Cornish Lithium

Cornwall RESOURCES

Deep Digital Cornwall:
Delivery Partner Open Report

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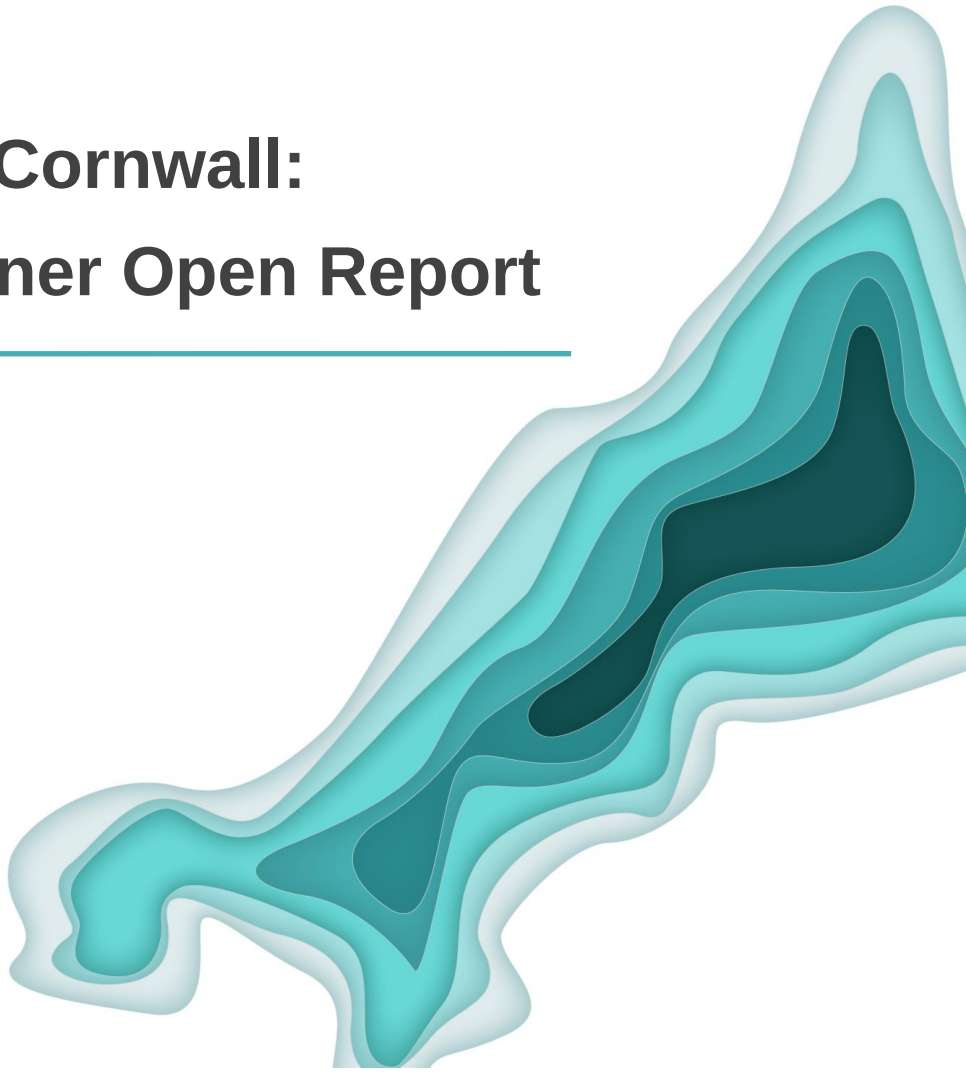

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Executive Summary

- This Deep Digital Cornwall Delivery Partner Open Report summarises the work conducted by Cornwall Resources Limited and Cornish Lithium Plc as part of the project where public data have been collected.
- Airborne geophysics was collected via a subcontractor and managed by Cornish Lithium over the United Downs and Redmoor areas of Cornwall (Cornwall Resources liaised with both contractor and landowners for the Redmoor area). The survey collected Time-Domain Electro Magnetic (TDEM) data. Noise from anthropogenic/cultural sources is unavoidable when flying overpopulated areas, and this is visible on both datasets, but is especially pervasive on the United Downs block. Conductivity modelling was considered spurious due to noise and model assumptions.
- Ground-based geophysics was conducted by Cornwall Resources over their Redmoor licence area. 927 ground-gravity measurements were made. Following the completion of data acquisition, datasets were merged with a historical gravity survey and processed by an external contractor to create map and report outputs, which include a subsurface interpretation of the granite bodies below Redmoor and the Tamar Valley.
- Soil geochemical surveys were conducted by both delivery partners. Extensive traverses were made over the Redmoor area by Cornwall Resources to ascertain elemental concentrations within the soils, and further analysis of results to quantify background values and highlight anomalous results for further investigation. Cornish Lithium conducted a more targeted approach over structures of interest to test the validity of tracing major cross-course structures through different areas relating to the Porthtowan Fault Zone.

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- Core-scanning studies were conducted at both delivery partner's sites using the Geotek Boxscan core-scanner. The Boxscan can be fitted with various sensors to measure the drill core from mineral exploration boreholes. The system is designed to be portable and measures approximately 2.2m x 1.4m. The Boxscan is designed to operate in either a laboratory or field environment and can scan both drill core and chippings. It contains a camera (for alignment of core), a linescan camera (with spray bars for dry and wet photography), 3D laser profiler and instruments to measure magnetic susceptibility, ASD multispectral imaging and Olympus Vanta XRF. Drill core has been scanned by delivery partners to demonstrate the ability of the Boxscan hardware.

- Outcomes of the project include: increased publicly available data and a better understanding of the subsurface beneath Cornwall; raising the international, national and local profile of Cornwall and the project partners; and, the creation of new permanent roles at both delivery partners. The indirect outcome of this project is a substantially closer business relationships between delivery partners and SMEs throughout the county. These relationships are built on a desire to better understand the subsurface of Cornwall whilst stimulating economic growth for the county.

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1 Introduction

Deep Digital Cornwall (DDC) is a £4.4 million project launched in early 2021, that gives SMEs based in Cornwall and Isles of Scilly access to research skills, knowledge, innovation expertise, new datasets and access to state-of-the-art immersive technology facilities for 3D and 4D data visualisation.

The project, led by the University of Exeter's Camborne School of Mines, included delivery partners from industry including Cornish Lithium Plc (originally Cornish Lithium Ltd at the beginning of the project), Cornwall Resources Limited and the South West Centre of Excellence in Satellite Applications.

The report herein details the outputs, outcomes and future plans relating to the data acquired by Cornish Lithium Plc ("CLP") and Cornwall Resources Limited ("CRL"), who worked closely on geoscientific data acquisition ranging across geological, geophysical and geochemical datasets.

