VULCAN ENERGY
ZERO CARBON LITHIUM™

ASX Release 29 September 2023

ASX:VUL
FSE:VUL

Fast Facts

Issued Capital: 168,335,301
Market Cap (@$2.91): $490m

Upgrade of Zero Carbon Lithium™ Project Resources

- ***Largest Lithium Resource in Europe increases in size***
- ***Increase in confidence, reduction of risk in the upstream of Phase One, in advance of upcoming Bridging Study completion and start of financing***

Vulcan Energy Resources Limited (Vulcan; ASX: VUL, FSE: VUL, the Company), the renewable energy and carbon neutral lithium company, is pleased to provide a Mineral Resources update for its Zero Carbon Lithium™ Project in the Upper Rhine Valley Brine Field (URVBF), Germany, towards the ongoing Bridging Study for its Phase One development, which is approaching completion.

Highlights:

- New, streamlined sub-surface work has incorporated:
  - New well data from production well workover at Insheim.
  - New 3D seismic data for better modelling of the reservoir.
  - Advanced reservoir engineering and scenario modelling to deliver optimised Field Development Plan (FDP).
  - Updated Phase One FDP which includes increased focus around the core, existing production/re-injection wells in the Insheim-Landau-Rift area (designated "Lionheart"), and removal of higher risk step-out zone from Phase One plans. Provides flexibility to cater for different risk and opportunities which could see improved CAPEX, recovery and injectivity.
  - Corresponding reduction of upstream risk, with one production centre instead of two, and around existing production infrastructure.
- Already the largest lithium Resource in Europe[1], Vulcan's URVBF lithium Resource has increased to 27.7 million tonnes of contained Lithium Carbonate Equivalent (Mt LCE) @ 175 mg/L, from 26.6Mt LCE @ 174 mg/L, to reflect a larger resource in the Phase One Lionheart area.
- Vulcan's URVBF area now comprises 11.2 Mt LCE @ 179 mg/L Li of Measured and Indicated Resource, of which 4.16 Mt LCE @ 181mg/l Li is in the Phase One Lionheart area, and 2.11 Mt LCE is now in the Measured category.
- The Phase One Bridging Study will be completed in November, after which Phase One financing will formally commence, with Vulcan seeking **project-level strategic equity and debt**, in line with successful market sounding conducted during 2023. Several key value

[1] According to public, JORC-compliant data. Refer Vulcan Zero Carbon Lithium™ Project Phase One DFS results and Resources-Reserves update <https://www.investi.com.au/api/announcements/vul/e617fca6-6d4.pdf 2022/02/13> (DFS Presentation)

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improvements not identified in the DFS from February have been identified (Figure 1), including driving further economies of scale through reduction of the planned two Lithium Extraction Plants (LEPs) and two geothermal power plants, to one central LEP and geothermal power plant with unchanged 24 ktpa lithium hydroxide equivalent capacity.

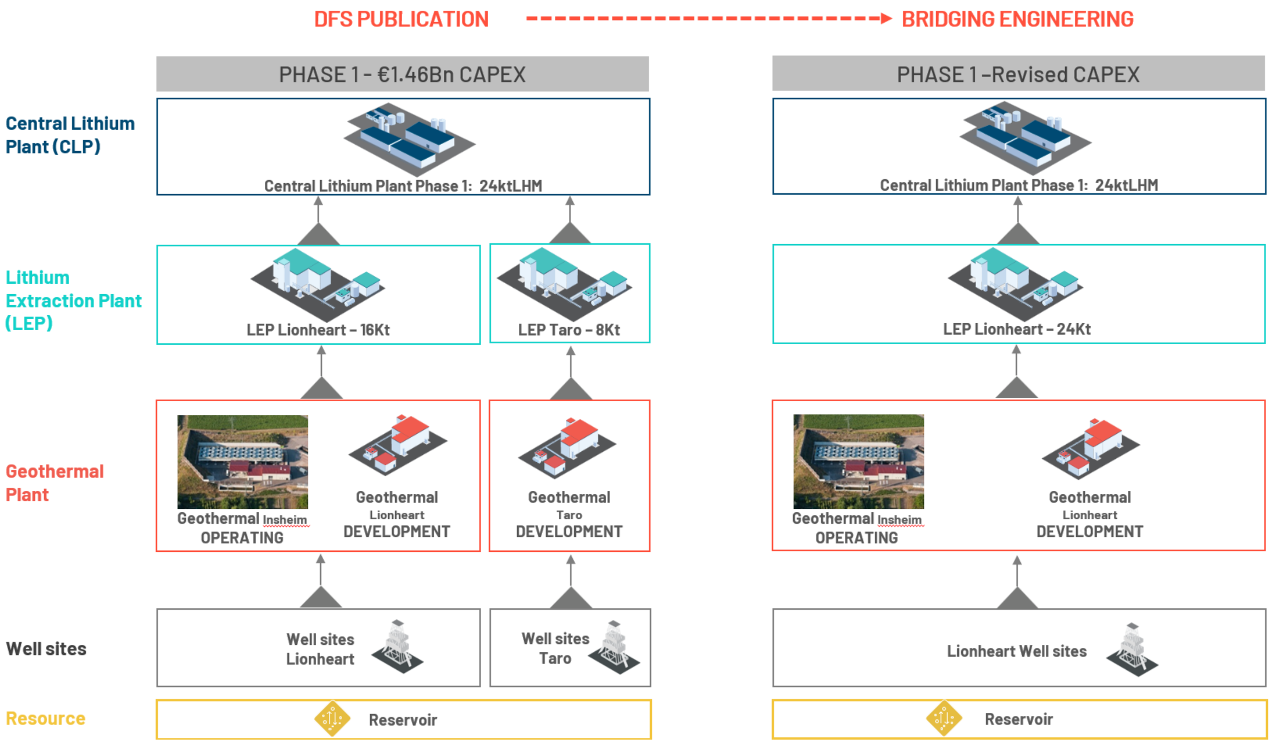

Figure 1 Simplification and de-risking of Phase One project structure

Location and Description

The upstream area for Phase One of the Zero Carbon Lithium™ Project comprises the Lionheart district, consisting of three licence areas. Lithium chloride (LiCl) production from wells in this area will be transported to the Central Lithium Plant (CLP), at Vulcan's downstream lithium chemicals production site at the Höchst Chemical Park near Frankfurt (Figure 4,5 & 6), to which Vulcan has secured exclusive access. Within the upstream Phase One district, Vulcan holds a 100% interest in the operating Insheim license, including the operational geothermal wells and plant. It has a brine offtake agreement in place to access brine from the geothermal wells and plant in the Landau-South permit, as well as a Joint Venture Agreement to develop another project area in Landau-South. It also has an agreement to develop the Rift North license neighbouring Insheim, subject to production compensation.

Figure 2 Location of Upper Rhine region in Germany. Source: (http://maps.geopotenziale.eu/, n.d.)

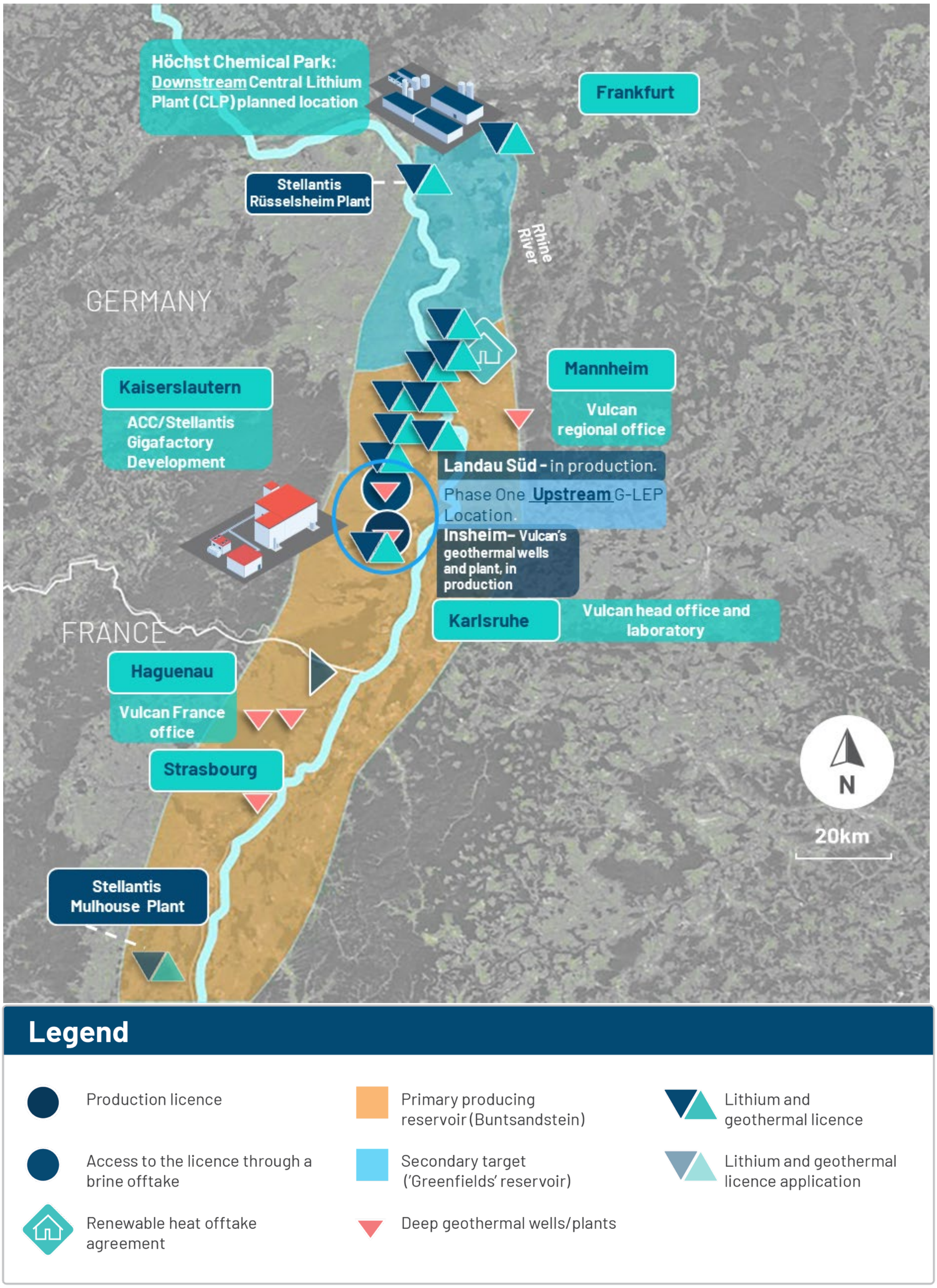

Figure 3 Overview of Vulcan's Zero Carbon Lithium™ Project area, showing Phase One[2].

[2] Please see Appendix 5 for further details on the licence area.

Figure 4 Site design for Vulcan's Central Lithium Plant located in Frankfurt (Hoechst Industrial Park). Close to 100,000sqm secured, enough for significant expansion.

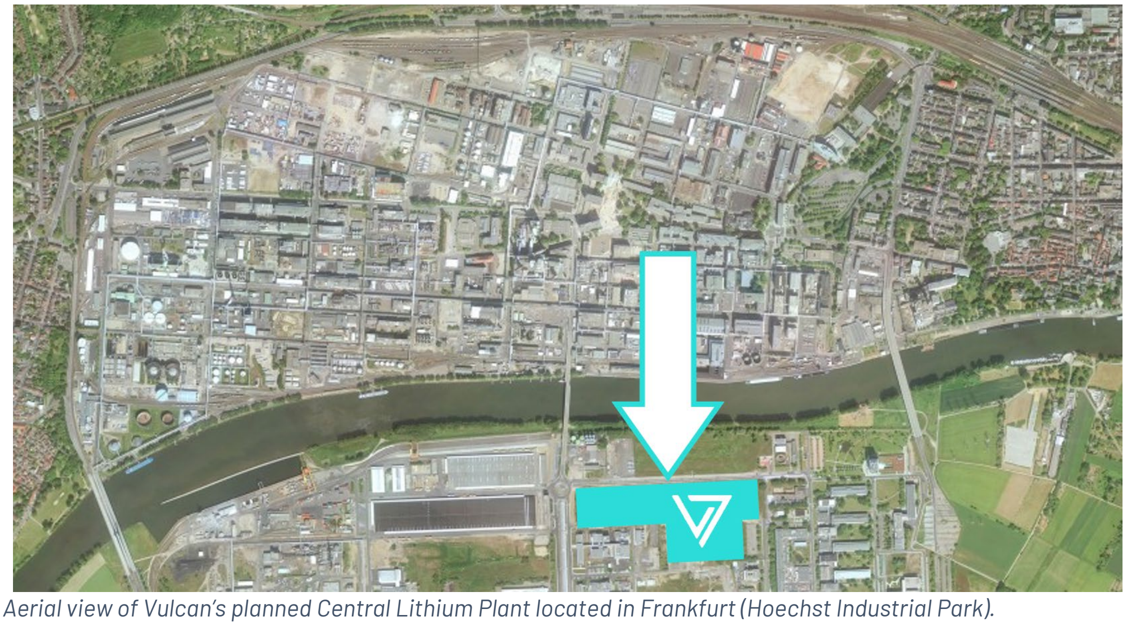

Figure 5 Aerial view of Vulcan's planned Central Lithium Plant located in Frankfurt (Hoechst Industrial Park).

