

7 February 2023

## Positive Pioneer Dome Scoping Study supports commencement of detailed studies

*The Scoping Study is based on the Dome North lithium Mineral Resource upgrade in December 2022 with an impressive 81% of the total contained lithium upgraded to the higher confidence Indicated Category, reflecting the thick, high grade and out-cropping nature of the deposits.*

### Highlights

- Pioneer Dome Lithium Project Scoping Study demonstrates the potential viability of a standalone mining and processing operation.
- The Study prepared by Primero, a leading engineering firm with significant lithium project experience, with inputs from other experienced consultants and from the Essential Metals team, resulted in a Base Case NPV10% (real, after tax) of \$367 million.
- The Scoping Study is based on:
  - A Mineral Resource estimate of 11.2Mt @ 1.16% Li<sub>2</sub>O containing 129,000 lithium tonnes;
  - Metallurgical testwork which demonstrates the potential to produce a saleable lithium concentrate; and
  - Mine optimisation modelling which generated economic open pits totalling 8.8Mt of process plant feed at 1.11% Li<sub>2</sub>O, an average strip ratio of 13.3:1 and a mine life of 7.3 years.
- The positive results of the Scoping Study support the commencement of detailed studies, cognisant of the proposed acquisition of 100% of Essential by Tianqi Lithium Energy Australia Pty Ltd (TLEA) by way of a Scheme of Arrangement (TLEA Scheme) for \$0.50 cash per Essential share as announced on 9 January 2023<sup>1</sup>.

Essential Metals Managing Director, Tim Spencer, said: *“The robust Scoping Study results support more detailed studies being undertaken to determine the optimal development pathway to developing a lithium mining operation in Western Australia whilst taking advantage of expected strong demand for lithium concentrate, which should generate healthy margins.”*

<sup>1</sup> Refer ASX announcement 9 January 2023 “Essential and TLEA to enter into Scheme of Arrangement”.

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## SCOPING STUDY CAUTIONARY STATEMENTS

The Scoping Study referred to in this announcement has been undertaken to ascertain whether to proceed to more definitive studies on the viability of the Pioneer Dome Lithium Project.

It is a preliminary technical and economic study to determine the potential viability of the Pioneer Dome Lithium Project. It is based on low level technical and economic assessments that are not sufficient to support the estimation of Ore Reserves. Further exploration and evaluation work and appropriate studies are required before Essential will be able to estimate any Ore Reserves or to provide any assurance of an economic development case.

Approximately 94% of the Life-of-Mine (LOM) Production Target is in the Indicated Mineral Resource category with only 6% in the Inferred Mineral Resource category. Essential has concluded that it has reasonable grounds for disclosing a Production Target which includes the 6% Inferred Mineral Resources given the characteristics of the deposits and the location of the Inferred Resources within the deposits.

There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of further Measured or Indicated Resources or that the Production Target or preliminary economic assessment will be realised.

It should be noted that the term “ore” is used in this announcement to describe mineralised material that mine optimisation modelling considered potentially economic. It should not be confused with the stricter definition of economically extractable material as denoted by ore in an “Ore Reserve”.

The Scoping Study is based on the material assumptions outlined in this announcement. These include assumptions about the availability of funding. While Essential considers all 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 Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study, funding of in the order of ~\$350 million will likely be required to cover capital expenditure and working capital. Investors should note that there is no certainty that Essential will be able to raise that amount of funding when needed.

It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Essential’s existing shares.

It is also possible that Essential pursues other ‘value realisation’ strategies such as a sale, partial sale or joint venture of the project or Company, such as is contemplated under the proposed TLEA Scheme of Arrangement.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

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## KEY OUTCOMES

The Scoping Study is based on the Mineral Resource upgrade reported on 20 December 2022<sup>2</sup> which comprises Indicated and Inferred Resources of 11.2Mt @ 1.16% Li<sub>2</sub>O, of which 81% of the total contained lithium is reported within the higher confidence Indicated category.

The Scoping Study is based on three open pits (one per deposit) producing 8.8Mt @ 1.11% Li<sub>2</sub>O for processing via a 1.2Mtpa concentrator process plant, resulting in the production of spodumene concentrate with a targeted lithium grade of 5.7% Li<sub>2</sub>O.

**Table 1: Pioneer Dome Lithium Project – Base Case Key Outcomes**

| SCOPING STUDY – BASE CASE KEY OUTCOMES   |   |
|--|---|
| <b>Post-tax NPV 10% (real, post-tax)</b> | A range between \$275M to \$458M with a <b>Base Case of \$367M</b> (range based on +/-25% of the Base Case NPV)   |
| <b>Internal Rate of Return</b>           | Base Case IRR of 40%  |
| <b>Payback Period</b>                    | ~1.7 Years  |
| <b>Life-of-Mine Production Target</b>    | 8.8Mt @ 1.11% Li <sub>2</sub> O   |
| <b>Life of mine</b>                      | ~7.3 Years  |
| <b>Pre-production capital cost</b>       | ~\$293M including \$36M contingency   |
| <b>Average LOM cash operating cost</b>   | ~\$1,030/tonne (US\$721/tonne) of 5.7% spodumene concentrate.<br><br><i>Cash operating costs include all mining, processing, transport and loading at Esperance port, site administration and overhead costs and state and private royalties.</i> |
| <b>Design Annual Production</b>          | ~193,745 tonnes of 5.7% spodumene concentrate at nameplate capacity   |

Approximately 94% of the Life-of-Mine (LOM) Production Target is in the Indicated Mineral Resource category with 6% in the Inferred Mineral Resource category (no Exploration Target has been incorporated).

Less than 3% of the contained lithium (Li<sub>2</sub>O) mined during the first four years of production is sourced from Inferred Resources. Essential has therefore concluded that the Inferred Resources included in the mine plan are not a determining factor in the viability of the Project and the Company has reasonable grounds for disclosing a Production Target which includes Inferred Mineral Resources. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of further Measured or Indicated Resources or that the Production Target or preliminary economic assessment will be realised.

The Net Present Value (NPV) for the Project of \$367 million assumes a ‘present value’ date as at the assumed construction and investment commencement date of July 2024 and first production in January 2026. Discounting the NPV to today’s dollars (i.e., 31 January 2023) using a 10% discount rate, gives a result of \$320 million.

<sup>2</sup> Refer ASX announcement 20 December 2022 “Dome North Resource upgrade”.

## NPV SENSITIVITY ANALYSIS

A range of sensitivities have been applied to the key input assumptions, as follows:

**Table 2: NPV Sensitivity Analysis – changes to inputs**

| KEY INPUT   | SENSITIVITY CHANGE |            |            | CHANGE IN INPUT |       |       |
|---|--------------------|------------|------------|-----------------|-------|-------|
|   | Base Case          | (-) Change | (+) Change | Low             | Base  | High  |
| Spodumene Conc. price (5.7% - US\$/t FOB Esperance) | 1500               | -15%       | 15%        | 1275            | 1500  | 1725  |
| Concentrator lithium head grade                     | 1.11%              | -10%       | 10%        | 1.00%           | 1.11% | 1.22% |
| Tonnes processed (Mt)                               | 8.80               | -10%       | 10%        | 7.9             | 8.8   | 9.7   |
| Cash operating cost A\$/tonne of SC5.7%             | 1031               | 10%        | -10%       | 1134            | 1031  | 928   |
| Concentrator recovered grade                        | 74%                | -5%        | 5%         | 70.0%           | 74.0% | 78.0% |
| AUDUSD exchange rate                                | 0.70               | 5%         | -5%        | 0.740           | 0.700 | 0.670 |
| CAPEX Pre-Production (A\$M)                         | 293                | 10%        | -10%       | 322             | 293   | 264   |

The impact of the change in each key input is measured assuming all other inputs remain the same. The sensitivity results are shown in Table 3.

**Table 3: NPV Sensitivity Analysis – Results**

| NPV Sensitivity Analysis                            | Low NPV | Change in NPV | Base Case | Change in NPV | High NPV |
|---|---------|---------------|-----------|---------------|----------|
|   | A\$M    | A\$M          | A\$M      | A\$M          | A\$M     |
| Spodumene Conc. price (5.7% - US\$/t FOB Esperance) | 205     | -162          | 367       | 161           | 528      |
| Concentrator lithium head grade                     | 262     | -105          | 367       | 105           | 472      |
| Tonnes processed (Mt)                               | 284     | -83           | 367       | 82            | 449      |
| Cash operating cost A\$/tonne of SC5.7%             | 298     | -69           | 367       | 68            | 435      |
| Concentrator recovered grade                        | 310     | -57           | 367       | 56            | 423      |
| AUDUSD exchange rate                                | 309     | -58           | 367       | 48            | 415      |
| CAPEX Pre-Production (A\$M)                         | 344     | -23           | 367       | 22            | 389      |

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## SCOPING STUDY PARAMETERS

The Scoping Study was managed by Primero with mining inputs from Orelogy and other inputs from Essential and was completed according to the following levels of accuracy:

**Table 4: Scoping Study level of accuracy**

| STUDY AREA   | LEVEL OF ACCURACY  |
|--|--|
| Capital and operating costs<br>(prepared by Primero) | <p>+/-25% accuracy per AACE Class 4, along with the relevant supporting engineering detail. The capital and operating cost estimates have been prepared at a narrower range than the +/-35% to +/-40% typically used for mining project scoping studies.</p> <p>This was requested by Essential to provide a higher level of accuracy of Project funding requirements and economic outcomes to assist Essential in sourcing financing, particularly given the cost escalation being witnessed in the Western Australian mining sector.</p> |
| Metallurgy<br>(prepared by Primero)                  | <p>Scoping Study level of accuracy on four composites representing the Cade Fresh, Cade Oxide, Davy Fresh and Davy Oxide zones. Samples from the Heller deposit (of which only 4.5% of the Production Target is sourced) have not yet been tested. Refer to the Metallurgy section for further information.</p>  |
| Mining study<br>(prepared by Orelogy)                | <p>A mining cost estimation was derived from first principles. Cost data for non-mining activities was provided by Primero and Essential to Orelogy for use in the pit optimisation modelling.</p>   |

### Scoping Study contributors

- |   |                     |
|---|---------------------|
| • Scoping Study manager                 | Primero             |
| • Mineral Resource estimate and geology | Trepanier/Essential |
| • Mine optimisation and mining          | Orelogy Consulting  |
| • Metallurgical testwork                | Nagrom              |
| • CAPEX and OPEX estimates              | Primero             |
| • Engineering design                    | Primero             |
| • Environment                           | Botanica Consulting |

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## SCOPING STUDY ASSUMPTIONS

The Scoping Study was based on assumptions and according to levels of accuracy as follows:

**Table 5: Scoping Study key parameters and assumptions**

| PARAMETER  | ASSUMPTION                          |
|--|-------------------------------------|
| <b>Economic</b>  |                                     |
| Discount rate (real, post tax)                             | 10%                                 |
| Spodumene concentrate price (5.7% Li <sub>2</sub> O) grade | US\$1,500/t FOB Esperance Port (WA) |
| AUD/USD exchange rate                                      | US\$0.70                            |
| Project loan (gearing)                                     | Nil                                 |
| <b>Production</b>  |                                     |
| Life of Mine (LOM) Production Target                       | 8.8Mt @ 1.11% Li <sub>2</sub> O     |
| Average LOM strip ratio                                    | 13.3:1                              |
| Process plant annual throughput                            | 1.2Mtpa                             |
| Lithium recovery rate                                      | 74%                                 |
| Concentrate moisture content                               | 10%                                 |
| Commencement of construction                               | July 2024                           |
| First production   | January 2026                        |
| <b>Costs</b>   |                                     |
| LOM average open pit mining costs (\$/t ore mined)         | \$67.26                             |
| LOM average processing cost (\$/t ore processed)           | \$51.11                             |
| Transport and loading costs (\$/t concentrate)             | \$48.50                             |
| General & administration (\$/t ore processed)              | \$5.36                              |
| Western Australian State royalty                           | 5%                                  |
| Private royalty  | 0.75%                               |
| <b>Pre-production CAPEX</b> (incl. 15% contingency)        | \$293M                              |
| Sustaining CAPEX per tonne processed                       | \$3.33                              |
| Corporate income tax rate                                  | 30%                                 |
| Plant and equipment residual value <sup>3</sup>            | Not included                        |
| Mine closure cost <sup>3</sup>                             | Not included                        |

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<sup>3</sup> The residual value of the process plant and equipment and mine closure costs are typically measured as part of detailed feasibility studies.

