KOPPAR RESOURCES

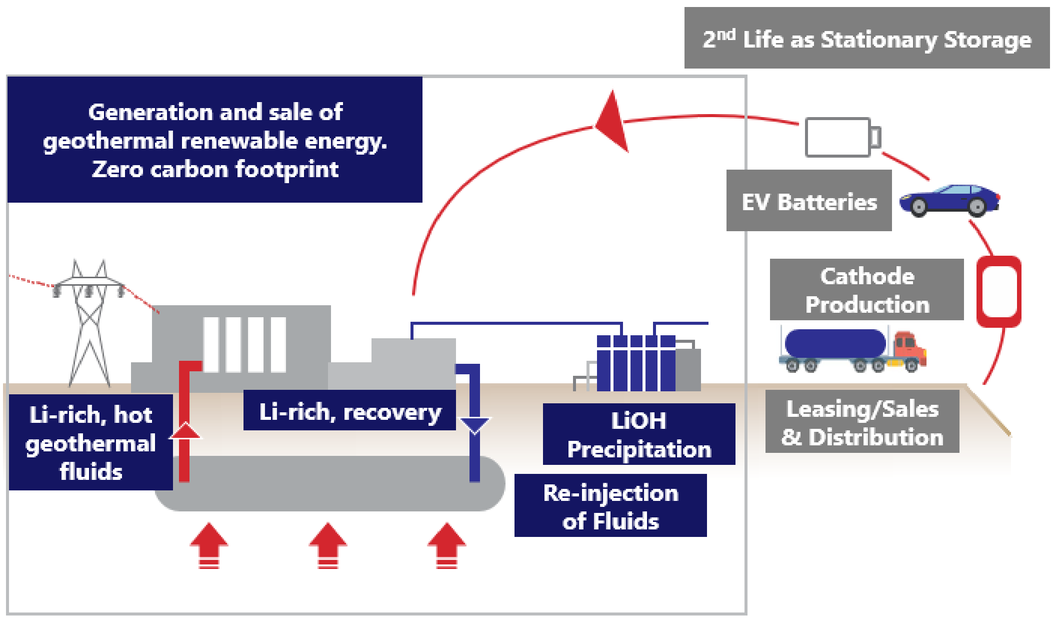
ASX Release
20 August 2019
ASX: KRX

SUBSTANTIAL LITHIUM BRINE EXPLORATION TARGET IDENTIFIED AT THE VULCAN LITHIUM PROJECT IN EUROPE

Koppar Resources Ltd. ("Koppar", "the Company") is pleased to provide the first update from its Vulcan Lithium Project in the Upper Rhine Valley of Germany. The Company has established a conceptual Exploration Target of 10.73 to 36.20 Mt (million tonnes) of contained LCE (Lithium Carbonate Equivalent), based on a range of lithium concentrations between 126 mg/L Li and 190 mg/L Li. The Exploration Target demonstrates the potential world-class scale of the project. The Exploration Target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

The Vulcan Lithium Project is aiming to be Europe's and the world's first **Zero Carbon Lithium** project. It aims to do achieve this by producing battery-grade lithium hydroxide from hot sub-surface geothermal brines pumped from wells, with a renewable energy by-product, without the need for hard-rock mining.

The Vulcan Lithium Project is **strategically located at the heart of the European auto and lithium-ion battery manufacturing industry**, just 60km from Stuttgart. The burgeoning European battery manufacturing industry is forecast to be the **world's second largest**, with currently zero domestic supply of battery grade lithium products.



Highlights

Large geothermal brine field, uniquely rich in lithium in the Upper Rhine Valley

Aiming to be the world's first **Zero Carbon Lithium** producer

Strategically located at the heart of the EU auto & Li-ion battery industry

Corporate Directory

Proposed MD
Dr Francis Wedin

Proposed Chairman
Gavin Rezos

In-Country Principal
Dr Horst Kreuter

Executive Chairman
Patrick Burke

Non-Executive Director
Bill Oliver

Non-Executive Director
Rebecca Morgan

Fast Facts

Issued Capital: 39,083,335
Market Cap (@18.5c): $7.2m

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Independent geological consultants, Roy Eccles P. Geol. and Steve Nicholls MAIG of APEX Geoscience Ltd. ("APEX"), have assessed data provided by Koppar and the Company's geothermal consultants, GeoThermal Engineering GmbH ("GeoT"), and prepared the Exploration Target and associated JORC Code information tables. The Company has yet to conduct exploration work at the Vulcan Project. The Exploration Target was estimated for the separate Koppar Licences using the following methodology:

- The volume of the Buntsandstein Formation within each licence was calculated by creating a three-dimensional model and wireframing the Buntsandstein domain. APEX utilized interpreted seismic profiles[1] to create the geological model. Example cross sections at the Ortenau and Mannheim Licences are presented in Figures 2 and 3. Whilst the Buntsandstein Formation has been the sole subject of this investigation due to the ready availability of porosity values, the Muschelkalk Formation and the alteration zone at the top of the crystalline basement are also target areas which will be examined as part of future studies.

- An average Buntsandstein Formation porosity of 9.51% is derived from historical work that includes porosity measurements on core plug samples (i.e., effective porosity in a confined aquifer that is equivalent to specific yield). The mean porosity is conservative and meant to reflect all lithostratigraphies within the entire Buntsandstein Formation section (i.e., individual high porosity 'flow zones' have not been defined for the Exploration Targets).

- A range of lithium concentrations between 126 mg/L Li and 190 mg/L Li, with a mean of 158.1mg/L Li, was used and is based on a compilation of all publicly available formation water lithium data in the Upper Rhine Graben area (n=43 analyses) of which, 6 analyses are specific to the Buntsandstein Formation (ranging between 118 and 210 mg/L Li; Figure 4). Proprietary data from GeoT were used by APEX to validate the mean Buntsandstein Formation lithium-brine ranges used in the conceptual exploration target estimations.

- The contained elemental lithium estimate is conducted using the relation: *Lithium Exploration Targets = Total Volume of the Brine-Bearing Aquifer X Average Concentration of Lithium in the Brine X Average Porosity*

- For the conceptual estimates, the range of elemental lithium is provided by multiplying the mean volume, porosity and lithium concentration of the Lithium Exploration Targets by +/- 20%.

Within Koppar's licences, the top of the Buntsandstein Formation is located at depths that range from 1,120 m to 4,910 m below the surface (average 2,910 m from surface). The Buntsandstein Formation varies in thickness between the five Licence Fields with the Taro Licence having the thickest (mean) Buntsandstein sandstone followed by: Rheinaue, Ortenau, Ludwig and Mannheim. (Table 1). The mean thickness was calculated on 500 m pierce points throughout the license area. All thicknesses less than 100m were omitted from the calculation as these pierce points were adjacent to fault zones and produced an artificial thinning of the Buntsandstein sandstone thickness. The conceptual Exploration Targets at each Licence Field within the Vulcan lithium-brine project is presented in Table 2. The total Exploration Target (i.e., the sum of Exploration Targets from all five

[1] Seismic profiles created via the Geothermal Information System created by the GeORG project, Landesamt für Geologie, Rohstoffe und Bergbau, available at: http://maps.geopotenziale.eu/?lang=en

Licence Fields) is between 2.015 to 6.800 million tonnes of elemental lithium. Using an elemental to Lithium Carbonate Equivalent ("LCE") conversion of 5.323, this amounts to between 10.725 and 36.195 million tonnes of LCE. The Exploration Target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

Table 1: Thickness of the Buntsandstein Formation at each Licence Field as measured in the three-dimensional model.