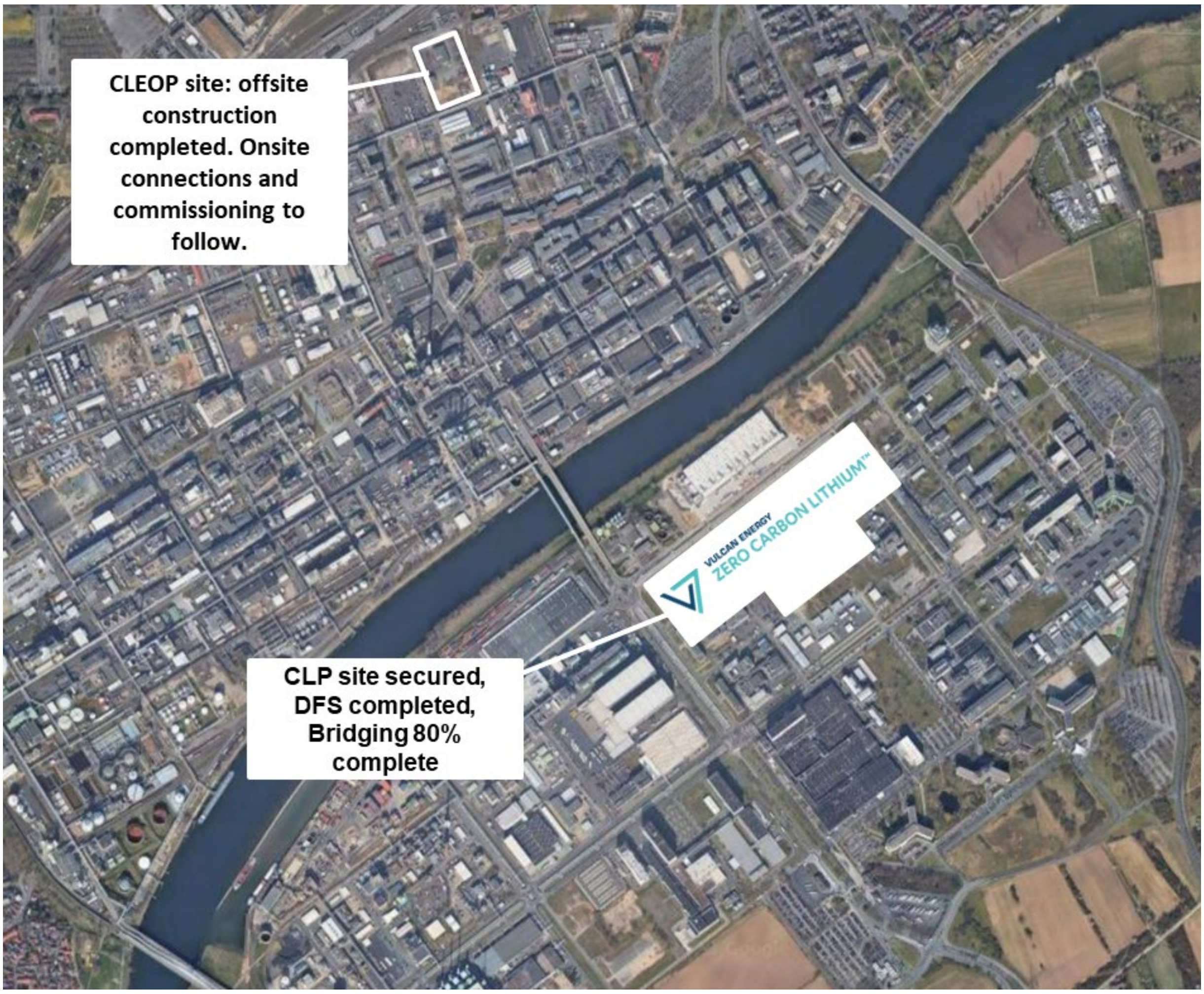

Figure 6 Hoechst Industrial Park, CLEOP and CLP sites.

The Project area is in the Upper Rhine Valley Brine Field (URVBF) (Figure 2), a sub-surface geothermal-lithium brine reservoir on the border between Germany and France. The area is located centrally in Europe and is highly developed with many rural and urban centres which are interconnected via roadways, freeways, and railways. This proximity to urban and rural centres presents a significant opportunity to provide sustainable renewable energy and heat. The Rhine River dominates the region as a major shipping route, and access to both sides of the river is possible, with many bridges. There are well developed industrial areas for automotive manufacturing, chemical industry, and related service sectors, including the Opel manufacturing plants owned by one of Vulcan's lithium offtakers, Stellantis.

The URVBF is a graben system containing a consistent geothermal lithium reservoir which, within Vulcan's Phase One development area and based on Vulcan's data, has an average lithium grade of 181 mg/l Li (see Mineral Resource section). The deep subsurface reservoirs targeted for lithium brine production are well explored in the region and have sufficiently high temperatures to support geothermal co-production with lithium recovery. There is a long history of deep well development in the URVBF, dating back to the 1980s, with many wells being developed for either hydrocarbon potential or geothermal potential (Figure 7). Many of the wells historically drilled in the URVBF have been shallower for the purpose of oil and gas production. Notable geothermal work includes R&D projects at Bruchsal, Germany and Soultz, France, which have tested various geothermal power generation technologies with deep geothermal source wells. Within the planned development area, Vulcan already has deep geothermal wells operating at the commercial geothermal energy plant at Insheim, and at neighbouring Landau South, where it has agreements with the license owner.

The Mineral Resource update includes discussion of the Vulcan licence areas that are planned for Phase One in the Lionheart district. An overview of licence locations in the central Upper Rhine Graben and details are provided in figure 7. In addition to the Phase One group of licences, Vulcan also holds 13 additional licences in the URVBF, for a total secured licence area of 1,745km^2. Vulcan has acquired the geothermal brine and lithium rights (licences) through direct application to the respective mining authorities of the German states of Rheinland-Pfalz, Baden-Württemberg, and Hessen. All exploration licences were granted pursuant to the German Federal Mining Act (Bundesberggesetz 'BBergG') for the purpose of commercial exploration of mining-free mineral resources: geothermal brine and lithium. Vulcan has acquired the lithium exploration and geothermal production licence at Insheim with 100% ownership.

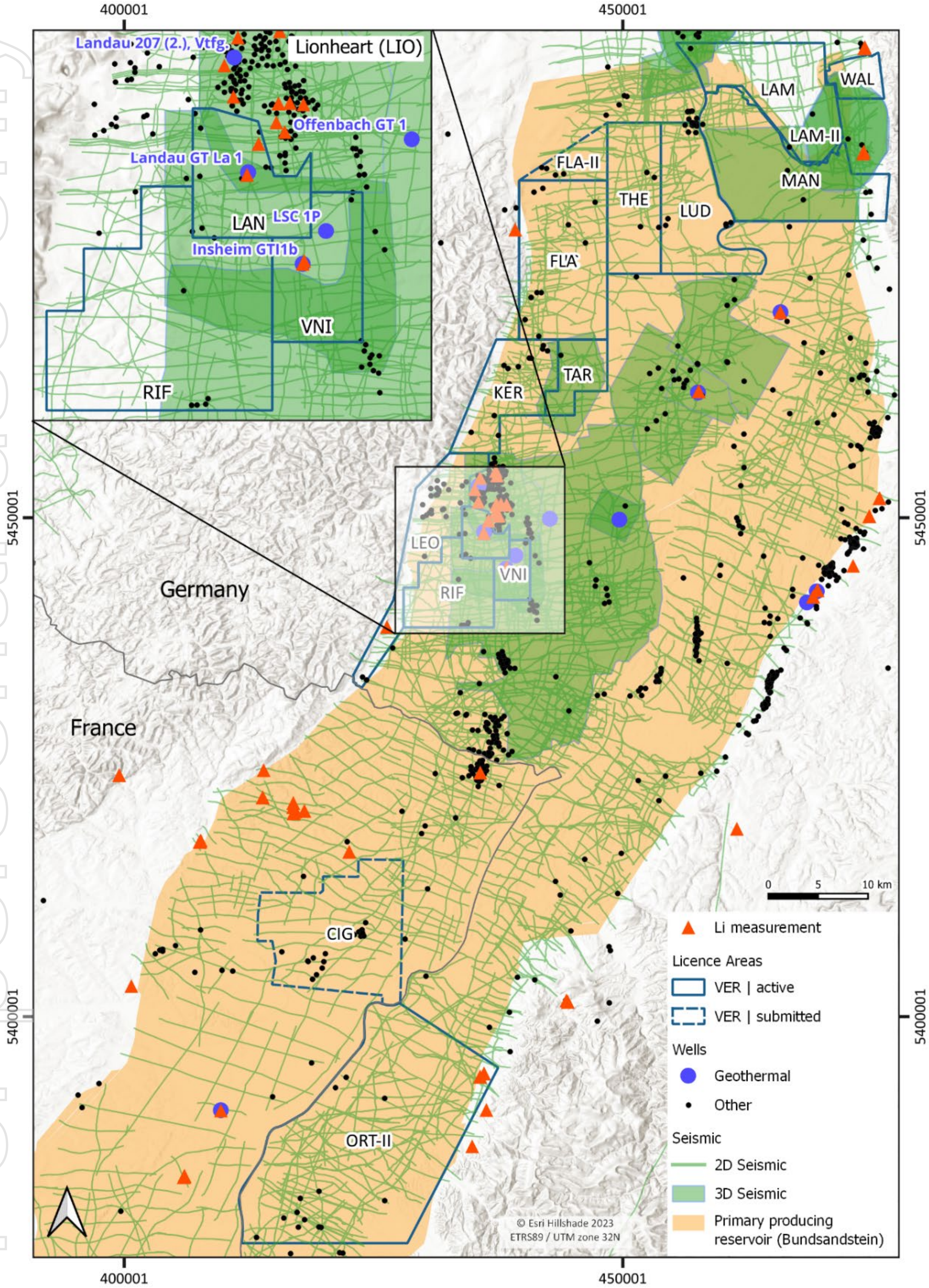

Figure 7 Map of Vulcan licensed areas in the central Upper Rhine Valley, showing well and seismic survey locations. Existing seismic data sets and well penetrations within the Upper Rhine Valley Brine Field, Germany. LAM: Lampertheim, MAN: Mannheim, LUD: Ludwig, THE: Therese, FLA: Flaggenturm, TAR: Taro, KER: Kerner, LEO: Löwenherz, VNI: Insheim, LAN: Landau-South, RIF: Rift North, CIG: Cigognes, ORT-II: Ortenau II. Other Vulcan licenses and application to the north and south not shown.

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Figure 8 Aerial photograph of Vulcan's Natürlich Insheim Geothermal Plant.

At Insheim, Vulcan operates the existing geothermal plant named Natürlich Insheim (Figure 8), which has the capacity to produce up to 4.8 MW of renewable power. There are two operating wells located at this plant, one for production of the 165°C hot brine and one for reinjection of cooled brine. The wells were drilled between 2009 and 2010. The plant has been in operation since 2012. There is a second geothermal plant in the region at Landau-South for which Vulcan has secured an offtake agreement for brine production with Geox GmbH (the operating company). The plant and wells have been in operation since 2007. Vulcan has entered a 51:49 (in Vulcan's favour) Joint Venture agreement with the owners of the Landau-South license to develop a new geothermal project in the same Landau-South licence as the current Landau plant, which will also supply Vulcan's Phase One operations with brine for lithium extraction. Vulcan has an agreement to develop new geothermal-lithium projects in the Rift North exploration license in return for a production royalty. Together, these licence areas comprise the "upstream", lithium chloride and geothermal renewable energy production area of Phase One, designated "Lionheart". Vulcan is concluding negotiations to supply the City of Landau with renewable heat as part of Phase One.

Vulcan plans to develop the licence areas in a phased approach. Phase One will be developed first, followed by future phases which will be further developments of similar size, in step out areas to the north and south. It should be noted that Vulcan's upcoming Bridging Study deals solely with Phase One. PFS data from Phase Two is now over two years old and should be treated with caution.[3] Subsequent Phases are planned to follow to fully leverage the large licence area that Vulcan has secured. The Phase One Project plans for a central surface facility for geothermal energy and lithium extraction operations

[3] Refer to disclaimer on pages 66-68.

to be fed from multi-well pads. Lithium extraction will be conducted in two stages, starting at the upstream Lithium Extraction Plant (LEP) and proceeding to a facility at Frankfurt Hoechst, the Central Lithium Plant (CLP). LHM product will be produced and marketed from the CLP.

The Phase One area is well located, close to existing road infrastructure and within relatively flat valley terrain. The Phase One area is mixed land use with rural, urban, agricultural, industrial, and park land. As stated previously the proximity to urban and rural centres presents a significant opportunity to provide sustainable renewable energy and heat. Vulcan has been diligent in ongoing planning development with consideration of existing land uses in consultation with local communities and landowners.

Geology and Exploration

The URVBF is part of the Upper Rhine Graben (URG) (Figure 2). The roughly 020° orientated Cenozoic Upper Rhine URG in west-central Europe forms part of the European Cenozoic Rift System (ECRIS) that extends from the North Sea, the Netherlands, western Germany, northern Switzerland, eastern France and down to the Mediterranean Sea. The URG extends from Frankfurt (Main) in the north to Basel in the south as a seismically active, morphologically distinct graben structure with a roughly 300 km long, 30 to 40 km wide lowland plain that drops from 200 m a.s.l. in the south to below 90 m a.s.l. in the north. It is surrounded by morphologically well-defined hills and mountains including: the Black Forest, the Vosges Mountains, Odin's Forest and the Palatinate Forest. The Rhine River flows through the valley formed by the URG and acts as a natural political and administrative boundary between Germany, France and Switzerland.

The URG can be subdivided into southern (Basel – Strasbourg), central (Strasbourg – Speyer) and northern (Speyer – Frankfurt) segments, each approximately 100 km long. Vulcan's licences are located within the northern and western part of the central segment. Due to its long history of hydrocarbon exploration and exploitation, the subsurface of the URG has been intensively investigated. Active geothermal power plants (Soultz, Rittershoffen, Landau, Insheim, Bruchsal) are exclusively located in the central segment. A geothermal district heating project was also established in Riehen (Switzerland) at the southernmost termination of the URG.

The focus of Vulcan's Zero Carbon lithium™ Project in the URG is on aquifers associated with the Permo-carboniferous Rotliegend Group sandstone, the Triassic Buntsandstein Group sandstone, and the Middle Triassic Muschelkalk Formation, which is composed of carbonate sediments, collectively the 'Permo-Triassic strata (Figure 9). The Permo-Triassic strata underly all Vulcan Property licences and are characterized as a laterally heterogeneous sandstone unit within a structurally complex rift basin. The Middle Triassic Muschelkalk succession, however, is only present from the Taro licence area towards the south in the URG.

The Rotliegend Group within the URG formed during the late stage of the Variscan Orogeny with local extension already happening. The Variscan Orogeny was accompanied by volcanism that led to the deposition of intrusive deposits into the basement, which is underlying the URG. Those intrusive deposits are believed to form an essential part of the lithium system. The actual rifting of the URG occurred during Cenozoic times. Hence, the fault system is comparably young.

The Lower Rotliegend comprised of alluvial-fan/fan-delta to fluvial-dominated Carboniferous and Permian sedimentary rocks. The basin infill subsequently transitioned from fluvial dominated to alluvial and eolian depositional environments during Upper Buntsandstein times.

The Lower Triassic Buntsandstein Group is subdivided into the Lower, Middle and Upper Buntsandstein subgroups as defined by distinct progradational and retrogradational fluvial sedimentary cycles. The Buntsandstein Group aquifer domain is defined as a confined sandstone aquifer that occurs between the fine grained Upper Buntsandstein Group and the coarse-grained base of the Lower Buntsandstein.

The Middle Triassic Muschelkalk represents the marine sedimentation that succeeds the fluvial deposition of the Buntsandstein. It consists of argillaceous dolomites and limestones as it represents a marine transgression. Towards the top of the Muschelkalk, evaporitic sediments dominate.

The Upper Triassic Keuper is dominated by pelitic sediments and represents a marine regression which provides a top seal for the reservoirs of interest together with the pelitic dominated Tertiary overburden.

The Permo-Triassic strata that includes the Rotliegend, Buntsandstein, and Muschelkalk Groups as well as 100 m of the Variscan basement are the focus of the resource models for the Lionheart development area, and Ortenau. Only the Buntsandstein group strata have been considered for the Northern licence areas that include Mannheim, Ludwig, Therese, Flaggenturm/Fuchsmantel, and the western part of Kerner.