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## NEXT STEPS

Essential will commence planning for a Pre-Feasibility Study and/or a Definitive Feasibility Study, subject to the conditions imposed by the TLEA Scheme.

As previously advised, the non-binding and indicative Expressions of Interest process, whereby interest was being sought from parties seeking a financing and off-take partnership to assist with advancing the Pioneer Dome Lithium Project into production has been paused until further notice due to the TLEA Scheme.

Detailed studies, based on the recommendation of the Scoping Study contributors, will include:

### Mining

- Additional drilling to raise the central part of the Cade Resource to Measured status and the Heller Resource to Indicated status.
- A geotechnical site investigation and updated geotechnical slope design parameters and rock mass properties for blasting analysis.
- A hydrogeological site investigation to assess the dewatering requirements.
- Undertake drill and blasting analysis based on the geotechnical test results to determine appropriate blasting parameters, which will be important in managing mining costs. This may be expanded to a mine-to-mill study as fragmentation using explosives is usually a lower cost than crushing and grinding.
- Development of preliminary designs and schedules to form the basis of a request for budget pricing from mining contractors to support the mining cost estimate.
- Re-optimisation, design and scheduling to a Pre-Feasibility and/or Definitive Feasibility Study standard.

### Processing

- Conduct optimisation testwork to potentially improve lithium recovery and to optimise the process such that equipment sizing can be satisfactorily reduced.
- Investigate advantages to alternate process plant throughputs. The throughput used for this study is a suitable match to the available Mineral Resource, however it may not be the optimal design point for process equipment selection and utilisation.
- Further metallurgical testwork and investigation of the mine plan is required to understand if there is a risk of lower grade feed and lower recoveries at various times during the mine life.

### Investigate Project Enhancement Opportunities

Flowsheet optimisation through further metallurgical testwork may reduce the risk to recovery rates and can be used to optimise the size and cost of equipment, thus potentially reducing costs. Key areas that require focus include:

- Identifying throughput to match optimum equipment sizing and utilisation.
- Conducting further comminution testwork to provide greater confidence around crushing, HPGR and milling equipment selection and potentially reducing size of selected equipment.
- Conduct further process engineering investigation into the possible variability in crushing circuit particle size distribution and how this may affect equipment sizing.
- Conduct flotation using site water and if successful, provide a basis to reduce the size of or eliminate water treatment from the flowsheet to reduce costs.
- Conducting further mica and spodumene flotation testwork and potentially optimise residence times such that there is a basis to reduce the size of selected equipment.

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## **Direct Shipped Ore (DSO)**

Direct shipped ore is based on mining ore with limited processing (e.g., crushing and sorting) and selling to a customer with access to a concentrator process plant to produce lithium concentrate. Currently all such plants are in China.

A spodumene DSO production strategy could potentially provide an opportunity to generate early cashflow in a project's development path prior to the CAPEX cost burden for the value-add spodumene concentrate process. It enables the producer to engage with customers, testing the commercial and technical elements of supply agreements. From an operational perspective it allows a producer to test logistics processes and procedures prior to shipping higher value spodumene concentrate.

DSO sales are only viable during supply constrained periods whereby there is elevated pricing. This may not necessarily prevail for the Life-of-Mine.

In the case of a large lithium Mineral Resource, the earlier cashflow generated by selling DSO early in the mine's development (e.g., during construction) can outweigh the opportunity cost of reducing ore tonnes earmarked for spodumene concentrate production. However, in the case of a smaller Mineral Resource such as Dome North, the opportunity cost of reallocating tonnes for DSO sales instead of spodumene concentrate production is more pronounced.

Investors and customers are increasingly focused more on the ESG aspects of lithium supply, particularly the chain of custody and the carbon intensity of each stage of the supply chain. DSO is the most inefficient and carbon intensive lithium product to transport given an average lithia content for DSO of circa 1.0% - 1.4%  $\text{Li}_2\text{O}$  compared to spodumene concentrate (6%  $\text{Li}_2\text{O}$ ). For example, assuming a head grade of 1.2%  $\text{Li}_2\text{O}$  and a concentrator recovery rate of 75%, 100 tonnes of DSO ore is reduced to 15 tonnes of 6%  $\text{Li}_2\text{O}$  concentrate (unadjusted for moisture).

As the trend grows for more responsibility with respect to carbon intensity, DSO may eventually be categorised as "dirty lithium". The Chinese supply chain is already regarded as the most carbon intensive in the world and previously the Chinese government has discouraged and even blocked the importation of bulk ores with high waste contents.

A more sustainable and long-term strategy is the development of a primary spodumene concentrate development strategy to realise superior margins with a parallel short-term DSO strategy.

In conclusion, the scale and timing of a DSO opportunity will be assessed as part of future detailed studies.

## **Resource growth**

Whilst drilling programmes to date have delineated the mineralised zones of the three deposits that comprise the Dome North Mineral Resource, further exploratory drill programmes will focus on finding new spodumene bearing pegmatites on the Pioneer Dome Project tenure.

## **Infrastructure**

The Project is in proximity (~10km) to a main highway that connects Kalgoorlie and Esperance. Alongside this highway runs an operating water mains pipeline, a currently non-operating gas pipeline and an operating rail line carrying bulk commodities to the Esperance Port, which lies approximately 270km to the south of the Dome North Mineral Resource.

The Scoping Study has assumed that power will be supplied using diesel generators, water will be sourced from nearby subterranean sources and concentrate will be transported by road to Esperance Port.



As part of the detailed studies to follow, Essential will investigate sourcing power from the WA electricity network via a substation located ~20km north of the Project and/or installing renewable power and/or sourcing gas from the currently inactive gas pipeline.

Potential water sources will be assessed, considering the quality, cost and capacity, including water from the aforementioned water pipeline and/or other water sources already supplying operations in the area.

Essential will also conduct a study on the costs and benefits of transporting concentrate via the railway instead of road haulage.

### **Environmental assessment**

A baseline environmental study was completed in early 2022, however more detailed and extensive studies will need to be commissioned, including EPA approvals.

### **Stakeholder engagement**

A comprehensive stakeholder engagement plan will be prepared to fully understand and address the information needs, concerns and aspirations of people affected by development of the Project.

### **Risk assessment and mitigation**

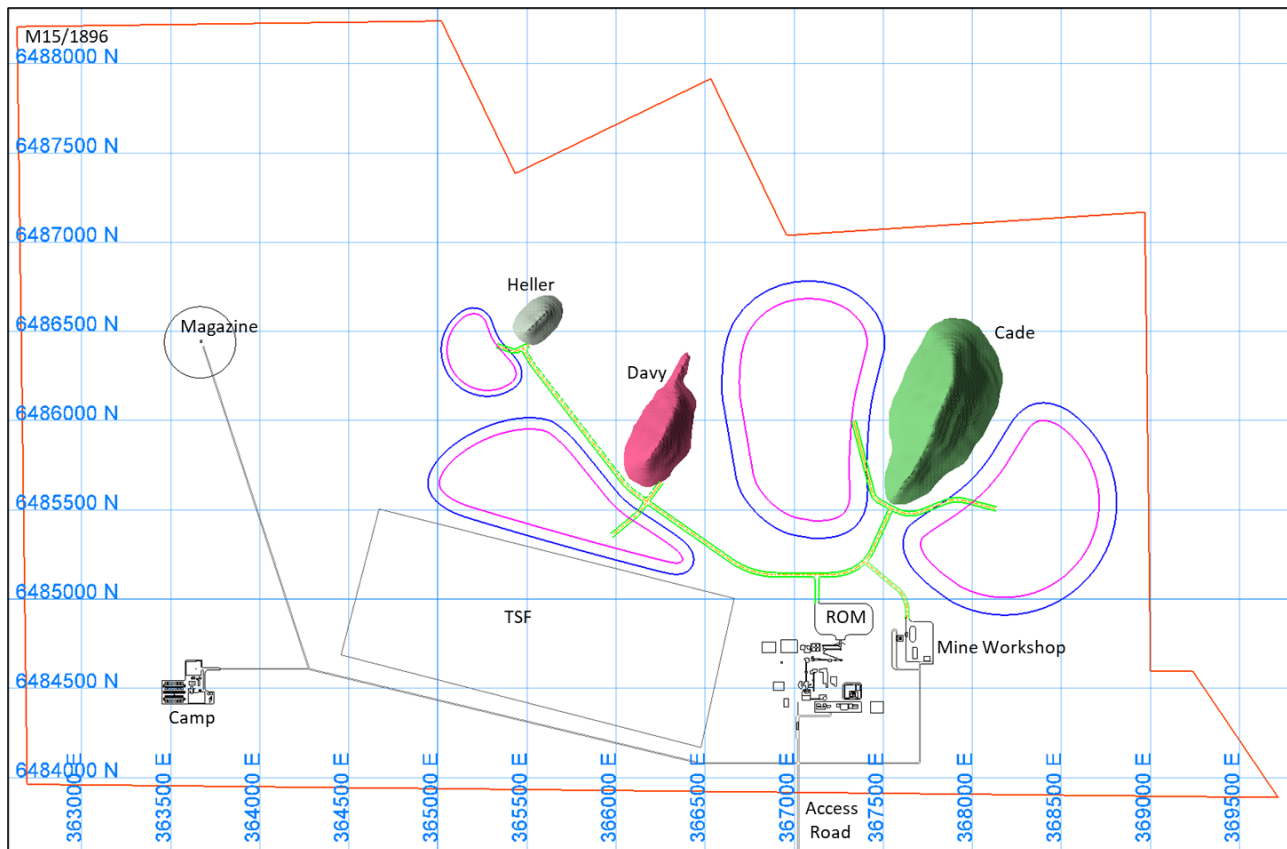
Essential and its consultants have identified various risks that will be addressed as part of future studies, including:

- Refining the inputs used in the Scoping Study;
- Further metallurgical testwork, including on bulk samples from suitable material available near-surface;
- Confirming geotechnical characteristics of the areas hosting the deposits to assist with open pit mine design;
- Further native title heritage clearance surveys across the mining lease and other relevant areas;
- Potential 'above CPI inflation' cost escalations associated with capital and operating cost estimates between now and commencement of construction;
- Personnel planning and sourcing; and
- Possible lower lithium prices as lithium raw material supply increases relative to the capacity and demand of downstream users of lithium chemicals.

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## SITE LAYOUT



**Figure 1 – Overall Mine Layout**

This is a conceptual layout that requires further refinement as part of engineering, environment and hydrology studies, future agreements to be reached with stakeholders including the Ngadju People, the native title custodians of the land on which the project is located, Main Roads WA and the Coolgardie and Dundas local shires.

Further detailed information on the Scoping Study is provided in Appendix 1 in this announcement.

*This ASX release has been approved by the Board of Directors.*

**For further information:**

Tim Spencer, Managing Director

Essential Metals Limited

T: +61 8 9322 6974

E: [tims@essmetals.com.au](mailto:tims@essmetals.com.au)

**Investor Relations**

Nicholas Read

Read Corporate

T: +61 8 9388 1474

E: [nicholas@readcorporate.com.au](mailto:nicholas@readcorporate.com.au)

## ABOUT ESSENTIAL METALS LIMITED

Essential Metals is a well-funded and active explorer/developer focussed on the discovery of lithium and other key global demand-driven commodities, for the creation of shareholder wealth through exploration and project development. The Company operates three strategically located lithium and gold projects in Western Australia.

