

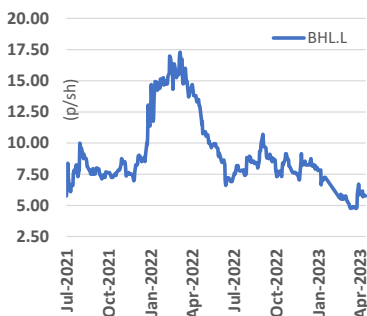
3<sup>rd</sup> May 2023

### Sector: Mining

Diversified lithium assets in the US, having all three common mineralised lithium style deposits within its portfolio.

### Market

Market	AIM-LSE
Ticker	BHL
Price (p/sh)	5.85
12m High (p/sh)	13.00
12m Low (p/sh)	4.75
Ordinary shares (m)	390.6
Market Cap (£m)	22.9



Source: Alpha

### Description

Bradda Head has exposure to sedimentary, pegmatite and brine lithium assets located in Arizona and Nevada. Bradda Head aims to develop assets to support the growing requirement for US-based lithium.

[www.braddaheadltd.com](http://www.braddaheadltd.com)

### Board

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## Bradda Head Lithium Ltd

### Crossing the creek reveals the stepping stones to resource expansion at the Basin project. + Site visit thoughts

Bradda reports that initial observation of drill core from the Basin East (BE) and Basin East Extension (BEE) prospects is highly encouraging. The first 5 holes from the 25-hole programme show that the upper clay unit (which typically carries higher lithium grades) thickens towards the BEE lease. Testing with a handheld spectroscopy device indicates that lithium is present in the clay and whilst actual assays are pending, this is clearly very promising. Even more exciting is the fact that hole #5, the first ever to be drilled on the north side of the creek returned a thick unit of upper clay along with an intact sequence of upper and lower clays. This could potentially have a significant impact on the next iteration of resource estimate at the project.

► **First look at the core brings smiles.** The 25-hole sonic drill programme at Basin, Bradda's sedimentary lithium project in Arizona, kicked off last month. The first 4 holes drilled to the south of the creek at BE and BEE show that the target upper clay horizon thickens to the north and north-west into the BEE lease. This upper clay unit has been shown in prior drill programmes to carry much higher lithium grades. Whilst the core has only just been sent off for assay, visual inspection by Bradda geologists is encouraging and testing with a handheld LIBS (laser-induced breakdown spectroscopy) device has confirmed the presence of lithium. The pending assays will confirm the grade of any potential intersections.

► **Thick intersections.** The thickness of upper clay in holes 3,4 and 5 averages 68m, 77m and 68m respectively. This is a great result for Bradda considering that the average thickness of upper clay in the prior 3 drill programmes was 34m.

► **Crossing the creek pays off.** The most exciting aspect of these initial observations is that hole 5 (BES-23-05) was located on the north side of the creek. Whilst a continuation of the clay horizons was postulated, hole 5 now confirms the theory. Furthermore, hole 5 displays a complete intact sequence of upper and lower clays, capped by basalt. This is the first time a complete sequence has been recorded in this BE area due to variable erosion levels and this highlights compelling resource expansion potential into BEE and potentially further into the BN claim which represent a contiguous land package.



