AUSTRALIAN
RESEARCH
INDEPENDENT INVESTMENT RESEARCH

Trigg Mining Limited (ASX: TMG)

July 2022

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INVESTMENT RESEARCH

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Trigg Mining Limited

Investment Profile	
Share Price ($) as at 12 July 2022	0.067
Issue Capital	
Ordinary Shares (M)	170.01
Options (M)	70.60
Performance Shares	2.12
Fully Diluted (M)	242.73
Undiluted Market Capitalisation (A$M)	11.39
12 month L/H ($/sh)	0.059-0.156

Board and Management

Directors

Mike Ralston – Non Exec Chair

Keren Paterson – Managing Director and CEO

Maree Arneson – Non Exec Director

Rod Baxter – Non Exec Director

Bill Bent - Non Exec Director

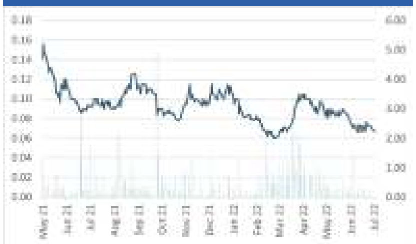
Management

Salina Michels - CFO and Co Sec

Damian Fletcher – Exploration Manager

Major Shareholders 24 January 2022	
Directors	8.1%

Share Price Performance



The investment opinion in this report is current as at the date of publication. Investors and advisers should be aware that over time the circumstances of the issuer and/or product may change which may affect our investment opinion.

WEST AUSTRAIAN POTASH PROJECT DEVELOPER

Trigg Mining is developing a Sulphate of Potash (SOP) production hub at Lake Throssell, Lake Yeo, and Lake Rason 170km east of Laverton in Western Australia. SOP is a source of potassium fertilizer essential to global agriculture. The proposed project will produce SOP from solar concentrated brine at a significant cost advantage to conventional Mannheim process, and with strong environmental credentials.

KEY POINTS

New entrant at exploration sweet spot – Trigg has a 4.2Mt indicated Resource, 10.2Mt Inferred Resource, and an Exploration Target of an additional 2.6-9.4Mt at its flagship deposit at Lake Throssell, and further potential at the close by Lake Yeo. The company is at that point of development where it is able to materially add to or upgrade its Resource base.

Strong cash position at $6M – A$4M raised in the March 2022 quarter.

Preliminary Feasibility Study to de-risk Lake Throssell project timed for 2023 – The PFS process will examine the project very broadly, and will investigate the production of by-products or co-products such as magnesium based compounds. Because of its broad scope, the PFS study has the potential to add significant value to the project and also differentiate this project from the other Australian brine potash project developers. The release of the PFS should de-risk the project, and also provide a basis for valuing the company. Pilot plant testing is also planned to deliver additional results by June 2024 which will further de-risk the project.

Corporate intention to generate a project with strong environmental credentials - The current energy cost pressures serve to encourage alternative energy sources, and the location of this project is ideal for maximising solar power generation. We would expect the ESG footprint of this project will be clarified with the issue of the PFS, and in ongoing new flow.

Kalium Lakes commercial start could boost the market's confidence in the sector – Kalium lakes has had an extended ramp up that has probably impacted the market's enthusiasm for other project promoters in the potash sector. If Kalium Lakes goes commercial in September 2022 and successfully ramps up over the rest of the year to June 2023, the market will see the economics of potash production in the current very strong potash price environment, and it is likely to trigger a lot more interest in the sector.

Potash spot price almost double the average price for the last three years – Russia and ally Belarus are major global potash producers. Belarus potash exports had been sanctioned prior to the start of the Ukraine war and its export path through Lithuania has been terminated. It now exports via Russia.

Valuation

The performance of the share price over the next 12 months is likely to reflect the overall Resource growth as the Exploration Target is converted into Resources, the improved Resource quality as Inferred is converted into Indicated category, and on comparative peer valuations, which on current peer comparisons sets a value on Trigg of between A$0.10/sh to A$0.43/sh.

There is an existing Scoping Study which has provided the basis for our Net Present Valuation range. However, the planned Preliminary Feasibility Study and the related publication of initial Reserves is likely to be a significant de-risking event which will increase the market focus on NPV style valuations, which are up to A$1.29/sh after allowing for estimated share issuance to fund development.

A$/share	Low	High
12 month trading range	0.06	0.14
Peer based valuation	0.10	0.43
Project Net Present Value based Valuation	0.60	1.29

WHEN WILL UNDERVALUATION GAP WITH PEERS CLOSE

STRONG INVESTMENT POSITIVES

As a share investment, Trigg represents:

- very low-cost entry into the potash industry at an investment sweet spot where relatively small capital expenditure can generate significant share price re-rating as the project fundamantals come together, through Resource increase and de-risking
- solid environmental credentials which are likely to improve as the project moves to finalisation
- tied to the thematic of food security which is very topical at present

Trigg is still early in its exploration effort and has substantial Inferred Resource. Its Indicated Resource is likely to increase substantially and that is expected to drive a share price increase, meaning that Trigg is currently a very low cost entry into the sector.