Brine aquifers within the Rotliegend Group and Buntsandstein Group are considered to have some degree of hydrogeological communication. This is particularly evident in zones with a high degree of faulting and fracturing in which fluid brine can flow throughout the Permo-Triassic strata and can also penetrate the underlying faulted, fractured and altered granitic basement and the overlying Muschelkalk zone. These fault/fracture zones generally contain hot brine and exhibit high fluid flow rates. Consequently, they are a prime target for geothermal development.

Historical and Vulcan-conducted geochemical analysis of the aquifer brine from the Permo-Triassic strata shows the brine is enriched with lithium. In line with recent German Government policy emphasising decarbonisation and promoting the development of renewable sources, Vulcan is focused on extracting lithium from the deep-seated aquifers as a co-product of geothermal power production within the URG. That is, the geothermal wells represent potentially cost-effective access points to acquire deep, geothermally heated, lithium-enriched brine associated with the Permo-Triassic aquifers overlying the crystalline basement.

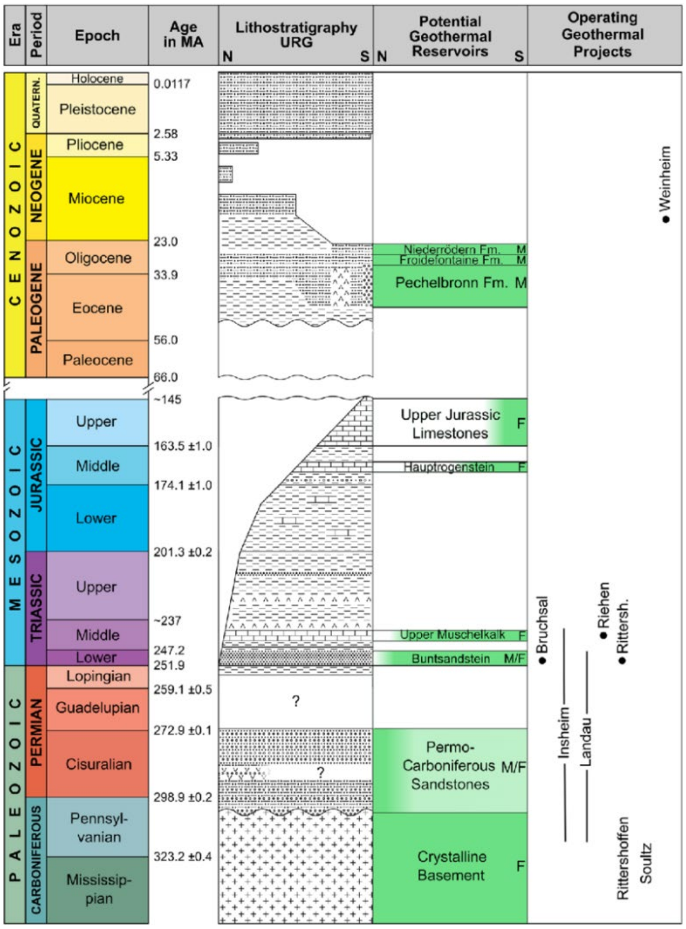

Figure 9 Stratigraphic chart for the Permo-Triassic strata in the URVBF

Lithium is a silver-grey alkali metal that commonly occurs with other alkali metals (sodium, potassium, rubidium and caesium). The atomic number of lithium is three and the atomic weight is 6.94, making it the lightest metal and the least dense of all elements that are not gases at 20º C (it is solid at 20º C, with a density of 534 kg/m^3). Lithium has excellent electrical conductivity (i.e., a low electrical resistivity of 9.5 mΩ•cm), making it ideal for battery manufacturing where lithium ions move from the negative electrode to the positive electrode during discharge and back when charging. Lithium imparts high mechanical strength and thermal shock resistance in ceramics and glass.

The average crustal abundance of lithium is approximately 17-20 parts per million (ppm) with higher abundances in igneous (28-30 ppm) and sedimentary rocks (53-60 ppm). Resource estimates and production quantities of lithium are often expressed as Lithium Carbonate Equivalent (LCE). The deep lithium-enriched brines of the URVBF originate from geothermal water-rock interaction in the deep subsurface. The lithium enrichment process consists of the following components:

- Recharge of meteoric water with no lithium.
- Downward flow of recharge water, to depth in the URG.
- Water interaction with micaceous, lithium-bearing basement rocks below the pre-rift sediments in the URG (high lithium concentrations) basement rocks.

- Upward flow of enriched brine (through fractures) into Rotliegend and Buntsandstein reservoirs.
- Natural seismicity maintaining the fracture permeability (i.e., self-sealed fractures are frequently reopened).
- Prevention of significant upward loss of enriched fluid by a low permeability top seal.
- Ongoing replacement (via recharge on the URG flanks) of any reservoir fluid that may be lost due to leakage through the upper seal (i.e., reservoir remains charged with lithium-enriched brines from basement).
- Ongoing convection of radiogenic heat from the crust maintains high temperature in the Rotliegend/Buntsandstein reservoir.

Enrichment of the deep URG waters with lithium is consistent with deep basin waters elsewhere in the world. For example, this process is known to occur to varying extents worldwide, at locations that include: the Cambrian Siberian Platform (Russia), the Devonian Basin (Michigan), the Mississippian-Pennsylvanian reservoirs (Illinois Basin), Paradox Basin (Pennsylvania), Triassic strata of the Paris Basin (France), and Jurassic Smackover strata from the Gulf Coast (Arkansas and Texas).

In the case of the Buntsandstein Group and Permo-Triassic aquifers in the URG, the deep-seated, lithium-enriched brine can be cost effectively recovered from the confined aquifer via existing, in-production and newly developed geothermal wells. Adsorption-type Direct Lithium Extraction (A-DLE) technology will be used to recover the lithium. The brine will be returned to the aquifer via reinjection wells, as it is now from Vulcan's operations, with no interruption in the geothermal plant operational cycle.

The URG is one of the most intensively investigated continental rifts worldwide. Consequently, there exists a large amount of relevant data including borehole logs, extensive 2D seismic surveys and a steadily increasing body of 3D seismic surveys directly related to lithium and geothermal development. Additionally, there are many scientific publications and R&D projects throughout the URG which provide a comprehensive understanding of this basin. Vulcan has acquired extensive existing 2D and 3D seismic data across its project areas.

Recently, Vulcan has also shot and acquired new 3D seismic data in the Lionheart, Mannheim and Lampertheim areas. Structural, geocellular and dynamic models were created from this data (tied to available well logs and production records from the Insheim and Landau geothermal wells), to determine the updated resource estimates for the Vulcan licences within the URVBF. The seismic data is important for resolving the presence and lateral continuity of the key zones of interest of the Rotliegend, Buntsandstein and Muschelkalk successions, as well as the granitic basement.

Geochemical data has been consistently acquired and verified throughout the URVBF to determine the presence and concentration of lithium within the brine. Samples have been verified independently and are consistent with averages used in the resource estimates. Vulcan's first comprehensive evaluation of brine chemistry was conducted in 2019 through a program that consisted of: 1) a geological compilation and subsurface review of the Permo-Triassic stratigraphy; 2) an assessment of the hydrogeological conditions underlying the Vulcan Property; and 3) collecting and analysing Permo-Triassic brine samples from the geothermal wells and plant operating at the Insheim resource area or property-neighbouring geothermal wells to verify the historical lithium brine geochemical results.

For the Phase One licences, the average lithium content from brine collected by Vulcan from six geothermal wells (including its 100%-owned Insheim geothermal plant) located throughout the URVBF and within or proximal to its licences was used as the representative grade for Resource Estimation. This grade was 181 mg/L Lithium (n=13 total metal analyses by ICP-OES). In addition, a detailed assessment of Permo-Triassic aquifer brine at the Insheim resource area production well yielded 181 mg/L Lithium (n=26 analyses). This grade was used as the regional lithium brine value for previous resource estimates and for the current update. These brine geochemical results demonstrate that the Permo-Triassic brine in the URG has a relatively homogeneous lithium chemical composition in the vicinity of the Phase One licences, both temporally and spatially.

In addition, independent brine sampling was conducted by former project Competent Persons (CPs) in September 2019 (Insheim), March 2022 (Landau), and November 2022 (Insheim and Landau). The former CPs sent the resulting samples directly to independent, certified laboratories. In all cases, analytical results were consistent with previous results from Landau and Insheim. Further confirmation of the consistent lithium content of brine recovered at Landau and Insheim is indicated by ongoing sampling and analysis conducted by Vulcan to support pilot lithium extraction operations at these facilities, which has been running consistently over 2.5 years, with hundreds of analyses returning similar results within analytical error margin of the average estimated grade.

The targets are permeable zones containing high temperature brine with lithium concentrations that can be extracted with minimal losses. The exploration programmes have evaluated public datasets, and proprietary data sets owned by Vulcan, utilising existing well data (sometimes on-property, sometimes off property) and seismic data. The recently completed seismic acquisition and processing campaign increased the confidence to extend the Mineral Resource estimation and enabled Vulcan to optimise well placement for improved field development, further de-risking the project. Models are planned to be regularly updated as Vulcan's development drilling and data acquisition continues across all its development areas.

Mineral Resources, Field Development Plan

Mineral Resources

Resources were estimated for Vulcan's licences within the URVBF. Geologically, the resource area includes the fault damage zones and host rock matrix of the Permo-Triassic sediments which includes the Rotliegend, Buntsandstein, Muschelkalk groups and 100m of Variscan basement. The fault damage zones were modelled to include 200 m on either side of the fault. The host rock matrix makes up much of the bulk volume within the licences. Petrel, an SLB geomodelling software package, was used to model the three geological units representing the permeable reservoirs for lithium-enriched brine: Rotliegend, Buntsandstein, Muschelkalk and 100m Variscan basement. This modelling approach is based on a comprehensive information package that includes 3D seismic data, 2D seismic data, geological well data (including core samples, outcrop data, depositional environment interpretations), and production data from currently producing wells at the Insheim and Landau licences within the core of the Phase One area. Dynamic modelling for the Lionheart zone in Phase One was also used to define the drainage areas and resource footprints for those licences. The workflow implemented for the calculation of the Vulcan lithium brine resource estimates for each licence is as follows:

- Definition of the geology, geometry and volume of the Permo-Triassic strata within the fault damage zones and host rock matrix using all the available subsurface and surface data.
- Hydrogeological characterisation and an historical compilation and assessment of effective porosity within the URVBF to estimate an average value for each geological unit.
- Determination of a representative lithium-in-brine concentration for each licence, based on Vulcan's brine sampling programs across the URVBF as well as independent testing of samples at Insheim and Landau.
- Numerical calculation (estimation) of the *lithium-initially-in-place (LIIP)* using the relation:

LIIP = Gross Rock Volume (GRV) X Average Net-to-Gross Ratio (Avg NTG) X Average Effective Porosity (Avg Phie) X Average Concentration of Lithium in the Brine (Avg LC)

Where;

GRV (km^3): gross rock volume - extracted from the geomodels after the verification and validation of the continuity of the stratigraphic horizons and fault interpretations from the 2D and 3D seismic data.

Avg NTG (decimal): net thickness to gross thickness ratio - gross thickness is determined from average thicknesses of the zones of interest identified in well log data and seismic data. The average net thickness is determined using an effective porosity cut-off of 5% within the gross interval. This is based on producing and previously producing geothermal and oil and gas wells within the URVBF (Appenhofen 1, Landau 207 and 211, Römerberg oil wells A-E – see reference list of studies below), within and proximal to Vulcan's Phase One area, that showed significant fluid flow from the target reservoirs. On the porosity versus permeability cross plot (Figure 10) of all the available core and sidewall core plug data in the URVBF for the Buntsandstein, 5 % effective porosity is equivalent to 0.02 mD permeability. Because permeability cannot be measured directly using wireline logs, this correlation of porosity with permeability helps to establish the effective flow of fluids within a reservoir where core data are not available. This is based on The Canadian Oil and Gas Evaluation Handbook (2005) for the evaluation of subsurface reservoirs (also see Nelson, 1994 for theoretical explanation).

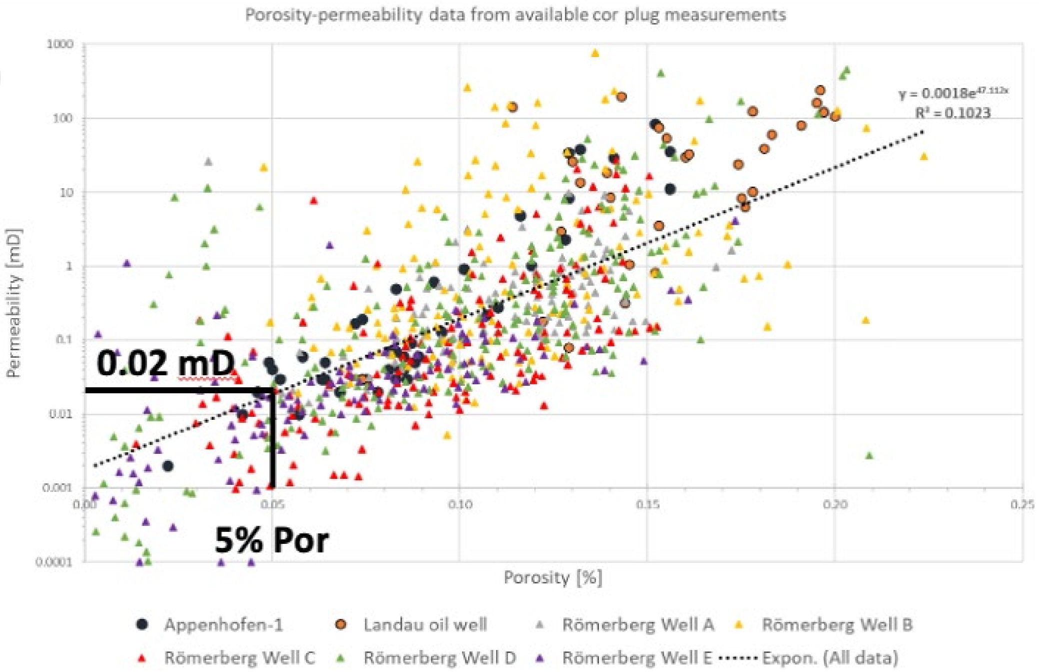

Figure 10 Porosity versus permeability cross plot of Buntsandstein core data for seven wells in the URVBF