	Buntsandstein Formation Thickness		
Licence Field	**Minimum (m)**	**Maximum (m)**	**Mean (m)**
Ortenau	140	605	395
Mannheim	125	400	261
Taro	325	535	469
Ludwig	100	410	274
Rheinaue	175	520	406

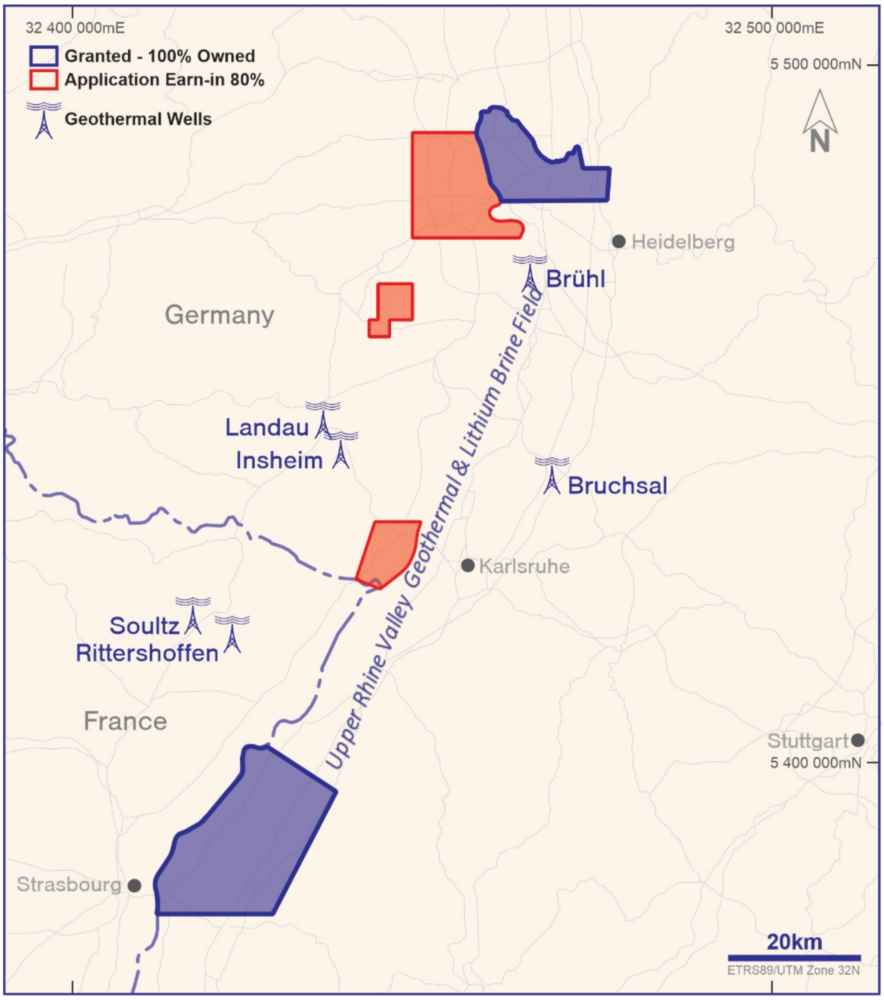

Figure 1: Location of Vulcan lithium-brine project Licence Fields within the Upper Rhein Graben of southwest Germany

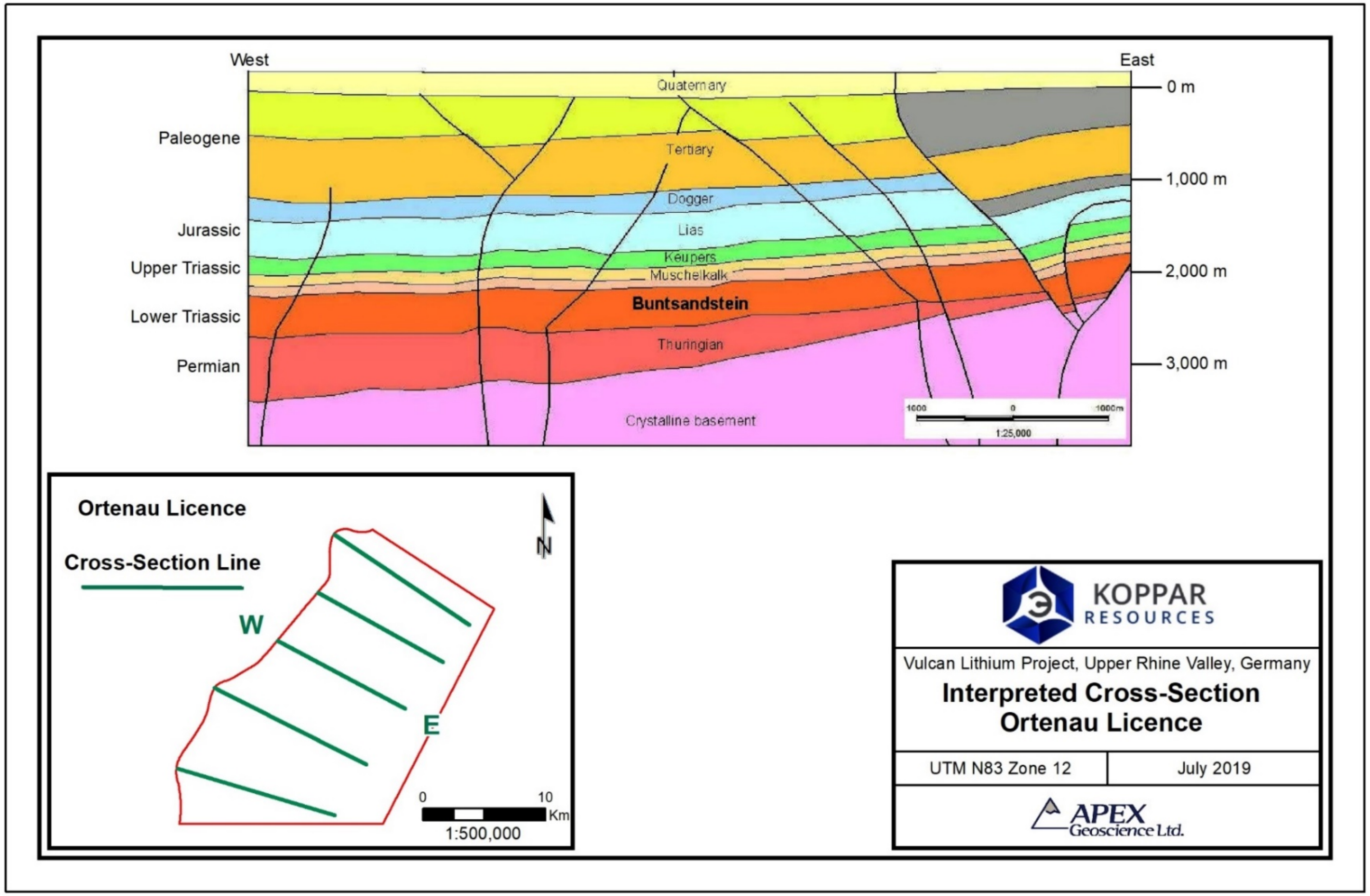

Figure 2: Interpreted cross-section at the Ortenau Licence. The outline of the Buntsandstein Formation was wireframed in the three-dimensional model to calculate the Buntsandstein volume at the Ortenau Licence.