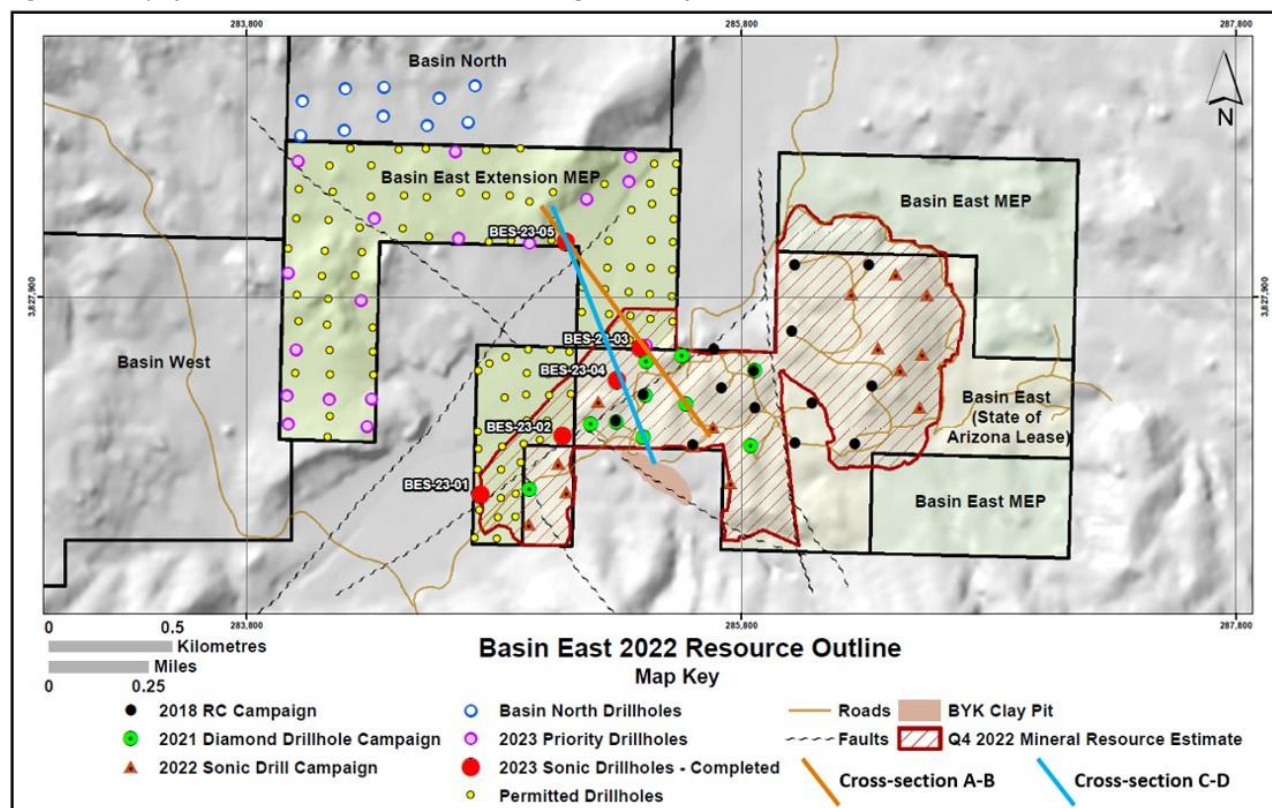
► **More drilling to come.** Bradda plans to drill the remaining 20 holes from this phase across the BEE, BE and BN prospects. Sonic drilling will continue to be used, a more environmentally sensitive method due to its lower water consumption and one that comes with the added bonus of superior core recovery in clays versus diamond drilling. At the start of the programme only a mere 1.4km<sup>2</sup> of Bradda's sedimentary claims in Arizona have been drilled. As Bradda ramps up drilling and based on the positive results from recent drilling, we would anticipate a decent upgrade to the resource base given the relative ease of scaling up resources in laterally extensive deposits such as clay units. The current resource at Basin East amounts to 94.5Mt at 738ppm Li for 371kt contained LCE. Bradda currently has permits for up to 120 holes at BE and 10 holes at BN and is in the process of permitting for drilling at Basin West and Basin West Extension. As well as increasing development potential, further resource growth to 1Mt contained LCE would trigger the next royalty payment of \$2.5m. **Bradda anticipates releasing a resource update in Q3 this year.**

► **Positive site visit.** We have just returned from visiting the Basin and San Domingo projects in Arizona and we were impressed by the scale of the lithium opportunity that Bradda is developing. Details in the note....

Whilst no assays are available yet, this is the best possible start to Bradda's drill new programme at the Basin project and one that highlights compelling potential to crystallise substantial resource growth in a short space of time.

## Charts: Initial core observation highlights resource expansion potential at Basin

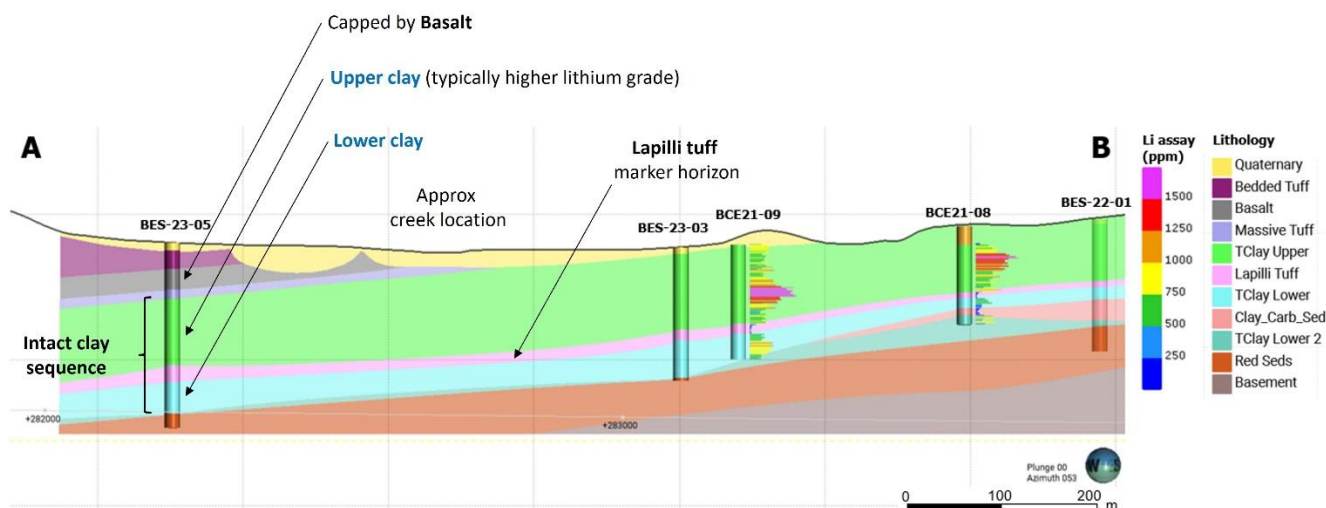
Figure 1 - Map of Basin East Extension, Basin East showing location of recent drill holes