STRONG ENVIRONMENTAL CREDENTIALS

Table 1 Carbon footprint – The basis of some of the carbon numbers is undefined so not necessarily comparable

	CO2 Kg/SOP tonne	Renewable Penetration	Source
Mannheim Scope 1,2&3	591		APC release 15 Dec 2021
Salt Lake	236		SO4 release 5 August 2020
Agrimin (CO2 equivalent)	158		AMN release 21 September 2020
Australian Potash Scope 1,2&3	187	63-69%	APC release 15 Dec 2021
Trigg (CO2 equivalent)	173	15-20%	TMG release 5 October 2021

Source: as per column 4

Remote brine producers using evaporation to supply most of the energy required for production already have strong environmental benefits over the production of SOP by the Mannheim process. The location of these projects in regions of high evaporation rates and strong sunlight means that there is the potential for solar power generation to provide a very large share of energy supply for the overall plant operation.

Trigg's Scoping Study envisaged a 5MW solar farm and a gas fired power station. However, the decision was to supply the power station with trucked in LNG rather than sign a long term gas supply deal, even though the Gruyere gas pipeline is less than 15km away. The logic is that a gas fired plant is a lower risk option for the plant start up and commissioning, and once the project is steady state, the solar farm will be built out and the gas fired plant held in reserve.

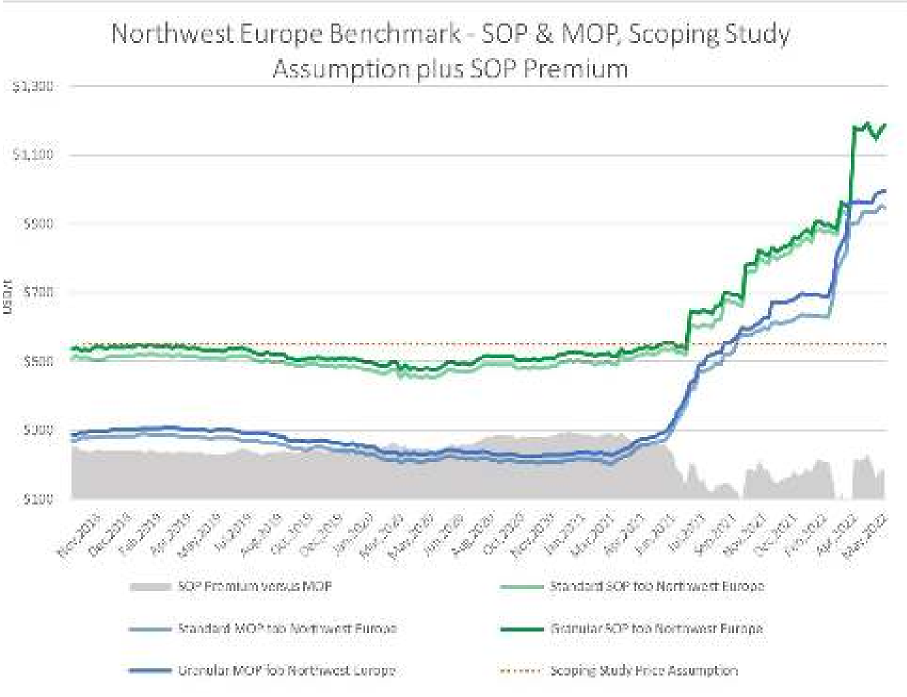
WHAT WILL TRIGGER CLOSURE OF THE VALUATION GAP?

- Of the major items of news flow that Trigg expects to generate listed below, the earliest is next March.
- Between now and next March, there will be several events generated outside the company that should have a positive impact on the Trigg share price.
- Kalium Lakes (ASX:KLL) is an SOP project expecting to be in commercial production from September 2022 and at full production (80Ktpa) by the end of the mid 2023. If achieved, we would expect the company to highlight the resultant economic performance. The problems experienced by Kalium Lakes and Salt Lake Potash (ASX:SO4) have been a negative weight on the share prices of other potash project sponsors. Kalium Lakes is likely to produce a string of news flow items between September 2022 and June 2023. If the news is positive, as is likely, market sentiment towards the sector should improve, driving increased investor focus and a re-rating across the sector in general.
- The issue of food security will continue to be front of mind as economies around the world experience rising food prices. The recent rises in potash fertiliser prices have resulted in reduced usage. Potash is a fertiliser that must be applied every year or face falling yields, so lower yields next year set the scene for even more food security concern until fertilizer application resumes.
- Fertilizer security is a related issue with Belarus and Russia being major suppliers of all kinds of fertilizer, but particularly of potash in muriate form (MOP).