### 100% OWNED AND MANAGED PROJECTS:

- **LITHIUM:** The **Pioneer Dome Lithium Project** is highly prospective for lithium-caesium-tantalum (LCT) mineral systems and includes the **Dome North Lithium Mineral Resource** of 11.2 million tonnes @ 1.16% lithium (Li<sub>2</sub>O) including 8.7 million tonnes @ 1.23% lithium (Li<sub>2</sub>O) within the Indicated Category.<sup>4</sup>
- **GOLD:** The **Juglah Dome Project** is located 60km east-south-east of Kalgoorlie and is considered to be highly prospective for gold and has potential for VHMS style polymetallic deposits.
- **GOLD:** The **Golden Ridge Project** is located ~20km south-east of Kalgoorlie, WA. Our activities are focussed on reappraising known prospects as well as identifying new areas within the large land tenure.

### JOINT VENTURE INTERESTS:

- **GOLD:** The **Acra Project** is near Kalgoorlie. Northern Star Resources Limited (ASX:NST) has earned a 75% Project Interest and continues to fully fund exploration programmes until approval of a Mining Proposal by DMIRS is received with Essential Metals holding a 25% interest.
- **GOLD:** The **Kangan Project** is in the West Pilbara and part of a joint venture with Novo Resources Corp (TSXV:NVO), who will fund 100% of gold exploration programmes until a decision to mine is made, with Essential Metals holding a 30% interest.
- **GOLD:** The **Balagundi Project** is subject to a farmin & JV agreement where Black Cat Syndicate Limited (ASX:BC8) is earning a 75% interest in the Project located at Bulong, near Kalgoorlie. Black Cat will then fully fund gold exploration programmes until a decision to mine is made, with Essential Metals retaining a 25% interest.
- **GOLD:** The Company holds a 25% free-carried interest (20% for nickel rights) in the **Larkinville Project** near Kambalda, WA, with Maximus Resources Ltd (ASX:MXR).
- **NICKEL:** The nickel mineral rights on the **Blair-Golden Ridge Project**, which includes the suspended Blair Nickel Sulphide Mine, are subject to a Farmin/Joint Venture with Australian Nickel Company Ltd, a nickel exploration specialist which is earning up to a 75% interest. The Company will retain a 25% free-carried interest up to a decision to mine.
- **NICKEL:** The Company holds a 20% free-carried interest (nickel only) in the **Wattle Dam project** near Kambalda, WA, with Maximus Resources Ltd (ASX:MXR).

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<sup>4</sup> Refer ASX announcement 20 December 2023 "Dome North Resource upgrade".

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## **Forward Looking Statement**

This announcement may contain forward-looking statements which involve a number of risks and uncertainties. These forward-looking statements are expressed in good faith and believed to have a reasonable basis. These statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more of the risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this announcement. No obligation is assumed to update forward looking statements if these beliefs, opinions, and estimates should change or to reflect other future developments.

## **Reference to previous market announcements**

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed. The company confirms that the form and context in which Exploration Results or Competent Person's findings are presented have not been materially modified from the original market announcements.

## **Dome North Mineral Metallurgical Test Work - Competent Person Statement**

The information in this report that relates to metallurgical testwork for the Dome North Lithium Project has been reviewed by Mr Joshua Paterson who is a member of the Australasian Institute of Mining and Metallurgy. Mr Paterson is an employee of Primero Ltd and has sufficient experience relevant to the style of processing response and type of deposit under consideration, and to the activities undertaken, to qualify as a Competent Person as defined in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Paterson consents to the inclusion in the report of a summary based upon his information in the form and context in which it appears.

## **Dome North Lithium Mineral Resource – Competent Person Statement**

The information in this report that relates to the Dome North Lithium Project Mineral Resource is based on information compiled by Mr Andrew Dunn (Exploration Manager and permanent employee of Essential Metals Limited) and Mr Lauritz Barnes (consultant with Trepanier Pty Ltd). Mr Dunn is eligible to receive equity-based securities in Essential Metals Limited under the Company's employee incentive schemes. Mr Dunn and Mr Barnes are both members of the Australian Institute of Geoscientists. Mr Dunn and Mr Barnes both have sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specifically, Mr Dunn is the Competent Person for the database (including all drilling information), the geological and mineralisation models plus completed the site visits. Mr Barnes is the Competent Person for the construction of the 3-D geology / mineralisation model plus the estimation. Mr Dunn and Mr Barnes consent to the inclusion in this report of the matters based on their information in the form and context in which they appear.

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**Dome North Mineral Resource by deposit and category: (0.3% Li<sub>2</sub>O cut-off grade)**

| <b>Deposit</b> | <b>Classification</b> | <b>Tonnes (Mt)</b> | <b>Li<sub>2</sub>O %</b> | <b>Ta<sub>2</sub>O<sub>5</sub> ppm</b> | <b>Contained Li<sub>2</sub>O (T)</b> | <b>Fe<sub>2</sub>O<sub>3</sub> %</b> |
|----------------|-----------------------|--------------------|--------------------------|--|--------------------------------------|--------------------------------------|
| Cade           | Indicated             | 6.9                | 1.26                     | 49                                     | 88,000                               | 0.44                                 |
|                | Inferred              | 1.3                | 0.88                     | 49                                     | 11,000                               | 0.44                                 |
| Davy           | Indicated             | 1.6                | 1.08                     | 81                                     | 18,000                               | 0.54                                 |
|                | Inferred              | 0.6                | 0.89                     | 73                                     | 4,000                                | 0.58                                 |
| Heller         | Inferred              | 0.7                | 1.02                     | 76                                     | 8,000                                | 0.72                                 |
| <b>Total</b>   | <b>Total</b>          | <b>11.2</b>        | <b>1.16</b>              | <b>57</b>                              | <b>129,000</b>                       | <b>0.48</b>                          |

*Note: Appropriate rounding applied.*

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## APPENDIX 1 – SCOPING STUDY MATERIAL ASSUMPTIONS AND ADDITIONAL INFORMATION

### PIONEER DOME LITHIUM PROJECT

The 450km<sup>2</sup> Pioneer Dome Project (ESS: 100%) is in the core of Western Australia’s lithium corridor in the Eastern Goldfields, approximately 130km south of Kalgoorlie and 270km north of the Port of Esperance. A Mineral Resource of 11.2Mt @ 1.16% Li<sub>2</sub>O has been defined at Dome North in the northern area of the Project.

The southern Yilgarn area is recognised as being well-endowed with spodumene deposits, including the Pioneer Dome, Bald Hill Mine, the Mt Marion Mine, the Manna Project and the Buldania Project, all of which are located within a circle with a 90km radius. The world-class Greenbushes Deposit, the Mt Holland Mine and the Mt Cattlin Mine are located further west, south-west and south-south-west, respectively.

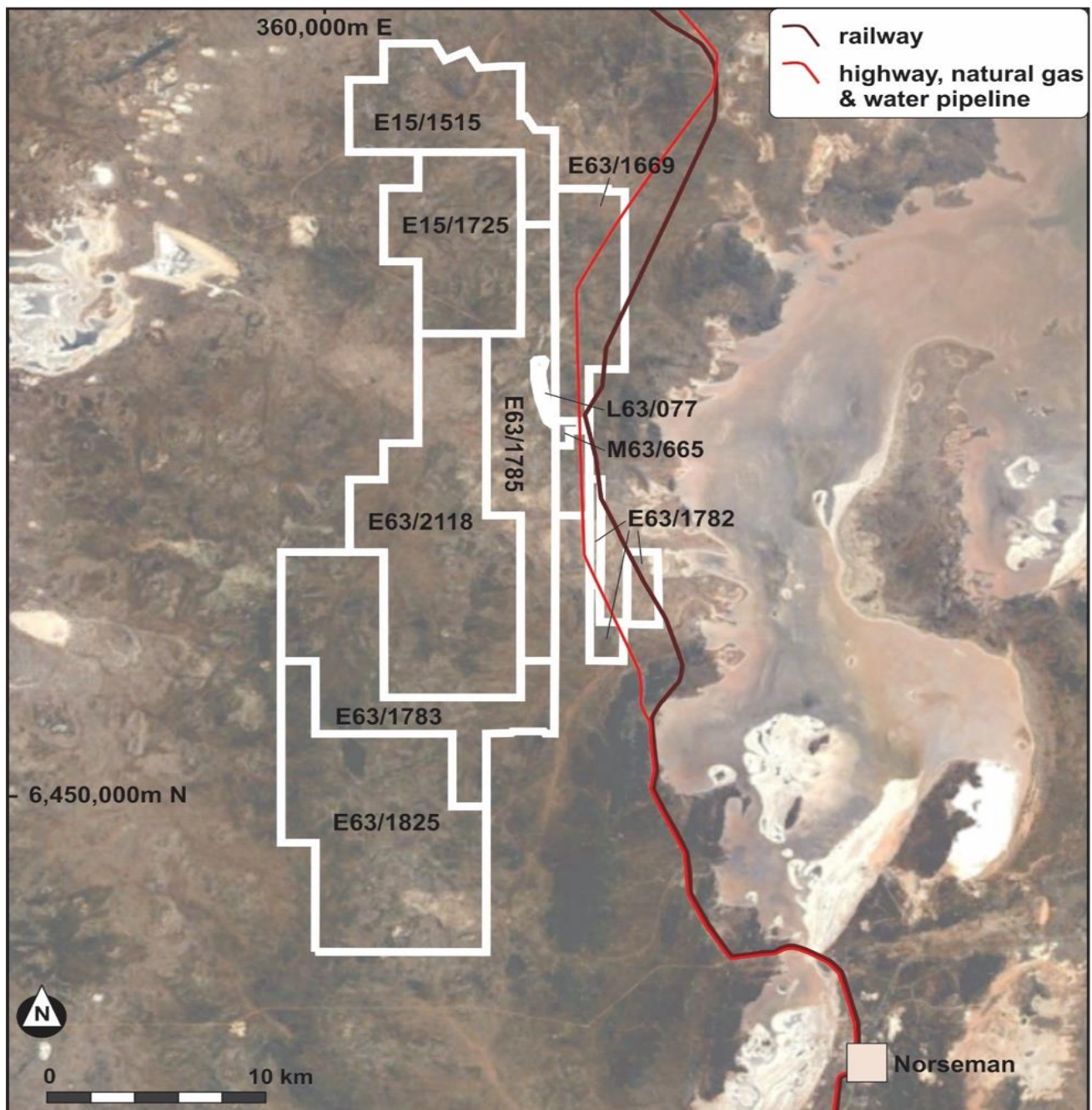


Figure 2 – The location of the tenements of the Pioneer Dome Lithium Project relative to major infrastructure.

## MINERAL RESOURCE AND GEOLOGY

### Mineral Resource

The Mineral Resource reported on 20 December 2022<sup>5</sup> was an update to the Mineral Resource reported in September 2020<sup>6</sup> and incorporated additional extension and infill drilling and further metallurgical testwork.

The Indicated and Inferred Mineral Resource, which was prepared by independent specialist resource and mining consulting group Trepanier (Geology & Resource Consultants), comprises 11.2Mt at an average grade of 1.16% Li<sub>2</sub>O and 57ppm Ta<sub>2</sub>O<sub>5</sub> and is set out in Table 6 and Table 7.