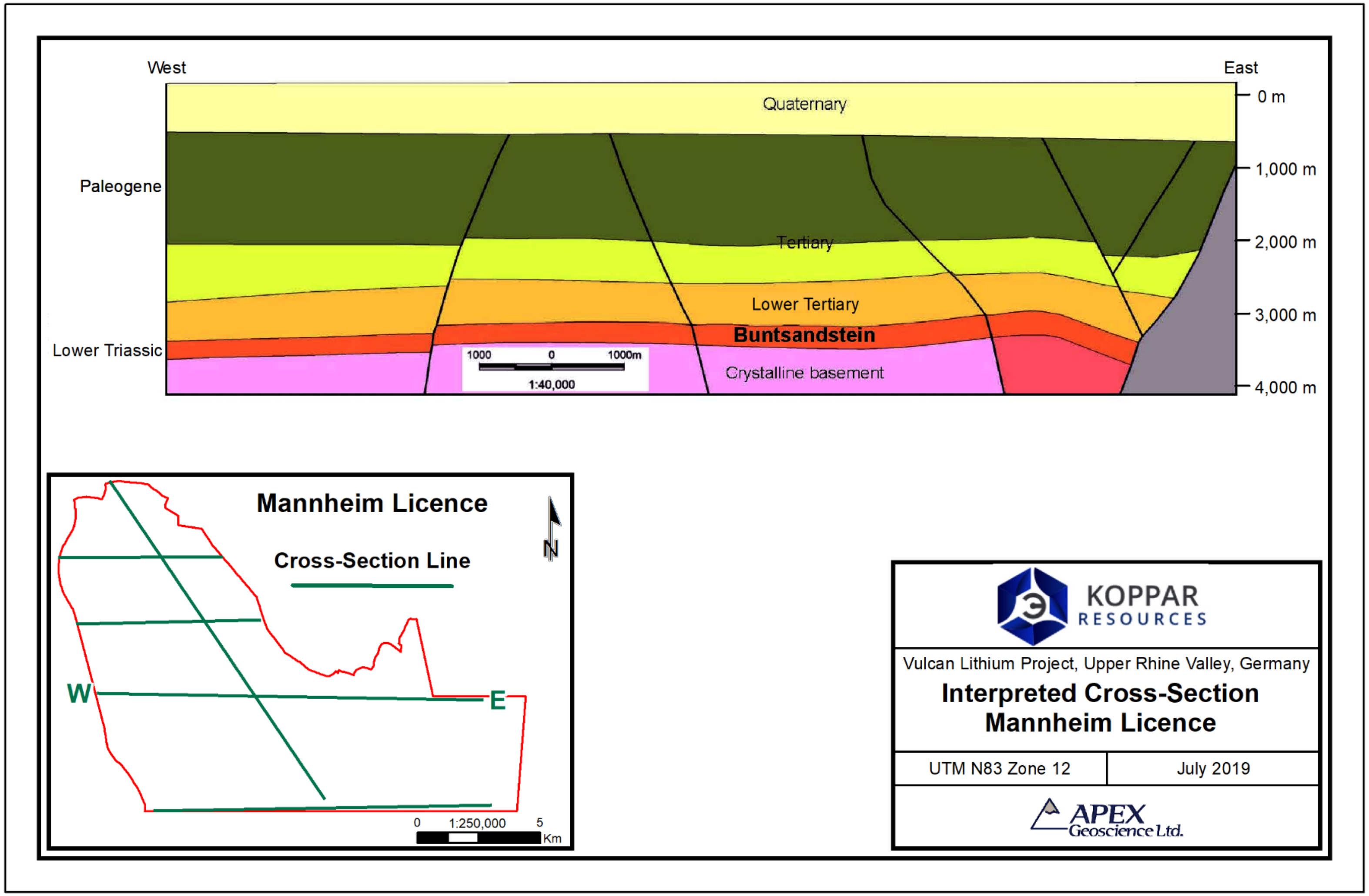

Figure 3: Interpreted cross-section at the Mannheim Licence. The outline of the Buntsandstein Formation was wireframed in the three-dimensional model to calculate the Buntsandstein volume at the Mannheim Licence

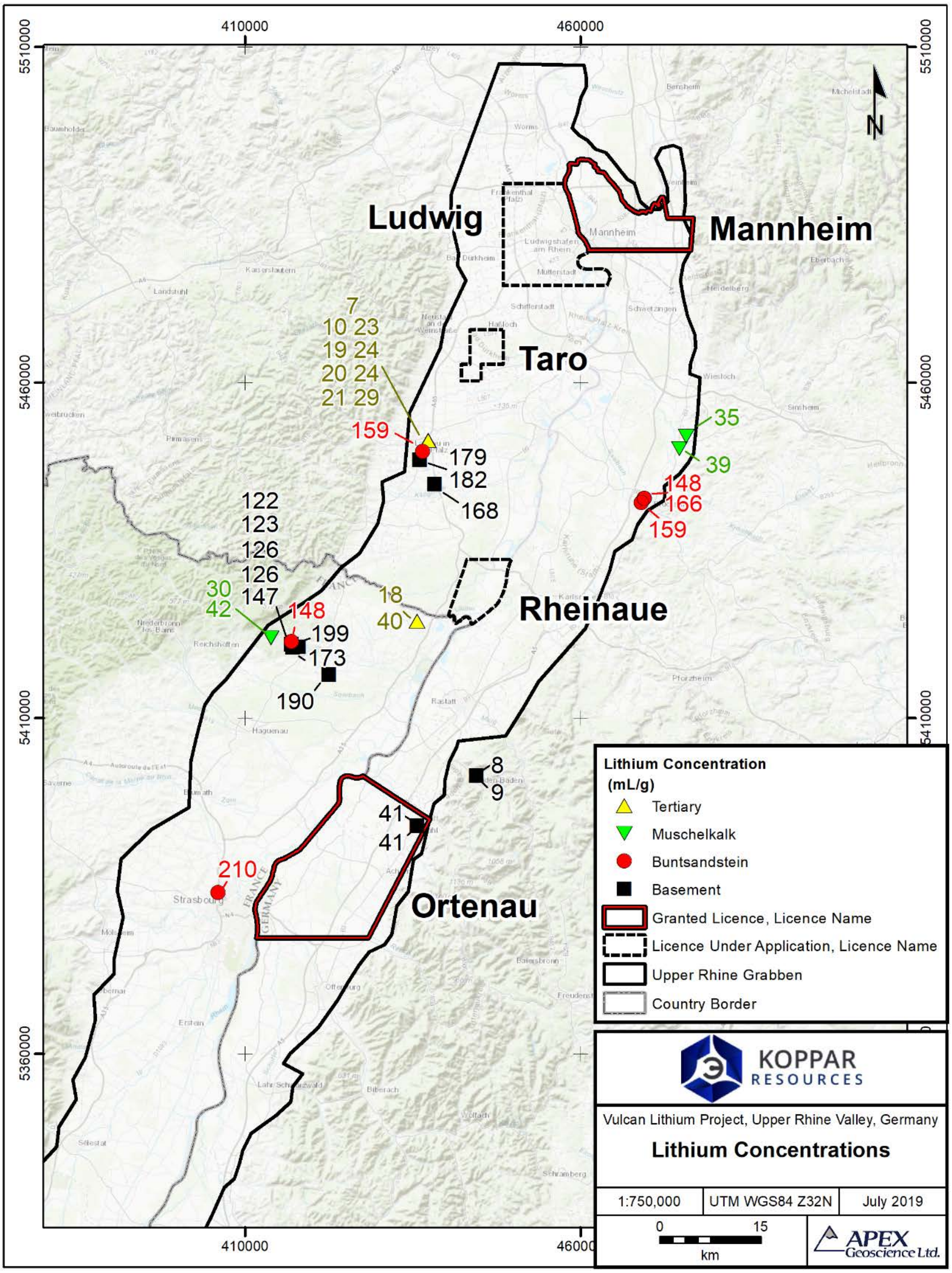

Figure 4: Summary of the lithium-brine concentrations across the Upper Rhein Graben. The image includes Li values from brine sourced within basement, Buntsandstein, Muschelkalk and Tertiary formations.

Table 2: Summary of the lithium-brine Exploration Targets at Koppar's Vulcan Project.

Licence name	Buntsandstein volume (m^3)		Porosity (%)		Lithium (mg/L)		Elemental lithium (tonnes)		Lithium carbonate equivalent (tonnes)	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Ortenau	116,955,310,023	175,432,965,035	7.6	11.4	126	190	1,125,000	3,798,000	5,991,000	20,218,000
Mannheim	26,330,185,372	39,495,278,058	7.6	11.4	126	190	253,000	855,000	1,349,000	4,552,000
Taro	12,242,856,163	18,364,284,244	7.6	11.4	126	190	118,000	398,000	627,000	2,116,000
Ludwig	34,796,431,605	52,194,647,408	7.6	11.4	126	190	335,000	1,130,000	1,782,000	6,015,000
Rheinaue	19,052,986,884	28,579,480,326	7.6	11.4	126	190	183,000	619,000	976,000	3,294,000
Total	**209,377,770,048**	**314,066,655,071**	**7.6**	**11.4**	**126**	**190**	**2,015,000**	**6,800,000**	**10,725,000**	**36,195,000**

Note 1: The Exploration Target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

Note 2: Buntsandstein volume ranges have been taken from the three-dimensional wireframed model created by APEX. The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs).

Note 3: Porosity is based on historical studies and information from GeORG, including measurements on core plugs (effective porosity); the porosity is intended to reflect the combined lithostratigraphic porosities of the entire Buntsandstein Formation section. In a 'confined' aquifer (as reported), porosity is a proxy for specific yield.

Note 4: The lithium concentration is based on 6 publicly available Buntsandstein Formation lithium analyses from throughout the Upper Rhine Graben.

Note 5: Numbers may not add up due to rounding of the resource values percentages (rounded to the nearest 1,000 unit).

Note 6: The Exploration Targets are reported using a cut-off of 100 mg/L Li.

Note 7: A conversion factor of 5.323 is used to convert elemental Li to Li_2CO_3, or Lithium Carbonate Equivalent (LCE).

Vulcan Lithium Project Summary

The Vulcan Lithium Project is in the Upper Rhine Valley (URV) geothermal field in Germany, an area **uniquely endowed with lithium-rich, hot sub-surface brines**. These brines have been sampled extensively at multiple locations throughout the URV, **with lithium grades often above 150 mg/l Li and up to 210 mg/l Li**. These concentrations are similar to the Hell's Kitchen lithium project in California (owned by Controlled Thermal Resources).

The aim will be to explore and develop the Vulcan Project to produce **battery-grade lithium hydroxide** from geothermal brines. Subject to confirmation in proposed study work, a **direct precipitation process** will be used for lithium processing which is **quicker and less water and carbon-intensive** relative to the evaporative method used in South American salars. The temperature of the brines is anticipated to be an advantage in the development of the processing method. Subject to entry into an offtake or joint venture agreement with a geothermal power producer, as a by-product of the production process, renewable geothermal energy could be generated from dual-purpose wells that fully offsets energy consumed in lithium production & processing, providing a premium, **"Zero Carbon Lithium"** product for the EV market.