LIKELY SOURCES OF NEWS FLOW

- PFS delivery in 2023, with potential for value add from alternative processing routes
- Pilot results June 2024
- Marketing Letters of Intent September 2024
- Approvals December 2024
- BFS/DFS September 2025
- Final Investment Decision (FID) September 2025

Figure 1 Potash prices rising strongly on shortages and supply insecurity

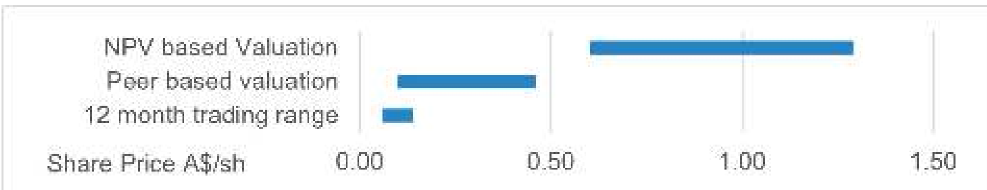


Source: TMG presentation 3 June 2022

VALUATION

SUMMARY

Figure 2 Valuation Range – Based on where the valuation of Trigg could be in June 2023



Source: Table 2

Table 2 Valuation Range

A$/share	Low	High
12 month trading range	0.06	0.14
Peer based valuation	0.10	0.43
Project Net Present Value based Valuation	0.60	1.29

Source: Peer valuation Table 4, NPV valuation Table 6

Our valuation is seeking to determine where the Trigg share price will be at June 2023. Between now and then, we expect Inferred Resource will be converted into Indicated Resource, and the project will be de-risked. The short term value driver will be increasing the Indicated and Total Resource and on peer comparisons, until the publication of the Preliminary Feasibility Study numbers, at which time the valuation should increasingly focus on Net Present Value analysis.

VALUATION BY COMPARISON WITH PEERS

Three peers that provide valuation guidance for Trigg

Trigg has three peers which are also promoting Australian brine-based potash projects, namely Agrimin, Australian Potash and Reward Minerals. Kalium Lakes has completed construction of an 80Mtpa project and is about to enter the commercial stage, so it is at a fundamentally different stage of development, and therefore not directly comparable.

Trigg's Lake Throssell Resource base is of a comparable magnitude to that of the peers and is at the better end of the grade spectrum. For this valuation, the Lake Rason resource is omitted. It is not part of the Lake Throssell project.

The table below shows the Enterprise Value divided by both the Measured and Indicated (M&I) Resource and by the total Resource. In the following analysis, we exclude Kalium Lakes because it is in operation. Of the remainder, using the Measured and Indicated Resources as the divisor produces a set of values ranging from A$1.53/t to A$4.71/t. This is a smaller range than the metric produced by dividing by Total Resources (A$0.12/t to A$2.08/t). Using Indicated makes sense because there can be issues like the low permeability that do not prevent mineralisation being in Resources, but will not be economic due to poor flow rates and will not be in Reserves.

Table 3 Comparative valuation based on Resources (M&I = Measured and Indicated)

Project	Trigg	Agrimin	Aust. Potash	Reward	Kalium Lakes
Stock Code	TMG	AMN	APC	RWD	KLL
Share of Project	100%	100%	100%	100%	100%
Share Price A$/sh (12 July 2022)	0.067	0.415	0.051	0.10	0.062
Shares on Issue M	170.0	287.4	808.4	195.2	1181.7
Market Capitalization A$M	11.4	119.3	41.2	19.5	73.3
Cash-Debt at 31 March 2022	6.1	9.1	3.7	0.5	-129.8
Enterprise Value A$M	5.3	110.2	37.6	19.0	203.1
Resource Mt SOP					
Measured		3.9	18.1		4.6
Indicated	4.2	19.5		12.4	15.1
Inferred	10.1	99.9		140.6	13.3
Total	14.3	123.4	18.1	153.0	33.0
SOP grade kg/m3	10.4	7.3	7.5	11.3	13.4
Valuation Metrics					
EV/M&I A$/t SOP	1.25	4.71	2.08	1.53	10.30
EV/All Resource A$/t SOP	0.37	0.89	2.08	0.12	6.16

Source: TMG 5 October 2021, AMN 21 July 2020 APC 28 August 2019, RWD 7 February 2017 KLL 29 April 2022

Trigg can be valued on Measured and Indicated or Total Resources

Table 4 details the mechanics of our peer valuation methodology. Trigg is early in its exploration of its deposits, and we expect the Resource to increase both in total and we expect that Resource will be upgraded, and the Measured and Indicated Resource will also increase.

Using Measured and Indicated Resources valuation metrics, and assuming between 30% and 100% of existing Inferred Resources are converted to Measured and Indicated, the valuation range generated is A$0.10/sh to A$0.43/sh.

Using Total Resource valuation metrics, and assuming the addition of either the lower or upper end of the Exploration Target range our valuation range is A$0.11/sh to A$0.25/sh. In arriving at this range, we have used peer metrics, excluding Reward. Reward has not converted any of its large Inferred Resource into Measured and Indicated since 2017, and so the low valuation of A$0.12/t Total Resource appears to reflect the markets lack of confidence in that number.