**Table 6: Dome North Mineral Resource by Category: (0.3% Li<sub>2</sub>O cut-off grade)**

| Classification | Tonnes (Mt) | Li <sub>2</sub> O % | Ta <sub>2</sub> O <sub>5</sub> ppm | Contained Li <sub>2</sub> O (t) | Fe <sub>2</sub> O <sub>3</sub> % |
|----------------|-------------|---------------------|------------------------------------|---------------------------------|----------------------------------|
| Measured       | -           | -                   | -                                  | -                               | -                                |
| Indicated      | 8.6         | 1.23                | 55                                 | 105,000                         | 0.46                             |
| Inferred       | 2.6         | 0.92                | 62                                 | 24,000                          | 0.55                             |
| <b>Total</b>   | <b>11.2</b> | <b>1.16</b>         | <b>57</b>                          | <b>129,000</b>                  | <b>0.48</b>                      |

*Note: Appropriate rounding applied.*

**Table 7: Dome North Mineral Resource by deposit and category: (0.3% Li<sub>2</sub>O cut-off grade)**

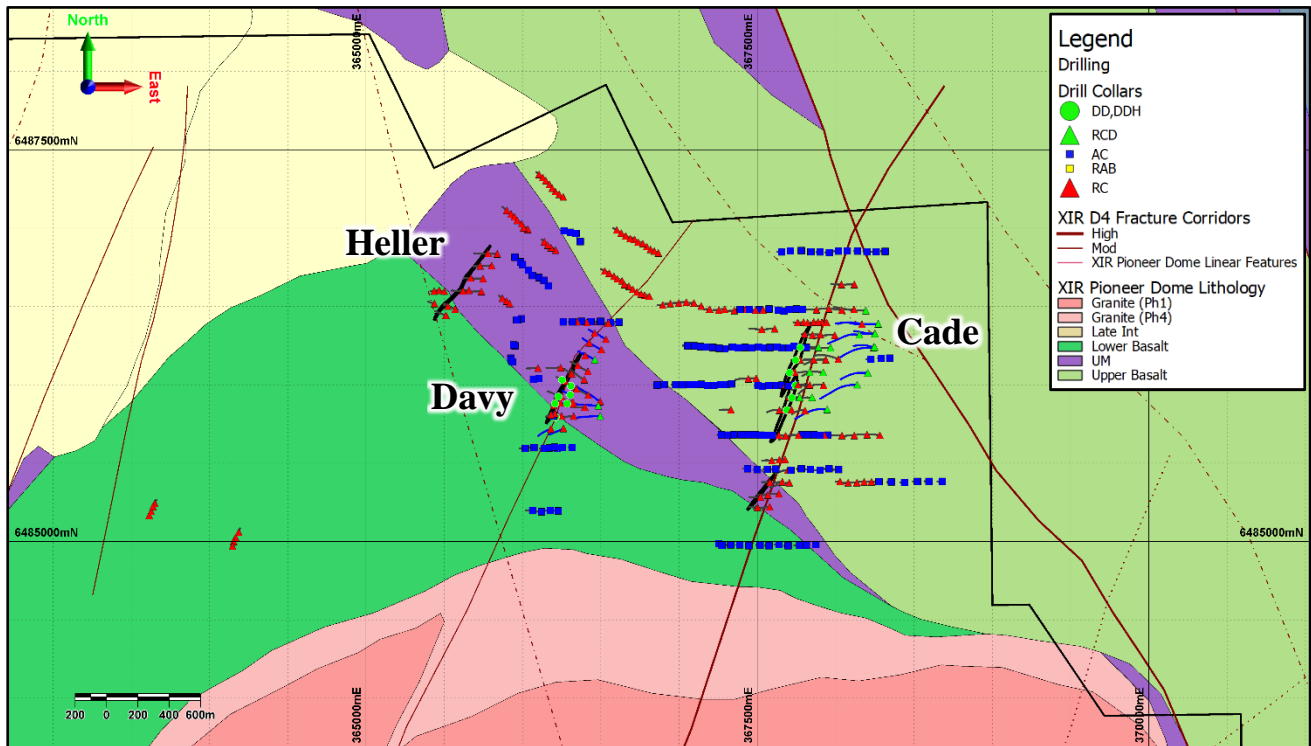
| Deposit      | Classification | Tonnes (Mt) | Li <sub>2</sub> O % | Ta <sub>2</sub> O <sub>5</sub> ppm | Contained Li <sub>2</sub> O (T) | Fe <sub>2</sub> O <sub>3</sub> % |
|--------------|----------------|-------------|---------------------|------------------------------------|---------------------------------|----------------------------------|
| Cade         | Indicated      | 6.9         | 1.26                | 49                                 | 88,000                          | 0.44                             |
|              | Inferred       | 1.3         | 0.88                | 49                                 | 11,000                          | 0.44                             |
| Davy         | Indicated      | 1.6         | 1.08                | 81                                 | 18,000                          | 0.54                             |
|              | Inferred       | 0.6         | 0.89                | 73                                 | 4,000                           | 0.58                             |
| Heller       | Inferred       | 0.7         | 1.02                | 76                                 | 8,000                           | 0.72                             |
| <b>Total</b> | <b>Total</b>   | <b>11.2</b> | <b>1.16</b>         | <b>57</b>                          | <b>129,000</b>                  | <b>0.48</b>                      |

*Note: Appropriate rounding applied.*

The Mineral Resource is reported and classified in accordance with the guidelines of the 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code; 2012).

<sup>5</sup> Refer to ASX announcement 20 December 2022 "Dome North Resource upgrade"

The three deposits that comprise the Mineral Resource Estimate are Cade, Davy and Heller and their locations are shown in Figure 3 below.



**Figure 3 – Lithium exploration drilling, local geology and structural interpretation of the Dome North Project area – Cade, Davy and Heller.**

## Geology

In the vicinity of the project area, the Archean greenstone sequence dominates, and is broadly north-south striking, westerly dipping and younging to the east. Lithologies include tholeiitic basalt, pyroxene spinifex-textured basalt, komatiite, peridotite and dolerite, in addition to sedimentary rock derived from felsic volcanic and volcanoclastic rocks and pelitic and psammitic metasedimentary rocks of the Black Flag Group (Cade Deposit host rock). Interflow sediments are also present, commonly in the form of carbonaceous shale horizons.

The entire greenstone sequence is intruded by a series of pegmatite dykes and sills associated with the later stage Pioneer Dome granite intrusive. These pegmatite dykes form a swarm of intrusive bodies along a strike length of approximately 15 km along the eastern edge of the granite dome.

The lithium mineralisation at Dome North is contained in three deposits: Cade, Davy and Heller. The deposits have left-stepping lensoidal pegmatites that are north-north-east to north-east trending with a steep dip to the east-south-east. Tantalum is elevated within the spodumene bearing pegmatites, but it does not occur by itself in economic concentrations and widths.



## MINING AND PRODUCTION

Orelogy Consulting Pty Ltd (Orelogy) undertook a scoping level mining study predicated on supplying a 1.2Mtpa process plant, sourcing ore from the three deposits, Cade and Davy and Heller, that make up the Mineral Resource.

The mining study produced three economic pits with a total of 8.8 Mt of ore at 1.11% Li<sub>2</sub>O with a strip ratio of 13.3:1 and a mine life of 7.3 years.

A conventional open pit mining method was selected as the basis for the mining operation using two 200 tonne class excavators matched to 90 tonne class trucks. It has been assumed that all material will require blasting. The mining costs are based on Contractor mining with the Essential providing management and technical support including geology, ore control, mine planning and survey.

The pit shells selected from the pit optimisation were based on a revenue factor of 1.0. The shells were smoothed and expanded by 5% to simulate additional waste captured during the design process to prepare total inventories prior to scheduling. The Cade pit was split into three stages with Davy and Heller as single stage pits. The Mineral Resources to be mined by stage used for scheduling is summarised in Table 7.

**Table 8: Mine Plan Stages**

| Schedule Stage | Mined Total Rock<br>Mt | Mined Waste Rock<br>Mt | Mined Ore (MIF)<br>Mt | Mined Grade (MIF)<br>% | Li <sub>2</sub> O metal<br>kt | Strip Ratio<br>t:t |
|----------------|------------------------|------------------------|-----------------------|------------------------|-------------------------------|--------------------|
| Cade Stage 1   | 16.2                   | 13.5                   | 2.7                   | 1.23                   | 33.2                          | 5                  |
| Cade Stage 2   | 35.8                   | 33.6                   | 2.2                   | 1.18                   | 26.0                          | 15.1               |
| Cade Stage 3   | 46.2                   | 43.9                   | 2.3                   | 0.98                   | 22.5                          | 19.1               |
| Davy           | 23.5                   | 22.1                   | 1.4                   | 1                      | 14.0                          | 16.2               |
| Heller         | 4.5                    | 4.2                    | 0.2                   | 0.87                   | 1.7                           | 19.1               |
| <b>Total</b>   | <b>126.2</b>           | <b>117.4</b>           | <b>8.8</b>            | <b>1.11</b>            | <b>97.5</b>                   | <b>13.3</b>        |

The mine schedule has assumed that all ore mined in each period is processed in the same period at a rate of 1.2 Mtpa through the process plant. Value has been maximised using the pit stages to optimise the mining sequence by mining the higher value stages first. The mining schedule physicals are shown in Figure 4.