Source: Bradda Head Lithium

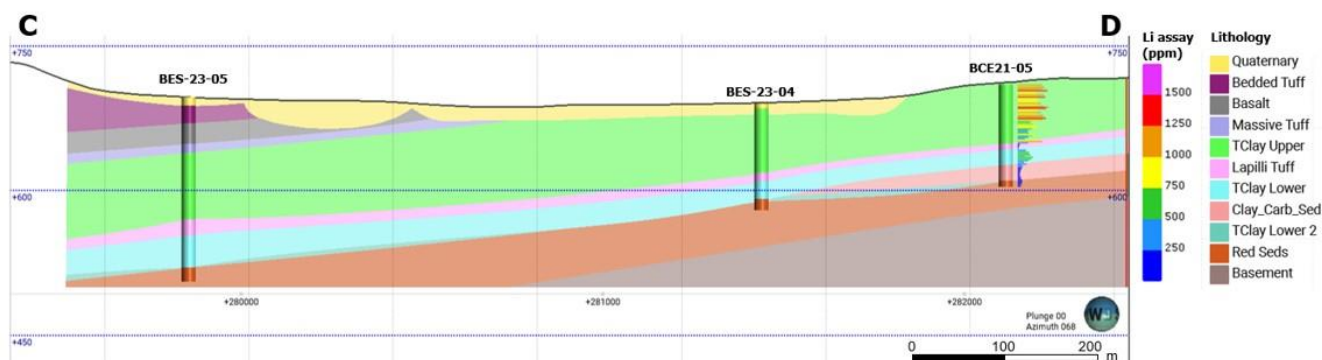
Figure 2 - Cross-section A-B North-West from Basin East to Basin East Extension through BES-23-03 to BES-23-05 showing clay thickening

- Note the continuation of the upper + lower clay unit across the creek from hole BES-23-03 to BES-23-05 and the intact sequence of upper and lower clays in hole BES-23-05. Also note the lithium assays in holes BCE-21-09 and 08 within the same horizon.



Source: Bradda Head Lithium, annotated by Shard Capital

Figure 3 -Cross-section C-D North-West from Basin East to Basin East Extension through BES-23-04 to BES-23-05 showing clay thickening



Source: Bradda Head Lithium

## Site visit musings

*We visited some of Bradda's lithium assets in Arizona earlier this month. Our site visit itinerary reflected the current focus of workstreams and we visited the Basin sedimentary lithium project and the Sam Domingo pegmatite lithium project.*

### A superlative location

Along with all of Bradda's projects, Basin and San Domingo are favourably located in close proximity to high quality infrastructure reflective of the projects' location in a first world country. Although self-evident from looking at the maps, being on the ground brings home the ease of which the projects are connected to local and regional infrastructure.

All projects are close to highways, with project area access typically from a dirt road off the main highway. San Domingo is a mere 1-hour drive from Phoenix, the state capital of Arizona. The Basin project is located a little further to the north, around 1.5hrs northwest from the town of Wickenburg.

It is abundantly clear that any potential development scenario for these assets would not be hampered by logistical or access issues. The biggest challenge during the exploration phase appears to be creek crossings after rare unseasonable rain events. With increasing scrutiny being put on carbon footprints and transport within the lithium supply chain, it is reassuring to see a project with true "mine to highway" credentials. The topography of both the San Domingo and Basin areas is of low to moderate relief typified by low rolling hills, nothing to cause an access issue in our view.

Furthermore, Bradda's projects are ideally located with respect to other key infrastructure including electricity, gas and rail. Thus, we deem that the location could support a mining project of some scale in a Tier 1 mining jurisdiction. At Basin for example, the tailings storage facility of the Bagdad copper mine can be seen when standing on the Basin project claim areas. The Bagdad open-pit copper-molybdenum mining complex is owned by Freeport McMoRan is one of the largest copper mines in North America with a 77,100tpd concentrator plant producing copper and moly concentrate and an SX/EW plant capable of producing 6Mlbs p.a of copper cathode.

### The North American lithium scene is hotting up

**Our site visit over to Arizona confirms that Bradda is in the right place at the right time to have a role in the burgeoning US domestic lithium sector.**

In addition to mine site logistics, the location of Basin, Wikieup and San Domingo is perfect to access Arizona, Nevada and California, the States forming the backbone of America's west coast area lithium Gigafactory and cell manufacturing industry. The entire US lithium sector and supply chain is evolving quickly from the up-stream mining industry, through the mid-stream and into the downstream lithium processing and battery landscape.

**Domestic investment is increasing** as evidenced by a number of government initiatives including the Inflation Reduction Act (IRA) passed in 2022 by President Biden. The act seeks to set aside US\$369bn for climate and clean energy projects. A key provision of the act is the provision of a US\$7,500 tax credit to US consumers to speed up the transition from the internal combustion engine to electric vehicles which will benefit manufacturers such as Tesla and GM. However, there is a catch and that is that the act requires that EV manufacturers source at least 40% of critical battery minerals domestically or with free trade partners by 2024, and 50% of battery pack components must be sourced from North America. At present, the US only has free trade agreements with Canada, Australia, Mexico and Brazil although sourcing from these other countries will have an impact on the overall carbon footprint of the supply chain. This is likely to further bolster the rationale for manufacturers to locate EV and battery plants on domestic soil. The idea of a “battery passport” has also been floated to certify the source of battery critical minerals.

