verification of sampling and assaying</i>	<ul style="list-style-type: none"> <i>The verification of significant intersections by either independent or alternative company personnel.</i> <i>The use of twinned holes.</i> <i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i> <i>Discuss any adjustment to assay data.</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherrm although limited historical drilling exists. Additional details from historic drilling are unknown.
<i>Location of data points</i>	<ul style="list-style-type: none"> <i>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i> <i>Specification of the grid system used.</i> <i>Quality and adequacy of topographic control.</i> 	<ul style="list-style-type: none"> All maps and locations are in UTM grid (GDA94 Z53). Drill hole positions have been reproduced from SA Government open file databases and the accuracy of this data is unknown.
<i>Data spacing and distribution</i>	<ul style="list-style-type: none"> <i>Data spacing for reporting of Exploration Results.</i> <i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</i> <i>Whether sample compositing has been applied.</i> 	<ul style="list-style-type: none"> No drilling or sampling has been undertaken by Petratherrm although historical drilling exists. Data spacing is insufficient to establish the degree of geological and grade continuity required for a Mineral Resource estimation.
<i>Orientation of data in relation to geological structure</i>	<ul style="list-style-type: none"> <i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i> <i>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherrm although limited historical drilling exists. The relationship between the drilling orientation and the orientation of key mineralised structures has

Criteria	JORC Code explanation	Commentary
		not been confirmed.
Sample security	<ul style="list-style-type: none"> The measures taken to ensure sample security. 	<ul style="list-style-type: none"> No sampling has been undertaken by Petratherm although limited historic sampling exists. Additional details from historic drilling are unknown.
Audits or reviews	<ul style="list-style-type: none"> The results of any audits or reviews of sampling techniques and data. 	<ul style="list-style-type: none"> No sampling has been undertaken by Petratherm although limited historic sampling exists. Additional details from historic drilling are unknown.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	<ul style="list-style-type: none"> Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area. 	<ul style="list-style-type: none"> The registration of ELA2022/00076 occurred on the 17/08/2022 following a competitive tender process, however the application received date is 13/05/2022. EL6815 was granted on 12/08/2022 for a period of 6 years. ELA2022/00076 & EL6815 are located approximately 120 km south south-west of Coober Pedy overlapping Bulgunnia and Mulgathing Pastoral Stations. The tenement is located within the Woomera Prohibited Area (Green Zone). Native Title Claims: SCD2011/001 Antakirinja Matu-Yankunyjtjara. The tenement is in good standing and no known impediments exist.
Exploration done by other parties	<ul style="list-style-type: none"> Acknowledgment and appraisal of exploration by other parties. 	<ul style="list-style-type: none"> Previous exploration work includes; Surface Geochemical Sampling: Calcrete Airborne Geophysics: Magnetism & Radiometrics. Ground Geophysics: Magnetism and Gravity. Exploration Drilling: Open file records indicate 195 RAB reconnaissance and prospect scale holes

Criteria	JORC Code explanation	Commentary
		drilled & 9 Reverse Circulation.
Geology	<ul style="list-style-type: none"> <i>Deposit type, geological setting and style of mineralisation.</i> 	<ul style="list-style-type: none"> Petratherm is primarily exploring for rare earths associated with the Muckanippie Intrusive Complex. Targets include primary basement mineralisation and secondary enrichment of rare earths in the weathering zone (Saprolite) (e.g. Ionic Clay-Style Rare Earths).
Drill hole Information	<ul style="list-style-type: none"> <i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:</i> <ul style="list-style-type: none"> <i>easting and northing of the drill hole collar</i> <i>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i> <i>dip and azimuth of the hole</i> <i>down hole length and interception depth</i> <i>hole length.</i> <i>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherm although limited historical drilling exists. Additional details from historic drilling are unknown.
Data aggregation methods	<ul style="list-style-type: none"> <i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.</i> <i>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</i> <i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherm.
Relationship between mineralisation widths and intercept lengths	<ul style="list-style-type: none"> <i>These relationships are particularly important in the reporting of Exploration Results.</i> <i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i> <i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherm.
Diagrams	<ul style="list-style-type: none"> <i>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherm.
Balanced reporting	<ul style="list-style-type: none"> <i>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be</i> 	<ul style="list-style-type: none"> No drilling has been undertaken by Petratherm.

Criteria	JORC Code explanation	Commentary
	<i>practiced to avoid misleading reporting of Exploration Results.</i>	
<i>Other substantive exploration data</i>	<ul style="list-style-type: none"> <i>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</i> 	<ul style="list-style-type: none"> No other substantive exploration data has been collected by Petratherm.
<i>Further work</i>	<ul style="list-style-type: none"> <i>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</i> <i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i> 	<ul style="list-style-type: none"> A range of exploration techniques are being considered to progress exploration including drilling.