1.1 Delivery Partner Profiles

1.1.1 Cornish Lithium Plc

Cornish Lithium Plc is a mineral exploration and development company headquartered at the Tremough Innovation Centre in Penryn. Cornish Lithium are proud to be innovators in mineral exploration technology focussed on the sustainable extraction of lithium and other battery metals in the historically significant mining district of Cornwall.

Metals such as lithium are the key enablers of the transition to clean energy given their role in power storage batteries making such metals vital components of the future UK economy. The Company has secured extensive mineral rights agreements across more than 500km^2 of Cornwall, enabling us to use modern exploration techniques on a regional basis.

Cornish Lithium's involvement as a delivery partner in Deep Digital Cornwall allowed us to further our understanding of the subsurface and collect new data that will be available to business and researchers working in the region.

The company worked closely with the university and our fellow delivery partner, Cornwall Resources Ltd, to deliver key outputs aligned to work packages that enhanced the subsurface understanding of Cornwall.

1.1.2 Cornwall Resources Ltd

Cornwall Resources Limited is an exploration and resource company located in Kelly Bray, east Cornwall, south-west England. Cornwall Resources is actively developing its flagship Redmoor deposit, which is a high-grade Tungsten - Tin - Copper deposit that, when in production, will supply critical metals that are required to support the U.K.'s transition to a net-zero economy. Coupled with the Redmoor deposit, Cornwall resources are actively exploring for new critical mineral deposits in east Cornwall, with a focus on developing novel and sustainable exploration techniques and practices that will acknowledge the true potential of Cornwall as a key component in the transition to a net-zero economy.

Cornwall Resources control the mineral rights within a 23km² licence area, within which the Redmoor Sheeted Vein System ("SVS") is located. Through exploration drilling and related activities, CRL have developed an inferred Mineral Resource Estimate of 11.7 Mt @ 1.17% Sn equivalent composed of high-grade zones of Tungsten - Tin - Copper mineralisation within the SVS. These metals located at Redmoor are key components for the transition to a net-zero economy and CRL continues to study the Redmoor deposit and the surrounding geology to better understand the nature of mineralisation and identify potential new zones of mineralisation.

The company has worked closely with Cornish Lithium and other partners during the Deep Digital Cornwall project to deliver outputs that help to better understand the geology and mineral potential of Cornwall, with the aim of providing a basis for further research and development in the region.

2 Outputs

2.1 Airborne Geophysics

Cornish Lithium, on behalf of the DDC project, commissioned an airborne geophysical survey from New Resolution Geophysics (NRG) for a Time Domain Electromagnetic (TDEM) survey over two areas covering the United Downs and Redmoor areas of Cornwall. United Downs is located near Falmouth, while Redmoor is located over Callington. These blocks are shown in Figure 1.

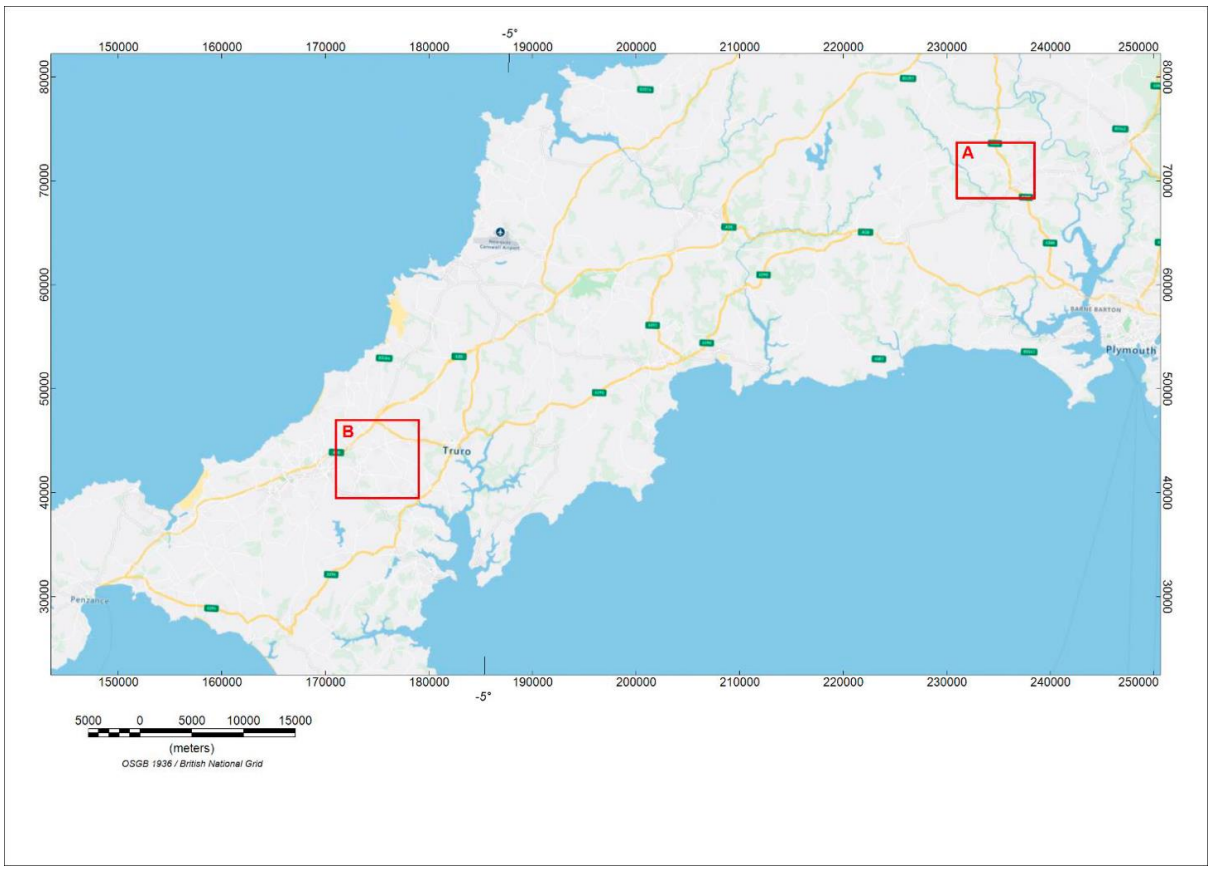

Figure 1 A map to show the two survey areas for the TDEM survey: A) United Downs, B) Redmoor

2.1.1 Why TDEM

TDEM (Time-Domain Electro Magnetic) surveys are commonly used in geophysics to identify conductive geological bodies such as minerals and groundwater. This survey technique was chosen for the DDC project to align with the project objectives by providing valuable subsurface information that can be leveraged by SMEs for

applications such as resource exploration, environmental assessment, and infrastructure planning. Another significant advantage of this method is its ability to rapidly cover large survey areas while minimising the need for ground-based data collection, making it an invaluable tool for understanding the subsurface properties of diverse terrains. The survey was also chosen to be complementary to earlier geophysical surveys in the area, including the Tellus South West project which UoE previously worked on in 2013.