Furthermore, other initiatives are in place by the US Department of Energy (DOE) including funding for studies into lithium extraction and conversion from geothermal brines, which includes funding for direct lithium extraction technologies. Funding also looks set to start flowing to the lithium upstream with direct government participation in the capital expenditure stage of projects.

For example, Lithium Americas (NYSE/TSX: LAC) is in the final stages of applying for DOE funding to assist in constructing the company’s Thacker Pass sedimentary clay lithium project in Nevada. LAC expects funding from the DOE’s Advanced Technology Vehicles Manufacturing Loan Program (ATVM) to provide up to 75% of Thacker Pass’ total capital cost for construction. Thacker Pass has a Phase 1 capital cost of US\$2.3bn and plans to produce 40ktpa LCE in Phase 1.

Visiting the US recently has affirmed our view that all the major players throughout the lithium supply chain will continue to be more involved in facilitating US domestic lithium supply, including car manufacturers and cathode and battery makers. We also see increased involvement and investment by major mining companies given the gestation period between exploration/discovery, development, funding, permitting, construction and ramp up for a new mining operation.

A case in point is the recent US\$650m investment in Lithium America’s by GM, under a binding off-take supply agreement, the largest ever investment by an automaker in battery raw materials. The proceeds will be used to fund development of Thacker Pass. Thacker Pass provides a good read through to Bradda’s sedimentary assets as the successful commissioning of the Thacker Pass process plant will significantly de-risk the flow sheets at other proposed sedimentary clay projects.

Simply put, the industry needs more lithium mines. Even Thacker Pass, the largest of the currently planned US projects has a projected Phase 2 capacity of 80ktpa LCE which represents only c.3% of forecast global demand of 2.5Mtpa of LCE by 2030.

Figure 4 - Bradda's projects are ideally located to feed into the burgeoning US lithium industry



Source: Bradda Head Lithium

## Upcoming catalysts

Key catalysts for 2023 at Basin and San Domingo

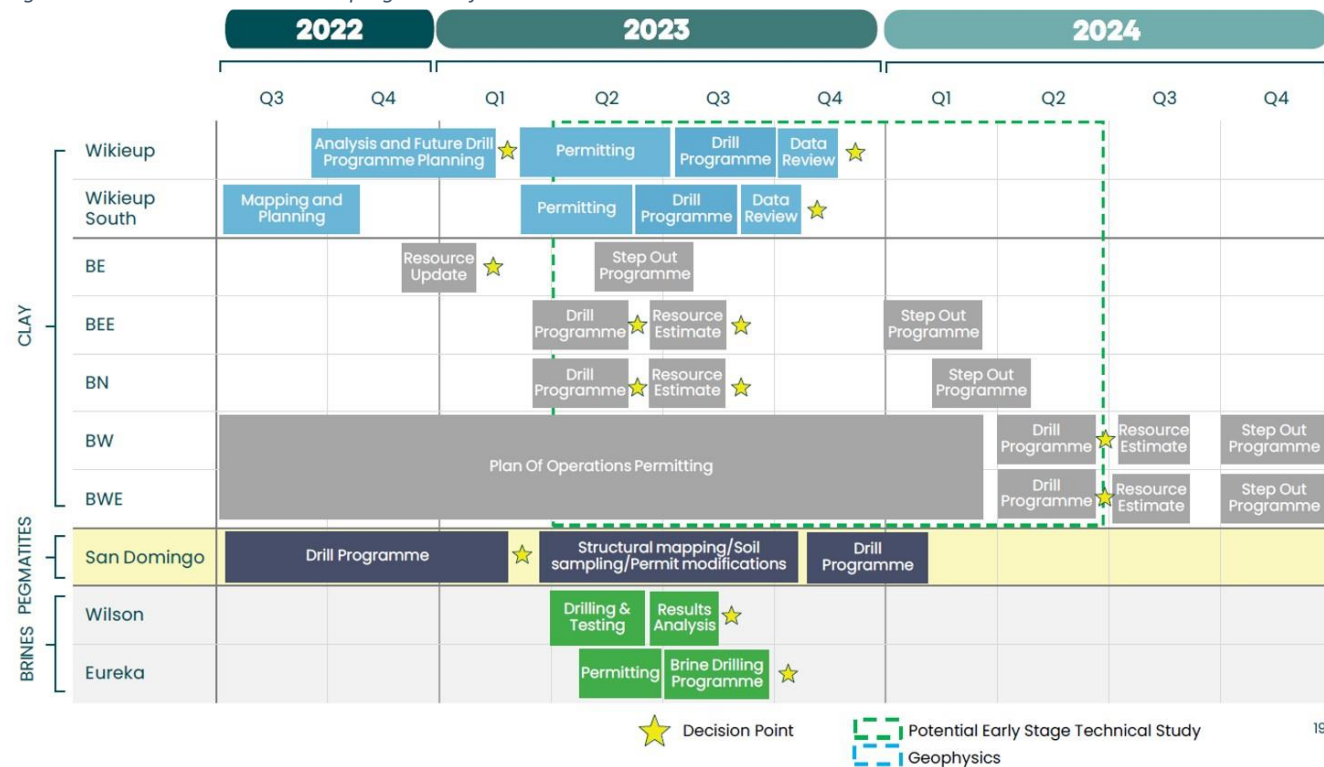
- ▶ **San Domingo** Remaining assays from 7,300m diamond core drilling programme at San Domingo (end of H1-2023). Follow-up drill programme being planned for H2.
- ▶ **Basin** – completion of 25 hole sonic drilling programme. Resource update in Q3.