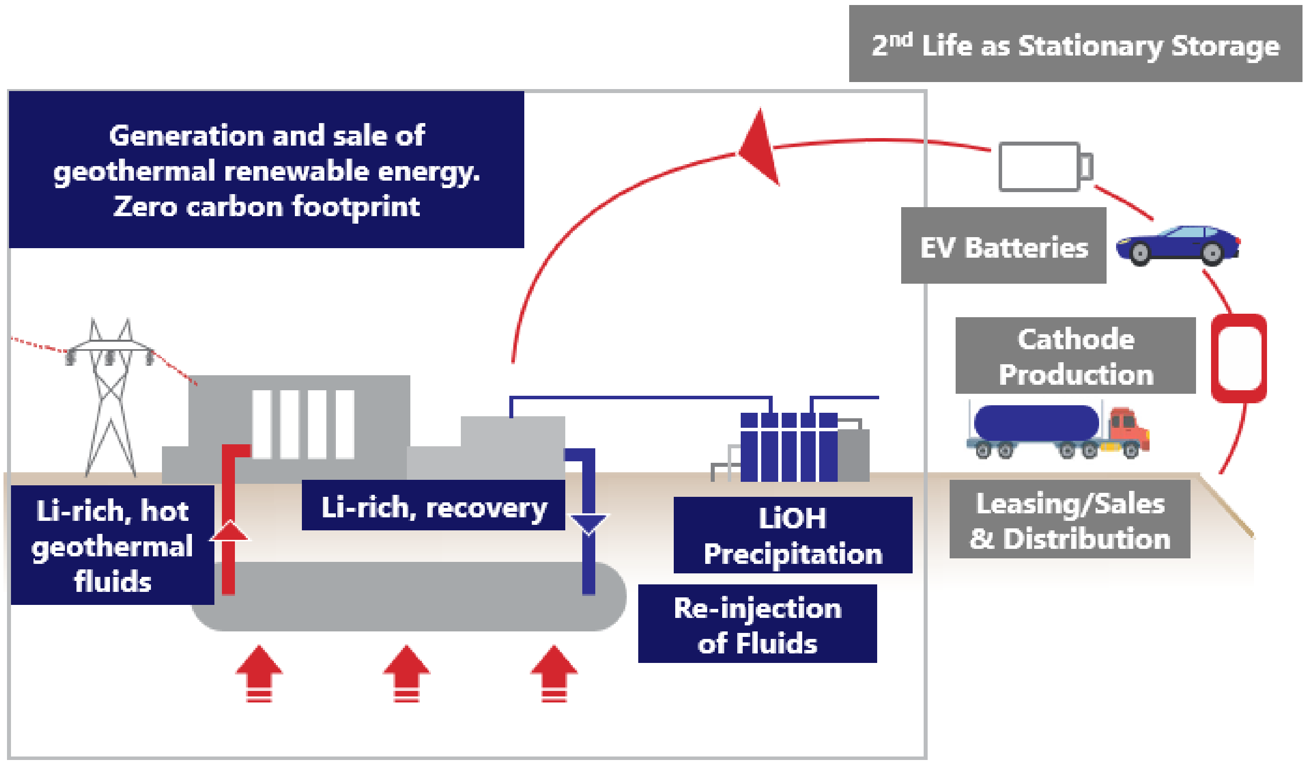

Figure 5: Planned process to produce Zero Carbon Lithium at the Vulcan Lithium Project

The project comprises two granted licenses and three license applications covering a total area of approximately 78,600ha. The Upper Rhine Valley brine field has been extensively studied due to its geological and geothermal characteristics, including exploration for oil and gas. As a consequence, the Company is acquiring a project in a very well understood brine field with considerable amounts of existing seismic and drilling data potentially available for exploration and resource evaluation.

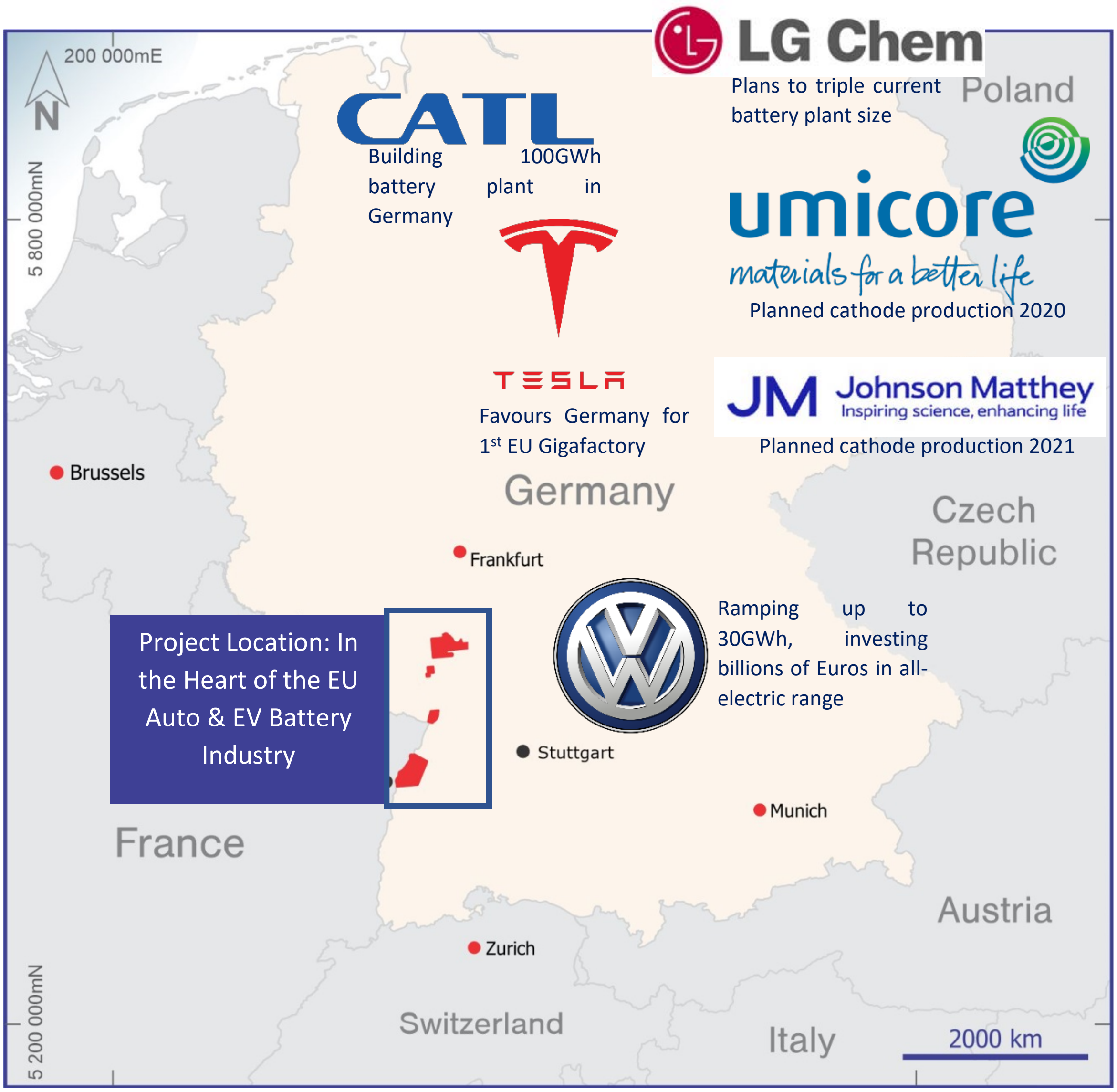

Figure 6: Vulcan project location, in the heart of European battery electric vehicle production

Need for a European, Low-Carbon Lithium Supply Chain

Hard-rock lithium operations are generally high OPEX and have high carbon footprint from processing methods and distance to markets. There is a bottleneck of lithium mineral concentrate processing to downstream, battery-grade lithium chemicals which as a consequence has reduced spodumene prices. Salar lithium operations in South America, typically at over 3,000 m above sea level, use large quantities of soda ash mined in the USA that needs to be transported to remote locations, resulting in a substantial carbon footprint. Salar operations also use large amounts of water in some of the driest places on earth. The salar evaporation process takes a long time (up to 12 months) and is vulnerable to weather events.

Electric Vehicle (EV) battery raw material supply chains have a carbon footprint problem. OEMs are **actively trying to reduce the carbon footprint** of their battery supply chains to bolster the credibility of their EV offerings. For example, **Volkswagen is placing great importance on having a CO_2-neutral production supply chain** for its new EV line-up, with **its sustainability metric for suppliers planned to be on par with price** (Volkswagen ID Presentation, 2019).

Global lithium demand, driven by high annual compound growth in lithium-ion battery manufacture and usage in vehicles and stationary storage, is set to increase to 1.85 million tonnes LCE by 2028, from a present level of around 0.3 million tonnes (Benchmark Mineral Intelligence, 2019). New lithium processing supply capacity is estimated to be around 1.7 million tonnes by 2028 (Roskill, 2019), **indicating a significant shortage**. This also assumes that current stated plans for increased capacity will progress on track without technical ramp-up issues, something that has not occurred to date (Roskill, 2019).