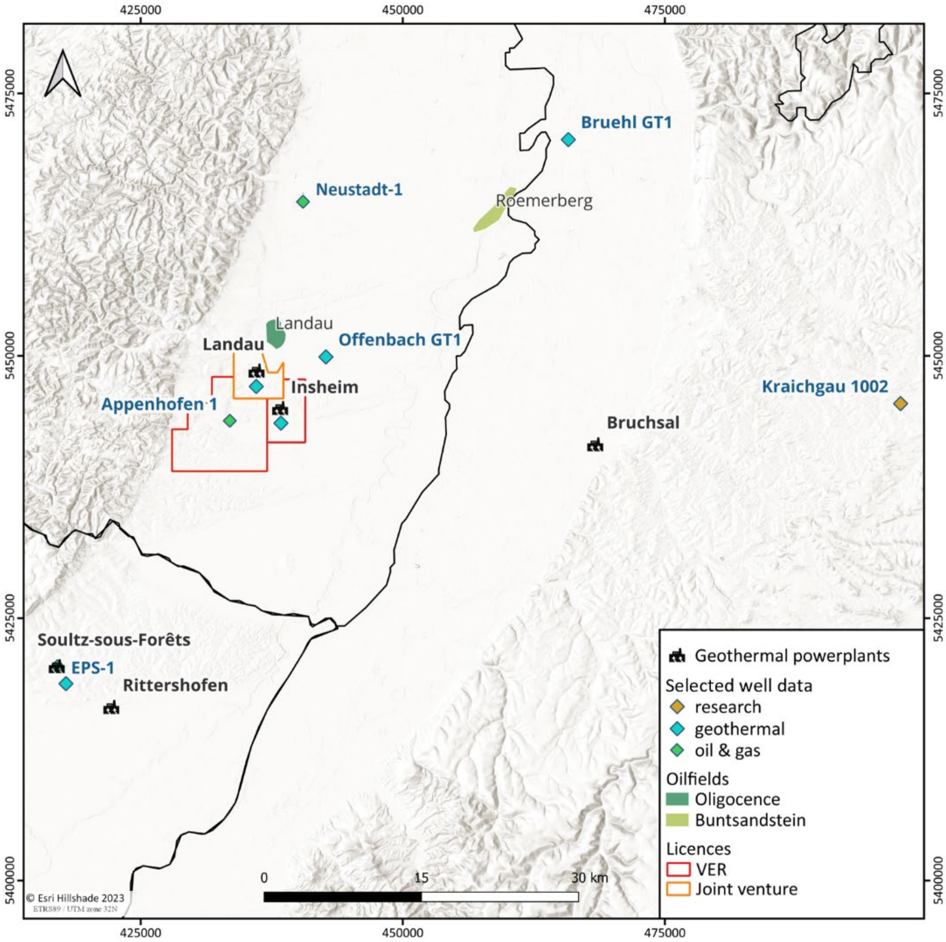

Figure 11 Map showing locations of wells with data incorporated into Phase One study, including on-property wells at Insheim-Landau geothermal plants, Appenhofen-1, wells within Landau field, and Römerberg field near to Taro. Green shows larger oil fields containing dense well drilling, coloured diamonds are indicating wells with data used for reservoir characterization, , geothermal plants with producing wells are also shown, including in Vulcan's own area.

Studies defining the porosity and permeability relationships using core plug measurements of producing geothermal and oil and gas wells (Figure 11):
GeORG Project, 2013 – Upper Rhine Graben regional study
Bossennec, 2019 – Römerberg oil field
Bush et al., 2021 – Landau geothermal wells
Heap et al., 2019 also provides core plug measurements of the Buntsandstein Group in the Soultz ESP-1 well in the URG in France.

Avg Phie (decimal): effective porosity - that portion of the total void space of a porous material that can transmit fluid. Determined from the petrophysical evaluation of density, neutron, and/or sonic well logs covering the zones of interest, supplemented with core and plug data where available.

Avg LC (mg/L): average lithium concentration determined from sampled wells in the URG.

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- Assessment and confirmation of "reasonable prospects for eventual economic extraction" for the estimated Mineral Resources on each licence, as per the JORC (2012) definition of Resources.

Derivation of NTG and Phie inputs to the Mineral Resource calculations was supported by a compilation of publicly available porosity and permeability data for the Rotliegend, Buntsandstein, and Muschelkalk units (fault damage zones and host rock matrix) including:

- Over 300 effective porosity measurements from Buntsandstein core and outcrop analysis and total porosity from wireline well log data, located throughout the URG (Sokol, Nitsch and GeORG-Projektteam, 2013; Soyk, 2015; Egert et al., 2018).
- Over 250 Buntsandstein Group permeability measurements and/or interpretations (Sokol, Nitsch and GeORG-Projektteam, 2013; Stober and Bucher, 2015), including inferences on fracture permeability (Vidal et al., 2015; Baujard et al., 2017a).
- Over 1,500 Rotliegend outcrop and 62 Rotliegend core plug porosity measurements (Bär, 2012; Aretz et al. 2016).
- Over 550 Rotliegend Group permeability measurements from well core plugs (Bär, 2012; Aretz et al. 2016).

Lithium-brine analytical data used in the resource estimates were discussed in the previous section. As noted, an average grade of 181 mg/L lithium was used for the Phase One licences.

To validate the continuity of the stratigraphic horizons of interest and to validate the fault interpretations, an independent audit of the modelled surfaces and faults was conducted based on; 1) raw seismic profiles, 2) downhole drill logs and e-logs associated with geothermal, and oil and gas wells drilled within the URVBF, 3) the regional 2D geological model cross-sections, and 4) the 3D geomodel.

A cut-off grade / resource quantity analysis was not strictly applicable to resource, due to the use of average grade in the static resource estimate. However, it is noted that a grade for economic extraction of 100 mg/L has been established on a provisional basis for the lithium extraction process and that all resources are currently estimated to exceed that grade.

The resource classification criteria used for the URVBF are based on the quality of the data available and the CP confidence level in the integration of all the data by Vulcan's multi-disciplinary team. This team includes geophysicists, geologists, reservoir engineers with experience from the oil and gas industry, hydrogeologists, geothermal specialists and chemical engineers with relevant experience in the Permo-Triassic brine geology, hydrogeology and lithium brine processing. The Mineral Resource classifications are shown on Table 1 for Vulcan's licences in the URVBF that were part of the Resource Estimate. Some important points to support the assigned mineral resource classifications include: 1) a greater level of confidence in the subsurface geological modelling because of Vulcan's acquisition of 2D and 3D seismic data, as well as static and dynamic modelling of the Permo-Triassic strata calibrated to available well data, 2) ongoing production data from two producing geothermal wells at Insheim (in production since 2012) and Landau (in production since 2007), and the acquisition of new well test data during a recent production well workover, and 3) knowledge of Vulcan's commissioned A-DLE mineral processing test work and results from its pilot plants at the operating wells.

Vulcan has completed multiple phases of test work, sampling and interpretation that are adequate to support the disclosure of Mineral Resource estimates (Table 1). In the opinion of the CPs, the Vulcan URVBF licences for lithium and renewable energy projects have reasonable prospects for future economic extraction based on aquifer geometry, delineation of fault zones using new 3D seismic data, brine volume, brine composition, hydrogeological characterization, porosity, fluid flow, optimization of field development plan, and advancement of the Company's DLS technology. The CP, Gabriella Carrelli, M.Sc., P. Geol. takes responsibility for this statement.

Per JORC, Mineral Resources are not Ore Reserves and do not have demonstrated economic viability. Inferred Mineral Resources have a lower level of confidence associated with their estimation than Indicated Mineral Resources, but it is reasonably expected that with further exploration the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources. Indicated Mineral Resources are sufficiently well defined to allow application of Modifying Factors to support well planning and economic evaluations of the deposit. Measured Mineral Resources are sufficiently well defined to allow application of Modifying Factors to support detailed well planning and final evaluation of the economic evaluations of the deposit.

Table 1. Vulcan's combined Zero Carbon Lithium™ Project Lithium (Li) brine Measured, Indicated and Inferred Mineral Resource estimates. Phase One licences indicated in orange highlight. Note: see Competent Person Statement at the end of this document.

Licence/ Area	**Reservoir**	**Classification**	**GRV** km^3	**Avg. NTG** %	**Avg. Phie** %	**Avg. Li** mg/L	**Elemental Li** t	**LCE** kt
Insheim	*MUS, BST, ROT, BM	Measured	13	69	9	181	151,823	808
Rift-North	*MUS, BST, ROT, BM	Measured	9.5	70	9	181	110,181	586
	*MUS, BST, ROT, BM	Indicated	29	71	9	181	355,443	1892
Landau South	*MUS, BST, ROT; BM	Measured	12	68	9	181	134,677	717
	*MUS, BST, ROT; BM	Indicated	2.7	69	9	181	29,620	158
Flaggenturm	BST	Indicated	7	90	10	181	115,215	613
	BST	Inferred	37	65	9	181	391,201	2,082
Kerner	BST	Indicated	5	90	10	181	76,242	406
	BST	Inferred	13	65	9	181	132,558	705
Kerner Ost	*MUS, BST, ROT	Indicated	4.3	73	8	181	66,708	355
Taro	*MUS, BST, ROT	Indicated	14.5	73	8	181	237,362	1,263
Ortenau	*MUS, BST, ROT	Indicated	57	73	8	181	659,013	3,507
	BST	Inferred	105	73	8	181	1,883,212	10,024
Mannheim	BST	Indicated	4	90	10	153	54,111	288

Licence/ Area	Reservoir	Classification	GRV km^3	Avg. NTG %	Avg. Phie %	Avg. Li mg/L	Elemental Li t	LCE kt
	BST	Inferred	32	65	9	153	290,312	1,545
Ludwig	BST	Indicated	7	90	10	153	93,220	496
	BST	Inferred	22	65	9	153	199,226	1,060
Therese	BST	Indicated	2	90	10	153	29,907	159
	BST	Inferred	22	65	9	153	200,708	1,068
						mg/L		**kt**
Total LCE		**Measured**				**181**		**2,112**
		Indicated				**178**		**9,137**
		Inferred				**172**		**16,484**

Note 1: Mineral Resources are not Ore Reserves and do not have demonstrated economic viability.
Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs). Numbers may not add up due to rounding of the resource value percentages.
Note 3: Reservoir abbreviations: MUS – Muschelkalk Formation, BST – Buntsandstein Group; ROT – Rotliegend Group; BM – Variscan Basement.
Note 4: To describe the resource in terms of industry standard, a conversion factor of 5.323 is used to convert elemental Li to Li_2CO_3, or Lithium Carbonate Equivalent (LCE).
Note 5: NTG and Phie averages have been weighted to the thickness of the reservoir. These averages are consolidations of multiple local zones and therefore multiplied together will not equate to the global elemental lithium values presented. The elemental lithium values presented are determined separately using detailed data for each zone and then summed together to show a total value for the purposes of this summary table.
Note 6: GRV refers to gross rock volume, also known as the aquifer volume. GRV values presented in this table are rounded to the first significant figure for presentation purposes. The elemental lithium values presented are calculated using GRV values that have not been rounded.
Note 7: Mineral Resources are considered to have reasonable prospects for eventual economic extraction under current and forecast lithium market pricing with application of Vulcan's DLS processing.
Note 8: The values shown are an approximation and with globalised rounding of values in the presented summary table as per JORC guidelines, cannot be multiplied through to achieve the Mineral Resource estimated volumes shown above.

Field Development Plan

The field development plan (FDP) is the overall well plan which defines the brine production and injection forecast for the Phase One project area at Lionheart. The development plan for Lionheart includes the addition of new wells, plus the continued operation of existing wells at Insheim and Landau. The placement of the new wells has been optimised using the newly acquired 3D seismic and improved static and dynamic models. The FDP takes into consideration the drilling plan for the wells and the timeline for construction of surface facilities and infrastructure for the project. All activities associated with the FDP and overall project execution take into consideration safety and environmental protection and plan to follow all regulatory requirements.

The aim of the revised FDP is to produce the same quantity geothermal-lithium brine, consistent with the DFS, from the upstream Lionheart area of Phase One, from multiple new and existing well sites, with a gradual ramp up process whilst construction of the geothermal plant, LEP and CLP are ongoing. The producer wells are planned to be connected to open faults which are within a high conductivity area, to minimise the drawdown. The injector wells are planned for drilling mostly away from the faults to optimise the sweep of lithium-rich brine toward the faults and the producers, while some injectors are planned to be drilled to the fault zones to increase the water injection capacity where deemed optimal. The injectors drilled in tighter, less fractured areas are mostly multilateral so that the connection to the reservoir is maximised. This hybrid development concept of reinjecting brine where geology is most favourable, allows for maximised recovery which serves to manage subsurface uncertainties, and reduces risk.

The typical well plan trajectory will start from vertical, at surface down to a depth of 1,000m, and will then deviate to achieve the bottomhole target location in the Buntsandstein. Vulcan plans out each well individually but uses a generic model as a base case. The wells are planned to be drilled with water-based mud systems and include extensive formation evaluation methods such as mud logging, wireline logging, coring and geochemical analysis of cuttings. The wells are planned to be large sized boreholes to accommodate the large fluid rates expected, with 20″ surface casing down to 7″ liner across the production or injection intervals.

The dynamic reservoir modelling assumes dilution of lithium concentration over time at the reservoir level near the producer wells due to sweep effects of the lithium diluted brine reinjection. The cut-off assumed for economic production is 100 mg/L lithium, where the starting concentration is 181 mg/L lithium.

The expected flow rate from each well is determined by geological characterisation and the dynamic flow modelling, with maximum drawdown for producers and maximum injection pressures taken into consideration, and then optimised for lithium sweep. A 1:1 ratio of produced to injected fluid is assumed, as there is no water storage planned for the sites. This replacement of brine back to the reservoir allows for pressure maintenance and sweep effects.

There are a total of 11 production wells planned for Lionheart, which includes two existing, operational production wells. A total of 17 injectors are planned with 2 existing operational wells, and an addition of 12 side-tracks.

Next steps

Vulcan, together with Hatch, is in the final stages of finalising its Bridging Study for Phase One. In the meantime, it is progressing works at its new drill site in the Insheim licence, within the Phase One upstream area. The aim of the Bridging Study will be to show a higher definition of engineering, at approximately a Class 2 estimate, sufficient to secure an EPCM contractor for Phase One. Once the Bridging Study is completed, Vulcan will formally commence its debt and equity financing process for Phase One, which is aiming to do at a project level. The market sounding process for the debt financing has already been successfully completed, with positive results. During the execution of the FDP, Vulcan will continue to iterate and improve its modelling and estimation with new data and update its Resources-Reserves accordingly.

About Vulcan

Founded in 2018, Vulcan's unique Zero Carbon Lithium™ Project aims to decarbonise lithium production, through developing the world's first net carbon neutral lithium business, with the co-production of renewable geothermal energy on a mass scale. By adapting existing technologies to efficiently extract lithium from geothermal brine, Vulcan aims to deliver a local source of sustainable lithium for Europe, built around a net zero carbon strategy with exclusion of fossil fuels. Already an operational renewable energy producer, Vulcan will also provide renewable electricity and heat to local communities.