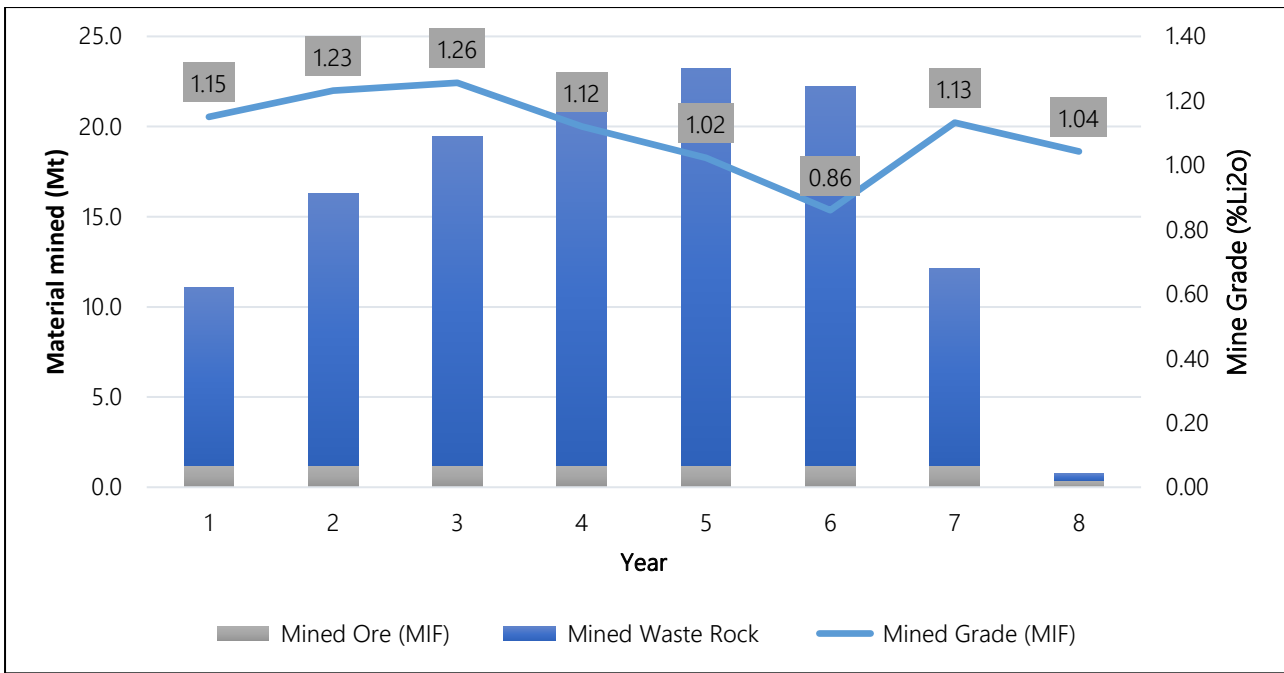


Figure 4 – Mining Schedule Physicals by year

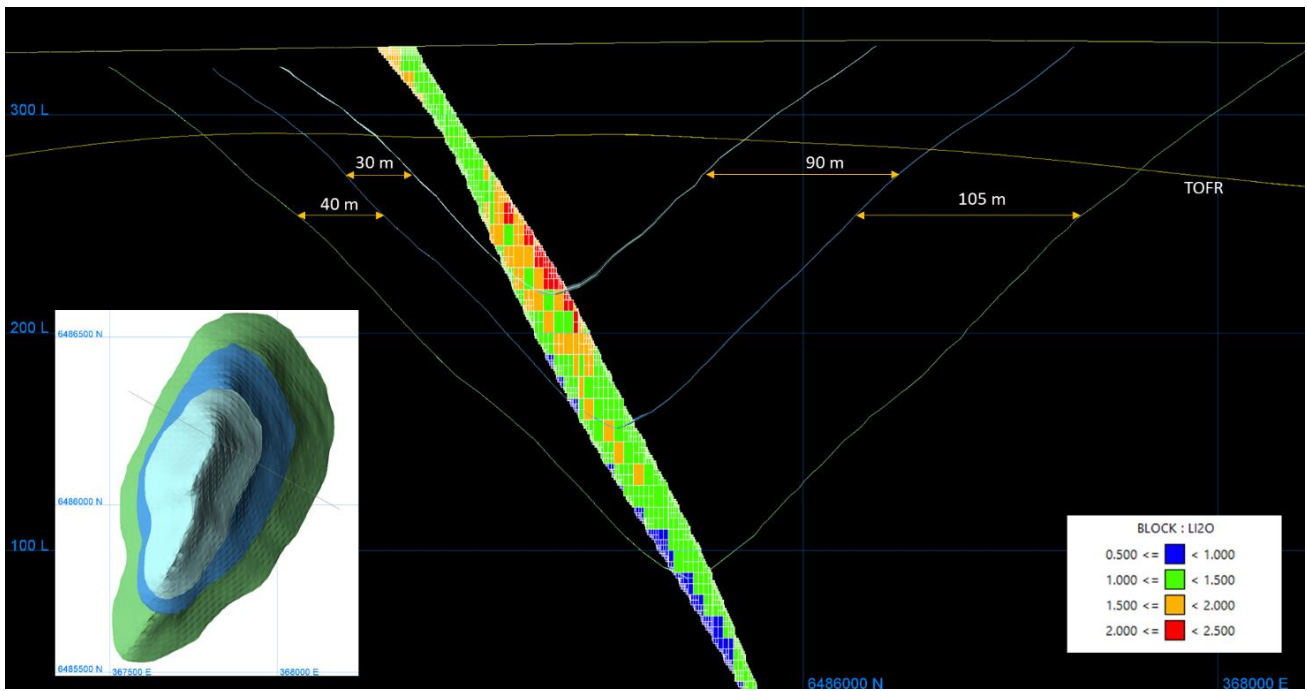
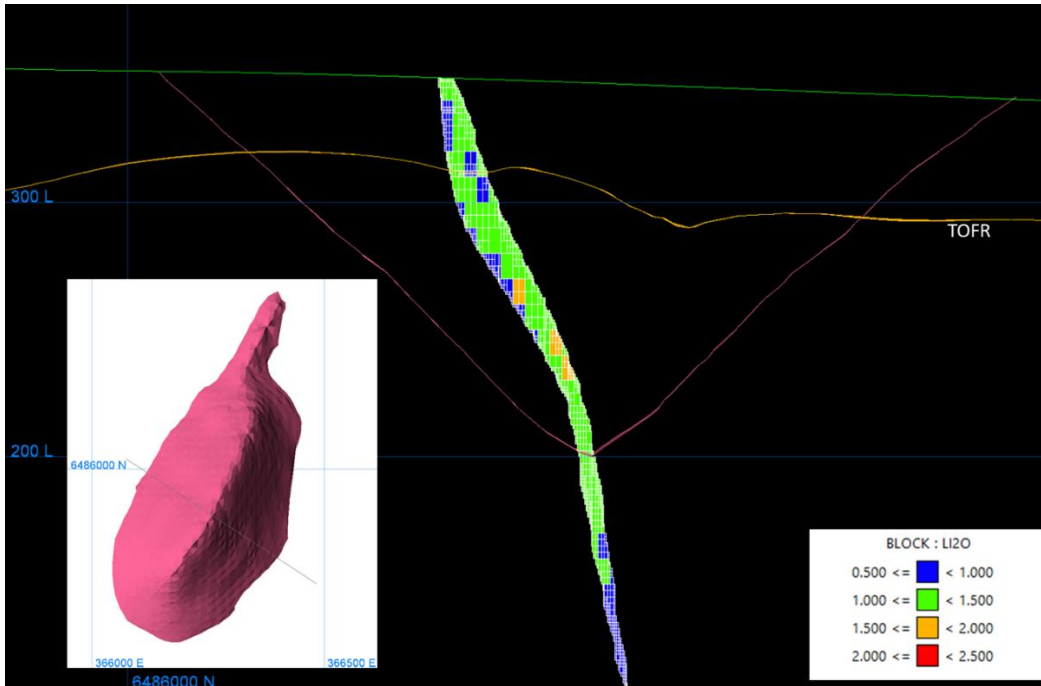


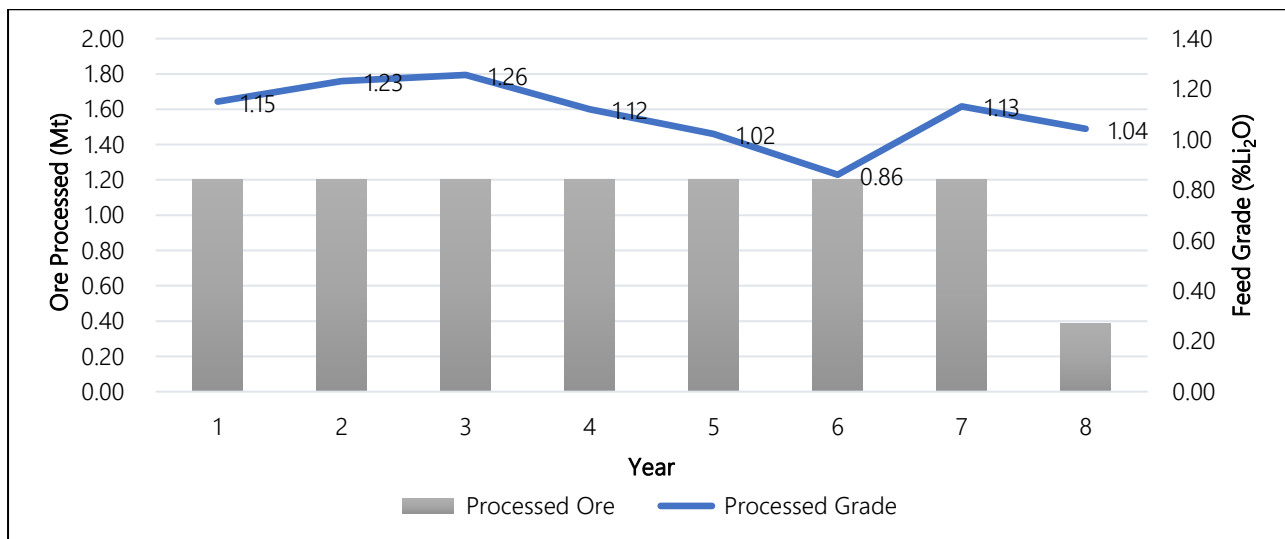
Figure 5 – Cross Section through Cade Pit showing stages



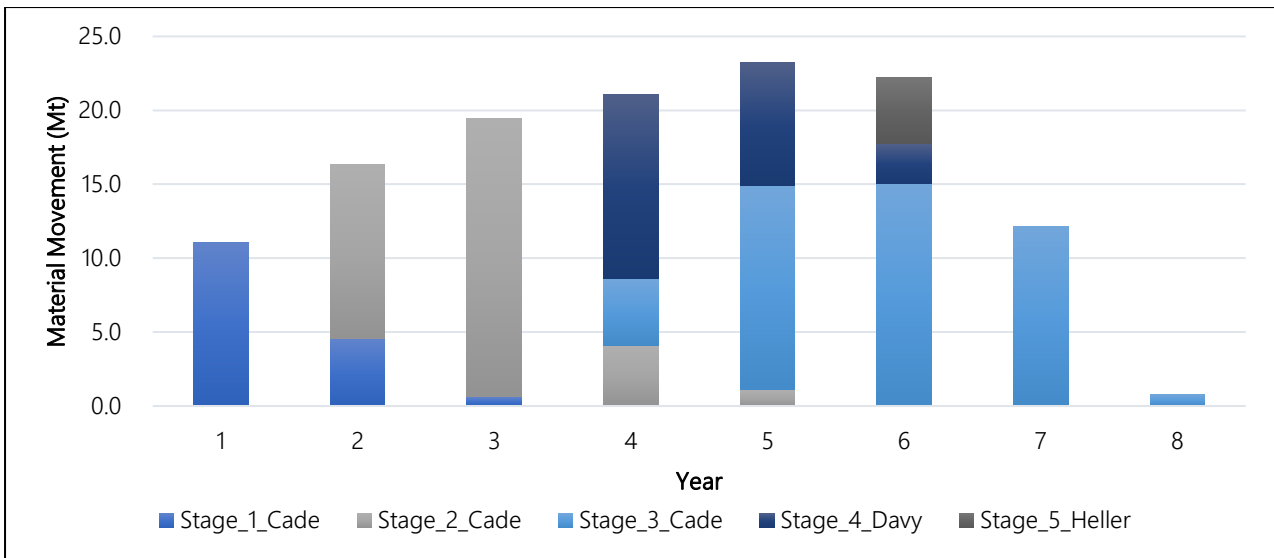
**Figure 6 – Cross Section through Davy Pit**

The latest physical, technical, and economic parameters were applied to the orebody to determine the “ideal” open pit excavation geometry for the pit shells. As this was a scoping level study, the pit shell was used as the basis for assessment and no pit design work was conducted.

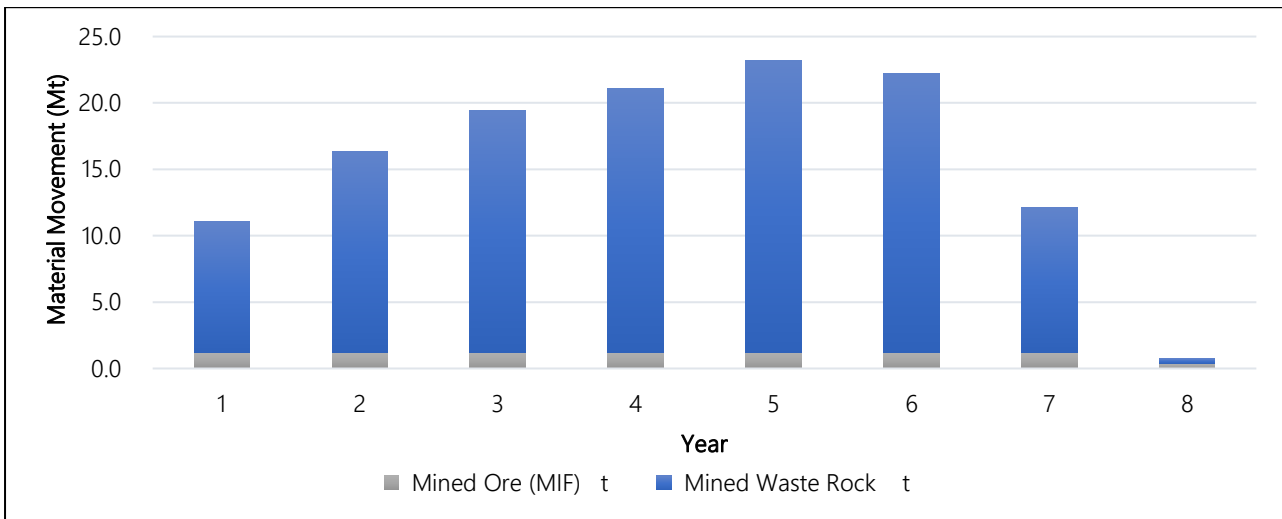
It should be noted that the term “ore” is used describing the optimisation process. It is used to describe mineralised material that the optimisation considered potentially economic. It should not be confused with the stricter definition of economically extractable material as denoted by ore in an “Ore Reserve”.