This presents an imminent problem for the lithium-ion battery industry, and thus the electric vehicle and stationary storage industries, who are committing multibillion-dollar CAPEX investments to achieve a total of 1.7 TWh battery production capacity by 2028 (Benchmark, 2019). The EU production of battery-grade lithium hydroxide or lithium carbonate is currently nil, yet the EU will require **150 kt per annum of LCE by 2023, and 290 kt by 2028** (Benchmark, 2019). The **majority of lithium supply** is controlled by just five companies, all of which are **non-EU** (SQM, Albemarle, Livent, Tianqi, Ganfeng, Source: Bloomberg).

Auto-**manufacturers require security of lithium supply** in the 21st Century for the transition to EVs, instead of relying solely on South American and Chinese production. The Vulcan Lithium Project presents a potential solution to this problem. Situated in a geothermal field of operational geothermal plants currently producing stable baseload, renewable energy, the URV field is one of the only heated brines globally that is uniquely enriched in lithium.

Subject to entry into an offtake or joint venture agreement with a geothermal power producer, the Vulcan Lithium Project aims to:

- **utilise dual-purpose geothermal energy and lithium-production wells to produce battery-grade lithium hydroxide,** in the heartland of EU battery EV manufacture, and

- produce more renewable energy than it consumes during lithium processing, which would effectively render it the first **zero-carbon lithium** project in the world (Figure 3).

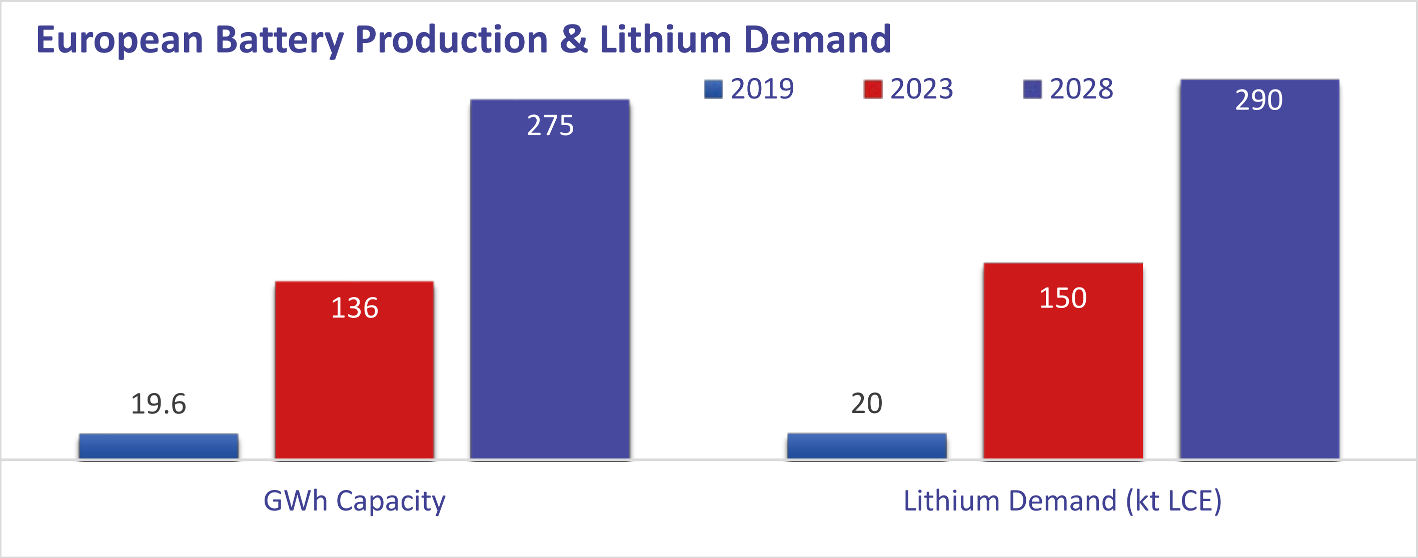

Figure 7: European forecast Li-ion production and associated lithium demand (Benchmark, 2019)

Lithium in Geothermal Brines

Globally, geothermal brines are relatively common, but the fluids are rarely lithium rich. Typical geothermal brine fields have lithium values in the order of 1-10mg/l Li. The Upper Rhine Valley geothermal brine field, in which the Vulcan Lithium Project is located, exhibits lithium values one to two orders of magnitude greater: **up to 210 mg/l Li,** and often over 150 mg/l Li from geothermal fluids sampled over extended periods of time from multiple locations (Sanjuan et al, 2016; Pauwels & Fouillac, 1993; refer KRX announcement 10/07/2019). The Vulcan Lithium Project includes a commanding land position in the brine field of over 78,600 ha of exploration licenses, of which over 51,000 ha is already granted. The overall brine field is well understood due to historical petroleum exploration, with considerable amounts of existing seismic and drilling data potentially available for purchase, exploration and resource evaluation.

Work Program

Koppar plans to rapidly advance the Vulcan Lithium Project to a Scoping Study over the next 12 months. Work programmes will commence with acquisition of all available seismic and geochemical data from the region, as well as a confirmatory geochemical sampling programme from available well locations, to confirm lithium grades.

The company will also commence lithium extraction processing test work on brine samples taken from existing wells within the Upper Rhine Valley.

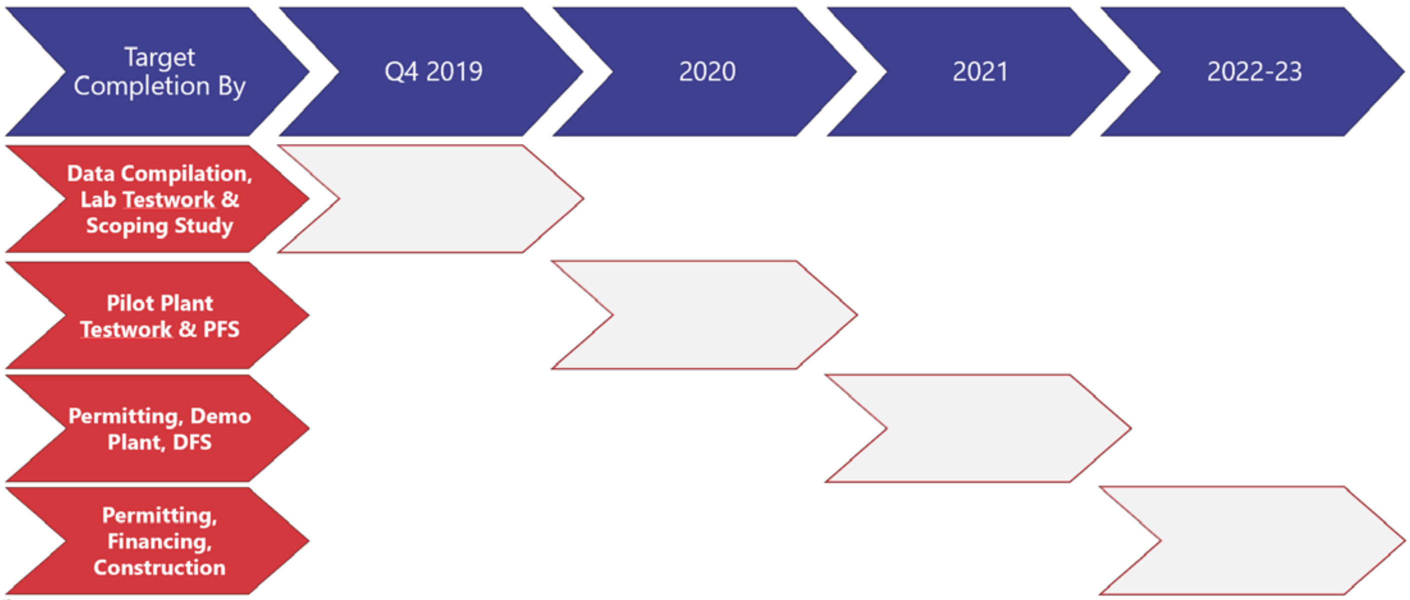

Figure 8: Planned work programme for Vulcan Lithium Project, pending exploration success at each stage.

About Koppar

Koppar is a junior exploration company established with the purpose of exploring and developing copper, zinc and other mineral opportunities. The Company owns mineral exploration projects located in the Trøndelag region of Norway, namely the Tverrfjellet Project, Grimsdal Project, Vangrøfta Project, and Undal Project. The Projects are located in a historic mining area, and mining has been previously carried out on several of the projects. Koppar has recently entered into a binding agreement to acquire Vulcan Energy Resources Pty Ltd., the owner of the Vulcan Lithium Project.