Figure 5 - Key catalyst for Bradda in 2023



Source: Bradda Head Lithium

Figure 6 - Indicative detailed work programme for Bradda in 2023



Source: Bradda Head Lithium

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## Basin sedimentary lithium project, Arizona

- ▶ **Overall impression.** Visiting the Basin area in Arizona brings home the true scale of the opportunity that Bradda is pursuing here. As is often the case, looking at a map does not always convey the real sense of scale. It becomes immediately apparent upon leaving the highway and driving through the project area that this is a substantial land package. Although Bradda defines multiple claims and leases at Basin with different names (e.g. BE, BEE, BN etc) this is more a function of legal land ownership with a mix of Federal mining claims, Arizona State leases and BLM (Bureau of Land Management) claims. In reality, the various claims have a contiguous nature and we view Basin as one large project with common geology and individual prospect areas.
- ▶ **Current Status.** As per the front page of this note, the 2023 sonic drilling programme is well underway at Basin. The planned programme amounts to 25 holes of which 5 have been completed to date, with core sent off for assay. The overarching aim of the programme is to cover as much ground as possible and ultimately support an upgrade to the current 371kt LCE resource at Basin East. This is being achieved through a mix of in-fill and step out drilling.
- ▶ **Hole 5 a major win.** In terms of step out drilling, the fifth hole of the programme (BES-23-05) is a high impact hole, notably for being located around 500m to the northwest of hole BES-23-03 and on the other side of the creek as described elsewhere in this note. Whilst there was an expectation that the target clay horizons would extend to the north and northwest based on geological interpretation and ground penetrating radar geophysics completed in 2021, it has now been confirmed. Hole 5 not only returned a thick intersection of upper clay but also a completely intact section of both upper and lower clays, the first time this has been recorded to date in drill core.
- ▶ **Resource expansion.** Notably, hole 5 (Basin East Extension) is located a few hundred metres beyond the boundary of the current mineral resource envelope. Assays are pending, but testing with a handheld LIBS device confirms the presence of lithium in the clay which is positive. If the upper clay is proven to contain similar lithium grades to prior drill holes, this could bolster the resource base substantially. It also raises the prospect of discovering further mineralisation in the rest of land package including not only Basin East Extension but also Basin North and Basin West.
- ▶ **Development potential.** In a short space of time, Bradda has progressed the Basin project from an early-stage exploration play into a large project with development potential. Recent metallurgical testwork has been positive but we believe the current focus remains on scaling up the resource base and identifying higher grade horizons. Promisingly, the higher lithium grades tend to be associated with the laterally extensive upper clay unit which potentially raises the prospect of shallow, low-cost open pit mining scenarios. The lithium grade of clay samples taken at surface is often depleted due to weathering interactions and Bradda is discovering that sub-surface clay samples returned from drilling often carry higher grades.
- ▶ **Next steps:** Bradda has 20 holes remaining of the current 25-hole programme with holes located in both BE and BEE. Refer to figure 1 which also indicates the location of a number of high-priority holes at the BEE prospect. Once the current drill programme has been completed and all the assay data has been received, Bradda will engage its consultants to work on an update to the current mineral resource estimate (Jan 2023) which would be 2<sup>nd</sup> MRE update this year and the 4<sup>th</sup> iteration overall. Bradda anticipates releasing the resource update in Q3 of this year. Depending on this resource, Bradda could elect to commence work on a preliminary economic assessment (PEA) later this year.

Figure 7 - Basin Project photos



A - General topography at Basin, Sonic drill rig in foreground  
B - Typical Basin project stratigraphy, Tuffs overlying clay formations  
C - Boart Longyear sonic drill rig in action drilling hole BES-23-04  
D - Clay horizon core from current drill programme

Source: Shard Capital

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## San Domingo pegmatite project, Arizona