The geophysics budget assigned by DDC allowed for approximately 100 km2 of data collection. The two survey areas were chosen to leverage the community engagement resources of the two delivery partners, whose operating areas roughly correspond to the areas chosen.

2.1.2 Theory

TDEM surveys, which aim to map the conductive properties of the subsurface, utilise the principle of electromagnetic induction. When an electromagnetic pulse is emitted from a transmitter coil onboard an aircraft, it creates a dynamic magnetic field, which, in turn induces secondary electrical currents within the subsurface. As the electromagnetic pulse dissipates, the secondary currents begin to decay at a rate determined by the electrical conductivity of the subsurface materials. Highly conductive materials, such as saline groundwater or metallic ore deposits, tend to sustain eddy currents for a longer duration, resulting in a slower decay of the induced electromagnetic signal. Conversely, less conductive materials allow the eddy currents to dissipate more rapidly, causing a quicker decay of the signal.

During an airborne TDEM survey, multiple electromagnetic pulses are systematically transmitted at regular intervals, and receiver coils on the aircraft record the ensuing electromagnetic responses. These recorded responses provide crucial data points, showcasing how the signal's amplitude changes over time after each pulse. This temporal information is essential for discerning the subsurface electrical conductivity distribution as a function of depth.

After data collection, geophysical inversion can be applied to generate a 3D conductivity distribution by generating theoretical models to compare against the observed response data using complex algorithms. The result is a depth-conductivity profile, which can be utilised to generate geophysical maps, cross-sections, and provide valuable insights into the geological and hydrogeological characteristics of the surveyed region.

2.1.3 Procurement

To purchase this survey, Cornish Lithium held a competitive open tender procurement, and the advertisement was posted on Contracts Finder (https://www.gov.uk/contracts-finder) for a period of 10 calendar days (ESIF requirement). The evaluation of the received bids is detailed in a separate evaluation report. On the basis of this evaluation, CLP awarded the project to NRG (New Resolution Geophysics), who flew the survey in early 2023.

2.1.4 Acquisition

NRG used the XciteTM airborne electromagnetic system (Figure 2), tethered beneath a helicopter flying at about 80 metres altitude (Figure 3), increasing to about 240 metres over built-up areas, subject to Civil Aviation Authority (CAA) requirements. Primary line spacing was planned at 200m on north-south lines, with tie lines at 2000m east-west, although actual line spacing varied considerably due to cultural and other considerations.

Both delivery partners assigned stakeholder engagement representatives who delivered outreach campaigns before and during acquisition, and who also worked closely with the flight team to ensure that there was minimal disruption and nuisance to the general public. Final data was unavoidably adversely affected by anthropogenic constraints, but careful denoise processing was applied to minimise any unwanted signal.

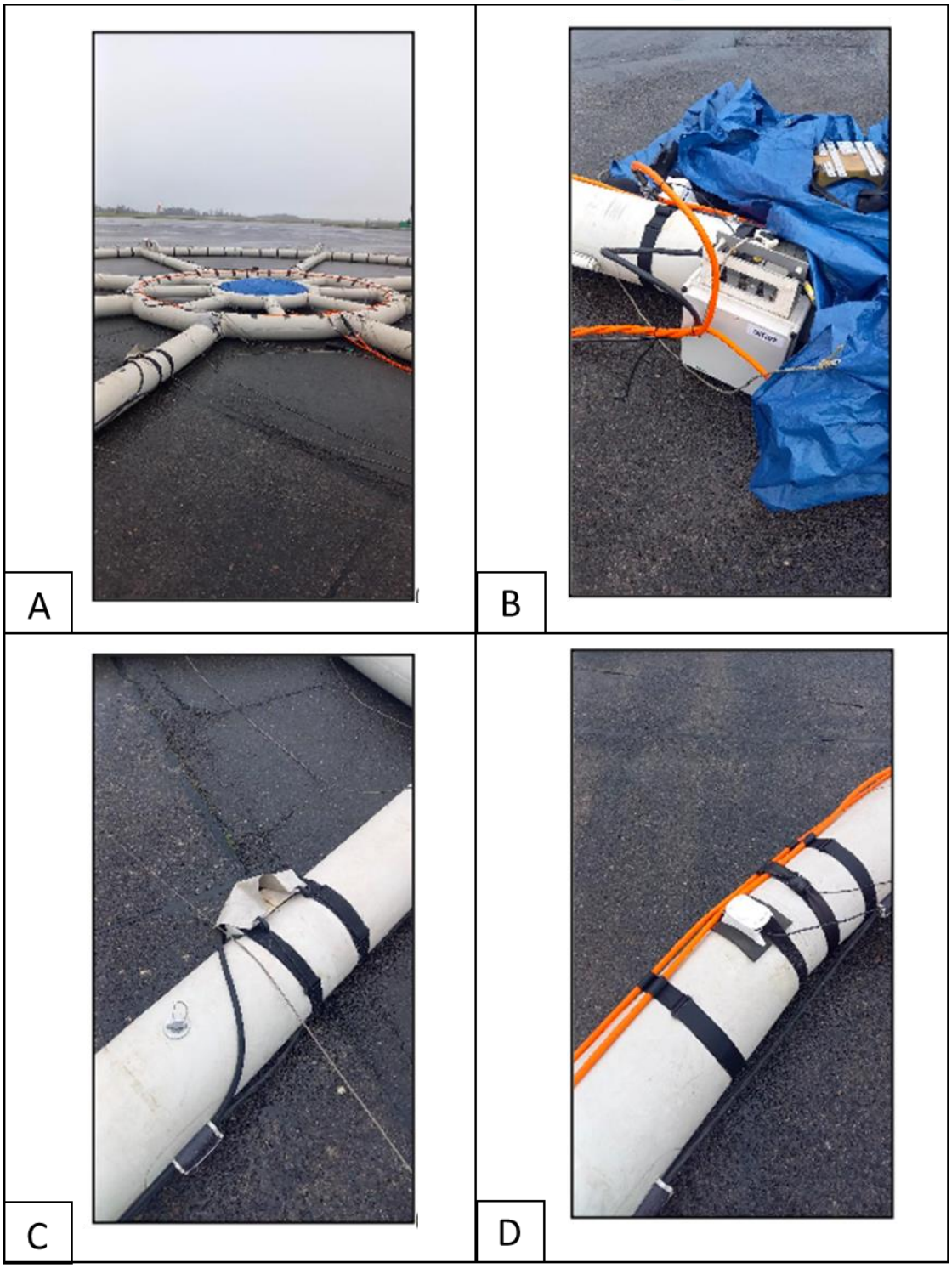

Figure 2 a) transmitter loop; (b) receiver assembly; (c) caesium magnetometer; (d) GPS receiver

Figure 3 NRG Helicopter with towed sensor equipment

2.1.5 Data processing

Data were calibrated by removing system response, lag, and parallax. Altimeter calibration was performed at the start of each survey. A standard processing workflow was applied to remove various unwanted effects (such as drift removal and B-field correction). EM data were levelled to remove inconsistences.