For further information visit www.kopparresources.com

Competent Person Statement:

The information in this report that relates to the Exploration Targets are based on, and fairly reflects, information compiled by Mr. Roy Eccles P. Geol. and Mr. Steven Nicholls MAIG, who are both full time employees of APEX Geoscience Ltd. and deemed to be both a 'Competent Person'. Both Mr. Eccles and Mr. Nicholls have sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity which they are undertaking to qualify as Competent Person as defined in the 2012 Edition of the Australian Code for the Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code). Mr. Eccles has reported to the scientific community, and as a geological consultant on exploration and resource related lithium-brine work, since 2010, specializing in confined, subsurface lithium-brine deposits in the Western Canada Sedimentary Basin, and the southern United States. Mr. Eccles and Mr. Nicholls consent to the disclosure of information in this report in the form and context in which it appears.

Disclaimer

Some of the statements appearing in this announcement may be in the nature of forward-looking statements. You should be aware that such statements are only predictions and are subject to inherent risks and uncertainties. Those risks and uncertainties include factors and risks specific to the industries in which Koppar operates and proposes to operate as well as general economic conditions, prevailing exchange rates and interest rates and conditions in the financial markets, among other things. Actual events or results may differ materially from the events or results expressed or implied in any forward-looking statement. No forward-looking statement is a guarantee or representation as to future performance or any other future matters, which will be influenced by a number of factors and subject to various uncertainties and contingencies, many of which will be outside Koppar's control.

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JORC TABLE 1

The following Tables are provided to ensure compliance with the JORC Code (2012 Edition) requirements for the reporting of Exploration Results.

Section1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling technique	• *Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or 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 (e.g. 'reverse circulation drilling was used to obtain 1m samples from which 3kg was pulverised to produce a 30g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.*	Koppar has yet to conduct any brine or core sampling at the project. Reported brine geochemistry is sourced from historical academic literature, being: - Pauwels, H. and Fouillac, C. (1993) Chemistry and isotopes of deep geothermal saline fluids in the Upper Rhine Graben: Origin of compounds and water-rock interactions. Geochimica et Cosmochimica Acro Vol. 51, pp. 2737-2749 - Sanjuan, B., Millot, R., Innocent, C., Dezayes, C., Scheiber, J., Brach, M., (2016) Major geochemical characteristics of geothermal brines from the Upper Rhine Graben granitic basement with constraints on temperature and circulation. Chemical Geology 428 (2016) 27–47 In the case of Pauwels and Fouillac (1993): the fluids collected were sampled between 1986 and early 1991, at the well head or at the spring discharge point. The fluids of all samples passed through a 0.45µm filter. A few parameters were determined on site, such as pH, total alkalinity, and GLR (gas/liquid volume ratio discharged during production). The sample fraction reserved for determining cations was acidified to pH = 2 with ultrapure HNO_3. Cadmium acetate was added to the solutions used for sulphur-isotope determinations and water isotopes were determined on a non-filtered fraction. All analyses were made at Bureau of Geological and Mining Research (BRGM). Chemical analysis of the Cronenbourg fluids was done at the geochemical laboratory of the Centre de Geochimie de la Surface (CNRS) at Strasbourg and the isotope analyses of the same samples were done at BRGM. In the case of Sanjuan et al (2016): Between 2012 and 2013 several fluid samples were collected from a) the geothermal wells drilled down to the granite basement at Landau, Insheim and Rittershoffen, and b) other geothermal or oil wells supplied in hot water from shallower Mesozoic or Cenozoic aquifers – i.e. the Bruchsal and Riehen geothermal wells,. Collection of the fluid

Criteria	JORC Code explanation	Commentary
		samples in the field was accompanied by appropriate on-site measurements such as fluid temperature, conductivity, pH redox potential, alkalinity and H_2S detection. The temperature, conductivity, pH and redox potential measurements were performed on the raw fluid samples, whereas alkalinity was analysed on fluid samples filtered at 0.45 µm. Collection and conditioning of all the brine samples followed the classical procedures recommended for each of the chemical and isotopic analyses to be performed. Thus, for the chemical analysis of major anions and some trace elements the water samples were filtered at 0.45 µm and collected in 100 ml polyethylene bottles. For the chemical analysis of major cations, the water samples were filtered at 0.45 µm, then acidified and collected in 100 ml polyethylene bottles. In order to avoid silica precipitation, the samples of hot water for silica analysis were collected in 50 ml polyethylene bottles and immediately diluted by a factor of 10 using Milli-Q water. For the chemical analysis of the other trace elements, such as B, Sr, Li, Ba, Mn, Fe, Al, Cs, Rb, Ge, As, Nd, Ag, Cd, Co, Cr, Cu, Ni, Pb and Zn, as well as for the isotopic Li and Sr analyses, the water samples were filtered at 0.1 µm, then acidified and collected in 100 ml polyethylene bottles. For the isotopic analysis of B, the water samples were filtered at 0.1 µm, then acidified using Suprapur HNO_3 and collected in 1l polyethylene bottles. • Seismic profiles, lithium concentrations and porosity values used to estimate the Exploration Target are based on information from: 1) a publicly available Geothermal Information System (GeORG Project, Landesamt für Geologie, Rohstoffe und Bergbau, available at: http://maps.geopotenziale.eu/?lang=en); 2) historical journal papers. • Geological (seismic) profiles used to design three-dimensional models were acquired via the GeORG Project, Landesamt für Geologie, Rohstoffe und Bergbau, available at: http://maps.geopotenziale.eu/?lang=en; the seismic interpretations were created by GeORG. • Brine sampling techniques within the various journal papers are cited in the respective papers. Brine is typically collected at the oil and gas, or geothermal, well head and analyzed at independent, accredited laboratories. • Journal- and PhD dissertation-cited porosity and permeability measurements were conducted on core plugs

Criteria	JORC Code explanation	Commentary
		utilizing, for example, bulk density meters, conversion of wireline logs to percent porosity using a sandstone density matrix, and gas pressure column and/or mini-permeate test methods. • The CP has reviewed the techniques and found the sampling was conducted using reasonable techniques in the field of brine assaying and there are no significant issues or inconsistencies that would cause one to question the validity of the data.
Drilling techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic etc.) and details (e.g. 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.).*	Koppar has yet to conduct any drilling at the project and is reliant on existing oil and gas, or geothermal, wells. No drilling results are reported. Historical geochemical samples reported in academic literature were taken from brines from existing geothermal production wells at well head. No further details are provided in the literature of the drilling techniques used to drill the wells.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed* • *Measurements taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and wether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	Koppar has yet to conduct any drilling and/or sampling of existing oil and gas, or geothermal, well infrastructure at the project No drilling results are reported. Historical geochemical samples reported in academic literature were taken from brines from existing geothermal production wells at well head. No further details are provided in the literature of the drill sample recovery in the wells.
Logging	• *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*	Koppar has yet to conduct any drilling and/or logging of existing oil and gas, or geothermal, drill cores at the project. Historical geochemical samples reported in academic literature were taken from brines from existing geothermal production wells at well head. No further details are provided in the literature of the drill logging in the wells.

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and wether quarter, half or all core taken.* • *If non-core, whether riffles, tube sampled, rotary split, etc. and whether sampled wet or dry.* • *For all sample types, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *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.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	According to Sanjuan et al (2016), collection and conditioning of all the water samples followed the classical procedures recommended for each of the chemical and isotopic analyses to be performed Thus for the chemical analysis of major anions and some trace elements, such as Cl, SO_4, Br, F, NH_4 and PO_4, the water samples were filtered at 0.45 µm and collected in 100 ml polyethylene bottles. For the chemical analysis of major cations, the water samples were filtered at 0.45 µm, then acidified using SuprapurHNO3 and collected in 100 ml polyethylene bottles. In order to avoid silica precipitation, the samples of hot water for silica analysis were collected in 50 ml polyethylene bottles and immediately diluted by a factor of 10 using Milli-Q water. For the chemical analysis of the other trace elements, such as B, Sr, Li, Ba, Mn, Fe, Al, Cs, Rb, Ge, As, Nd, Ag, Cd, Co, Cr, Cu, Ni, Pb and Zn, as well as for the isotopic Li and Sr analyses, the water samples were filtered at 0.1 µm, then acidified using Suprapur HNO_3 and collected in 100 ml polyethylene bottles. It is unknown whether measures were taken to ensure *in situ* material was collected, such as field duplicate sampling. However, multiple samples were taken from the same location at different times, with materially similar results. Koppar has yet to conduct any brine or core sampling at the project.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *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.* • *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	All the chemical analyses for both major and trace elements in the collected water samples were done in the BRGM laboratories using standard water analysis techniques such as Ion Chromatography, Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES), Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), Flame Emission Spectrophotometry, TIC analysis and Colorimetry (Sanjuan et al, 2016). No information was provided regarding quality control procedures. Koppar has yet to conduct any brine or core sampling at the project.