Table 4 Valuation range based on peer comparison supporting a value of between A$0.10/sh and A$0.43/sh on Measured & Indicated or A$0.11/sh and A$0.33/sh on current Resource plus Exploration Target

Valuation Range EV$/M&I t	Low (RWD)	Mid (APC)	High (AMN)
Valuation on Measured & Indicated Resources Plus	**At A$1.53/t**	**At A$2.08/t**	**At A$4.71/t**
Trigg Enterprise Value A$M			
Indicated + 30% of Inferred (7.2Mt)	11.1	15.1	34.2
Indicated + 100% of Inferred (14.4Mt)	22.1	30.0	67.8
Trigg Market Capitalisation A$M			
Indicated + 30% of Inferred (7.2Mt)	17.3	21.2	40.3
Indicated + 100% of Inferred (14.4Mt)	28.2	36.1	73.9
Trigg Value A$/sh on 170.0M shares			
Indicated + 30% of Inferred (7.2Mt)	0.10	**0.12**	0.24
Indicated + 100% of Inferred (14.4Mt)	0.17	0.21	**0.43**
Valuation Based on All Resources + Exploration Target	**Current/A$0.37/t**	**Mid/A$0.89/t**	**High/A$2.08/t**
Trigg Enterprise Value A$M			
Resource (14.4Mt)	5.3	12.9	28.5
Resource + lower end to Exploration Target (2.9Mt=15.2Mt)	6.3	15.5	35.9
Resource = Higher End of Exploration Target (9.4Mt=23.7Mt	8.7	21.3	49.4
Trigg Value A$/sh on 170.0M shares			
Resource (14.3Mt)	0.07	0.11	0.21
Resource + lower end to Exploration Target (2.9Mt=15.2Mt)	0.07	**0.13**	0.25
Resource = Higher End of Exploration Target (9.4Mt=23.7Mt	0.09	0.16	**0.33**

Source: Table 3, Table 11 in Resource section

VALUATION BY NET PRESENT VALUE OF PROJECT CASH FLOW

Table 5 Company valuation on current share base and sensitivity to SOP price assumptions

Trend SOP A$/t	700	800	900	1000
Scoping	135.2	278.2	421.2	564.1
Corporate Overhead	-13.9	-13.9	-13.9	-13.9
Cash on hand	3.9	3.9	3.9	3.9
Debt	0.0	0.0	0.0	0.0
Net Working Capital	0.3	0.3	0.3	0.3
Valuation A$M	125.6	268.6	411.6	554.6
Valuation A$/sh	0.74	1.58	2.42	3.26
Shares M	170.0	170.0	170.0	170.0

Source: IIR estimates

The valuation assumes:

- Scoping study capital and operating cost inputs
- State royalty at 5% of revenue
- Base cash SOP price A$800/t (ie US$600/t at AUDUSD 0.75 or US$560/t at AUDUSD 0.70). The SOP price has been US$450-550/t for the last three years, but the current and likely ongoing energy and cost inflation should see the high cost producers take the long term price to at least US$600/t. The AUDUSD of 0.75 has been the consensus long term exchange rate for some years now.
- The model has no inflation. If inflation was included for both costs and prices, the valuation would increase, as would margin. We expect the current cost surge to abate next year.
- Discount Rate 8.75% (Table 7). This is a nominal Weighted Average Cost of Capital and again has been chosen as a conservative measure, rather than using the current real terms WACC of 6.58%. The valuation is as at June 2023.
- Construction starts in FY2026 and full production in FY2028

Table 6 shows a range of valuations depending on how the per share valuation changed depending of the issue of shares required to fund the development of the project.

While the valuation on the current share base is relevant, investors have to remember that the current 170M shares will not own 100% of the project once it is fully funded. In our assumptions, the peak preproduction funding requirement is A$412M (Table 11). Of that we assume 60% is debt funded, leaving A$165M equity to be raised. While some of it might be raised by offtake pre-payments, royalty sales or other alternatives, we have assumed it is all equity.

The table below assumes the Base Case valuation of A$269M, and assesses the impact of the per share valuation of issuance at different issue prices, ranging from A$0.30/sh to A$1.00/sh.

Table 6 Valuation impact of future equity dilution caused by funding the project development

Share Price A$/sh	0.30	0.50	0.70	0.80	0.90	1.00
Current Shares M	170	170	170	170	170	170
Additional Shares M	549	330	235	206	183	165
Total Shares M	719	500	405	376	353	335
Current/Total	23.6%	34.0%	41.9%	45.2%	48.1%	50.8%
TMG Value A$M	269	269	269	269	269	269
Cash Raised A$M	165	165	165	165	165	165
Post Issue Value A$M	433	433	433	433	433	433
Post Issue Value A$/sh	0.60	0.87	1.07	1.15	1.23	1.29
Issue Discount to value	-50%	-42%	-35%	-31%	-27%	-23%
Market Cap. Pre issue at value A$M	102	147	182	196	209	220

Source: IIR estimates

At A$1.00/sh issue price for the capital raise required to fund the project, the discount to the resultant value of A$1.29/sh is 23% which is the discount likely for an issue this size and sets the upper limit of the range for raising the development capital, assuming our project valuation, and the upper end of our valuation range.