- ▶ **Overall impression.** Much the same as Basin, getting on the ground at the San Domingo lithium pegmatite project in Arizona opens your eyes to the sheer scale of the size opportunity available. Immediately one can get a sense of the disconnect between the relatively small area tested and the highly prospective wider land package, relatively untested by modern exploration methods. A number of named lithium-bearing pegmatites exist on the claim area that have been mined at surface historically. We see that as a great start but have the sense that the outcropping pegmatites at San Domingo may be a vector into a much larger sub-surface mineralised pegmatite opportunity. Bradda is certainly not short of targets to drill.
- ▶ **A huge pegmatite district.** Exploration work so far has highlighted the potential for 9km NE-SW trending mineralised pegmatite zone, broadly from the Morning Star pegmatite outcrop in the southwest to the Midnight Owl pegmatite in the northwest. SRK's 3D remote mapping work last year identified almost 1,500 inferred pegmatite outcrops on the San Domingo claims. Bradda since been working towards sorting the wheat from the chaff and differentiating between small discontinuous pegmatites and what could be larger pegmatite swarms. The surface expression of pegmatites can stand out because they are light coloured rocks and the dominant quartz mineralogy makes them resistant to erosion.
- ▶ **And further claims added.** Bradda recently expanded its foothold in the San Domingo district with the acquisition of three inlier lode claims in the middle of the San Domingo claim block. The new claims consolidate the ground around the Sunrise and White Ridge pegmatites with one of the new claims bordering the historical Lower Jumbo mine which reportedly produced c.155t at 5.3% Li<sub>2</sub>O.
- ▶ **It's what you can't see that interesting.** Soil geochemistry completed in late 2022 identified follow up lithium targets over a strike length of >3km despite the soil programme only covering a mere 11% of the claim area. This soil geochemistry suggests that the pegmatite swarm is largely of the LCT (lithium-caesium-tantalum) mineralisation type. LCTs are the primary class of spodumene bearing pegmatite that is typically associated with economic occurrences of lithium and tantalum, e.g. The Western Australian pegmatite district where Greenbushes would be the "type" deposit. Given the often weak magnetic or poorly conductive properties of LCTs, the identification of geochemical pathfinder elements is critical in providing a potential vector to mineralisation. A key takeaway from the site visit was that Bradda has a number of very interesting looking surface soil geochemical anomalies in areas where there is no obvious outcrop of pegmatite. This adds further credence to the theory that there may be a substantial network of pegmatites and feeder systems at depth.
- ▶ **Refining the geological model and vectors to mineralisation.** Ongoing exploration at San Domingo is helping to refine the geological model, a crucial step in defining drill target areas, especially given the large land package. This modelling and exploration strategy is predicated on the theory that LCT pegmatites typically display geochemical and thus mineralogical zonation on a district scale. This zonation is often concentric radiating away from an inferred source granitic pluton due the geochemical evolution and fractionation of the pegmatite melt away from the source pluton. These melts are often highly enriched in incompatible elements such as Li, Cs and Ta. The more distal pegmatites further out from the pluton source tend to be more fractionated and enriched in elements of interest, versus the proximal pegmatites which are called "common" pegmatites and tend to be formed only of normal rock forming minerals such as quartz, feldspar and muscovite etc. Enriched pegmatites are often far outnumbered by common/barren pegmatites but the presence of even single LCT-type enriched pegmatite such as has been demonstrated at San Domingo often signals the existence of others nearby. This is all relevant because further geochemical work along with drilling may help Bradda to vector into more prospective pegmatite occurrences. Often, determining which granitic body is related to pegmatites is challenging but regional zonation work can still be a very important guide to further exploration.

- ▶ **Recent drill results.** Bradda recently reported (27<sup>th</sup> March) the second tranche of assay results from the 7,300m Phase 1+2 drill programme at San Domingo. The Phase 1 programme focused on the Northern Claim Block (February assays which included 31.85m at 1.6% Li<sub>2</sub>O) with Phase 2 moving into the Central Claim block. Phase 2 also returned highly promising results including 9.54m at 1.85% Li<sub>2</sub>O at the Jumbo pegmatite. See our recent note: *San Domingo drilling continues to hit the mark, 5/4/2023*.
- ▶ **Next steps and upcoming catalysts.** Based on the positive results to date, Bradda is planning to embark on a Phase 3 drill programme at San Domingo. This fully funded programme, expected to comprise 10,000m of drilling will utilise data from recent geochemical soil sampling, mapping and the current drilling to identify additional targets. The aim will be to extend known mineralisation and also explore the potential of previously untested areas in the wider 23km<sup>2</sup> claim blocks in Arizona which remain 99% untested.