The primary output from the processing is the B-field data. This refers to the magnetic field or magnetic flux density, denoted by the symbol "B". The B-field is an essential parameter in geophysics because it carries valuable information about the subsurface geology and can be used to detect magnetic anomalies caused by various geological features, such as different rock types, mineralisation, fault zones, or human infrastructure.

These data are provided as three datasets (early-time, mid-time, and late-time). These refer to the time intervals during which the response of the subsurface to the applied electromagnetic pulse is observed and recorded. These individual datasets are useful because the decay of the induced currents and the subsequent changes in the magnetic field over time contain valuable information about subsurface electrical

conductivity distribution. These data are presented as ternary images, where each pixel has three levels of intensity or colour representing the three B-field time intervals. The combination of data from these time intervals helps in constructing a comprehensive picture of the subsurface conductivity distribution. The B-field data are presented in Figure 4 B-field data of the United Downs block: a) early-time, b) mid-time, c) late-time, d) ternary image.

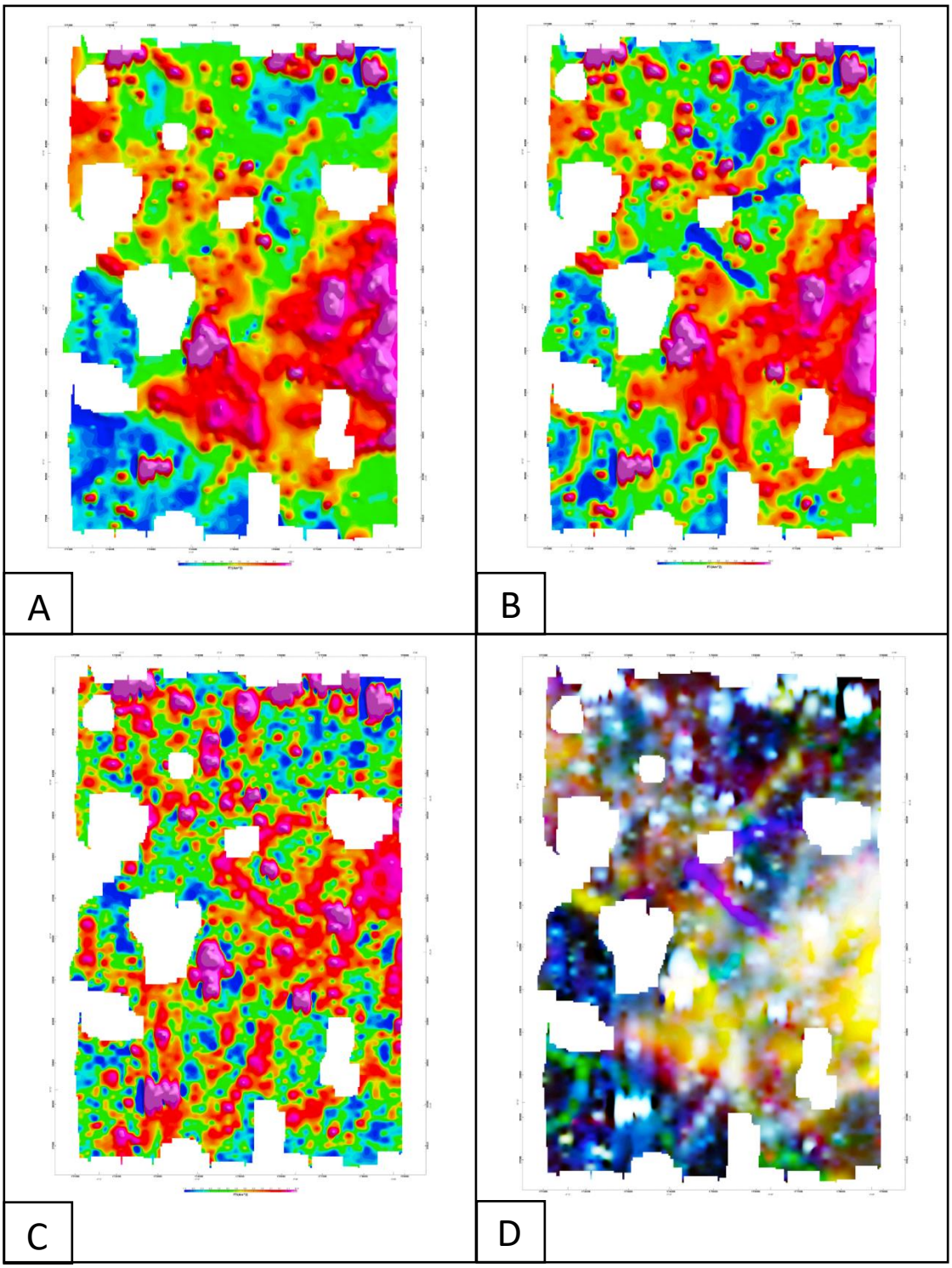

Figure 4 B-field data of the United Downs block: a) early-time, b) mid-time, c) late-time, d) ternary image

2.1.6 Data quality

Noise from anthropogenic/cultural sources is unavoidable when flying overpopulated areas, and this is visible on both datasets, but is especially pervasive on the United Downs block. In addition, no-fly zones identified prior to survey commencement for safety and navigational reasons (mostly over human settlements) have reduced data coverage, particularly at United Downs.

Anthropogenic noise generally manifests as large white areas due in the ternary image to the ultra-high conductivity caused by anthropogenic activity where signal is present in all three time windows. Processing procedures were adapted to keep this noise as localised as possible, and not contaminate adjacent data measurements, however it is important to remain aware of the known sources of interference when interpreting any data products. An interpretation of the observed noise is shown in Figure 5.