If Trigg were to trade up to A$0.60/sh prior to the capital raise, then the company's market capitalisation on 170M shares would be A$102M. The current market capitalisation of Agrimin is A$119M, suggesting that a value of A$0.60/sh is not unreasonable for Trigg once it has de-risked Lake Throssell to the same extent that Agrimin has de-risked its project.

The lower end of our NPV range is A$0.60/sh, implying a pre-issue market capitalisation of A$102M. We would see this as the bottom end of the range.

Calculation of discount rate

Table 7 Calculation of Weighted Average Cost of Capital – Our valuation has used 8.75%

Cost of Equity	Trigg	Used
Beta Range	3.03	1.60
Risk free rate (Rf)	3.38%	3.38%
Market Risk premium (Rm)	3.23%	5.00%
Market premium (Rm)	6.61%	8.38%
Cost of Equity	**13.17%**	**11.38%**
Nominal WACC		
Cost of Equity Ke	13.17%	11.4%
Cost of Debt Kd	10.00%	10.0%
Gearing D/(D+E)	60.0%	60.0%
Gearing E/(D+E)	40.0%	40.0%
Tax Rate	30.0%	30.0%
Weighted Average Cost of Capital (Ke)	**9.47%**	**8.75%**

Source: Trigg beta from Yahoo Finance, market risk premium for the Australian Market from www.market-risl-premia.com, risk free rate is the RBA 10yr bond average rate for 12 July 2022, cost of debt being the weighted average of our estimated cost of the Project debt book.

The calculation of the discount rate is shown in the table below which used the Capital Asset Pricing Model. The calculated beta for Trigg is extremely high, and much higher than its peers. As a result, we have chosen a lower beta more in line with peers on the basis that over the next 12 months, Trigg's beta will move more in line with the rest of its sector.

OTHER ASSETS

The private exploration company, Tigers Paw Prospecting Pty Ltd (Tigers Paw), purchased Trigg's E38/3302 – a non-core gold tenement south of Laverton. Key commercial terms include:

- A payment of $200,000 in cash or shares within 7 days after delineation of a JORC 2012 Inferred Minerals Resource of >200,000oz gold or equivalent reported above a cut-off of 0.5g/t gold or equivalent.
- A payment of $500,000 in cash or shares within 7 days after delineation of a JORC 2012 Inferred Mineral Resource of >500,000oz gold or equivalent reported above a cut-off of 0.5g/t gold or equivalent; and
- The grant of a 1.5% net smelter return royalty capped at $1 million.

This asset has not been included in our valuation of Trigg.

RISKS

The elephant in the room: Australia's first two potash projects disappoint

Trigg is part of an industry that includes a number of peers. For the market and the industry, the elephant in the room is that the first into production, Salt Lake Potash Limited (ASX:SO4) is currently in receivership, and the next contender for first into production, Kalium Lakes (ASX:KLL), is expecting to start commercial production in September 2022, after a number of financing mis-steps, cost over-runs, and ramp up delays.

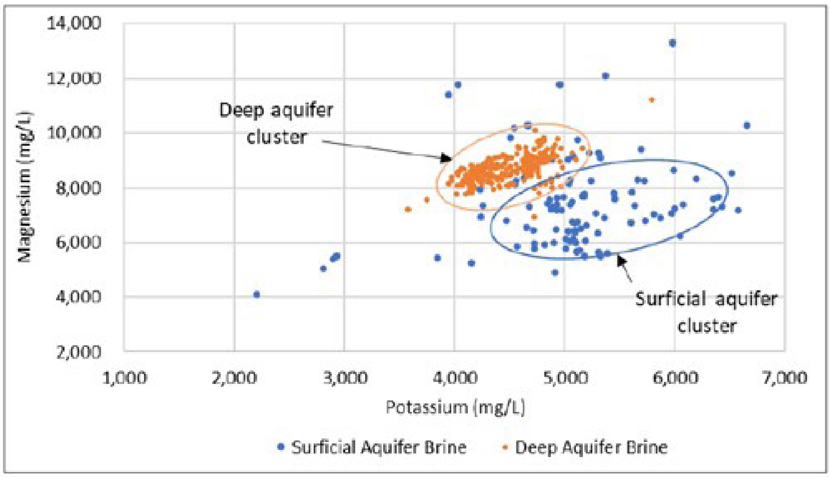
These two problematic cases have provided the rest of the industry with concrete examples of what can go wrong. In our discussions with the Trigg management, we have formed the view that Trigg has learned from the experiences of these companies and is very focussed on the proper management of the relevant issues.

In the Appendix and the end of this report there is discussion of the issues experienced by SO4 and Kalium Lakes. The conclusions are summarised below.