Vulcan's combined geothermal energy and lithium resource is the largest in Europe[2], with license areas focused on the Upper Rhine Valley, Germany. Strategically placed in the heart of the European electric vehicle market to decarbonise the supply chain, Vulcan is rapidly advancing the Zero Carbon Lithium™ Project to target timely market entry, with the ability to expand to meet the unprecedented demand that is building in the European markets.

Guided by our Values of Climate Champion, Determined and Inspiring, and united by a passion for the environment and leveraging scientific solutions, Vulcan has a unique, world-leading scientific and commercial team in the fields of lithium chemicals and geothermal renewable energy. Vulcan is committed to partnering with organisations that share its decarbonisation ambitions and has binding lithium offtake agreements with some of the largest cathode, battery, and automakers in the world. As a motivated disruptor, Vulcan aims to leverage its multidisciplinary expert team, leading geothermal technology and position in the European EV supply chain to be a global leader in producing zero fossil fuel, net carbon neutral lithium while being nature positive. Vulcan aims to be the largest, most preferred, strategic supplier of lithium chemicals and renewable power and heating from Europe, for Europe; to empower a net zero carbon future.

Corporate Directory

Executive Chair	Dr. Francis Wedin
Managing Director and CEO	Cris Moreno
Deputy Chairman	Gavin Rezos
Non-Executive Director	Ranya Alkadamani
Non-Executive Director	Annie Liu
Non-Executive Director	Dr. Heidi Grön
Non-Executive Director	Josephine Bush
Non-Executive Director	Dr. Günter Hilken
Non-Executive Director	Mark Skelton
Executive Director, Germany	Dr. Horst Kreuter
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For and on behalf of the Board

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Reporting calendar

27 October 2023	September Quarterly
29 January 2024	December Quarterly Report
28 March 2024	Annual Report

Disclaimer

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Vulcan has carried out a definitive feasibility study for Phase One of its Zero Carbon Lithium™ Project ('Project'), the results of which were announced to the ASX in the announcement "Zero Carbon Lithium Project Phase 1 DFS Results" dated 13 February 2023 ('DFS'), ('DFS Announcement'). This announcement may include certain information relating to the DFS. The DFS is based on the material assumptions outlined in the DFS Announcement. While Vulcan considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the DFS will be achieved. This Bridging Study Update uses the results of the DFS as a basis to update its Mineral Resources, estimated in accordance with the 2012 Edition of the Australian Code for the Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code).

Competent Person Statement:
Information in this announcement that relates to Mineral Resources is based on and fairly represents, information that was reviewed, overseen, and compiled by Gabriella Carrelli, M.Sc., P.Geo., who is a full-time employee of GLJ Ltd. and deemed to be a 'Competent Person'. Ms. Carrelli is a Professional Geoscientist of the Association of Professional Engineers and Geoscientists of Alberta (APEGA), with certification in the Province of Alberta, Canada, a 'Recognised Professional Organisation' included in a list that is posted on the ASX website from time to time. Ms. Carrelli has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which she is undertaking to qualify as Competent Person as defined in the JORC Code. Ms. Carrelli consents to the disclosure of the technical information as it relates to the Mineral Resource information in this announcement in the form and context in which it appears.

JORC Table 1

JORC Code 2012 Table 1. Section 1: Sampling Techniques and Data.

Criteria	JORC Code Explanation	Commentary

Sampling techniques	• 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 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 (e.g., '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 gold that has inherent sampling problems. Unusual commodities or mineralisation types
		• Vulcan's Zero Carbon Lithium™ Project Phase One Lionheart area as it pertains to Vulcan's mineral resource estimations and associated brine sampling programs contains the following licences: Insheim, Landau South, and Rift North. The Lionheart licences are located in the Upper Rhine Valley Brine Field (URVBF). Vulcan has access to existing, operating deep geothermal wells with proven drilling information and lithium brine grades within the core of the Lionheart licence area, through 100% ownership of the Insheim project and through access agreements to the Landau project.
		• Within the Lionheart area, geothermal wells access hot brine from the Permo-Carboniferous Rotliegend Group, Lower Triassic Buntsandstein Group, and the Middle Triassic Muschelkalk Group, (collectively, Permo-Triassic) sandstone and carbonate aquifers/reservoirs overlying the granitic basement, as well as the upper 100 m of the basement itself. Vulcan brine sampling programs collected Permo-Triassic brine samples from available wells through the following programs:
		  ○ In 2021-23, extensive brine sampling at the Landau and Insheim geothermal wells and power plants for the lithium extraction pilot plant study was carried out.
		  ○ In 2019-21, sampling and analysis from five different geothermal wells located throughout the URVBF (Landau Gt La1, Insheim GT2, Vendenheim and Soultz GPK2 wells) was undertaken to verify historically reported lithium concentrations.
		• Brine can be sampled at the well head, (the hot side of the geothermal production circuit) or after the heat exchanger (the cold side of the geothermal production circuit) prior to reinjection of the brine back down into the aquifer. Brine samples taken at the well head require a cooling mechanism (e.g., brine flows through a tube immersed in ice) and a mobile degasser unit to reduce CO_2. No special equipment is required on the cold side of the production circuit.
		• The Mineral Resources CP for the Definitive Feasibility Study (DFS CP) for the DFS report dated February 2023 collected independent brine samples at the Landau and Insheim resource area during the November 2022 site visit and submitted these for analysis at AGAT Laboratories, an accredited and ISO 9001:2015 registered commercial analytical services firm located in Calgary, Canada. Splits of these samples were also submitted blindly to the Vulcan laboratory located in Karlsruhe, Germany. Results of the 2021-

	(e.g., submarine nodules) may warrant disclosure of detailed information.	2022 sampling program are consistent with previous Vulcan sampling programs and also with historical reporting associated with this field. • Brine sampling programs were conducted in 2019 and 2021 by Vulcan employees who maintained a chain of custody protocol from sample site to delivery of the samples to the Karlsruhe Institute of Technology (KIT), University of Heidelberg (Uni HD), and IBZ-Salzchemie GmbH & Co. KG in Halsbruecke, Germany, for analytical work. Industry standard collection techniques were applied to collect new samples averaging 10 litres in volume. A split of each sample collected by Vulcan in 2019 was shipped by commercial courier to the Pre-Feasibility Study (PFS) Mineral Resources CP from APEX Geoscience Ltd. and analysed at the accredited AGAT Laboratories facility in Edmonton, Alberta, Canada. In addition, four brine samples collected by GeoT were shipped by commercial courier to the PFS Mineral Resources CP in Edmonton, Alberta, Canada for analysis at the accredited and ISO 9001:2015 registered facilities of AGAT Laboratories and also at the accredited and ISO 9001:2015 registered Bureau Veritas Laboratory (formerly Maxxam Analytical). • The current Mineral Resources CP reviewed the techniques of the regional brine sampling and the Insheim resource area brine sampling programs carried out by Vulcan, along with their related analytical procedures, and concluded that these were conducted using reasonable and industry-standard techniques in the field of brine sample collection and assaying and that there are no significant issues or inconsistencies that would cause the validity of the sampling or analytical techniques used by Vulcan to be questioned. • In combination, these data support the Mineral Resource CP's conclusion that the Permo-Triassic brine in the URVBF and specifically within the Lionheart development reservoir units is consistently enriched in lithium.
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.).	• A range of well data from various sources are available for this project covering different sections of the Mesozoic and Paleozoic rock formations of the URVBF. The majority of well data are from geothermal wells (GT) in the area that typically have been drilled into fault damage zones in the reservoir units and terminated in granitic basement. Insheim and Landau within the Lionheart development area are producing geothermal wells, the Appenhofen well on the Rift licence provides key data for the Buntsandstein reservoir, and the Vendenheim well was drilled into the granitic basement. Brühl GT1 was successfully drilled into the geothermal reservoir by a third party and was subsequently sealed, and Offenbach GT1 is an unsuccessful well that did not tap productive zones. Additional well data are available from publications addressing areas of the Landau and Römerberg oil fields or geothermal projects in Rittershoffen (e.g., well GRT-1) and Soultz-sous-Forêts (e.g., wells EPS-1, GPK-1, and GPK-2). Also

		contributing to the current Vulcan database are regional studies conducted in the URVBF in association with the trans-national GeORG project, which combines data from individual wells, excerpts from various well databases, and outcrop data to establish overall ranges on reservoir properties, lithologies and facies. • Since these are planned to be completed as part of the Field Development Plan for Phase One, Vulcan has not yet conducted any new drilling programs designed specifically to support exploration, evaluation, or resource estimation work programs. It is therefore currently reliant on its own existing, producing/re-injection geothermal wells, as well as published or otherwise available data from existing geothermal wells to characterise brine chemistry. • Geothermal and lithium production wells are usually designed with larger diameters than holes commonly drilled for production purposes in the oil industry. This is necessary to optimise fluid flow hydraulics for both brine production and injection wells. • Current geothermal well drilling in the URVBF generally consists of a 30" diameter (30") conductor casing drilled vertically to depth followed by several additional sections. These comprise a 20" surface casing in a 26" hole, a 13 3/8" intermediate liner in a 17 ½" hole, and a 9 5/8" production liner in a 12 ¼" hole, above a 7" liner in an 8 ½" hole. The final diameter hole is drilled into the targeted reservoir and to the well's total depth. Each section reduces in diameter as the drill hole deepens and their designed intervals are dependent on factors such as lithology and stability. • Drilling muds are typically water based and have weights chosen to correspond with lithological and pore pressure conditions. • Conventional rock coring within the reservoir interval may occur, and logging of cuttings returned with the drilling mud (mud logging) typically provides lithological and stratigraphical information for the units encountered (i.e., formation tops and formation thickness, etc.). Mudlogging is highly relevant in cases of drilling geothermal production or injection wells. Drilling data with regards to depth, time, rate of penetration (ROP), weight on bit (WOB), revolutions per minute (RPM), pump pressure, mud flow rates, and gas chromatography, among others, are constantly monitored and recorded. Resulting data are typically available or summarized in associated reporting.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample	• While Vulcan has yet to conduct any new drilling or core sampling programs within the URVBF, it owns its own production/re-injection wells in its core Insheim project and has access to operating geothermal production/re-injection wells at Landau, along with all associated technical information. This includes a large amount of drilling,

	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.	geological, petrophysical and lithium brine data that apply to the Lionheart development area. • Brine samples from regional geothermal wells and the Insheim and Landau wells were generally recovered directly from the flowing brine stream within associated geothermal facility brine circuits, typically on both the "hot" and "cold" sides of such circuits. The brine sample collection method and sample collection documentation are in accordance with lithium brine industry standards and include procedures to avoid dilution of brine by drilling or process fluids prior to sample collection.
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.	• Vulcan's Phase One Lionheart project area, located in the larger URVBF, benefited greatly from access to publicly available detailed lithological logs and down hole geophysical logs (where available) data for the various oil and gas and geothermal wells that occur within or adjacent to the licenced areas. Government agencies have compiled such data for more than 30,000 oil and gas wells, geothermal, thermal, mineral water and mining boreholes across the entire URVBF, within and proximal to Vulcan's resource areas. • During 2020, Vulcan acquired additional detailed lithological and downhole geophysical measurements from geothermal well Brühl GT1-3 which is located approximately 5km from Vulcan's northern licence areas. It penetrated through the same Permo-Triassic strata being assessed by Vulcan. Wireline logging runs were performed in the open hole and included: FMI-GR (resistivity image, caliper), DSI-GPIT-PPS-GR (sonic, caliper), LDS-GR (density, photo electric factor), and UBI-GR (acoustic image). The downhole information provided both qualitative (e.g., litho-logs) and quantitative information such as porosity and permeability measurements. These data were used to study and assess the hydrogeological characteristics and variations between, for example, host rock matrix porosity and fault zone fracture porosity. • From 2020 to 2022, Vulcan reinterpreted existing 2D seismic data in the Ortenau, Taro, and Lionheart (i.e., Insheim, Landau and Rift) licence areas. This interpretation benefited particularly from detailed study of historical well logs from two wells (Appenhofen 1 and Brühl GT1). These logs were acquired by companies other than Vulcan, but their content facilitated Vulcan's interpretation and correlation of subsurface stratigraphy. That is, the historical well logs data helped with interpretation of seismic line profiles and to confirm and validate key stratigraphic marker horizons including the Buntsandstein surface and various fault zones that are critical to the current resource estimation process. • In the Phase One area in late 2022 to early 2023 Vulcan acquired, processed, and interpreted state of the art depth imaged 3D seismic data. The new 3D seismic was integrated

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		with existing subsurface data resulting in a high confidence reservoir model of the Phase 1 brine reservoir, which allowed for optimised well placement. • The detailed lithologic and geophysical well logging data acquired by Vulcan from various sources was assessed based on quality and resolution and incorporated into the Lionheart modelling that underlies the resource estimation program carried out by the company. • Based on validation discussions with Vulcan staff, plus review of compiled logging data and related geological and resource estimation digital models, the Mineral Resources CP has concluded that such data are acceptable for use in Vulcan's current brine resource estimation program.
Sub-sampling techniques and sample preparation	• If core, whether cut or sawn and whether quarter, half or all core taken. • If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. • For all sample types, the nature, 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.	• As part of its lithium extraction piloting programme which has been running for 2.5 years, Vulcan collects regular samples from the hot and cold circuit sample points at Insheim and Landau, to gain an understanding of whether the geothermal plant cycle influences lithium concentration as the brine cycles through the plant. • The sample sizes are appropriate for industry standard brine assay testing and comparable to those documented in Vulcan's previous brine resource reports for the URVBF holdings prepared in 2019 and 2020. • Vulcan's sampling protocol includes collection of the following three aliquots: o one aliquot of the unfiltered, non-acidized brine sample for anion analysis o one aliquot of unfiltered brine with supra-pure HNO_3 for total metal analysis via ICP-OES; and o a filtered and acidized sample for analysing solutes (cations/ trace metals) and dissolved metal analysis via ICP-OES. • Insertion of Sample Blanks and Sample Standards into the sample stream is included in the Vulcan sampling protocol. • In addition, duplicate samples are collected at each sample site and the duplicate sample geochemical analyses was conducted at numerous laboratories that included independent University and commercially accredited laboratories. All labs have experience with analysing lithium in brine.
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and	• The brine sample collection, sample handling, analytical techniques, and QA/QC protocols used by Vulcan conform to industry standards.