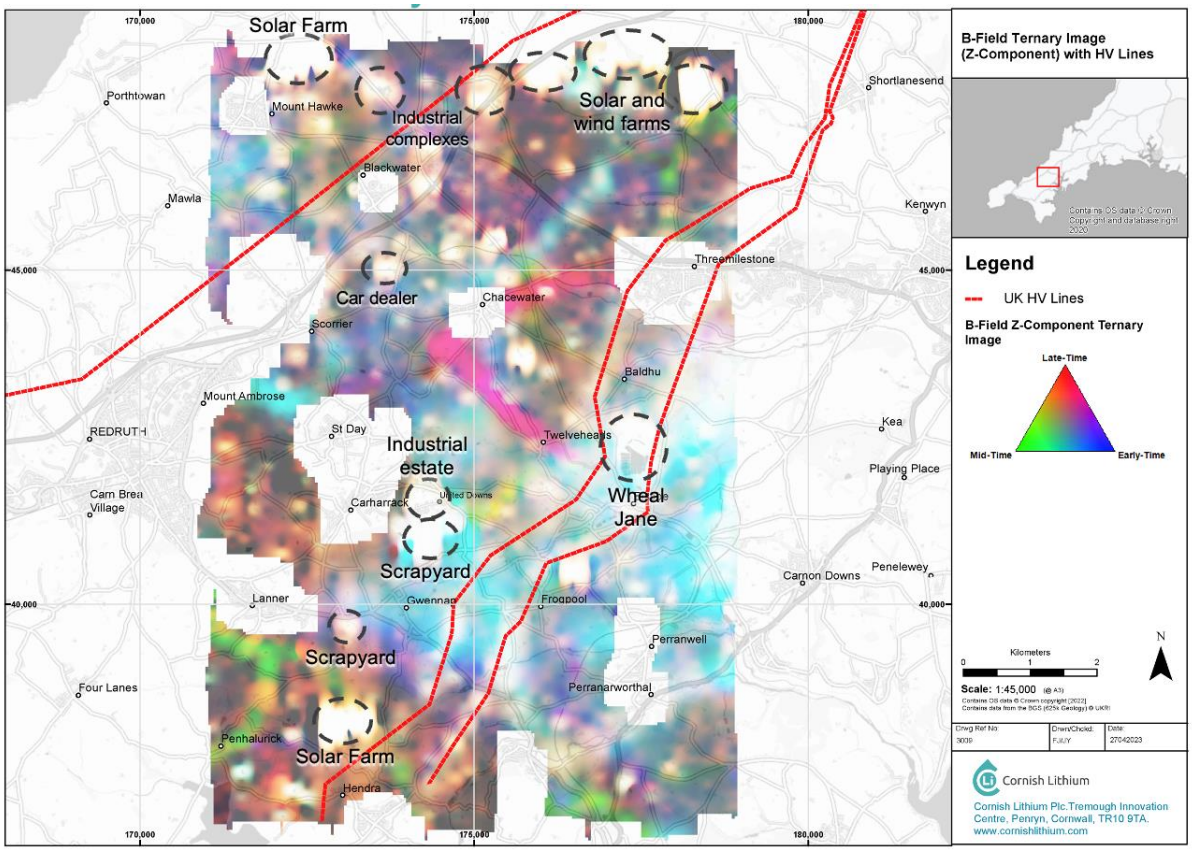

Figure 5 Ternary Image of the B-field data in the United Downs block, with several sources of anthropogenic noise identified

2.1.7 Conductivity modelling

Conductivity depth images were generated using the GALEI software for each representative flight line. These models are not intended as an accurate interpretation of data, but instead to ensure data were processed properly and to indicate the location of major conductive units. Inversion results are non-unique and vary depending on the algorithm used, the starting model, noise specification and other inversion parameters.

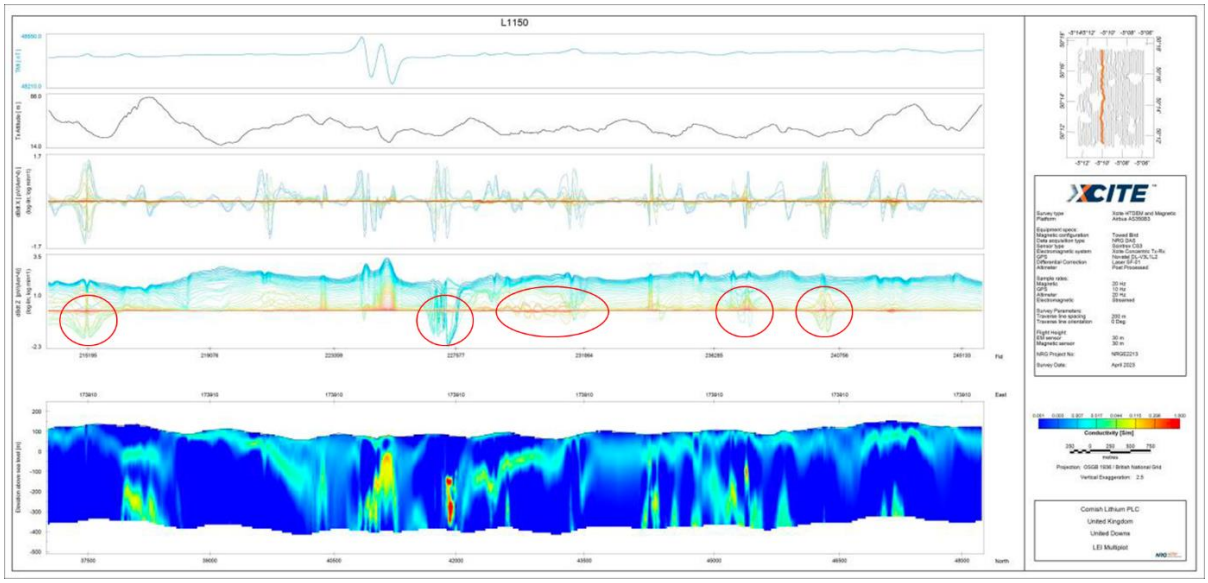

Figure 6 A conductivity profile along Line 1150 of the United Downs Survey block showing conductive bodies which may be related to geological bodies, or related to anthropogenic noise (circled in red)

These models are also negatively affected by anthropogenic noise, which appears as significant pervasive high conductivity anomalies across multiple depths; highlighted in Figure 6. Another drawback of this modelling is the layered earth approximation used by the inversion algorithm, which assumes horizontal isotropy within the model layers, and does not model superparamagnetic or induced polarisation effects often observed in TDEM data. For the above reasons it was decided not to publish these models.

2.1.8 Accessibility

Maps and TIF files of the B-field for United Downs and Redmoor are available on the University of Exeter ORE repository website. ASCII data for the survey are available upon request from CLP.

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2.2 Ground-based Geophysics

2.2.1 What is this survey?

Between July 2021 and December 2021, CRL conducted a ground-based gravity survey, over the majority of CRL's licence areas. Resulting in the collection of 927 gravity readings.

With the primary aim of inferring the underlying geology of the region, including the creation of a granite model, and linking that back to the various mineralised systems seen in Cornwall.

The survey data has been made openly available to all interested parties, via DDC's 3D visualisation suite.