**Figure 7 – Ore Feed**

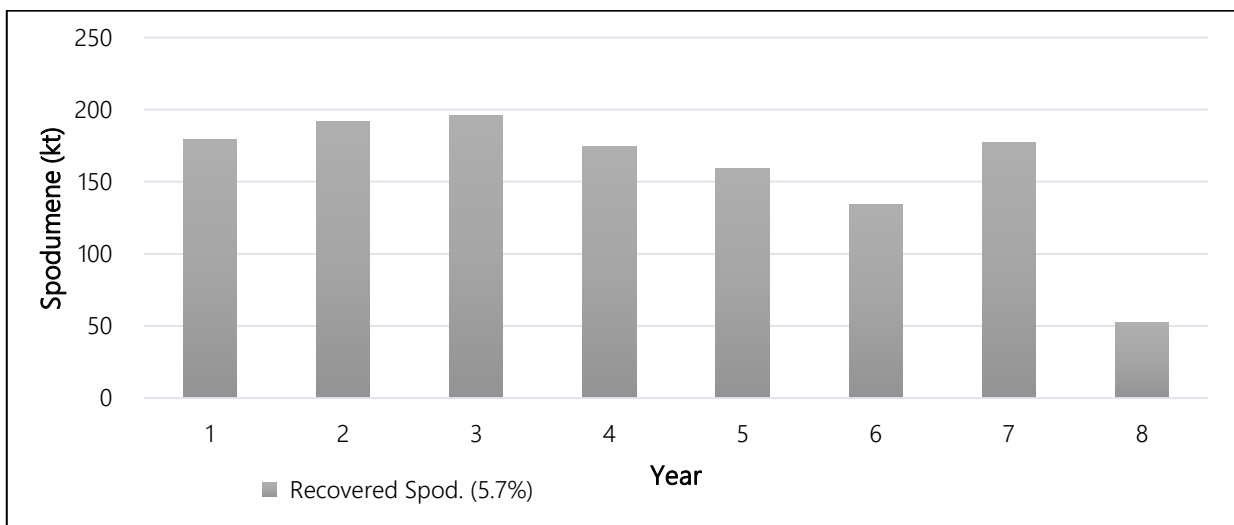


**Figure 8 – Total Material Movement by Stage**



**Figure 9 – Total Material Movement**

Annual spodumene production is presented in Figure 10, where it can be seen that the production rate is related to the grade profile.



**Figure 10 – Spodumene Production**

## METALLURGY AND PROCESS PLANT

### METALLURGY

#### Initial Test Work – 2020

In December 2020<sup>7</sup>, Essential reported highly encouraging results from the first metallurgical testwork programme completed on fresh rock mineralisation from the Cade deposit ('Cade Fresh'). This domain represents 63% of the Dome North Mineral Resource tonnes.

The results demonstrated that the lithium mineralisation (spodumene) from the deposit can be processed into a concentrate that should meet market specifications while achieving a high overall lithium recovery rate.

**Table 9: Initial Cade Metallurgical Concentrate Summary**

| Concentrate            | Grade (% Li <sub>2</sub> O) | Grade (% Fe <sub>2</sub> O <sub>3</sub> ) | Overall Recovery (%Li <sub>2</sub> O) |
|------------------------|-----------------------------|---|---------------------------------------|
| T12 Flot Con & DMS Con | 5.66                        | 1.3                                       | 82%                                   |
| T15 Flot Con & DMS Con | 5.65                        | 0.7                                       | 74%                                   |

#### Additional Test Work – 2022

In March 2022, a diamond drilling (DD) programme was completed, consisting of six holes drilled into the weathered profile (up to the first ~50m from surface) of the Cade deposit (Cade Weathered), four holes drilled into the weathered profile of the Davy deposit (Davy Weathered) and three into the fresh rock of the Davy deposit (Davy Fresh).

The results from the drill programme were announced to the ASX in June 2022 and included the assay results that demonstrated the presence of near surface lithium mineralisation.

Metallurgical testwork was then completed on composite samples representing three further mineralisation domains – Cade Weathered, Davy Weathered and Davy Fresh mineralisation – from the Cade and Davy lithium deposits at Dome North<sup>8</sup>.

#### Cade Weathered

The Cade Weathered composite returned very similar results for Heavy Liquid Separation (HLS) and flotation when compared to the Cade Fresh test results at a target grade of 5.7% Li<sub>2</sub>O.

The composite performed as follows:

- The HLS recovery was 40% Li<sub>2</sub>O at a grade of 5.7% Li<sub>2</sub>O. It is expected that Dense Media Separation (DMS) performance for this samples may be similar to the Cade Fresh composite sample.
- The Whole of Ore Feed (WOF) recovery was 68% at a grade of 5.7% Li<sub>2</sub>O. It is expected that flotation circuit performance for this sample may be similar to the Cade Fresh composite sample.
- On this basis, it is expected that the Cade Weathered composite can achieve an overall recovery of 74-82% Li<sub>2</sub>O via a hybrid pilot DMS and flotation flowsheet.

<sup>7</sup> Refer ASX announcement 18 December 2020 "Dome North outstanding met testwork results".

<sup>8</sup> Refer ASX announcement 7 October 2022 "Positive lithium met testwork results".

## Davy Fresh

The Davy Fresh composite returned very similar results for HLS when compared to the Cade Fresh test results at a target grade of 5.7% Li<sub>2</sub>O. However, this composite returned marginally lower WOF recovery at a target grade of 5.7% Li<sub>2</sub>O.

The composite performed as follows:

- The HLS recovery was 41% Li<sub>2</sub>O at a grade of 5.7% Li<sub>2</sub>O. It is expected that DMS performance for this samples may be similar to the Cade Fresh composite sample.
- The WOF recovery was 57% at a grade of 5.7% Li<sub>2</sub>O. It is expected that flotation circuit performance for this sample will be marginally lower compared to the Cade Fresh composite sample.
- On this basis it is expected that the Davy Fresh composite can achieve an overall recovery of 64% Li<sub>2</sub>O via a hybrid pilot DMS and flotation flowsheet.

It should be noted that the flotation tests conducted were based on the baseline reagent regime and test methodology applied to the other composites, which are significantly less weathered. Further testing specifically designed to optimise recovery for the Davy Fresh mineralisation will be conducted as part of future studies. These tests will also analyse whether the recovery rate could improve if Davy Fresh mineralisation is blended with mineralisation from other zones during commercial production.

## Davy Weathered

The Davy Weathered composite WOF and HLS results returned lower recoveries, lower grades and higher gangue grades when compared to the other composites. The composite performed as follows:

- The HLS Li<sub>2</sub>O recovery was 26% at 5.7% Li<sub>2</sub>O concentrate grade and higher iron levels of 1.8% Fe<sub>2</sub>O<sub>3</sub>.
- The WOF recovery was 38% Li<sub>2</sub>O at a grade of 5.7% Li<sub>2</sub>O.

The impact of the lower recovery rates for the Davy Weathered composite sample will be mitigated by the fact that the Davy Weathered mineralised zone represents <5% of the overall Dome North Mineral Resource tonnes.

## PLANT DESIGN

The concentrator process plant design is a hybrid DMS and flotation flowsheet. This is similar to some recent Western Australian spodumene processing flowsheets. The process design basis assumes continuous operation (24 h/day, 365 d/annum) typical plant availability and operating hours of 8,000 hours, which is considered appropriate given the type of process infrastructure. The nominated availability considers all downtime associated with planned maintenance and typical process interruptions.

The process flowsheet was developed based on the metallurgical testwork results and the ore types and characteristics. A high-level process mass balance model was developed from the process design criteria and testwork data. The information was used as the basis for selection and sizing of major process equipment.

Although the flowsheet is similar to some recent Western Australian spodumene processing flowsheets, wet high gauss magnetic separation and gangue pre-flotation are included ahead of spodumene flotation. Wet high gauss magnetic separation ahead of spodumene flotation is not always utilised in these flowsheets.

## PLANT DESIGN FLOWSHEET

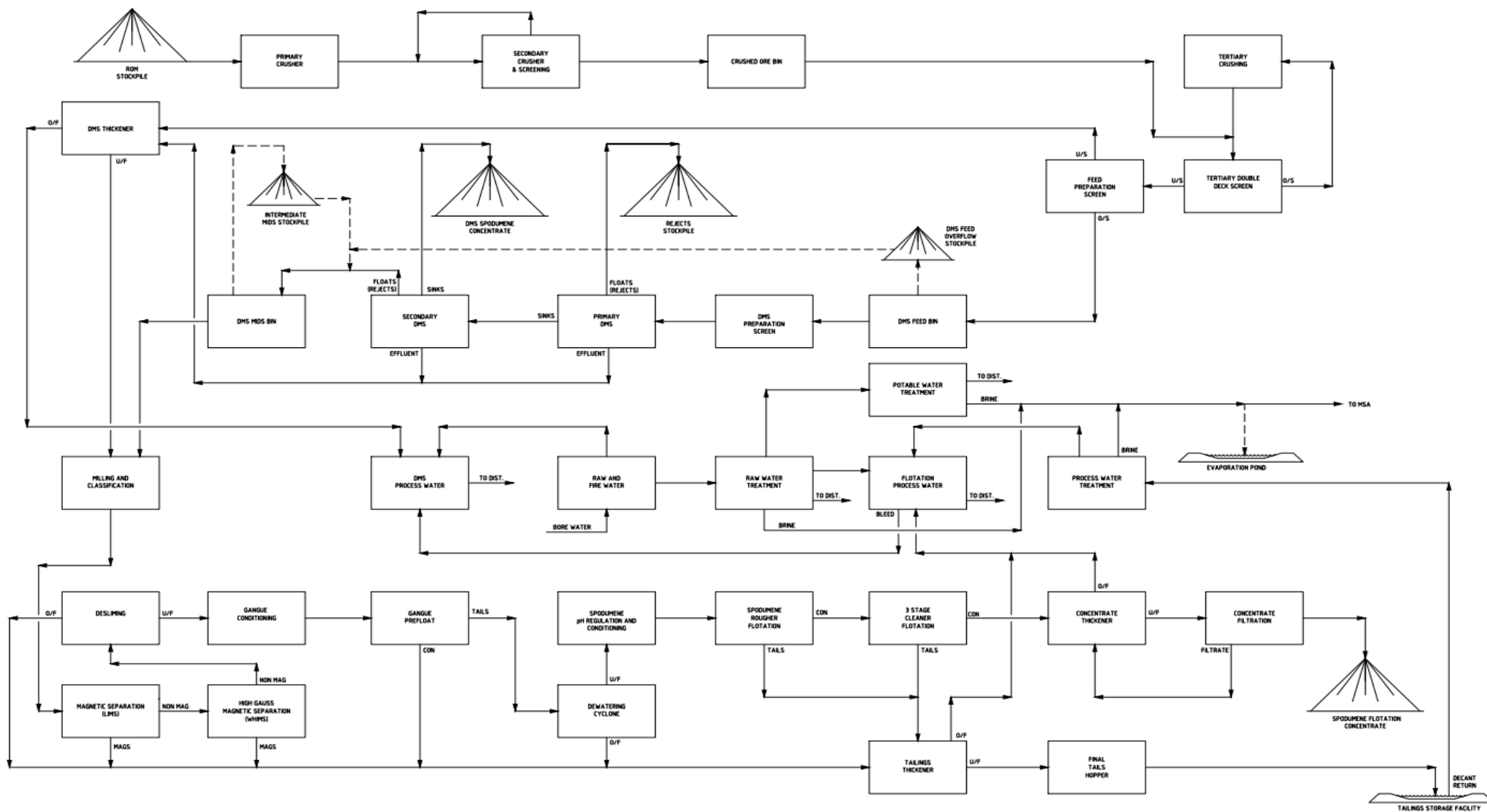


Figure 11 – Block Flow Diagram

Gangue preflotation for rejection of mica ahead of spodumene flotation has been considered in the development of some spodumene processing flowsheets, however, its application in operating plants is considered novel. The testwork to date has demonstrated that these process steps are required or beneficial for generating a spodumene flotation concentrate with acceptable quality.

Mica rejection ahead of DMS with an up-flow classifier is commonly implemented in similar spodumene processing flowsheets. In this instance, it has not been included in the flowsheet as high quantities of mica were not observed in the ore and testwork to date has demonstrated that it is not required to generate a DMS concentrate of acceptable quality.

Equipment selection and sizing is preliminary for the purpose of this Scoping Study, however, it is based on metallurgical testwork, high level mass balance modelling, database/benchmark data or assumptions if required. Details of key equipment sizing is as follows:

### **Crushing circuit**

Ore from the ROM is crushed to a suitable feed size for the high pressure grinding roll (HPGR), which is approximately P100 32mm. The C130 primary crusher size was selected based on its suitability to treat a ROM ore particle size of up to 800mm. A preliminary Metso Bruno model, using testwork and benchmark data was used to select an HP300 secondary cone crusher.