Figure 8 - San Domingo core photos from recent drilling



Source: Shard Capital

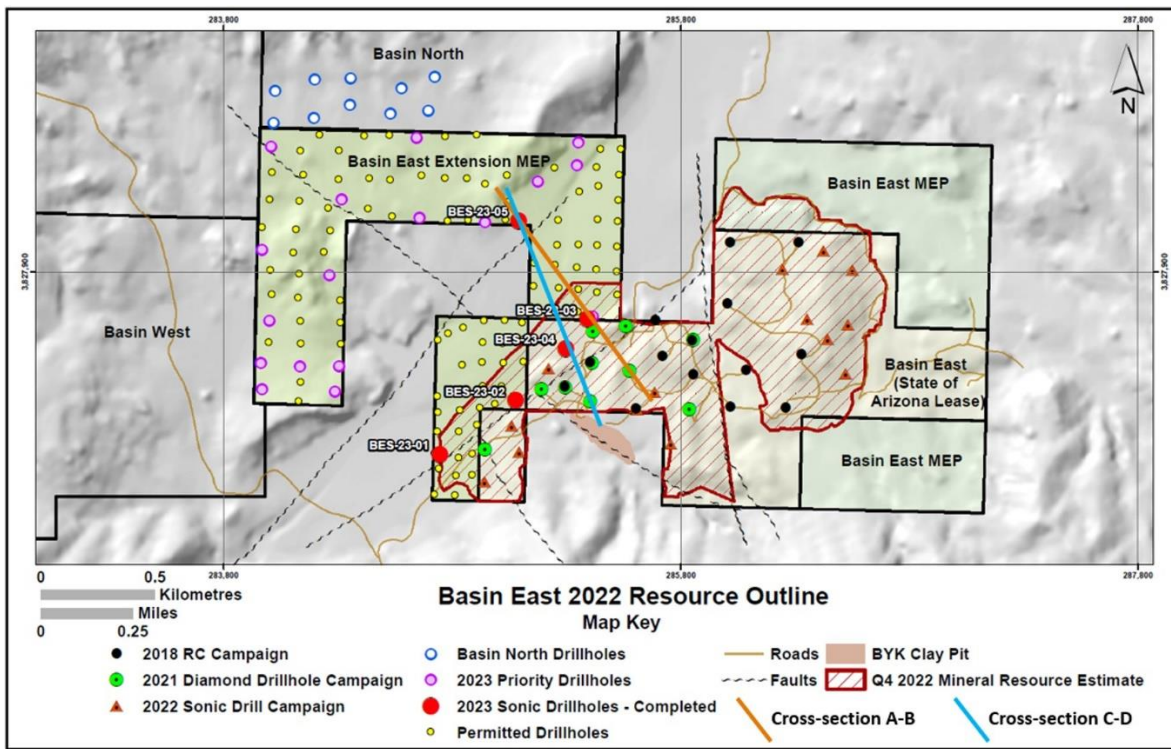
Figure 9 - San Domingo Project photos



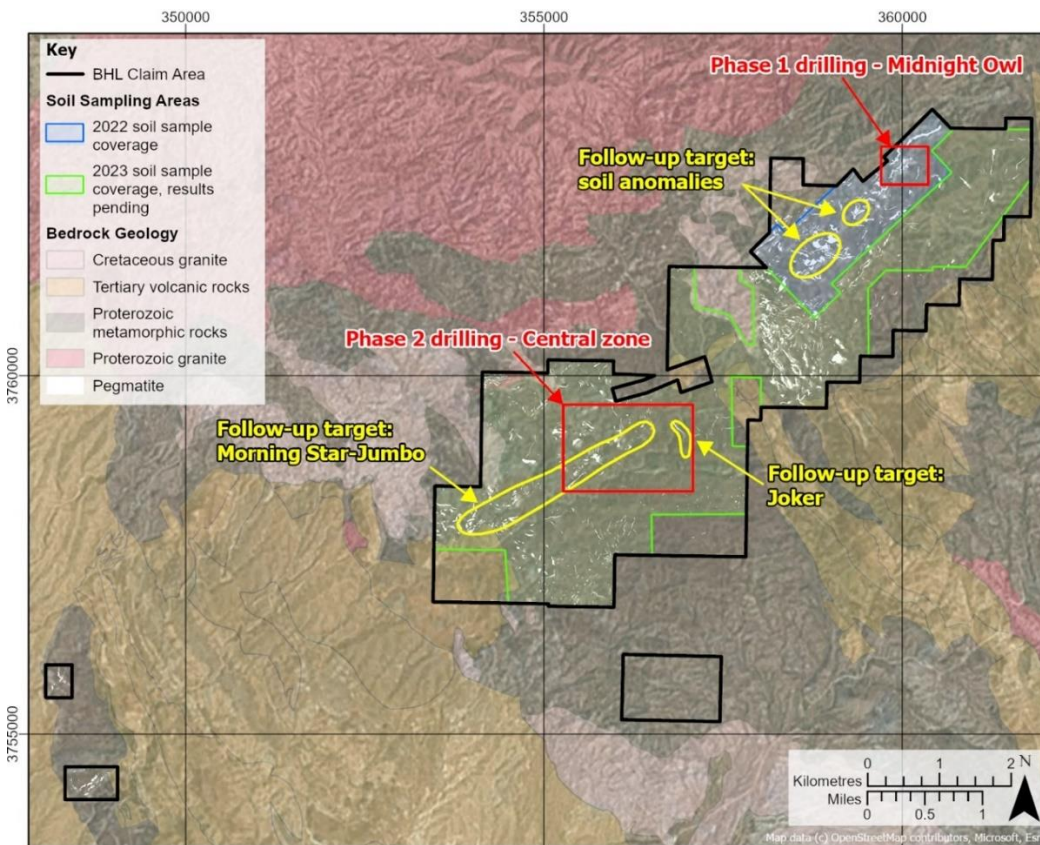
A - Morning Star pegmatite in outcrop – wide zone of pegmatite and spodumene zone  
 B - The view standing at the Jumbo pegmatite and looking back southwest to the prominently outcropping Morning Star pegmatite  
 C - Spodumene crystals in outcrop at Morning Star. Note hand lens for scale  
 D - Typical spodumene flat sample from San Domingo  
 E & F - Spodumene crystals in outcrop at Sunrise