Key lessons from earlier projects

1. Brine production volumes must be carefully managed to build pond inventory before the peak evaporation period in summer. Underperformance of brine production prior to summer cannot be made up during winter because of the lower evaporation rates.
2. Brine quality must be very consistent to allow the processing plant to operate. Figure 3 highlights the variability of in ground potassium grades, and the brine from surface trenching is likely to be intrinsically higher in variability. Brine quantity and quality from all sources must be monitored as close to real time as possible to deliver a feed grade consistent with the plant input specifications. Buffer ponds assist in this process, but buffer pond grade will be impacted by evaporation rates which can vary considerably, and this requires dynamic management.
3. The process plant design should be driven by the best design for the deposit and the local conditions, not by the best funding deals offered by equipment suppliers. That said, the European equipment suppliers to previous projects have probably learned a lot about local conditions.
4. Commissioning a SOP processing plant is far more complex that a typical gold or base metals plant. Performance guarantees from suppliers are probably essential and will be demanded by the banks, and the quality of the vendor support will be a critical determinant on the time taken to ramp up to full capacity.
5. Open borders are also essential. Global equipment suppliers have operated with easy international access, and rapid and simple delivery of experts to sites as required. That did not happen under COVID in Western Australia in 2020 and 2021. While Kalium's contractors and guarantors did provide expertise, the border issues clearly had an effect on expertise delivery, which may have been provided by online consultations rather than on site management.

Figure 3 Throssell Lake potassium and magnesium concentrations by borehole – note higher variability of surface layer



Source: TMG Scoping Study 5 October 2021

Commodity Price Risk – Not relevant at Trigg's current market capitalisation

There are two risks assessments required in respect of potash price risk.

- The sensitivity of the project valuation to changes in assumed SOP price
- The sensitivity of Trigg's share price to changes in SOP spot price

Trigg share price has to appreciate substantially before it is likely to be influenced by SOP prices

At present, Trigg does not appear to be priced on the value of its project, nor does the share price movements appear to be driven by changes in potash prices. In our view, Trigg's share price will not be sensitive to changes in potash spot prices or any of the project related variables discussed below until it has to be re-rated closer to the value of its project.

Financial model sensitivity to SOP assumption changes: +A$10/t SOP changes NPV by +A$14M or 8.2cps

The financial model based on the published Scoping Study is sensitive to commodity price changes. The question is whether the valuation base price chosen is conservative or optimistic. This question is considered in the section starting page 28.

Marketing risk

Quite separate to the price risk is gaining access to market. SOP is an industrial product rather than a fungible commodity like gold or copper. There is no terminal market to dump onto. SOP must be placed into the market via specific sales contracts with off takers.

Pre-production capital and construction risk (A$40M increase in capex cuts NPV by A$24M or 14cps)

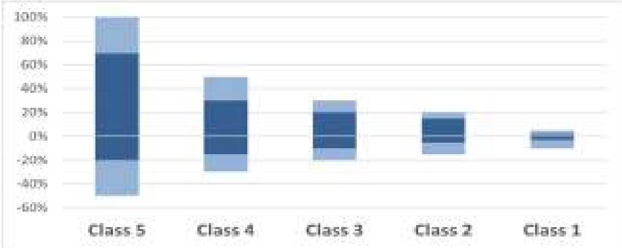
The accuracy of the initial capital cost estimates is considered by the company to be AACE Class 5 or +/-25-35% for the Scoping Study costings reported on 5 October 2021. The NPV change is less than the change in capital cost because of the impact of increased tax deductions and the discounting from the time of the spend back to today.

Table 8 Sensitivity to changes in capital and operating costs

	NPV Change A$M	NPV Change A$/sh
Capex +10% (A$40M)	-25	-0.15
Opex +10% (A$8Mpa)	-48	-0.28

Source: IIR estimates

Figure 4 American Association of Cost Engineers classes of cost reliability and accuracy



Source: AACE project costing classification (18R-97) - Using Class 5 as and example, if a cost estimate is Class 5, then there is an 80% confidence that the final costs will not be more than 70-100% higher or 20-50% lower).

Processing risk and operating costs (A$8/t SOP cost increase reduces NPV by A$48M)

Trigg operating costs for the scale of project appear to be higher than the peers, providing comfort that the Scoping Study estimates are conservative. The current cost environment is quite challenging. One factor that will drive costs will be energy prices, but the Trigg project consumes significantly less energy than does the higher cost producers in the cost curve, so if the project does experience higher costs, it would be very likely that it would be more than compensated by higher prices.

Financing risk

These potash projects have historically received strong support from the Northern Australia Infrastructure Fund and from Import Export funding related to equipment purchases. Our valuation considers a range of share prices and resultant dilution in respect of the equity raisings required to fund the development (Table 6).