An HPGR with 1,240mm x 980mm rolls and 2 x 500kW drives was selected based on benchmarking and advice from vendors during budget quotation.

### **DMS circuit**

The DMS circuit was sized based on the required throughput and particles size to be treated. This resulted in four 420mm cyclones being required.

### **Milling circuit**

A preliminary calculation and benchmarking based on the required throughput and target grind size of P80 150 µm were used to select the 1.75MW ball mill.

### **Magnetic Separation**

The required volumetric slurry throughput from the preliminary mass balance was used as the key parameter for sizing and selection of a low intensity magnetic separator (LIMS) and a wet high intensity magnetic separator (WHIMS). Benchmarking was used to ensure the models selected were appropriate for the required duty.

### **Flotation Circuit**

The volumetric slurry throughput from the preliminary mass balance was used along with the required residence time from metallurgical testwork as the key parameters for sizing and selection of flotation cells in the gangue pre-flotation and spodumene flotation circuits. The same flowsheet configurations were used as per testwork. Benchmarking was used to ensure the cell sizes selected were appropriate for the expected carry rates and lip loadings.



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## **De-watering**

Dewatering equipment have been based on high-level process mass balance data. Settling rates for thickener sizing and filtration rates for filter sizing were not available from testwork and benchmarked values from Primero's database were used in place.

## **Utilities**

Water supply and air service duties have been developed from the high-level process design criteria and mass balance.

Brackish Water Reverse Osmosis (BWRO) has been allowed for treatment of raw water before adding to the process water circuit, to mimic the Perth tap water quality that testwork was conducted in. Likewise, Dissolved Air Flotation (DAF) followed by BWRO has been allowed for treatment of tailings storage facility (TSF) decant return prior to adding back to the process plant water circuits. The treatment duties have each been developed from the high-level PDC and MB and the technology selected based on internal Primero benchmarking.

## **SITE INFRASTRUCTURE**

### **Site access road**

Road access to the Pioneer Dome Lithium project is currently available using a public gazetted road that runs approximately 10km east to the Coolgardie-Esperance Highway. Also, a private haul road (connecting an inactive mine to the Highway) is located on the southern boundary of the proposed Pioneer Dome mining operation and may be able to be utilised, subject to an access agreement with the road's owner.

Further review of the development requirements for the site access road sections based on planned vehicle loads and the number of vehicle movements during construction and operational stage will occur in the next study phase. Vehicle movements will include, but are not limited to, mine vehicles, logistics supply/transport and concentrate transport to Esperance Port.

### **Accommodation camp**

A self-contained accommodation village with supporting facilities and infrastructure will be constructed to meet the accommodation requirements of the permanent workforce, as well as visitors and temporary additional workforce (i.e., shutdowns).

The village will be located nearby the plant to minimise travel distances and infrastructure costs (power and supply), however, sufficiently far away to minimise noise and dust. The camp will be located in a flat area not prone to flooding and separated from areas of aboriginal heritage or environmental sensitivity.

During plant construction, a fly camp will be set up adjacent to the permanent village site to accommodate the construction workforce whilst the permanent village is constructed. The fly camp can be retained if required for permanent or peak personnel requirements.

The camp design will be able to provide standard camp accommodation and facilities equal to or better than similar mining villages, including good quality communications and internet access.

## Site power

There are no existing grid power and gas pipeline currently connected to the Project site so for the purposes of the Scoping Study, it is assumed that diesel gensets will be available onsite in a duty/reserve arrangement and the supply of diesel will be available from retail outlets or commercial facilities near Norseman.

As part of future detailed studies, Essential will investigate sourcing power from the WA electricity network via a substation located ~20km north of the Project and/or installing renewable power and/or sourcing gas from the currently inactive gas pipeline.

## Tailings Storage Facility

The site geological aspects relevant to the TSF design have not been assessed in this Scoping Study and further development is required in a subsequent study phase.

A preliminary location for the TSF was selected based on proximity to the process plant.

An allowance for the first stage of earth works and infrastructure was made based on benchmarks for other wet unlined TSF benchmarks. No allowance for future wall raises or infrastructure extensions have been included in the scope of this study.

## Water management

Hydrology and surface water management has not been assessed in the Scoping Study and further assessment is recommended in subsequent study phases.

## Site Buildings

The design and associated costs of buildings facilities and infrastructure require further development in the next phase. The likely requirements for buildings and facilities are discussed below:

- *Plant control room*: the plant control room will be in a central elevated location overlooking the process plant and be fitted out with control desks and OITs. The building can also house offices, crib facilities and ablutions and changerooms for operational personnel as well as control system hardware;
- *Administrative buildings*: office, crib and ablutions facilities for management and administration personnel, with adjoining car and bus parking area;
- *Warehouse buildings and office*;
- *Workshop building, office, and cleanroom*;
- *Training building*;
- *ERT and Ablution building*: adjoining admin building and housing all requirements for onsite medical treatment and emergency services response; and
- *Laboratory*: A laboratory facility located adjacent to admin facilities and housing an adjoining sample preparation area, laboratory offices and equipment.

## Air strip

For the purpose of this Scoping Study, an existing air strip (e.g., Norseman, Coolgardie) will be utilised for the FIFO workforce. FIFO staff will be bussed between the airstrip to the Project site.

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## ENVIRONMENTAL ASSESSMENT AND STAKEHOLDER ENGAGEMENT

### Environmental assessment

A baseline environmental study was completed in early 2022, however more detailed and extensive studies will need to be commissioned, along with various studies required to be undertaken to obtain EPA approvals.

Botanica Consulting Pty Ltd (Botanica) was commissioned by Essential to undertake a detailed flora/vegetation survey and basic fauna survey of their North Dome project (referred to as the 'survey area'). The survey area was approximately 2,682 ha in extent and is located approximately 52km north of Norseman, Western Australia.

The survey area lies within the Eastern Goldfield (COO3) subregion of the Coolgardie Bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Eastern Goldfield subregion (5,102,428 ha) lies on the Yilgarn Craton's Eastern Goldfields Terrain, which is described as gently undulating plains with a subdued relief, interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan 2001).

The vegetation consists of Mallees, Acacia thickets and shrub-heaths on sandplains, with diverse Eucalyptus woodlands occurring around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and Dodonaea shrubland occur on basic granulite of the Fraser Range, and the area is rich in endemic Acacias.

In accordance with Beard (1990) the survey area is located in the Coolgardie Botanical District of the Southwestern Interzone Province. The landscape is described as gently undulating with occasional ranges of low hills, with sandplains in the western part and some large playa lakes. Soils are principally brown calcareous earths, which overlays the Proterozoic granite and gneiss of the Fraser Range block and Archaean granite, with infolded volcanics and meta-sediments, of the Yilgarn block. Vegetation is predominately Eucalyptus woodlands, with slopes and flats containing *E. longicornis* alongside *E. salubris* and *E. salmonophloia*. Woodland understories range from tall sclerophyll shrubland dominated by *Melaleuca pauperiflora* to soft-leaved saltbush shrubland of *Atriplex vesicaria* and *A. nummularia*. Some hill slopes contain mallees of *E. livida* or *E. loxophleba*, while ironstone ridges are covered in thickets of *Acacia quadrimarginea*, *Allocasuarina acutivalvis* and *A. campestris*. Other vegetation assemblages include species-rich scrub-heaths and *Allocasuarina* thickets on sandplains, merging into *Acacia* thickets and Kwongan vegetation to the north.

The dominant land uses of the Eastern Goldfield subregion includes Unallocated Crown Land (UCL) and Crown reserves and pastoral grazing, with conservation areas and mining leases also present (Cowan, 2001). The survey area is not located within a pastoral station.

Prior to the field assessment a literature review was undertaken of previous flora and fauna assessments conducted within the local region. Documents reviewed included:

- Botanica Consulting (2021). *Mt. Edwards Project: Flora, Fauna and Vegetation Assessment*. Unpublished report prepared on behalf of Widgie Nickel Ltd., December 2021
- Botanica Consulting (2021). *Reconnaissance Flora/ Vegetation Survey and Basic Fauna Survey Lake Lefroy/ Lake Fore*. Unpublished report prepared on behalf of Mincor Resources NL, August 2020

In addition to the literature review, searches of the following databases were undertaken to aid in the compilation of a list of significant flora within the survey area:

- DBCA Threatened/ Priority Flora spatial data (DBCA, 2019a);
- Atlas of Living Australia (ALA) database (ALA, 2022); and
- EPBC Protected Matters search tool (DAWE, 2021a).

The ALA spatial portal search and EPBC Protected Matters search were conducted with a 40 km buffer from the survey area.

The ALA desktop search identified 707 vascular flora species as occurring within 40 km of the survey area, representing 229 genera from 68 families. The most diverse families were Myrtaceae (135 species), Fabaceae (84 species) and Asteraceae (74 species). The most dominant genera were Acacia (46 species), Eucalyptus (79 species) and Eremophila (36 species).

The desktop review identified 15 introduced flora (weed) species, representing six families, as potentially occurring in the vicinity of the survey area. None of these species are listed as a Declared Pest on the Western Australian Organism List (WAOL) under the Biosecurity and Agriculture Management (BAM) Act 2007. One species, *Tamarix aphylla*, is listed as a Weed of National Significance.

The assessment of the DBCA Priority/ Threatened flora database records (DBCA, 2019), ALA (ALA, 2022) and Protected Matters searches (DAWE, 2020a) and previous relevant literature identified 56 significant flora species recorded within a 40 km radius of the survey area or within similar habitat. These consist of three Threatened, 19 Priority 1, seven Priority 2, 23 Priority 3 and four Priority 4 taxa (Appendix C).

These taxa were assessed for distribution and known habitat to determine their likelihood of occurrence within the survey area. The assessment did not identify any taxa as likely to occur in the survey area. The assessment identified the Priority 3 species *Eremophila acutifolia* as being previously recorded within the survey area. In addition, 12 taxa were identified as possibly occurring in the survey area; consisting of four Priority 1, one Priority 2 and seven Priority 3 taxa.

The Protected Matters search (DAWE, 2020a) did not identify any Threatened Ecological Community as recorded within 40 km of the survey area. Analysis of the Priority Ecological Communities within the Goldfields region (DBCA, 2021a) did not identify any additional significant vegetation assemblages as likely or possibly occurring within the survey area.

Vegetation associations within the survey area retain >96% of their pre-European extent, and development within the survey area will not significantly reduce the current extent of these vegetation associations.

According to the results of the ALA database search (ALA, 2022), a total of 229 terrestrial vertebrate fauna taxa have been recorded within 40 km of the survey area, consisting of 149 bird, 10 mammal, 66 reptile and four amphibian taxa.

The desktop review identified six terrestrial vertebrate fauna species of conservation significance as previously being recorded in the regional area, consisting of four Threatened and two migratory or otherwise protected species. In addition, six migratory wading/shorebird species were assessed collectively due to their similar habitat requirements.

Habitat and distribution data was used to determine the likelihood of occurrence within the survey area. The assessment identified two significant fauna species, consisting of two Vulnerable (VU) taxa, as potentially occurring in the survey area.

No Environmentally Sensitive Areas were identified within the survey area.

There are no wetlands of international importance (Ramsar Wetlands) or national importance (Australian Nature Conservation Agency Wetlands) within the survey area.

There are no proposed nor gazetted conservation reserves within the survey area.

The closest conservation reserve is Binaronca Nature Reserve vested with the Conservation Commission of WA for the conservation of flora and fauna, located approximately 4 km north of the survey area. Activities within the survey area are unlikely to impact this reserve.

Botanica conducted a detailed flora/vegetation and basic fauna survey on the 22nd -23rd November 2021, with the area traversed on foot and by 4WD vehicle by Jim Williams (Director/Principal Botanist, Diploma of Horticulture) and Jennifer Jackson (Senior Botanist, BSc (Honours) Environmental Management). A total of 28 quadrats (20 m x 20 m) were installed and assessed during the survey effort.