Source: Shard Capital

Figure 10 - Basin Project map

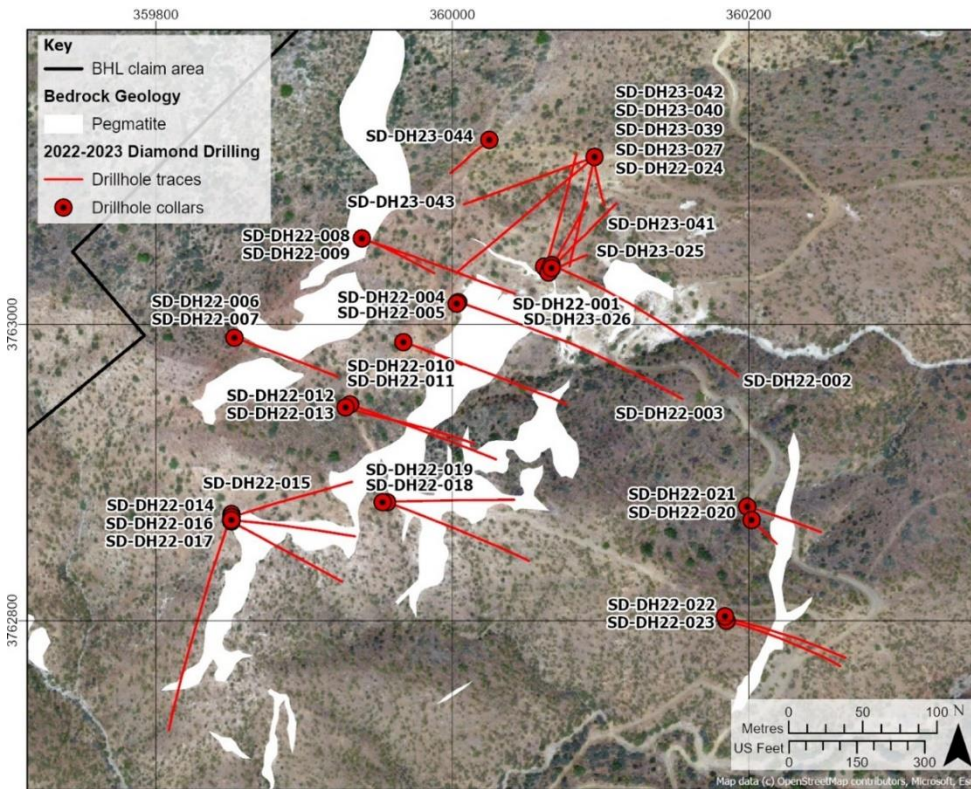


San Domingo project map

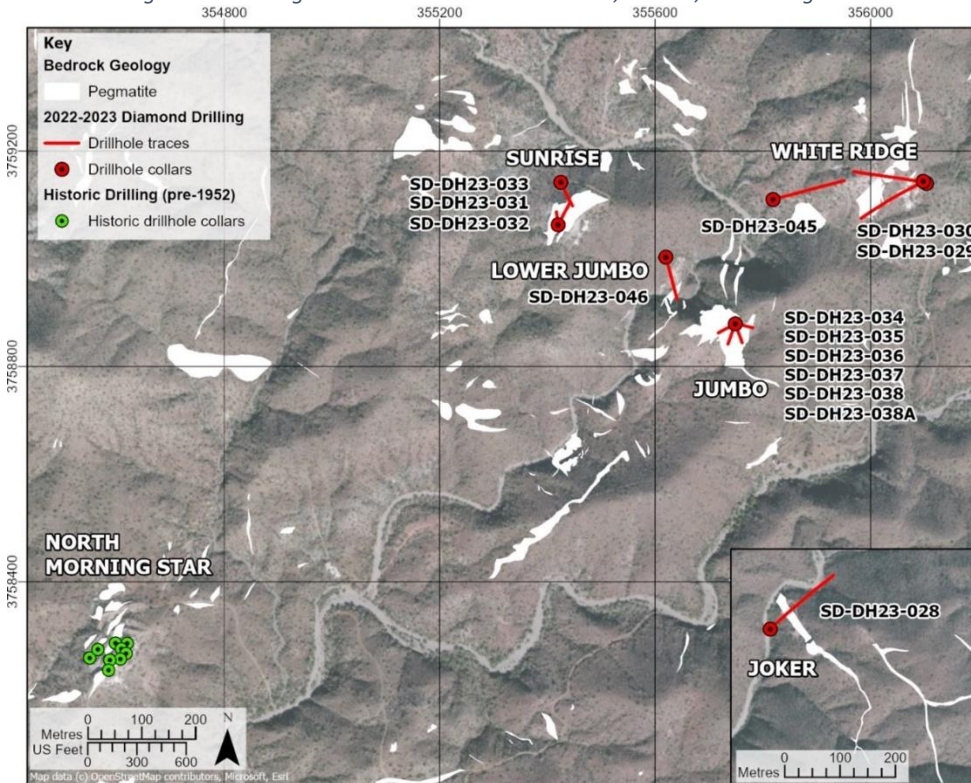


Source: Bradda Head Lithium (both images)

Figure 11 - Phase 1 drilling at San Domingo – Northern Claim Block – Midnight Owl area



Phase 2 drilling at San Domingo – Central Claim Block – Jumbo, Sunrise, White Ridge and North Morning Star areas



Source: Bradda Head Lithium (both images)

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