Criteria	JORC Code explanation	Commentary
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes* • *Documentation of primary data, data entry procedures, data verification, data storage (physically and electronic) protocols.* • *Discuss any adjustment to assay data.*	No drilling results are being presented. Historical brine geochemistry results are presented as a regional indicator of the presence of mineralisation, therefore this is not material. No adjustment to assay data has been carried out. Koppar has yet to conduct any brine or core sampling at the project, and therefore Koppar are unable to verify Li assays.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resources estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	Koppar has yet to conduct any brine or core sampling at the project, and hence, the Company has made no attempt to survey the oil and gas, or geothermal, wells that have been sampled as part of historical brine assaying work. The surface Digital Elevation Model used in the three-dimensional model was acquired from JPL's Shuttle Radar Topography Mission (SRTM) dataset; the 1 arc-second gridded topography product provides a nominal 30 m ground coverage. The grid system used is UTM zone 32N.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Reserve and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	Koppar has yet to conduct any brine or core sampling at the project. Three-dimensional geological models for each of the Licences were created by using west-east seismic cross-section profiles spaced approximately 3 km apart (see Figures 2 and 3). A roughly north-south cross-section was also used to confirm the stratigraphy between cross sections. The orientation of the Buntsandstein Formation is generally flat-lying and continuous in the Licence Fields (see Figures 2 and 3). Historical lithium concentrations were compiled from throughout the Upper Rhine Valley in wells with highly variable spatial locations. Spacing between wells varied from proximal locations (<1 km) to up to 32 km apart. In the conceptual Exploration Targets, Buntsandstein Formation lithium values are reviewed across the Upper Rhein Graben to assess the homogeneity of lithium in the aquifer.

Criteria	JORC Code explanation	Commentary
		No additional sample compositing has been performed.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *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.*	It is assumed that faulting within the Upper Rhein Graben will have an influence on local elemental concentrations, particularly on elements associated with deep basement circulating and/or geothermal fluids (such as lithium). Deciphering the influence of fault-related fluids was beyond the scope of this conceptual Exploration Target study. The historic well orientations are generally perpendicular (and optimal) to the orientation of the flat-lying Buntsandstein Formation
Sample security	• *The measures taken to ensure sample security.*	Not known due to historical nature of sampling. Koppar has yet to conduct any brine or core sampling at the project.
Audits or reviews	• *The results of and audits or reviews of sampling techniques and data.*	Koppar has yet to conduct any brine or core sampling at the project. An audit and review of the original Exploration Target – completed on behalf of Koppar by GeoT – was conducted by APEX. APEX reconstructed the Exploration Targets by modelling the Buntsandstein in a three-dimensional model to confirm and recalculate the Buntsandstein volume within each Licence. In addition, APEX validated the historical porosity and permeability data, and revised the average concentration of lithium used to calculate the Exploration Targets to conform with the geochemical data cited in public journal manuscripts.

Section2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenements and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interest, 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.*	Vulcan holds two, 100%-owned granted licenses within the Upper Rhine Valley geothermal field, called Mannheim and Ortenau. It also has an agreement with Global Geothermal Holding (GGH) to earn a joint venture (JV) interest into 80% of three other license applications in the Upper Rhine Valley geothermal field. The Licences are defined as 'Exploration Licences' and include the exploration rights to geothermal, brine and lithium. If required, Exploitation Rights would need be acquired pending the results of Koppar's future exploration work. The Exploitation Licence is typically smaller in spatial area in comparison to the Exploration Licence and require advanced modelling of the aquifer production and injection wells. Protected areas exist in each of the Licence's and include: water protection areas (Zones I and II), nature conservation areas and Natura 2000 areas. Licence's Ortenau and Mannheim were granted on 1st of April 2019 and 18th of June 2019 respectively for a period of two years. The licence applications for Taro (submitted 26th of November 2018), Rheinaue and Ludwig (both submitted 24th of April 2019) are expected to be approved this year. Although it is expected that these license applications will be successful, there is no guarantee that these applications will be granted to GGH. A summary of these licenses is shown below.

Name	Area (ha)	Status	Date Granted / Applied for	Ownership by Vulcan Energy Resources Pty Ltd
Ortenau	37,360	Granted	03/2019	100%
Mannheim	14,427	Granted	06/2019	100%
Taro	3,268	Application	03/2019	Earn in to 80%
Ludwig	17,716	Application	04/2019	Earn in to 80%
Rheinaue	5,848	Application	04/2019	Earn in to 80%

Criteria	JORC Code explanation	Commentary
Exploration done by other parties	• *Acknowledgement and appraisal of exploration by other parties.*	According to information publicly available from Geotis.de, a geothermal information website, there has been extensive exploration conducted in the Upper Rhine Valley geothermal field for oil and gas, as well as for geothermal energy, including 2D and 3D seismic data collection and exploration well drilling. As part of its initial work in the project, KRX aims to ascertain the parties who carried out the exploration and own the data. The Upper Rhine Valley is being actively investigated for its geothermal potential by multiple companies. The EuGeLi Consortium, including lead

Criteria	JORC Code explanation	Commentary
		partner (Eramet) and supporting partners (BASF, BRGM, ParisTech, IFP Energies nouvelles, Vito and Virje Universiteit Brussel), recently secured funding for lithium-brine projects in the Upper Rhine Graben at Soultz-Sous Forets (France).
Geology	• *Deposit type, geological settings and style of mineralisation.*	The potential lithium mineralization is situated within subsurface aquifers associated with the Lower Triassic Buntsandstein Formation sandstone situated within the Upper Rhein Graben at depths of greater than approximately 1,120 m below surface. The Buntsandstein Formation is comprised predominantly of terrigenous sand facies deposited in arid to semi-arid conditions in fluvial, sandflat, lacustrine and eolian sedimentary environments. The various facies exert controls on the porosity (1% to 27%) and permeability (<1 to >100 mD) of the sandstone sub-units. Potential sources of lithium mineralisation occur with brine occupying the Buntsandstein Formation pore space as well as within fractures. The chemical signature of the brine is controlled by fluid-rock geochemical interactions. With increasing depth, total dissolved solids (TDS) increases in NaCl-dominated brine. Lithium enrichment associated with these deep brines is believed to related to interaction with crystalline basement fluids and/or dissolution of micaceous materials at higher temperatures.
Drill hole information	• *A summary of all information material for the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* o *Easting and northing of the drill hole collar* o *Elevation or RL (Reduced level-elevation above sea level in metres) and the drill hole collar* o *Dip and azimuth of the hole* o *Down hole length and interception depth* o *Hole length*	No drilling results are being presented. Koppar has yet to conduct any drilling and/or sampling of existing oil and gas, or geothermal, well infrastructure at the project. Appendix 1 presents the well collar locations, well descriptions and lithium concentrations that were compiled from publicly available information.
	• *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*	No drilling results are being presented. Coordinates and depths of sampled geothermal well heads are provided in Appendix 1.

Criteria	JORC Code explanation	Commentary
	clearly explain why this is the case.	
Data aggregation methods	• *In reporting Exploration results, weighing averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually material and should be stated.* • *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.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	Koppar has yet to conduct any drilling and/or sampling of existing oil and gas, or geothermal, well infrastructure at the project Elemental lithium has been converted to Lithium Carbonate Equivalent ("LCE" using a conversion factor of 5.323 to convert Li to Li_2CO_3); reporting lithium values in LCE units is a standard industry practice. A lower cut-off of 100 mg/L Li has been used for the Lithium samples.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known')*	The Exploration Targets reported are conceptual in nature. Koppar has yet to conduct any drilling and/or sampling of existing oil and gas, or geothermal, well infrastructure at the project.