The field survey identified 134 vascular flora taxa within the survey area. These taxa represented 63 genera across 31 families, with the most diverse families being (Myrtaceae (23 species), followed by Fabaceae and Scrophulariaceae (17 species each). Dominant genera include Eremophila (17 species), Eucalyptus (14 species) and Acacia (11 species). A total of six introduced (weed) species, representing 4.4% of floristic diversity, were recorded within the survey area.

A total of six species of introduced flora, representing four families, were recorded within the survey area. None of these species are listed as a Weed of National Significance or a Declared Pest in Western Australia.

No Threatened flora species were recorded within the survey area.

The Priority 3 species *Eremophila acutifolia* was recorded within eight quadrats, specifically Q1, Q4, Q11, Q12, Q18, Q19, Q25 and Q26. These quadrats were predominately associated with vegetation community CLP-EW3, with some being located in communities CLP-EW1 and RH-EW2.

No other Priority or otherwise significant flora species were recorded within the survey area.

A total of six broad-scale vegetation communities were identified within the survey area. Vegetation community descriptions and extents were determined from field survey results, aerial imagery interpretation and extrapolation of the communities.

The survey found CLP-EW3 was the most widespread community in the survey area, occupying 1,297.9 ha (48.4%), while SCLP-EW2 was the most restricted with 134.9 ha (5.0%). The most diverse vegetation type was CLP-EW1 with 49 species (36.6%), while the least diverse was SCLP-EW2 with 25 species (18.7%).

No Threatened, Priority or otherwise significant ecological communities were identified within the survey area.

Based on vegetation and associated landforms identified during the flora and vegetation assessment, three broad scale terrestrial fauna habitats were identified as occurring within the survey area.

No evidence for the presence of Malleefowl, including nesting mounds, tracks or other signs, were recorded within the survey area. No other evidence of significant fauna species were observed during the survey.

Native vegetation condition within the survey area was categorized as 'very good' to 'good'. Disturbances within the survey area included access tracks, low levels of grazing and historical impacts.

Based on the outcomes from the survey undertaken, Botanica assessed the results of the desktop and field survey with regards to the native vegetation clearing principles listed under Schedule 5 of the EP Act. The assessment found that the proposed vegetation clearing activities may be at variance with clearing principle (f).

## **Stakeholder engagement**

A comprehensive stakeholder engagement plan will be prepared to fully understand and address the information needs, concerns and aspirations of people affected by development of the Project.

Access to the Project site and to certain infrastructure will require discussion and agreement with the Shires of Coolgardie and Dundas and other bodies such as Main Roads WA.

## **Native title**

The tenements comprising the Pioneer Dome Project, which includes exploration licence E15/1515 on which the Dome North lithium Mineral Resource is located, are wholly overlapped by the Ngadju Part B (WCD 2017/002) native title determination (Ngadju Determination). The interests of the Ngadju people are represented by the Ngadju Native Title Aboriginal Corporation NNTAC (NNTAC).

A mining agreement is in place with the NNTAC. This agreement encompasses the entire Pioneer Dome Project plus a buffer zone. The agreement specifies that a royalty based on a percent of gross revenue, inclusive of GST, is payable to NNTAC on sales of pegmatite-related minerals, which would include spodumene concentrate.

A heritage agreement is also in place with NNTAC to enable Essential to protect and avoid all aboriginal sites in relation to the Pioneer Dome Project by conducting surveys using the processes and lines of communication established by the agreement.

The grant of a mining tenement (where the grant constitutes a future act under the Native Title Act 1993 (Cth) (NT Act) attracts procedural processes under the NT Act. Where exploration licences have been applied for or granted over land (where the extinguishment of native title has not been confirmed), the future act provisions of the NT Act apply on future conversion to a mining lease.

E15/1515 is subject to a pending application for conversion to M15/1896 (conversion 658055) and has progressed through the right to negotiate (RTN) process under Subdivision P, Division 3, Part 2 of the NT Act, which has resulted in a section 31 deed and ancillary agreement or an indigenous land use agreement (ILUA) (being a voluntary agreement between a native title claimant group and others about the use and management of land and waters).

## **Aboriginal cultural heritage**

The Native Title Act 1993 (Cth) (NNTTAA) recognises and protects the rights and interests in Australia of Aboriginal and Torres Strait Islander people in land and waters, according to their traditional laws and customs. Separate legislation in each State and Territory of Australia (and at a Commonwealth level) also governs the protection of Aboriginal heritage, and regulates proposed impacts of development where site avoidance will not be possible. Native title and associated Aboriginal heritage matters may impact on Essentials' operations and future plans (legally, and from a social licence to operate/external affairs perspective).

There may be Aboriginal heritage in or near the vicinity of Essentials' current, planned, proposed or future operations. Impacting Aboriginal heritage is usually a criminal offence carrying significant penalties. Even when

(where applicable) regulatory approvals are obtained that permit impacts on heritage, proceeding with operations in that situation can still carry significant external affairs risk that may impact a proponent's social licence to operate.

Heritage legislation and policy across Australia, at both a Commonwealth and State/Territory level, is also the subject of numerous ongoing and proposed reforms exposing projects to additional risk.

In Western Australia, it is anticipated that the new cultural heritage legislation (Aboriginal Cultural Heritage Act 2021 (WA) (ACH Act 2021)) will come into effect this year and the existing Aboriginal Heritage Act 1972 (WA) (AH Act) is expected to be repealed. The repeal of the AH Act will mark the end of the section 18 approvals process under the AH Act, and proponents will need to undertake a due diligence assessment for activities that may harm Aboriginal cultural heritage, and depending on the classification of the activity (the classification of such activities will be specified in the regulations, which are being prepared), a proponent may require an Aboriginal Cultural Heritage (ACH) permit or an approved or authorised ACH plan.

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## FINANCIAL INFORMATION

A financial evaluation was completed using the Base Case Production Target of 8.8 million tonnes at an average grade of 1.11% Li<sub>2</sub>O, mined at a LOM average strip ratio of 13.3:1 and to be processed through the concentrator process plant at a rate of 1.2 million tonnes per annum.

### Financial Summary

**Table 10: Life of Mine Project cashflows**

|  |                  | TOTAL \$M |
|--|------------------|-----------|
| <b>Revenues</b>                            |                  | 2,709.6   |
| <b>Operating costs</b>                     |                  | (1,150.1) |
| <b>Capital expenditure</b>                 | - Pre-production | (293.4)   |
|  | - sustaining     | (29.3)    |
| <b>Royalties</b>                           |                  | (152.3)   |
| <b>Corporate income tax</b>                |                  | (319.3)   |
| <b>Life of mine Project Free cash flow</b> |                  | 765.1     |

### Capital Expenditure

**Table 11: Capital Expenditure Estimate**

| Direct Area Costs                             | Total \$M |
|---|-----------|
| Dry Plant                                     | 31.60     |
| Feed Prep & DMS                               | 20.94     |
| Grinding & Classification                     | 15.16     |
| Mag Sep & Flotation                           | 27.76     |
| Concs & Tails Handling                        | 10.48     |
| Reagents                                      | 4.03      |
| Plant Services - Water & Air                  | 15.48     |
| Power Generation & Fuel Storage               | 16.61     |
| Process Plant Subtotal                        | 142.06    |
| Tailings Facility - Stage 1 & Decant          | 3.80      |
| Plant Earthworks & Internal Roads             | 9.71      |
| Site Infrastructure- Buildings & Control room | 7.75      |
| Site Infrastructure Subtotal                  | 21.27     |
| Total Direct Site and Plant Subtotal          | 163.33    |
| Bore-field Water Supply                       | 8.94      |
| Off Site Infrastructure Subtotal              | 8.94      |



|                                     |        |
|-------------------------------------|--------|
| Subtotal Direct Field Costs         | 172.27 |
| Engineering & Design                | 9.52   |
| Contractors Flights & Accommodation | 9.94   |
| Contractor -Site Management         | 22.49  |
| Heavy Lift Cranes                   | 1.04   |
| Commissioning                       | 1.72   |
| Vendors Support - Equipment         | 0.49   |
| Contractors Indirect Costs          | 45.21  |
| Capital Spares                      | 1.95   |
| Mobile Equipment                    | 8.37   |
| First Fills                         | 1.95   |
| Owners Project Costs                | 5.21   |
| Owners Indirect Costs               | 17.49  |
|                                     |        |
| Subtotal Indirect Costs             | 62.69  |
|                                     |        |
| Total Plant Cost No Contingency     | 234.96 |
| Contingency                         | 36.26  |
| Project Contingency @ 15%           | 36.26  |
| Permanent Accommodation Village     | 13.20  |
| Off Site Road Development           | 9.00   |
| Off Site Infrastructure Subtotal    | 22.20  |
| Total Project Costs                 | 293.42 |

## Cash Operating Expenditure

**Table 12: Cash Operating Cost Estimate**

| Operating Cost                         | \$ per tonne of ore processed | \$ per tonne of concentrate |
|--|-------------------------------|-----------------------------|
| <b>Mining</b>                          | 67.26                         | 468                         |
| <b>Processing</b>                      | 51.11                         | 356                         |
| <b>Transport &amp; loading at port</b> | 6.97                          | 49                          |
| <b>General &amp; administration</b>    | 5.36                          | 37                          |
| <b>Royalties</b>                       | 17.30                         | 120                         |
|  |                               |                             |
| <b>Total cash operating cost</b>       | 148                           | 1,030                       |

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## Commodity Pricing

A forecast spodumene price of US\$1,500 per tonne of 5.7% Li<sub>2</sub>O concentrate FOB Esperance Port WA was used in the Scoping Study. This price is equivalent to approximately US\$1,624 per tonne of 6% concentrate CIF China, assuming a linear discount for lower purity concentrate (6% versus 5.7%) and CIF freight costs of US\$45 per tonne. The forecast price was selected after reviewing various public domain analyst reports and company announcements of other lithium developers and producers. An independent forecast was not commissioned. There are no agreed offtake contracts or commitments in place. It is noted that recent pricing for spodumene concentrate (SC6%) is in the vicinity of US\$5,000/t CIF China.

## Foreign Exchange

All capital and operating costs have been calculated in Australian dollars. Revenue is derived from sales of lithium concentrate in US dollars and converted to Australian dollars using a fixed exchange rate of US\$0.70.

## PROJECT FUNDING

Essential believes that the Scoping Study provides reasonable grounds to believe that Pioneer Dome Lithium Project will be a sufficiently economically viable project to enable funding to be procured to enable its development and operation.

Subject to the pricing and other terms of future offtake arrangements, Essential believes that a portion of the funding to construct the Mine may be able to be sourced in the form of debt from sources such as banks, bond markets, specialist mine financiers and/or offtake partners. However, Essential cautions that debt funding for industrial mineral products, such as lithium concentrate, is made challenging by the lack of transparent commodity pricing, a lack of hedging derivatives, pricing volatility, the lithium supply and demand outlook being highly uncertain and a number of other risks.

A prerequisite for Essential to attract future funding, in the form of both debt and equity, will require the completion of a definitive feasibility study that demonstrates sufficient financial and technical outcomes to satisfy the providers of future funding. It is likely that future funding will involve the issue of shares in Essential, which may be dilutive to or otherwise affect the value of existing Essential shares.

In the December Quarter 2022, Essential invited various local and international lithium participants interested in off-take and/or investment to participate in an 'Expressions of Interest' (EOI) seeking a financing and off-take partnership to assist with advancing the Pioneer Dome Lithium Project into production.

The EOI process achieved one of its primary outcomes, namely to test which of the many parties who had previously engaged with Essential would be prepared to submit non-binding indicative terms for offtake and funding and the types of terms envisaged by that party.

Essential cautions that the EOI process is strictly confidential, non-binding and of a preliminary and incomplete nature and that it is not party to any binding agreements with respect to the aforementioned discussions. In addition, any investment decision in relation to Essential shares should not be made on the basis of these discussions as there can be no certainty that any binding agreement or agreements will eventuate.

In light of the aforementioned proposed TLEA Scheme or Arrangement, the non-binding and indicative Expressions of Interest process was paused until further notice.

It is also possible that Essential pursues other 'value realisation' strategies such as a sale, partial sale or joint venture of the project or Company, such as is contemplated under the proposed TLEA Scheme of Arrangement.