PROJECT DESCRIPTION

KEY METRICS

Table 9 Lake Throssell Key Metrics

Key Assumptions & Financial Metrics	Units	Value
Key Financial and Physical Assumptions		
SOP price	(A$/t, FOB)	800
Discount rate	%	8.75
LOM Production Target	Mt	5.9Mt @ 10.4kg/m3 SOP
Life of Mine (LOM)	Years	21
Trench network	km	110
Bores	number	22-112
Overall recovery	%	82
Annual Production Target	ktpa SOP	245
Capital Cost		
Total direct costs	$M	269
Total indirect costs	$M	40
Contingency and growth	$M	70
Total Capital Cost	$M	378
Pre-production working capital	$M	34
Total Funding Requirement	$M	412
Operating Cost		
C1 Cash Operating Cost	$/t SOP	341
Sustaining Capital, Native Title compensation and closure costs	$/t SOP	30
All-in Sustaining Cost (AISC)	$/t SOP	372
State Royalties	%	5

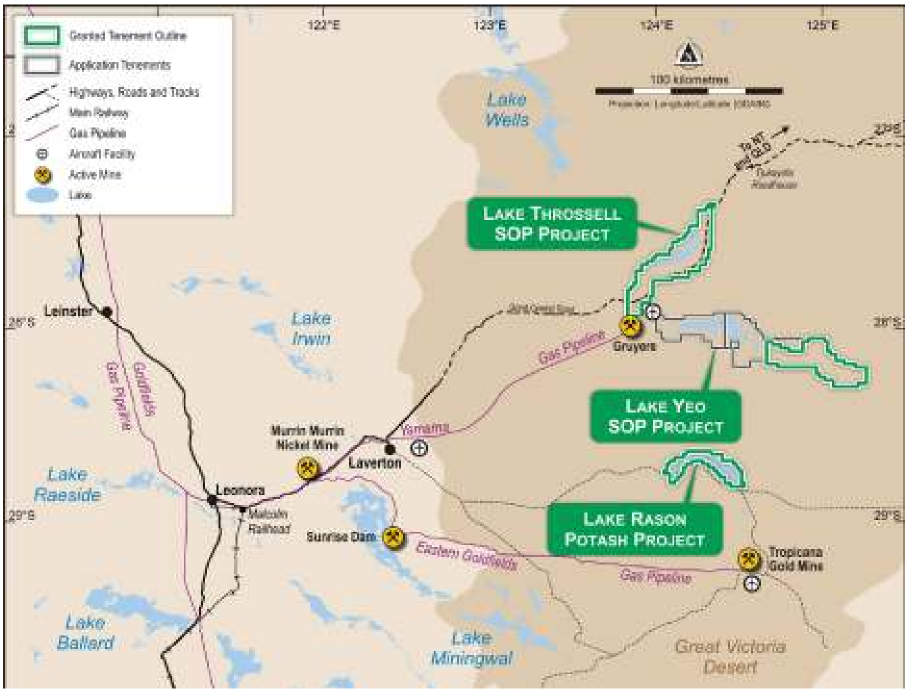
Source: TMG Scoping Study 5 October 2021

LOCATION AND TENURE

Trigg has Resources at two locations at Lake Rason (Laverton Links Project) and at Lake Throssell/Lake Yeo. All the company's attention is focussed on the Lake Throssell Project which has the higher grade Resource. Lake Yeo is located 35km south to Lake Throssell.

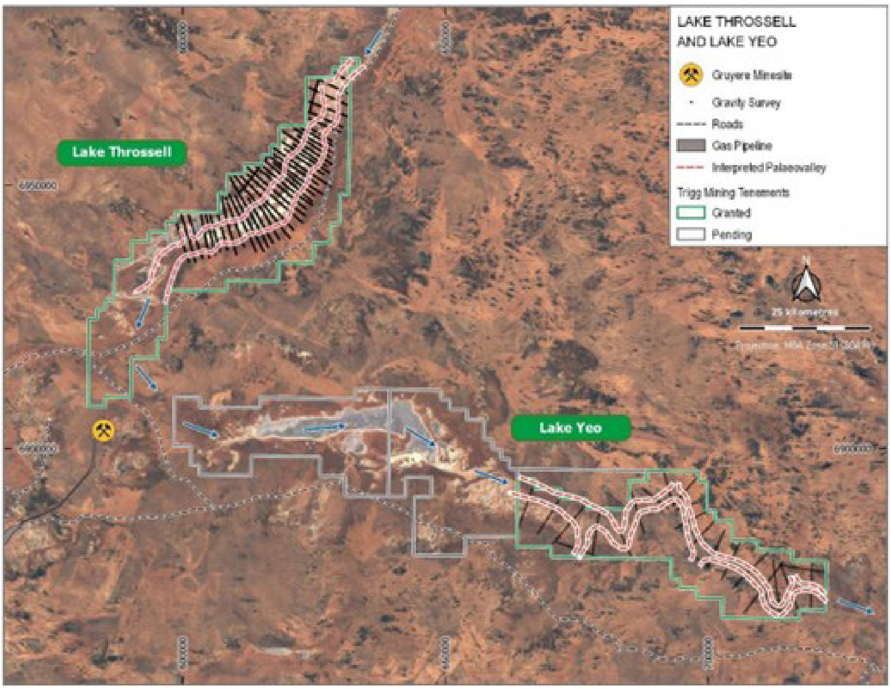
The Lake Throssell SOP Project is 100%-owned and operated by Trigg and lies approximately 180km northeast of Laverton. While the site is remote, the "active mine" marked in Figure 5 is the major Gruyere gold operation of Goldfields and Gold Road, and that operation is serviced by a gas pipeline from Laverton.