	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.	• The Mineral Resources CP concludes that Vulcan lithium brine sampling and analysis uses industry standard protocols and are acceptable for use in the Mineral Resource estimates.
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 (physical and electronic) protocols. • Discuss any adjustment to assay data.	• Vulcan has operating geothermal wells with proven drilling information and lithium grades within its Insheim licence and access to operating geothermal wells in the Landau licence, as well as access to historical and/or nearby well data. • A site visit was completed by the Mineral Resources CP for the DFS (DFS CP) who visited the Vulcan properties and Karlsruhe offices and laboratory for three full days, from November 8-10, 2022. At both the Landau and Insheim operations, the DFS CP collected five brine samples from the production wells. Two of samples were analysed at the Vulcan analytical laboratory in Karlsruhe, Germany (one sample location identified to Vulcan and one not identified). Two of the samples were analysed at the Karlsruhe Institute of Technology (KIT) Laboratory, (one sample location identified to Vulcan and one not identified). The fifth sample was analysed by AGAT Laboratories, an independent, ISO 9001:2015 registered laboratory in Calgary, Alberta, Canada (delivered by CP). All three labs routinely process high TDS brine, perform trace element analysis for lithium, and have rigorous internal QA/QC protocols. The mean lithium results from the three labs for site visit samples were similar (KIT 181 mg/L, Vulcan 177 mg/L and Canadian lab 171 mg/L). The results are also comparable to the lithium grade of 181 mg/L used in the current resource estimation for the southern Vulcan licences, which is based on previously collected data.

		• Verification samples were also collected by the PFS CP during site inspection in 2019. Samples were analysed at 2 separate commercial labs in Calgary, Alberta Canada (AGAT Laboratory and Bureau Veritas Laboratory). The analytical results showed a mean value of 180 mg/L Li. This result is similar to the average analytical result for Vulcan's regional well sampling and Insheim resource area well sampling programs (181 mg/L Li).
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 Resource estimation. • Specification of the grid system used. • Quality and adequacy of topographic control.	• The grid system used is UTM WGS84 zone 32N. • 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.
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 Resource and Ore Reserve estimation procedure(s) and classifications applied. • Whether sample compositing has been applied.	• The Lionheart Phase One Resource estimation uses subsurface lithological information from existing, operating wells within the Insheim and Landau licences, and from off-property geothermal wells including at Vendenheim and Brühl. These well locations are supplemented with extensive 2D seismic data and 3D seismic data. • Vulcan has existing, operating geothermal wells with proven drilling information and ongoing lithium grade sampling results within the Insheim and Landau resource areas that form the core of the field. Existing production/re-injection wells are located within 10m of each other on the surface, and within 2km of each other at the target depth. The Landau and Insheim production wells, as well as Appenhofen well, in the Measured Resource area in Phase One, are approximately 5km apart on the surface. • Subsurface 3D geological models were constructed by Vulcan, to outline the Permo-Triassic aquifers and fault domains underlying the URVBF, in support of resource estimation. Below is a description of the seismic surveys that were used to construct these models: ○ With several data purchases from third party public and private entities completed, the Vulcan 2D database was expanded over the past year and now includes most existing 2D seismic data sets across most of Vulcan's license areas in the URVBF. ○ Late 2022 early 2023 Vulcan acquired, processed, and interpreted state of the art 3D seismic data over the Insheim, Landau South, and Rift North licences, the licenses that cover the Phase One project area.

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		○ The GeORG Project provided an extensive interpreted 2D seismic grid across the URG which complemented interpretation. • The orientation of the Permo-Triassic strata is generally flat-lying and continuous in the URVBF area. High-angle faults have created a complex horst and graben structural environment. However, the Permo-Triassic strata are generally laterally continuous, despite being locally offset by rift-related faulting. It is noted that the Permo-Triassic strata have been mapped for approximately 250 km along the north-northeast strike length of the entire URVBF. • With respect to lithium brine concentration, the average brine analytical results from both the regional well sampling and detailed Vulcan sampling at the Upper Rhine Valley Brine Field resource area from 2019 to 2023 are comparable, with a combined average value of 181 mg/L lithium. In addition, these values are comparable to historical and proprietary lithium concentrations that were compiled throughout the URVBF. The combination of Vulcan-sampled and historically sampled and analysed brine shows a narrow range of lithium brine concentrations in the Permo-Triassic aquifer brine in the vicinity of and within Vulcan's licences, as well as consistency over time. • Given the consistency of the lithium grades within the reservoir, and the sedimentary, continuous nature of the reservoir itself, 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.
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.	• Vulcan has two operating geothermal wells (Insheim and Landau) with proven drilling information and ongoing lithium grade results. These wells were highly deviated to intercept fault zones that constitute corridors of high fluid flow. Based on the overall dimensions of the Permo-Triassic aquifer and consistent analytical results, no sample bias is expected. • The 3D geological models were constructed by Vulcan using its recent Lionheart 3D PSDM seismic data, calibrated to wells in a geophysical and structural sense, and extended to previously acquired seismic data to fully cover the Phase 1 and adjacent project area. Key stratigraphic markers such as top and base reservoir were correlated via its unique seismic character. Isochrone/isochore mapping was used to quality control the interpretations and to avoid unrealistic models. Fault zones were picked only where they could be positively identified in the seismic data and were correlated in consideration of their offset, dip angle and depth. Where possible, basic seismic attributes such as coherency and local structural azimuth or dip were used to validate the interpretations.

		• Marker horizons were validated against wireline logs and check shot data from the acquired well data drilled in or adjacent to the south and northeast portions of the URVBF resource area. • The 2022/2023 new 3D seismic data broadly confirmed the previous in-house interpretation based on existing 2D seismic data and further enhanced the confidence in the local stratigraphic record. • Access to detailed data from studies of nearby geothermal wells acquired by Vulcan in 2020 improved understanding of the hydrogeological characteristics of the fault and fracture zones within the Permo-Triassic strata. The structurally complex fault damage zones are interpreted to typically represent conduits for localised high fluid flow of mineralised brine, due to higher fracture abundance and high fracture connectivity. • In the opinion of the Mineral Resources CP, Vulcan's revised Lionheart geological models, based on the totality of seismic data and drilling data available to date, provide an acceptable level of confidence in the spatial location and orientation of the top and bottom surfaces of Muschelkalk, Buntsandstein and Rotliegend Group successions, as well as the basement surface and fault zones. Further, the resulting models are considered to provide a reasonable approach for estimating Gross Rock Volumes, for use in resource estimation.
Sample security	• The measures taken to ensure sample security.	• Vulcan's 2019 through 2023 brine sampling programs were conducted by Vulcan employees. Samples were transferred with chain of custody from sample site to analytical laboratories that included: the Vulcan Lab in Karlsruhe, the Karlsruhe Institute of Technology (KIT), University of Heidelberg (Uni HD), and IBZ-Salzchemie GmbH & Co. KG in Halsbruecke, Germany. • Independent sampling by the DFS CP was discussed earlier in Section 1, under "Verification of sampling and assaying."
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• A review and check of the Lionheart resource estimations was completed by an external consultant independent from Vulcan (GLJ). In addition, the CP (independent of Vulcan) conducted a review of all Vulcan activities that supported resource estimation and the activities of the external resource check consultant. • The DFS CP assisted with, and reviewed, the adequacy of Vulcan's sample collection, sample preparation, security, analytical procedures and QA/QC protocol, and conducted a site inspection of the Vulcan Property in November 2022. • The Mineral Resources CP participated in numerous and ongoing discussions and meetings involving methods and interpretations for the exploration work to define the geometry and hydrogeological characterization of the Permo-

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		Triassic aquifer that forms the basis of the current resource model. • Independent sampling by the DFS CP was discussed earlier, in Section 1, under "Verification of sampling and assaying."

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Section 2: Reporting of Exploration Results.

Criteria	JORC Code Explanation	Commentary
Mineral tenement 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 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.	• The Vulcan Zero Carbon Lithium™ Project area within the URVBF is comprised of 16 licenses (14 exploration licenses and two geothermal production licenses), thirteen of which, including the Insheim production license, are 100% owned by Vulcan. Rift North is an exploration license where Vulcan has an agreement to develop geothermal brine projects in return for production compensation Landau South is a production license where Vulcan has an offtake agreement with the owner operator for the existing geothermal operation, and a 51:49% JV agreement (in Vulcan's favour) to develop a new geothermal brine project on the same license, at a separate location. All of them (apart from Lampertheim, Lampertheim II, Löwenherz, Waldnerturm and Ried) collectively cover the current lithium brine Mineral Resources described in this document. In addition, Vulcan has a further 155 km^2 of license area applied for within the URVBF on the French side. For present purposes, the Insheim, Landau South and Rift North licences are referred to as Vulcan's Phase One Lionheart Project area. • An Exploration Licence is issued pursuant to the German Federal Mining Act (Bundesberggesetz: BBergG) which defines freely mineable mineral resources as property of the state that is administered by state authorities. Accordingly, state permits are required for exploration and extraction. Vulcan requires both an Exploration Licence and an Extraction Licence or Mining Proprietorship to ultimately produce from its holdings. Any future geothermal brine production from any site would also require granting of a Production Licence plus completion of an operating plan and planning approval procedure that comply with the *Act on the Assessment of Environmental Impacts.* • An Exploration Licence is granted for a maximum of five years and can be extended by a further three years under certain conditions. If exploration has not commenced within one year of the licence being granted, the licence may be revoked. The same result may apply if exploration is interrupted for more than one year. The Exploration Licence is merely a legal title for the exploration of mineral resources in the granted area and is not sufficient to carry out technical programs such as seismic surveys or exploration work in the form of drilling. For such purposes, an operating plan (Betriebsplan) must be approved by the responsible state authority. • An Exploration Licence shall accord the holder the exclusive right to: Explore for the geothermal resources specified in the licence; to extract and acquire ownership in the resources that must be stripped or released during planned explorations; to erect and operate facilities that are required

		for exploring the resources and for carrying out related activities. • The CP was advised by Vulcan that all Exploration and Production Licences covering its Lionheart area were in good standing at the Effective Date of the current Mineral Resource estimate. A tabulation of Vulcan's Exploration Licence holdings within the Lionheart area is presented below. • The Insheim licence in the southern area of the licence group is 1,900 hectares and is centred at UTM 439040 m Easting, 5444442 m Northing, in the WGS84 UTM Zone 32N projection. • The Rift North licence in the southern area of the licence group is 6,483 hectares and is centred at UTM 435535 m Easting, 5442945 m Northing, in the WGS84 UTM Zone 32N projection. • The Landau South licence in the southern area of the licence group is 1,941 hectares and is centred at UTM 435916 m Easting, 5448130 m Northing, in the WGS84 UTM Zone 32N projection. • Vulcan has 100% interest in the Insheim licence. In Rift North, Vulcan has a 100% right to develop any new geothermal-lithium brine project there, subject to a production royalty. In Landau South, Vulcan has a brine offtake agreement with the owner-operator for the existing geothermal brine operation, and a 51:49 JV for a new development in the same license. • On December 7, 2022 Vulcan and Geo Exploration Technologies GmbH, Mainz signed a shared Licence agreement. Under the terms of the agreement Vulcan has the exclusive right to explore and develop lithium and geothermal energy on the northern part of Geo Exploration Technologies' Rift North Licence based on a royalty agreement. The agreement has been approved in writing by the Rheinland Pfalz government office, which is managed by the Mainz State Office, Council for Geology and Mining, and is subject to formal registration of joint ownership of the license by the same office. • The Insheim production Licence and Insheim Geothermal Power Plant were acquired by Vulcan through the 100% acquisition of Pfalzwerke geofuture GmbH effective on 1. of January 2022. • On November 5, 2021, Geo-x GmbH, Landau, owner of the Landau geothermal plant and Landau-Süd geothermal production license, was granted 100% of the Ilka Exploration Licence for Lithium exploration by the Rheinland Pfalz government office, which is managed by the Mainz State Office, Council for Geology and Mining. In parallel in November 2021 Vulcan and geo-x GmbH signed a brine offtake agreement. Under the terms of the agreement Vulcan has the right to purchase and extract the lithium from the brine produced at the Landau plant until 2043. In addition, Vulcan has entered into a 51:49 JV to develop a new geothermal project on the Landau-Süd license, separate to the existing project.

		• The CP notes that there is always some risk or uncertainty that government regulations and policies could change between the issuance and termination dates of Exploration Licences, Production Licences and related permits issued by state authorities. • Any future geothermal and/or lithium brine production would require an operating plan and planning approval procedure that complies with the Act on the Assessment of Environmental Impacts. • In the URVBF, induced seismicity is a potential risk which can be caused by injection of brine. The CP notes that mitigation of such risk may be addressed by the following activities, among others: ○ Performing regular seismic monitoring, as is currently practiced by Vulcan at its Insheim wells and plant; ○ Reducing production flow rates temporarily if seismicity occurs during the operational phase.
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• The URVBF is under active exploration for its geothermal potential by multiple companies. Geothermal production is currently occurring at several sites other than those in which Vulcan is involved. As a result, important geological and brine data developed in support of non-Vulcan initiatives and evaluations is present. This has been accessed to the maximum degree possible by Vulcan for application in its own exploration and development programs. • Historical brine geochemical analytical results include historical analysis from the Landau, Insheim, Soultz, Brühl, and Vendenheim geothermal sites from 2019 to 2021. This includes samples from the Buntsandstein Group aquifer (n=6) and the Rotliegend Group-basement aquifer (n=11). The areal weighted mean concentration of these samples is 181 mg/L lithium. The historical data are presented in referenced journal manuscripts and the Mineral Resources CP has verified that the analytical protocols were standard in the field of brine analysis and conducted at university-based and/or accredited laboratories. The historical geochemical information was used as background information and was also used as part of the resource estimation process. • GeotIS and GeORG data were evaluated and used to support construction of the 3D geological model used in Vulcan's current Mineral Resource estimates. GeotIS and GeORG are digital geological atlases with emphasis on geothermal energy. They provide access to extensive compilations of well data, seismic profiles, information, and interpreted schematic cross sections from the evaluation of 2D seismic data with emphasis on deep stratigraphy and aquifers in Germany. The raw data, such as seismic data, are not available, as they are owned by the respective energy companies, but data profiles have been collated and interpreted for inclusion in the representative geo-dataset information systems.