Criteria	JORC Code explanation	Commentary
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts would be included for any significant discovery being reported. These should include, but not be limited too plan view of drill hole collar locations and appropriate sectional views.*	Representative plan-view figures of the Property and historical lithium-brine sampling analytical results and geological model cross sections are presented in this news release.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	Historical geochemical datasets have been used to calculate the mean lithium concentration used in estimating the Exploration Targets. The geochemical dataset (n=6 analyses) included all publicly available Buntsandstein brine analyses (see Appendix 1).
Other substantive exploration data	• *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 containing substances.*	There is no other substantive data to disclose.
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, providing this information is not commercially sensitive.*	A comprehensive compilation of historical data, including purchase of 2D and 3D seismic data where possible, will be carried out. New verification sampling of well heads will be carried out where possible. Work recommendations include, but are not limited to: 1. Review and statistical analysis of current geochemical datasets. 2. Conduct a brine sampling program(s) to verify the historical brine assay results (i.e., in the greater Upper Rhein Graben area). 3. Conduct a brine sampling program within the boundaries of the Vulcan Property Licence's to verify Buntsandstein Formation aquifer geochemical values beneath the Property. 4. Conduct a thorough lithostratigraphic and hydrogeological investigation of the target formations, including the Buntsandstein

Criteria	JORC Code explanation	Commentary
		Formation. This work would involve, for example, compiling and interpreting historical oil and gas wireline log data and analysing archival core samples – if available – to better understand the hydrogeological characteristics and flow dynamics of the Buntsandstein Formation aquifer. 5. Conduct a qualified person site inspection of the Property – preferably during the brine sampling program. 6. Conduct a thorough investigation of the land tenure, including a review of any brine access 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. 7. Review and discuss Koppar's pending mineral processing and technological work plans toward recovery of lithium from the brine. 8. Pending the results of the points above, prepare a maiden mineral resource estimation for the Vulcan Project in accordance with JORC (2012).

Appendix 1: Collar locations for publicly available geochemical data. Buntsandstein Formation lithium results highlighted in grey.

Well ID	Easting (wgs84z32n)	Northing (wgs84z32n)	Depth (TVD)	Dip (°)	Azimuth (°)	Stratigraphic unit	Lithology	Li (mg/l)	Source
Miramar Weinheim GT2	NA	NA	1150	-90	0	Tertiary	Sand lens in clay	74.8	Al Najem (2016)
Buggingen Schacht 3	398227.816	5303818.504	1115	-90	0	Tertiary	Basaltic dyke	61.0	Carlé (1975), S. 423
LA-113 Landau oil well	437321.571	5451324.072	881	-90	0	Tertiary	Clay/sand/marl	10.5	Sanjuan et al. (2016)
LA-107 Landau oil well	437321.571	5451324.072	853	-90	0	Tertiary	Clay/sand/marl	6.9	Sanjuan et al. (2016)
LA-95 Landau oil well	437321.571	5451324.072	1002	-90	0	Tertiary	Clay/sand/marl	19.0	Sanjuan et al. (2016)
LA-134 Landau oil well	437321.571	5451324.072	1447	-90	0	Tertiary	Clay/sand/marl	24.5	Sanjuan et al. (2016)
LA-53 Landau oil well	437321.571	5451324.072	959	-90	0	Tertiary	Clay/sand/marl	20.2	Sanjuan et al. (2016)
LA-15 Landau oil well	437321.571	5451324.072	999	-90	0	Tertiary	Clay/sand/marl	23.0	Sanjuan et al. (2016)
LA-7 Landau oil well	437321.571	5451324.072	1451	-90	0	Tertiary	Clay/sand/marl	20.9	Sanjuan et al. (2016)
LA-33 Landau oil well	437321.571	5451324.072	1527	-90	0	Tertiary	Clay/sand/marl	29.4	Sanjuan et al. (2016)
LA-42 Landau oil well	437321.571	5451324.072	1050	-90	0	Tertiary	Clay/sand/marl	23.9	Sanjuan et al. (2016)
NDL-101 Scheibenhart oil well	435699.557	5424437.160	947	-90	0	Tertiary	Clay/sand/marl	39.7	Sanjuan et al. (2016)
NDL-102 Scheibenhart oil well	435699.557	5424437.160	561	-90	0	Tertiary	Clay/sand/marl	17.6	Sanjuan et al. (2016)
GBRU-1 Bruchsal geothermal well	469082.093	5442093.953	2542	-90	0	Triassic-Permian (Buntsandstein-Rotliegendes)	Sandstone	159.0	Sanjuan et al. (2016)
Bad Langenbrücken Karl-Sigel-Quelle	474713.709	5450147.417	610.9	-90	0	Triassic (Muschelkalk)	Limestone	39.1	Käß & Käß (2008), S. 903
Merkwiller GB Helios 2	413884.015	5421964.885	1146	-90	0	Triassic (Muschelkalk)	Limestone	41.6	Pauwels et al. (1993); Aquilina et al. (1997); Stober & Bucher (2012)
Merkwiller GB Helios 2	413884.015	5421964.885	1146	-90	0	Triassic (Muschelkalk)	Limestone	29.6	Pauwels et al. (1993); Aquilina et al. (1997); Stober & Bucher (2012)
RB-1 Riehen geothermal well	398455.379	5271293.423	1547	-90	0	Triassic (Muschelkalk)	Limestone	4.5	Sanjuan et al. (2016)
Riehen-1	398455.379	5271293.423	1547	-90	0	Triassic (Muschelkalk)	Limestone	4.8	Hauber (1991)
Riehen-2	NA	NA	1247	-90	0	Triassic (Muschelkalk)	Limestone	4.0	Hauber (1991)
Bad Mingolsheim Lambertus-Quelle	475737.134	5451956.021	637	-90	0	Triassic (Keuper, Muschelkalk)	Limestone	35.0	Käß & Käß (2008), S. 909
Soultz-sous-Forêts 4616	416948.996	5421383.477	1403	-90	0	Triassic (Buntsandstein)	Sandstone	148.0	Pauwels et al. (1993); Aquilina et al. (1997)
Bruchsal GB 1	469515.315	5442734.114	1932	-90	0	Triassic (Buntsandstein)	Sandstone	166.0	Pauwels et al. (1993); Aquilina et al. (1997)
Bruchsal GB 1	469515.315	5442734.114	1932	-90	0	Triassic (Buntsandstein)	Sandstone	148.0	LOGRO-Schlussbericht
Brühl GT1	NA	NA	3285	-90	0	Triassic (Buntsandstein)	Sandstone	117.5	Al Najem (2016)
Cronenbourg 1	406025.713	5384005.546	3220	-90	0	Triassic (Buntsandstein)	Sandstone	210.0	Pauwels et al. (1993); Aquilina et al. (1997)
Landau GT1	436522.032	5449701.070	3044	-90	0	Crystalline basement to Triassic	Granite to Sandstone	159.0	Teza et al. (2008)
ESC-04 Eschau oil well	407338.353	5370567.325	873	-90	0	Jurassic (Dogger)	Limestone	72.0	Sanjuan et al. (2016)
Soultz-sous-Forêts EPS 1	417129.902	5420536.880	2200	-90	0	Crystalline basement	Granite	199.0	Pauwels et al. (1993); Aquilina et al. (1997)
Soultz-sous-Forêts GPK 1	416967.999	5420992.931	2000	-90	0	Crystalline basement	Granite	123.0	Sanjuan et al. (1998)
Soultz-sous-Forêts GPK 1	416967.999	5420992.931	2000	-90	0	Crystalline basement	Granite	122.0	Pauwels et al. (1993); Aquilina et al. (1997)
Soultz-sous-Forêts GPK 1	416967.999	5420992.931	2000	-90	0	Crystalline basement	Granite	126.0	Pauwels et al. (1993); Sanjuan et al. (1998)
Soultz-sous-Forêts GPK 1	416967.999	5420992.931	2000	-90	0	Crystalline basement	Granite	126.0	Pauwels et al. (1993); Aquilina et al. (1997)
Soultz-sous-Forêts GPK 1	416967.999	5420992.931	2000	-90	0	Crystalline basement	Granite	147.0	Sanjuan et al. (1998)
Bühl 1	435689.333	5393970.874	2699	-90	0	Crystalline basement	Gneiss	41.2	Pauwels et al. (1993); Aquilina et al. (1997)
Bühl 1	435689.333	5393970.874	2699	-90	0	Crystalline basement	Gneiss	41.0	Pauwels et al. (1993); Aquilina et al. (1997)
GTLA-1 Landau geothermal well	436057.343	5448458.977	3044	-90	0	Crystalline basement	Granite	179.0	Sanjuan et al. (2016)
GTLA-1 Landau geothermal well	436057.343	5448458.977	3044	-90	0	Crystalline basement	Granite	182.0	Sanjuan et al. (2016)
INSH Insheim geothermal well	438292.684	5444886.855	3600	-90	0	Crystalline basement	Granite	168.0	Sanjuan et al. (2016)
GPK-2 Soultz geothermal well	418056.947	5420610.989	5000	-90	0	Crystalline basement	Granite	173.0	Sanjuan et al. (2016)
GRT-1 Rittershoffen geothermal well	422558.348	5416499.485	2580	-90	0	Crystalline basement	Granite	190.0	Sanjuan et al. (2016)
Friedrich-Quelle Baden-Baden thermal spring	444479.360	5401463.250	0	-90	0	Crystalline basement	Granite	8.7	Carlé (1975), S. 411
HQ Heilquelle Baden-Baden thermal spring	444479.360	5401463.250	0	-90	0	not specified	Not specified	8.0	Sanjuan et al. (2016)
							Mean of six Buntsandstein lithium analyses	**158.1**	