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Cornish Lithium: Exploration for Geothermal Lithium Resources in Southwest England

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Cornish Lithium aims to develop the UK's domestic lithium supply from novel geothermal lithium resources. These warm geothermal fluids (80°C at approx. 2 km) containing elevated lithium concentrations have been known to ingress Cornish mines since ca. 1864, at which time great expense was dedicated to dewatering mine workings. Now, 250 years on, it is clear there is huge potential to utilise both the lithium and heat contained within these fluids for fuelling the transition towards a low-carbon economy.

Cornish Lithium has access to a wealth of historic data from the extensive tin and copper mining from the 17th century to present. Mining records show that lithium-enriched geothermal fluids are hosted at depth within a network of permeable fractures comprising pervasive ENE-WSW–trending Sn-Cu lode structures as well as kilometre-scale NW-SE–oriented faults, termed cross-courses. We show that historical records, supplemented with modern geological and remote sensing techniques, can be used to target lithium-bearing fracture networks with high accuracy using 3D implicit modelling software. The holistic approach Cornish Lithium is taking to mineral exploration has led to the development of an exploration portfolio based on these 3D models that has intersected target structures at depths of up to 2 km. We will present recent results and from testwork conducted in Summer 2023 from the CRM-geothermal project; these include geological and reservoir assessments in the United Downs area and results from our latest exploration drilling.

To date, Cornish Lithium has proven elevated lithium concentrations and a geothermal gradient of ~45°C/km with fluids encountered throughout the fracture network in the United Downs area with exploration ongoing across a wider area. In March 2022, Cornish Lithium commissioned a pilot plant for direct-lithium extraction, which is the first of its kind in the UK and a major step towards commercial production.