		• The Lionheart Project area 3D modelling was improved beyond the constraints of GeORG subsurface information through Vulcan's 2020 acquisition of 2D seismic profile lines for these areas. This 2D seismic data acquisition was then extended to Vulcan's other license areas across the URVBF. These data were acquired by Vulcan specifically for the purpose of improving the associated 3D geological model. The seismic information and subsequent 3D geological models were re-interpreted by Vulcan as part of Vulcan's 2020-22 exploration work. • Vulcans 2022/2023 proprietary 3D seismic data confirmed the extent of the brine field in the Insheim, Landau-South, and Rift-North licenses, and increased confidence in the 3D geologic model. • Any modelling or data artifacts within the model space were addressed by Vulcan and with involvement of the CP, in advance of the current Mineral Resource modelling.
Geology	• Deposit type, geological setting and style of mineralisation.	• The lithium mineralisation at the URVBF is situated within confined, subsurface aquifers associated with the Permocarboniferous Rotliegend Group, the Lower Triassic Buntsandstein Group, and the Middle Triassic Muschelkalk Group (collectively, the Permo-Triassic strata) sandstone aquifers and carbonates situated within the URVBF at depths of between 2,165 and 4,004 m below surface. • The Permo-Triassic strata are comprised predominantly of terrigenous sand facies, with minor shales, carbonates, and anhydrites, 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 sandstone sub-units. Within the Permo-Triassic strata, porosity, permeability, and fluid flow rates are dependent on the fault, fracture and micro-fracture zones that are targeted by geothermal companies in the URVBF. • Lithium mineralisation occurs in the brine that is occupying the Permo-Triassic aquifer pore space. • With respect to a deposit model, the lithium chemical signature of the brine is believed to be controlled by geothermal fluid-rock geochemical interactions. With increasing depth, total dissolved solids (TDS) increase in NaCl-dominated brine. Lithium enrichment associated with these deep brines is related to interaction with hot crystalline basement fluids and/or dissolution of micaceous materials at higher temperatures. • Vulcan's current URVBF geological models benefit from reinterpretation of existing 2D and 3D seismic data acquired in 2020-22 by Vulcan, as well as its 2022/2023 proprietary 3D seismic data. Depending upon the area considered, the seismic reinterpretation program mapped in detail four formation horizons based on their uniqueness within the seismic profiles. Faults were interpreted where doubling of a specific reflector occurs (thrust fault) or where a specific reflector is missing (normal fault). Numerous substantial faults penetrating through the Buntsandstein Group strata are interpreted for the entire Vulcan URVBF in the most

		recent geological model. The seismic interpretation mapped, in detail, formation horizons based on the uniqueness of the marker horizons within the seismic profiles. Faults were interpreted by evaluating every tenth inline and crossline (line spacing of approximately 20 m). To be interpreted as a fault zone, a feature was required to have a minimum horizontal extension of 400 m. Damage zone envelopes associated with particularly well-defined faults were developed through modelling and are applied as 200 m fault damage zone half widths from the fault centre. • In the opinion of the Mineral Resources CP, the current geological models provide a level of confidence that is reasonable in terms of identifying the spatial location and orientation of the Buntsandstein Group, Rotliegend Group, Muschelkalk zone, basement and constituent faults for use in the current resource estimates. • The structurally complex fault damage zone areas are interpreted from geological modelling as representing zones for localised high fluid flow of mineralised brine, due to higher fracture abundancy and connectivity.
Drill hole Information	• 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: ○ easting and northing of the drill hole collar ○ elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar ○ dip and azimuth of the hole ○ down hole length and interception depth ○ hole length. • 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	• Within the Lionheart area Vulcan has yet to conduct any new drilling or coring programs. However, the current Mineral Resource estimation was able to utilise subsurface lithological information from existing production/re-injection wells that Vulcan owns or has agreements to access, as well as historical wells within and adjacent to the holding. • There are numerous historical geothermal wells or petroleum wells drilled by other companies that extend deep enough to penetrate Permo-Triassic strata within the URVBF licence area. • Location coordinates plus orientation information for wells used to assess the lithium concentration of brine within Permo-Triassic aquifers covered by Vulcan's URVBF holdings are tabulated below. • Coordinate system: DHDN/3-degree Gauss zone 3, EPSG:31463.

	explain why this is the case.	(see table below)

Hole Name	Collar Easting (m)	Collar Northing (m)	Collar Elevation (m)	Azimuth (deg)	Total Depth (TVDSSm)	Top Perforation (TVDSSm)	Base Perforation (TVDSSm)
Landau Gt-La1	3436152	5450302	149	270	-2896	-2324	-2896
Landau Gt-La2	3436149	5450308	149	90	-3107	-2135	-2641
						-2726	-2922
Insheim GTI1	3438343	5446624	139.78	146	-3410	-3113	-3410
Insheim GTI1b	3438343	5446624	139.78	146	-3611	-2319	-2624
						-2657	-2680
						-2850	-2873
						-2972	-3611
Insheim GTI2	3438345	5446617	139.78	34	-3525	-2775	-3081
						-3253	-3525
Soultz EPS1	3417106	5422154	176.6	n/a	-2035	-	-
Brühl GT1	3465862	5472347	98.3	n/a	-3174	-3022	-3183
Vendenheim GT1	3409685	5390570	135	~120-130	-4515	-	-

Data aggregation methods	• In reporting Exploration Results, weighting 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.	• For the Lionheart licences, the average lithium content from brine collected by Vulcan from six geothermal wells, (including its 100%-owned Insheim geothermal wells and plant), was used as the representative grade for Mineral Resource Estimation. This grade was 181 mg/L Lithium (n=13 total metal analyses by ICP-OES). In addition, a detailed assessment of Permo-Triassic aquifer brine at the Insheim resource area production well yielded 181 mg/L Lithium (n=26 analyses). This grade was also used as the regional Lithium brine value for previous resource estimates (ASX, 2020), and also for the current update. These brine geochemical results demonstrate that the Permo-Triassic brine in the Upper Rhine Graben has a relatively homogeneous lithium chemical composition in the vicinity of Vulcan's central and southern license areas. • The brine geochemical data presented and evaluated by Vulcan represent laboratory analytical values. Averaging of results has been carried out in some instances but resulting mean values are clearly identified as such where this has taken place. • Elemental lithium values applied in the current Vulcan resource estimate were converted to Lithium Carbonate Equivalent ("LCE") using a conversion factor of 5.323, based on the stoichiometric quantity of lithium in Li_2CO_3. Reporting lithium values in LCE units is standard lithium industry practice.
Relationship between mineralisation widths and intercept lengths	• These relationships are particularly important in the reporting of Exploration Results.	• Vulcan has operating geothermal wells with proven drilling information and ongoing measurement of lithium grades, within the Insheim and Landau licences in the core of the field.

	• 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').	• With respect to the geothermal well data used, all engineering aspects of the wells are documented. Hence, the Mineral Resources CP has a good indication of the true vertical depths of the perforation windows used to sample and pump brine from the Permo-Triassic aquifers to the surface, for geothermal power generation. • As mineralisation is related to liquid brine within a confined aquifer, intercept widths are not a critical concept. Well perforation points essentially gather mineralised brine from the aquifer at large, assuming the pumping rate is sufficient to create drawdown in the aquifer.
Diagrams	• 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.	• The current associated News Release and previous News Releases by Vulcan include explanatory figures that were used in reporting of project information to support respective resource estimation disclosures. • All map images include scale and direction information such that the reader can properly orientate the information being portrayed.
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.	• Comprehensive reporting of all exploration results is presented in previous associated News Releases and in the Technical Reports associated with Vulcan's Lionheart licences. • There are no outlier analytical results in the geochemical dataset used to evaluate the lithium concentration of Permo-Triassic aquifer brine. The lithium brine values, within analytical error margins, are interpreted to be relatively homogenous in the vicinity of Vulcan's Exploration Licences, as informed by brine analytical data assembled by Vulcan.
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,	• A substantive amount of historical data was used to investigate and characterise the configuration and hydrogeological properties of the Permo-Triassic aquifers. These aquifers include the Buntsandstein Group, Rotliegend Group and Muschelkalk Group. Hydrogeological properties include porosity and permeability. Historical geochemical data were used to assess the lithium concentration in Permo-Triassic aquifer brine. A total of 43 historical brine analysis records were compiled. These historical data were verified by Vulcan, and it is the opinion of the Mineral Resources CP that: ○ The Permo-Triassic aquifer is relatively homogeneous in terms of lithium concentration within the extent of Vulcan's Lionheart Licences.

	geotechnical and rock characteristics; potential deleterious or contaminating substances.	○ The verification of historical geochemical results produced a geochemical dataset that is adequately reliable for inclusion in the current resource estimation. • During 2020, Vulcan commissioned GeoT, now part of Vulcan, to: 1) review the acquired seismic information and nearby well data, 2) to conduct hydrogeological characterisation studies specific to URVBF Permo-Triassic fault/fracture zones, and 3) make inferences on potential geothermal well (and Lithium brine) production scenarios and their influence on fluid flow within and adjacent to fault/fracture zones. The Mineral Resources CP has reviewed a series of related internal reports and found them to be factually prepared by persons holding post-secondary degrees with an abundance of experience and knowledge in geothermal and geochemical evaluation within the URVBF. • Numerous geothermal, or oil and gas wells, were historically drilled by companies other than Vulcan within the boundaries of the URVBF licences. • Intersected formation tops were reviewed for five historical wells in the Lionheart (i.e., Insheim, Landau, and Rift) development area. Two of these wells (Insheim GTI1 and GTI2) intersected formation tops of the Muschelkalk, Buntsandstein and Rotliegend groups as well as the basement rock.
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, provided this information is not commercially sensitive.	• Vulcan plans to continue to de-risk and develop its Zero Carbon Lithium™ Project in the Upper Rhine Valley Brine Field using the following systematic, stepwise approach: ○ Drill development wells in Vulcan's Lionheart area, focused on the producing core of the field in the Insheim-Landau region. The focus should be on sustainably increasing brine production and re-injection flow rates across the field to feed larger scale commercial production, using recently acquired state-of-the-art seismic data and associated modelling and simulation. Continually refine model as more data is gathered during the development drilling and ramp-up of brine flow, aiming for continuous improvement during development. ○ Construction, commissioning, and implementation of a pre-commercial demonstration/optimisation plant, to train a lithium operations team in a pre-commercial environment, currently in the commissioning phase, and planned to be operational in November. Continuation of the demonstration plant operation, and current pilot plant operation which has been operating since April 2021, to further optimise operating conditions prior to commercial production start. ○ Completion of the bridging engineering phase for Phase One, towards project execution, construction and commissioning. Currently in progress and to be complete by November 2023.

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Section 3: Estimation and Reporting of Mineral Resources.

Criteria	JORC Code Explanation	Commentary
Database integrity	• Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes. • Data validation procedures used.	• A review of compiled data was conducted by the Mineral Resource CP who, to the best of their knowledge, can confirm the data was generated with proper procedures, has been accurately transcribed from the original source and is suitable for use in the resource estimations. • Independent sampling by the DFS CP was discussed earlier in Section 1, under "Verification of sampling and assaying." 3D geological models were prepared for the Vulcan licences, with the use of extensive 2D seismic data and 3D data. These data were interpreted by Vulcan and represented in modelling software Petrel. Interpreted features included picks for the upper and lower surfaces of the Muschelkalk Formation, Buntsandstein Group and Rotliegend Group, plus fault locations. Model representations were checked by the Mineral Resources CP (GLJ). In the opinion of the Mineral Resources CP, these geological representations, and the seismic data used to develop them are reasonable and appropriate for resource estimation. • Numerous hydrodynamic property studies and data were compiled from throughout the URVBF by Vulcan, to support the selection of appropriate values for Effective Porosity (Phie) and Net to Gross ratio (NTG) to use in resource estimation. In the opinion of the CP, these studies, and the resource estimation parameters that were derived them, are reasonable and appropriate. • Based on the Mineral Resources CP's previous experience in estimating lithium brine resources, and the DFS CP's extensive experience with associated sampling and analytical protocols, the CPs are satisfied with the integrity of the chemistry, geological and hydrodynamic datasets and information sources used to estimate Mineral Resources. • For an additional summary of the lithium analytical results used in the resource estimation, please see ASX announcements by Vulcan dating 13 February 2023, 20 August 2020, and 4 December 2019. Recent lithium data from the lithium extraction Pilot Plant operations at the Insheim-Landau geothermal wells was materially similar and reinforced the confidence in the average values derived from these original results, within analytical error.

Site visits	• Comment on any site visits undertaken by the Competent Person and the outcome of those visits. • If no site visits have been undertaken indicate why this is the case.	• The DFS CP visited the Vulcan properties and Karlsruhe offices and laboratory for three full days, from November 8-10, 2022. The inspection included detailed tours of the two operating sites (Landau and Insheim), a review of the in-progress 3D seismic survey on the Insheim licence, and reconnaissance visits to all the remaining licences. • Independent sampling by the DFS CP was discussed earlier in Section 1, under "Verification of sampling and assaying."
Geological interpretation	• Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit. • Nature of the data used and of any assumptions made. • The effect, if any, of alternative interpretations on Mineral Resource estimation. • The use of geology in guiding and controlling Mineral Resource estimation. • The factors affecting continuity both of grade and geology.	• The addition, and reinterpretation, of new and existing 2D and 3D seismic data, combined with verification of lithium grades over time from lithium pilot plant operations at the geothermal production well sites, significantly increased the Mineral Resources CP's confidence level in the subsurface 3D geological models that supported resource estimation. • The interpreted seismic data and subsequent structural model enabled the Mineral Resources CP to create detailed Muschelkalk zone, Buntsandstein Group, Rotliegend Group surfaces. The 2D seismic profiles (including the GeORG data and other more recently acquired data) covered 100% of Vulcan's URVBF licences. • Using the seismic profiles, subsurface stratigraphic horizons were correlated throughout the Lionheart licences. The marker horizons were validated against wireline logs from wells drilled in the southern and adjacent to the northern portions of the Lionheart licence areas. • The fault/fracture zones were distinguished in the seismic profiles. The vertical displacement of the fault zones on the seismic profiles enabled definition of the activity level of the fault zone, with many interpreted to be active. The fault zones were picked only where they could be positively identified in the seismic lines and the faults were correlated in consideration of their offset, dip angle and depth. • The vertical displacement of the fault zone on the seismic profiles was also used to make calculated inferences on the horizontal width of the fault zone in the geological model. • The addition of 2D and 3D seismic data significantly increased the confidence level in the subsurface 3D geological model.
Dimensions	• The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	• The geometry of the Permo-Triassic strata in the URVBF has a gentle northward dip at the southern end of the field (i.e., at the Ortenau licence area) which transitions to a south-east dip further northwards at the Taro licence area. The top and base surface elevations of the Buntsandstein Group under the URVBF licences are approximately from 2000 m (south) to 3800 m (north) subsea (m SS) with an average thickness range of 310 m in the north and 380 m in the south, up to 475m thick locally. The top and base surface elevations of the Rotliegend Group under the URVBF licences south of the Taro licence are approximately from 2200 m SS to 3300 m SS with an average thickness range of 120 m to 310 m, across the URVBF.
Estimation	• The nature and appropriateness of the	*The Lithium Resource is defined as the summation of the following, for all unique units within a given Licence:*

and modelling techniques

estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.

- The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.
- The assumptions made regarding recovery of by-products.
- Estimation of deleterious elements or other non-grade variables of economic significance (e.g., sulphur for acid mine drainage characterisation).
- In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.
- Any assumptions behind modelling of selective mining units.
- Any assumptions about correlation between variables.
- Description of how the geological interpretation was used to control the resource estimates.
- Discussion of basis for using or not using grade cutting or capping.

Total Volume of the Brine-Bearing Aquifer (GRV) x Average Effective Porosity (Phie) x Average Net to Gross (NTG) x Average Concentration of Lithium in the Brine (C).

- The parameter values used in the Resource Estimate are summarised in the table below.