2.2.2 What is the purpose of the survey?

The survey was used in conjunction with the soils and airborne electromagnetic (AEM) survey, to identify potential granite upwellings, hidden by overlying geology. These Granite upwellings are the primary source for the tin, tungsten, copper, and other critical minerals needed for the UK's green energy transition. The potential for at least two granitic bodies beneath the surface, within the Redmoor area, has been identified by this work. Geophysical surveys like this are a low cost, non-invasive method of undertaking regional mineral exploration.

2.2.3 How was the survey undertaken?

CRL's team of Field Assistants worked together to collect sample stations, using a high-resolution DGPS to locate and accurately measure predetermined points (Figure 7), followed by the acquisition of gravity data. A CG-6 Autograv Gravitimeter was used, ensuring it was correctly levelled, with field staff monitoring the equipment throughout data collection in case tolerance limits were breached and a repeat sample was required. A total of 3% repeat stations were collected to verify the accuracy of dataset, and two regional stations were also collected to tie the Redmoor dataset into a national grid.

At the end of each day, data was downloaded from the gravimeter and, along with the GPS data, uploaded for QAQC by Reid Geophysics Ltd, who were contracted to complete project oversight, data validation, processing and interpretation.

Following the completion of data acquisition, datasets were merged with a historical gravity survey and processed by Reid Geophysics, to create map and report outputs (available via ORE), and includes a subsurface interpretation of the granite bodies below Redmoor and the Tamar Valley, which can be viewed in the DDC visualisation suite.

Figure 7 Collection of GPS data for CRL's gravity survey.

2.2.4 Accessibility

The survey data can be viewed by all interested parties, via DDC's 3D visualisation suite.

A map and report for the Redmoor area available on the University of Exeter ORE repository website.

2.3 Soil geochemistry

2.3.1 What is this survey?

Both Cornwall Resources Limited and Cornish Lithium Plc, as DDC project partners have undertaken soil sampling campaigns within their operating areas, as part of DDC work programs. Soil sampling involves the collection and analysis of soil samples to ascertain elemental concentrations within the soils, and further analysis of results to quantify background values and highlight anomalous results for further investigation.

2.3.2 What is the purpose of the survey?

This survey's purpose was for data collection and proof-of-concept for regional geochemistry surveys, whilst providing high-detailed datasets to DDC which can be used by anyone to further understand the link between granite emplacement, structural geology and mineralisation. Soils data can also provide a valuable insight for landowners and farmers.

Project partners intend to use the data to prove the usefulness of soil geochemistry, and how the combination of this dataset with others collected during DDC can be used as low-cost, high-impact regional exploration tools in the historically mined, but under-explored Cornish mining region.

2.3.3 Geochemical analysis

ALS (OMAC) Laboratory was selected through a tender process to undertake sample analysis. This included:

- Dry screening of samples to 180 micron (80 mesh) (SCR-41).
- Sodium Peroxide Fusion for the digest (FUS-PER02p).
- Analysis via ICP-MS and ICP-AES using ALS Lowest DL Multi-Element Super Trace method. (ME_MS89L)
- Add-on determination of B (B-MS89L).

2.3.4 Cornwall Resources survey

Comment on field practice

CRL undertook the soil sampling survey over an understudied and underexplored part of its licence area, along 400m spaced lines, with 10m spaced samples. The soil sample survey was planned using specialist mapping software, ioGAS, that allows for the identification of certain geological units and structures that may contain elevated concentrations of critical metals. More importantly, this software allowed CRL's geologists to identify private property, roads and other infrastructure that needed to be considered in order to undertake the sampling program, through this CRL was able to identify landowners and contact them directly and request permission to enter their property and collected the necessary samples, which was completed with no issues throughout the program.

Results

Between July 2021 and February 2023, CRL conducted a soil geochemistry survey in agricultural fields, in the western section of their Mineral Rights Exploration Area. In total, 2,186 geochemical soil samples were collected and sent for analysis at ALS Laboratory Loughrea. This survey complements the gravity and electromegnetic data, and the survey data will be made openly available to all interested parties, including industry, landowners and academia, through DDC's 3D visualisation suite and through ORE.

One of the main outputs from this collaboration was the collection, analysis, interpretation, and modelling. These soil samples were systematically collected throughout the DDC programme, with samples taken along roughly N-S trending profiles that were 400m apart with sample points being at 10m spacings. The sample locations were targeted in areas that had previously been untested geochemically, with a full and modern suite of chemical analysis, and were aimed at traversing the typical E-W trending structures that are known to host tungsten, tin and copper and other base-metal mineralisation. Upon collection and cataloguing, these samples were sent to ALS Laboratories in Loughrea, Ireland to be analysed for a suite of 53 elements using a Multi-Element Induce Coupled Plasma – Mass Spectrometer (ICP-MS)

methodology, with Boron add-on. ALS was awarded this contract based on the evaluation of a competitive open tender procurement.

The results and subsequent data from the soil sampling campaign have been made publicly available for any parties interested in the project (***CRL Soils Campaign 2021/2023***). Further to the publication of the data collected, CRL has undertaken a comprehensive review and interpretation of the subsequent results, resulting in the identification of numerous anomalous occurrences of Tin, Tungsten, Copper and other base-metals. These geochemical anomalies have been confirmed to be occurring in close correlation with geological structures identified as part of CRL's aerial geophysical survey undertaken in the spring of 2023, coupled with a close relationship with to the previously identified granitic upwellings identified as part of the gravimetric survey.

Further to the anomalous areas identified, CRL have identified a highly prospective, previously unidentified, target that shows an east-west trending Copper-Lead-Zinc-Arsenic soil anomaly that has a strike length of 1km and width of 150m coupled with an adjacent 650m long Tin-Tungsten soil anomaly. These anomalies also occur in geologically favourable environments and in close proximity to previously modelled granite upwellings and subsequent geological structures and located 1.3km east of the historically productive Holmbush Tin-Tungsten-Copper mine.

Accessibility
Maps files are available on the University of Exeter ORE repository website.

2.3.5 Cornish Lithium survey

Comment on field practice
In contrast to the Redmoor soil sampling campaign, the soil sampling conducted by CLP was arranged in a series of traverses to specifically target known cross-course and lode structures. Sample lines were designed to be between 50 m and 200 m apart, along a perpendicular orientation to the target structures and with soil samples at 10 m spacing. The soil sample survey was planned using specialist mapping software

that allows for the identification of certain geological units and structures that may contain elevated concentrations of critical metals. Prior to undertaking sampling surface and mineral rights owners were contacted and made aware of the work. Environmental consultants were engaged to assess the area for any environmental risks and advise on mitigation strategies.

The survey was also split across two different areas, the Burncoose area and the Wheal Busy area. During February – June 2023, a total of 895 soil samples were collected, 634 from Burncoose and 261 from Wheal Busy.

Results – Burncoose

Metals that have been assessed for base metal enrichment include As, Bi, Co, Cu, Ni, Pb, Sb, Sn, U, W and Zn. Background values were established from the geometric mean and natural logged standard deviation of the data, due to the elevated metal content of the county. Where modelled background values were considered to be unrepresentative, background values have been adjusted by using expert knowledge with reference to previous soil campaigns (e.g. around the Wheal Jane/Chacewater area.

The Co, Ni and Zn anomalies are geologically interesting, as they potentially represent both crosscourse mineralisation and a metabasalt bed (known locally as “greenstone”) within the Mylor Slate Formation. Across the county, crosscourses are variably mineralised with Ag-Pb ± Zn, As, Bi, Co, Ni and U.

Titanium, yttrium and zinc values are elevated across the mapped basalt in the study area. Other metals commonly associated with basalt that are enriched in the area include Co, Mn, Ni and V. All these metals are also enriched in the area mapped as basalt to the north-east of Burncoose House.

The basalt is likely to be the source of Ni-Co anomalies in the area that have been remobilised due to hydrothermal fluids and precipitated along faults. The Great County Crosscourse aligns with Pb, Zn, As, Co and Ni anomalies in the northeast/southwest trending sampling lines.

Results from the electromagnetic survey also support these north south projections of the Great County Crosscourse and indicate that the structure may be better constrained as a result of the soil sampling.

Results – Wheal Busy

In contrast to the Burncoose survey, the sampling lines in the centre and to the east of the Wheal Busy area are characterised by elevated Cu with minor Zn occurrences. These anomalies appear to coincide with historically mapped lodes but cross-courses are more difficult to determine. The Cu and Zn anomalies in the area to the west would be of greater interest than those in the central and eastern area, as they seem less adversely affected by alluvium.

Tin anomalies are largely muted, and the largest values generally occur in the east close to mapped alluvium. Tungsten anomalies are rare and equate to single points of interest.

Ni-Co anomalies are sporadic and do not generally correlate with each other as would be expected, it is noted that nickel is very low in the area.

The geological signatures of the bedrock are not easily identified due to the lack of variability – the area is exclusively underlain by Porthtowan Formation. These sedimentary rocks are intruded by elvan (quartz-porphyry) dykes and it is possible to identify geochemical anomalies in potassium and rubidium that map the eastward continuation of known elvans in the south-central part of the survey area.

Accessibility

Map files are available on the University of Exeter ORE repository website. ASCII data for the survey are available upon request from CLP.

2.4 Boxscan core-scanning

2.4.1 What is this survey?

The DDC project procured a multi-sensor core logging machine from Geotek Ltd known herein as the “Boxscan”. The Boxscan can be fitted with various sensors to measure the drill core from mineral exploration boreholes. The system is designed to be portable and measures approximately 2.2m x 1.4m. The Boxscan is designed to operate in either a laboratory or field environment and can scan both drill core and chippings. In this project, the focus was on drill core. It contains a camera (for alignment of core), a linescan camera (with spray bars for dry and wet photography), 3D laser profiler and instruments to measure magnetic susceptibility, ASD multispectral imaging and Olympus Vanta XRF (Figure 8).

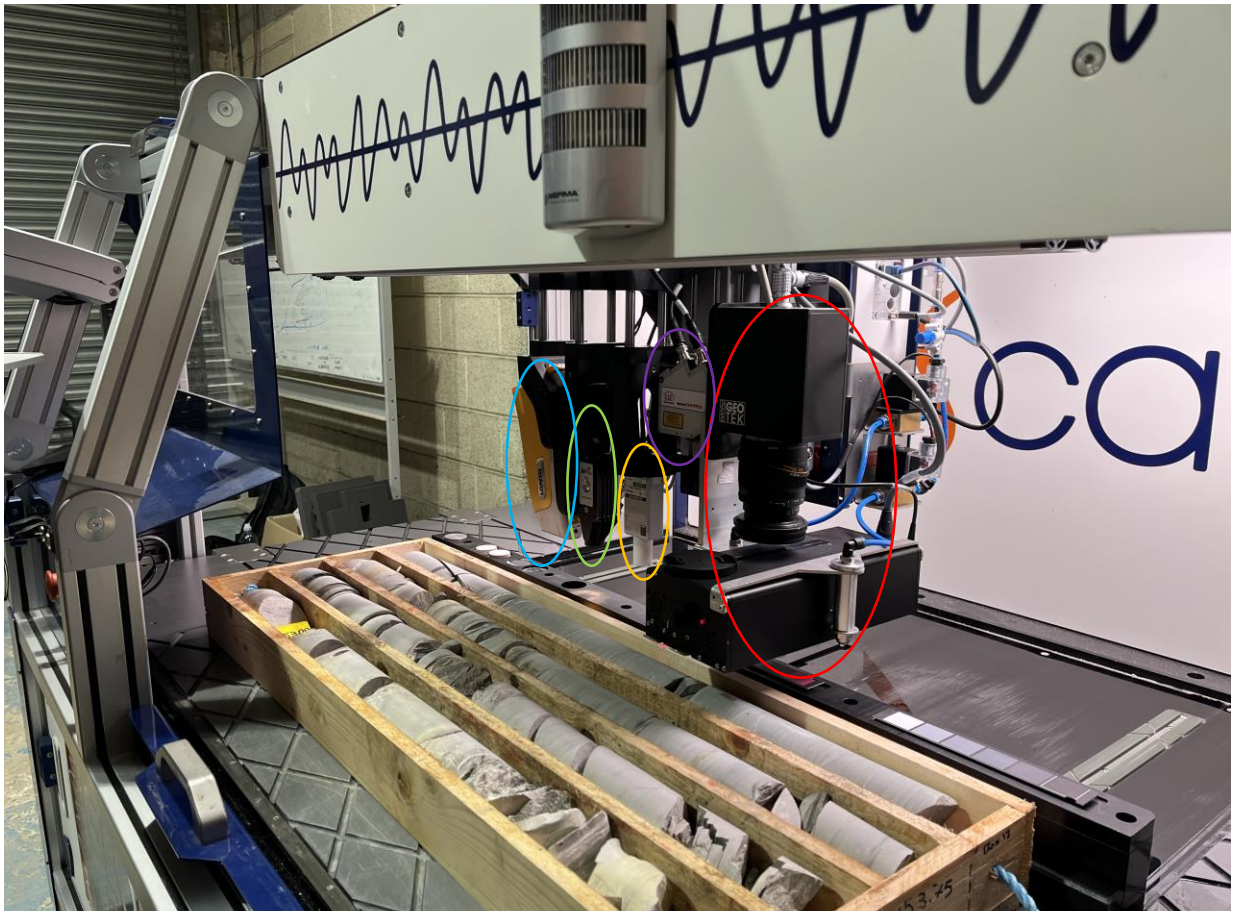

Figure 8 Collection of data for CRL’s BoxScan Survey. Red = Linescan camera (with spray bars for dry and wet photography), Purple = 3D Laser Profiler, Yellow = Magnetic Susceptibilty, Green = ASD multispectral imaging, Blue = Olympus Vanta XRF

2.4.2 How was the survey undertaken?

In March 2023 CRL and CLP hosted the Geotek BoxScan as part of the DDC project. BoxScan is an all-in-one core logging machine, using a range of sensors such as XRF, ASD, Magnetic Susceptibility, along with high resolution photography and laser scanning.