Licence/ Area	Reservoir	Classification	GRV km³	Avg. NTG %	Avg. Phie %	Avg. Li mg/L	Elemental Li t	LCE kt
Insheim	*MUS, BST, ROT, BM	Measured	13	69	9	181	151,823	808
Rift-North	*MUS, BST, ROT, BM	Measured	9.5	70	9	181	110,181	586
	*MUS, BST, ROT, BM	Indicated	29	71	9	181	355,443	1892
Landau South	*MUS, BST, ROT; BM	Measured	12	68	9	181	134,677	717
	*MUS, BST, ROT; BM	Indicated	2.7	69	9	181	29,620	158
Flaggenturm	BST	Indicated	7	90	10	181	115,215	613
	BST	Inferred	37	65	9	181	391,201	2,082
Kerner	BST	Indicated	5	90	10	181	76,242	406
	BST	Inferred	13	65	9	181	132,558	705
Kerner Ost	*MUS, BST, ROT	Indicated	4.3	73	8	181	66,708	355
Taro	*MUS, BST, ROT	Indicated	14.5	73	8	181	237,362	1,263
Ortenau	*MUS, BST, ROT	Indicated	57	73	8	181	659,013	3,507
	BST	Inferred	105	73	8	181	1,883,212	10,024
Mannheim	BST	Indicated	4	90	10	153	54,111	288
	BST	Inferred	32	65	9	153	290,312	1,545
Ludwig	BST	Indicated	7	90	10	153	93,220	496
	BST	Inferred	22	65	9	153	199,226	1,060
Therese	BST	Indicated	2	90	10	153	29,907	159
	BST	Inferred	22	65	9	153	200,708	1,068
						mg/L		**kt**
Total LCE		**Measured**				**181**		**2,112**
		Indicated				**178**		**9,137**
		Inferred				**172**		**16,484**

Note 1: Mineral Resources are not Ore Reserves and do not have demonstrated economic viability.

Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs). Numbers may not add up due to rounding of the resource value percentages.

Note 3: Reservoir abbreviations: MUS – Muschelkalk Formation, BST – Buntsandstein Group; ROT – Rotliegend Group; BM - Basement.

Note 4: To describe the resource in terms of industry standard, a conversion factor of 5.323 is used to convert elemental Li to Li2CO3, or Lithium Carbonate Equivalent (LCE).

Note 5: NTG and Phie averages have been weighted to the thickness of the reservoir. These averages are consolidations of multiple local zones and therefore multiplied together will not equate to the global elemental lithium values presented. The elemental lithium values presented are determined separately using detailed data for each zone and then summed

	• The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	together to show a total value for the purposes of this summary table. Note 6: GRV refers to gross rock volume, also known as the aquifer volume. GRV values presented in this table are rounded to the first significant figure for presentation purposes. The elemental lithium values presented are calculated using GRV values that have not been rounded. Note 7: Mineral Resources are considered to have reasonable prospects for eventual economic extraction under current and forecast lithium market pricing with application of Vulcan's DLS processing. Note 8: The values shown are an approximation and with globalised rounding of values in the presented summary table as per JORC guidelines, cannot be multiplied through to achieve the Mineral Resource estimated volumes shown above. • The workflow implemented for the calculation of the Vulcan lithium-brine resource estimations included the following steps: o Based on seismic information, the geometry of the top and bottom surfaces of the Muschelkalk, Buntsandstein, and Rotliegend (where resolvable) were defined as well as 100 m of Basement o Based on seismic information, the faults within the Muschelkalk, Buntsandstein, and Rotliegend (where resolvable) were defined. o A conservative Fault Damage Zone (FDZ) half-width of 200m was defined for all faults based on the average displacement across the faults within the URVBF. o Estimation of volumes for applicable matrix bodies (Buntsandstein only) and FDZs within applicable geological units (depending on licence). o Identification of applicable Effective Porosity and Net to Gross Values for each of the volumes estimated above. The Effective porosity was based on wireline well log data of three wells within the URVBF (Appenhofen 1, Offenbach GT1, and Brühl GT1) as well as published porosity and permeability core plug measurement data within the URG (see Estimation Methodology section for references). In total, there are over 300 effective porosity measurements from core and outcrop analysis, and over 250 permeability measurements and/or interpretations for the Buntsandstein Group. Data points for the Rotliegend group include 62 core plug porosity measurements, as well as over 550 permeability measurements from core plugs. Porosity versus permeability plots using these data help determine cut-offs for effective fluid flow within reservoirs (Canadian Oil and Gas Evaluation

Handbook, 2005; Nelson, 1994) achievable because of the availability of production data from producing geothermal and oil and gas wells within the URVBF (Landau 207, 211, Appenhofen 1, Römerberg A to E). For the Permo-Triassic sediments in the URVBF, a porosity cut-off of 5 %, equivalent to a permeability cut-off of 0.02 mD, is reasonable for significant fluid flow to occur. Net thickness is then determined from this relationship by applying the 5 % effective porosity cut-off to the gross interval thickness. Determination of applicable average lithium concentration (C) for each licence, based on Vulcan's brine sampling and interpretation program. Determination of average grade (C) is discussed under "Data Aggregation" Methods" in Section 2.

  - Spreadsheet compilation of all volumes and applicable parameter values, followed by resource calculation, according to the equation noted above.
  - Confirmation of reasonable prospects of eventual economic extraction for the identified resource zones.

- The current Mineral Resource estimations replace and supersede the previously published estimates for the Insheim, Landau (Landau South) and Rift (Rift North) licences.
- The only element being estimated is lithium, and consideration of deleterious elements is beyond the scope of this project and resource estimate. Determination of such factors is dependent on application of specific mineral processing and lithium recovery flowsheet assessments and comprehensive market studies. Based on the lithium extraction piloting that Vulcan has conducted since April 2021, no deleterious elements have been noted which have a materially negative effect on Vulcan's sorption-type lithium extraction process.
- In the case of Landau South, Insheim and Rift North, the extent of the Measured Resource domain was estimated through dynamic modelling of a reasonable, future, full-scale recovery, and injection system. The overall circulation footprint of the system over a 15-year simulation period was used as the outer boundary (footprint) of the Measured Resource domain. This footprint generally conformed with the full spatial extents of the Insheim licence, and most of the Landau South licence. In the case of Rift North, the circulation footprint was considerably less than the licence extent. Portions of Rift North and Landau South that extend beyond the footprint were defined as Indicated Resource.
- The average lithium-in-brine concentration used in the resource estimations is 181 mg/L.
- No top cuts or capping upper limits have been applied, or are deemed to be necessary, as confined lithium brine deposits typically do not exhibit the same extreme values as precious metal

		deposits. This statement is applicable to the Permo-Triassic aquifer lithium brine data in this study. • A cut-off grade / resource quantity analysis was not strictly applicable to the resource, due to the use of average grade in the static resource estimate. However, it is noted that a grade for economic extraction of 100 mg/L has been established on a provisional basis for the lithium extraction process, and that all resources are currently estimated to exceed that grade. • The unit volumes, parameter values, and resource estimate calculations were checked and validated by the Mineral Resources CP. In the opinion of the CP, the volumes, parameter values and calculations are appropriate and provide Resource Estimate results that are reasonable for the assigned resource categories.
Moisture	• Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	• Not applicable. The lithium resources in Vulcan's URVBF licences and Phase One Lionheart are brine-hosted resources.
Cut-off parameters	• The basis of the adopted cut-off grade(s) or quality parameters applied.	• Cut-off considerations are discussed above.
Mining factors or assumptions	• Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	• It is the CPs opinion that geothermal facilities and lithium brine extraction operations represent a feasible co-production opportunity. • Vulcan's lithium brine extraction pilot plants in Landau and Insheim (or future commercial operations) are situated after the heat exchanger, and therefore do not influence the geothermal operations of the plant. Any future plants would follow the same approach. • Assuming the lithium extraction process causes only small compositional changes to the brine (which has been preliminarily shown in the geochemical data), the lithium-removed brine, as well as any evolved gases, could return to the subsurface aquifer via a reinjection well. Hence, it is assumed both operating interests (geothermal and lithium) are extracting their own commodity of interest with minimal interference between the two processes. • It is assumed that Vulcan could drill their own production/re-injection wells at the Lionheart licences to expand the existing production in the core of Vulcan's field. The 3D geological models completed for each licence shows there is a high degree of faulting with potential for high fluid flow in the Permo-Triassic strata underlying the Lionheart. • Dilution from re-injected brine has been factored into the production study on Phase One areas conducted by Vulcan, which shows a 1.8% annual lithium grade reduction on average over the project life. Since this study was limited to brine modelled within the confines of the license area, and since any potential "recharge

		effect" from basement rocks was also not modelled, this could prove conservative.
Metallurgical factors or assumptions	• The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	• Vulcan uses an Adsorption-type Direct Lithium Extraction (A-DLE) process, similar to commercially operating A-DLE processes used on salar-type brines in Argentina and China. Because of environmental and meteorological considerations, Vulcan uses geothermal heat, instead of fossil gas and solar evaporation ponds, to drive the adsorption process and drive the subsequent concentration of the lithium eluate respectively. • It is the opinion of the CP that the extraction of lithium from salar-type brines using adsorption is commercially proven having been used since the 1990s, and the use of adsorption on the particular Upper Rhine Valley brine chemistry provides no technical impediment to the same process being applied, as evidenced by Vulcan's 2.5 year piloting programme. • Vulcan's lithium engineering team designed, and has since operated, a lithium extraction pilot plant demonstrating the sorption process on its geothermal brine since April 2021. Vulcan Energy Resources has operated its pilot plant at two existing geothermal operations (Insheim and Landau) since April 2021. The results of this operation back up the assumptions used in Vulcan's feasibility study and provide the basis for assumptions and predictions regarding metallurgical amenability. For the Lionheart Phase One of Vulcan's commercial operation, brine from these geothermal operations, combined with brine from additional planned geothermal production wells in the vicinity, will feed one lithium extraction plant (LEP), for a total annual rate of 24,000 TPY lithium hydroxide monohydrate (LHM) equivalent capacity in lithium chloride (LiCl).
Environmental factors or assumptions	• Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have	• German Federal and State policy is targeting net zero power and heating production, and EU policy targets the onshoring and bolstering the sustainability of lithium and other critical raw materials production. It is the opinion of the CP that combined geothermal energy and lithium extraction projects such as Vulcan's Zero Carbon Lithium™ Project have the necessary environmental credentials to enable stakeholder support. • Vulcan's process has been designed to be very low waste and circular, in that all brine produced is re-injected into the reservoir, in materially the same state but just with most of the lithium extracted. The surface footprint of planned operations, being geothermal wells and plant, and lithium extraction plants, are very small compared to a traditional mine or salar operations, and sites have been selected to be located on industrial or farming land. It is therefore likely that Vulcan will have a low environmental impact, and in fact will have a net positive effect on the climate by decarbonising the lithium supply chain and energy supply. • In Lionheart, induced seismicity is a potential risk which can be caused by injection of brine. The CP notes that mitigation of such risk may be addressed by the following activities, among others:

	not been considered this should be reported with an explanation of the environmental assumptions made.	○ Performing regular seismic monitoring, as is currently practiced by Vulcan at its Insheim wells and plant; ○ Reducing production flow rates temporarily if seismicity occurs during the operational phase.
Bulk density	• Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples. • The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit. • Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	• Bulk density is not applicable, or necessary to be applied, to the liquid, brine-hosted resource. • Details of the resource calculations are provided above.
Classification	• The basis for the classification of the Mineral Resources into varying confidence categories. • Whether appropriate account has been taken of all relevant factors (i.e., relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data). • Whether the result appropriately reflects the Competent Person's view of the deposit.	• The Vulcan Lionheart lithium brine project has reasonable prospects for economic extraction based on aquifer geometry, delineation of fault zones using re-interpreted 2D and 3D seismic data, brine volume, brine composition, hydrogeological characterization, porosity, fluid flow, and the advancement of Vulcan's lithium adsorption technology and subsequent testwork through their pilot plants through thousands of hours of continuous processing data, and thousands of cycles of testwork. • The updated Lionheart lithium brine Mineral Resource estimations are classified as Measured and Indicated Mineral Resources, depending on location and availability of data. • Pertinent points to support a Measured and Indicated Mineral Resource classification within the producing core of the Upper Rhine Valley Brine Field, and Indicated classification within the wider fault damage zones include: 1) a greater level of confidence in the subsurface geological model due to Vulcan's acquisition of detailed 2D and 3D seismic data, 2) acquisition of a detailed downhole geophysical dataset to analyse the hydrogeological characteristics of a fault-associated fracture zone within a geothermal well, and 3) knowledge of Vulcan's commissioned lithium adsorption mineral processing testwork and results, following thousands of hours of testwork conducted over the course of 2.5 years, 4) Vulcan's acquisition of production/re-

		injection wells in the core of the field at Insheim, and agreement to access other production/re-injection wells at the neighbouring Landau geothermal plant, which has resulted in hundreds of additional analyses from live geothermal brine, and 5) Vulcan's integration of extensive reservoir production simulation into its models. • The Mineral Resource estimate has been prepared by a multi-disciplinary team that include geologists, reservoir engineers, hydrogeologists, geothermal specialists, and chemical engineers with relevant experience in Permo-Triassic and other brine geology/hydrogeology and lithium brine processing environments. There is collective agreement that the Vulcan project has reasonable prospects for economic extraction at current and forecast lithium market pricing levels. Technical Report author Gabriella Carrelli, M.Sc., P. Geo takes responsibility for this statement, as Mineral Resources CP.
Audits or reviews.	• The results of any audits or reviews of Mineral Resource estimates.	• Vulcan's Lionheart Phase One lithium brine project consists of one field with one production centre fed by multiple well sites. Current resource estimation methodologies have been compared to past estimation methods utilised in the DFS and PFS.
Discussion of relative accuracy/ confidence	• Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. • The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include	• In the opinion of the Mineral Resources CP, the Lionheart Measured and Indicated lithium brine Mineral Resource estimations are reasonable for the Permo-Triassic aquifer within the Vulcan Lionheart licences. • Risks and uncertainties as they pertain to the lithium brine Mineral Resource estimate include: o Risks and uncertainties associated with deep geothermal brine exploration are linked to the high cost of deep well drilling. As development continues, incorporation of associated results will reduce inherent Mineral Resource uncertainty and project risk. o The reader should be aware that the reality of any geothermal or lithium brine recovery program is that the extent of brine recovery from the resource estimate zone will be a function of the design of the recovery/reinjection system and the connectivity of the subsurface brine zones. To some extent, it will not be feasible to capture all brine from the subsurface strata included in the resource estimate. o The planned brine production system will be based on doublets with a production well and reinjection well. It is noted that dilution factors caused by injecting the spent brine into the hydraulic system could influence the operational timeline of a given well doublet, beyond the extent to which already modelled.

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	assumptions made and the procedures used. • These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	○ Localised high permeabilities can lead to channelling effects such that the geothermal reservoir potentially becomes inefficient in terms of capturing brine from a broader zone. Thus, the exploitation of fault zones can constitute a trade-off between high permeability and reduced reservoir volumes.