The survey was undertaken by geologists at CRL and CLP, who had been adequately trained and certified for the use of all machinery and subsequent analytical apparatus. The process of analysis begins with core preparation, to ensure good data collection, the core to be scanned must be in good condition, therefore the core was aligned, meter marked, orientated, and cleaned. The core was then subsequently placed within the BoxScan system with the parameters of the drill core boxes and drill core type was inputted in to the BoxScan software, allowing the system to run through its various stages, beginning with laser scan, then the XRF, ASD and Magnetic Susceptibility, followed by the wet and dry high-resolution imaging. Sampling was applied consistently across the borehole and picking out areas of interest for detailed data collection.

2.4.3 What is the purpose of the survey?

Cornwall Resources Ltd

The primary purpose of the survey was to collect a wide range of geological data from core stored at CRL's office. The decision was taken to scan core which had been drilled adjacent to the main resource at the old Redmoor mine site, to collect a wide range of geological data, to be later used to infer conditions surrounding the system and any possible extension. In total, 460m of core was scanned in a 12-day period. This provided a significant amount of new data for CRL geologists to review and interpret, allowing for a better understanding of all the relationships we see in the mineral deposit, and highlighting areas which had been overlooked in the past.

Cornish Lithium Plc

Whilst at CLP's United Downs site, the Boxscan system was used to scan core from a range of local companies including Petrolab, Cornish Metals and Marine Minerals.

Samples were also scanned for research at the University of Exeter by two PhD students.

Alongside scanning core for businesses in Cornwall, CLP also scanned 600 m of core from our Twelveheads geothermal exploration borehole. The data collected targeted fractured sections of core to better understand the alteration styles associated with the structures and how this may impact permeability and porosity. Due to time constraints, further work on the data was not possible during the DDC project.

2.4.4 Accessibility

Boxscan files from CLP and CRL are available on the University of Exeter ORE repository website. XRF data is restricted.

3 Outcomes

3.1 Direct outcomes

3.1.1 Public data and the subsurface

The DDC project collected a large amount of data that will be available publicly. Modern mineral exploration uses airborne geophysics, especially electromagnetic surveys, as routine data acquisition. Whilst Cornwall had previously flown airborne geophysics in 2014 for magnetic and radiometric data, it was a notable omission that electromagnetics were missing from this package when compared to similar pre-competitive surveys in Northern Ireland and Ireland. The DDC project has not been able to completely fill this gap, but it provides a seed that we hope will raise further finance from central government to complete pre-competitive data acquisition for the whole region.

Furthermore, the use of ground-based gravity provides an excellent case study example of how different techniques can be used to target specific geological phenomena – in this case a buried granite – and enhance our understanding of the subsurface. The ground-based gravity also provides a different scale of exploration for collecting geophysics and demonstrates its use for local exploration compared to regional data as would be the case for the airborne geophysics. It also provides a proof of concept for this technique and we anticipate other exploration companies to look into this work in more detail.

Soil geochemistry has been demonstrated extensively through the DDC project. Soil geochemical surveys are far from novel and have been employed as the main exploration tool for historic exploration in Cornwall, with data being collected under previous government schemes such as MEIGA and the Mineral Reconnaissance Programme, as well as by private companies. The outcomes of the soil geochemistry were arguably less impactful than new geophysical data, however, they provide a key link in mineral exploration to geophysics, which map the subsurface using complete indirect methods, and the bedrock by creating a geochemical comparison to what

would be expected. This geochemistry is potentially fallible but is a rapid and cheap way to provide inferences about the underlying geology.

3.1.2 International profile

The airborne geophysical survey has had international impact and raised the profile of Cornwall as a region for mineral exploration across the globe. Many countries fly these surveys to provide pre-competitive datasets that can kick-start a nations mineral exploration industry – world-leading examples include Australia and Finland.

The DDC project has lifted Cornwall's international profile within the mining industry by collecting these high-impact datasets and let the world know that mineral exploration in Cornwall is open for business.

The project has also been publicised at events such as PDAC (Canada) and other major conferences.

3.1.3 National and local profile

The DDC project has had substantial national and local impacts. The project has led to discussions about data with the British Geological Survey, especially tapping into their vast archive of largely undigitized files to see if more data can be released. These conversations remain on-going but the DDC project has laid a platform and grown interest in revisiting historic data held in the national archives.

Locally, the project has had substantial impact and engagement with the local population. The marquee engagement was related to the airborne geophysical survey which featured a low-flying helicopter survey. Substantial engagement efforts were undertaken to notify the public of the activities and the response was broadly well-received with minimal push-back.

Further engagement came through the soil sampling and ground-based gravity where local landowners and tenants were contacted, and access permissions were arranged.

3.1.4 Permanent staff roles

Both delivery partners recruited new staff to conduct the work related to the DDC project. This resulted in 1 new job being created at CLP and 2 new jobs at CRL. All three positions have been kept on beyond the project. Three part-time short-term appointments were made at CLP to assist with the soil campaign.

3.2 Indirect outcomes

3.2.1 Closer business relationships

As a direct result of the DDC project, both delivery partners have built closer working relationships between their businesses. This includes between the two delivery partners, CLP and CRL and more widely across the region. A key part of the engagement was related to hosting the Boxscan core-scanning equipment where a number of local companies came to test their samples in the machine, which included Imerys, Petrolab, Cornish Metals and Marine Minerals.

Business relationships with companies dealing with the subsurface in Cornwall has thrived due to the opportunities provided by the DDC project and it is testament to their strength that future funding bids are in preparation to continue these close working relationships.

4 Future plans

There are a number of plans afoot to continue the post-Deep Digital Cornwall legacy. These include:

- Continued work between delivery partners, especially relating to the upgrade and release of undigitized data in the archives of the British Geological Survey.
- Engagement with local and national government to provide funding for pre-competitive data acquisition across the region.
- Seeking funding to build a geo-resources sector hub that will provide greater integration, an on-going public-facing data platform and viewer so that no specialist software or skills are required to view the public data produced.