Figure 5 Lake Throssell located on the proposed Outback Way sealed highway from WA to Queensland



Source: TMG March 2022 quarterly activities report 28 April 2022

Figure 6 Granted and pending tenements at 31 March 2022 (Note Gruyere Gold Mine)



Source: TMG March 2022 quarterly activities report 28 April 2022

The Federal Government, as part of the 2022 budget handed down during the Quarter, committed the final $678 million to complete the Outback Way Highway shown in the figure above, with a total of $400 million to be spent in Western Australia (WA).

This key national infrastructure project will connect Laverton in WA to Winton in Queensland with a modern sealed highway. This Highway will run adjacent to Lake Throssell and is ideally located approximately 5km to the south of the proposed process plant location. It will provide truck assess to WA ports for export and to the Queensland market.

To date the first 50km from Laverton has been completed, with planning underway for the section past Cosmo towards Lake Throssell. Trigg anticipates that the section from Laverton to the Project's gate will be completed before construction of the project commences, with completion of the entire trans-Australian Highway anticipated by 2030.

Product from the Lake Throssell Project would be bagged, loaded into sea containers and trucked by sealed roads 350km to the Leonora railhead then railed 900km to the port of Fremantle.

The Lake Throssell Mineral Resource is currently restricted to E38/3065 and the Exploration Target is additional extending north and south within the other Lake Throssell tenements only.

Lake Yeo has been identified using gravity survey which has revealed an 80km long paleovalley, up to 3.5km wide within granted tenements. Planning is currently underway for a heritage survey and air core drilling program to test this area.

Table 10 Tenement Schedule at 31 March 2022

Tenement Number	Location	Registered Owner/ Applicant	Status	Interest
E38/3065	Lake Throssell	K2O Minerals Pty Ltd	Granted	100%
E38/3458	Lake Throssell	K2O Minerals Pty Ltd	Granted	100%
E38/3483	Lake Throssell	K2O Minerals Pty Ltd	Granted	100%
E38/3537	Lake Throssell	K2O Minerals Pty Ltd	Granted	100%
E38/3544	Lake Throssell	K2O Minerals Pty Ltd	Granted	100%
E38/3610	Lake Yeo	K2O Minerals Pty Ltd	Granted	100%
E69/3851	Lake Yeo	K2O Minerals Pty Ltd	Granted	100%
E38/3607	Lake Yeo	K2O Minerals Pty Ltd	Application	100%
E38/3608	Lake Yeo	K2O Minerals Pty Ltd	Application	100%
E38/3724	Lake Yeo	K2O Minerals Pty Ltd	Application	100%
E38/3089	Lake Rason	K2O Minerals Pty Ltd	Granted	100%
E38/3437	Lake Rason	K2O Minerals Pty Ltd	Granted	100%
E38/3464	Lake Rason	K2O Minerals Pty Ltd	Granted	100%

Source: TMG March 2022 quarterly activities report 28 April 2022

RESOURCES

Table 11 Lake Throssell Resource and Exploration Target

Resource Domain	Mineral Resource Category	Drainable Brine Volume (10^6 m^3)	Potassium (K) Grade (mg/L)	Potassium (K) Mass (Mt)	SOP Grade (K_2SO_4) (kg/m^3)	SOP Mass (Mt)
LAKE THROSSELL MINERAL RESOURCE						
Surficial Aquifer	Indicated	170	4,985	0.9	11.1	1.9
Basal Aquifer	Indicated	225	4,605	1.0	10.3	2.3
Total Indicated Resource		**395**	**4,770**	**1.9**	**10.6**	**4.2**
Surficial Aquifer	Inferred	310	4,605	1.4	10.3	3.2
Confining Layer	Inferred	350	4,595	1.6	10.2	3.6
Basal Aquifer	Inferred	330	4,675	1.5	10.4	3.4
Total Inferred Resource		**990**	**4,625**	**4.5**	**10.3**	**10.2**
TOTAL MINERAL RESOURCE		**1,385**	**4,665**	**6.4**	**10.4**	**14.4**
LAKE THROSSELL EXPLORATION TARGET (in addition)						
Lower Estimate		288	4,261	1.2	9.5	2.6
Upper Estimate		945	4,616	4.2	10.3	9.4

Source: TMG Scoping Study 5 October 2021

Table 12 Lake Rason Resource

Resource Domain	Mineral Resource Category	Drainable Brine Volume (10^6 m^3)	Potassium (K) Grade (mg/L)	Potassium (K) Mass (Mt)	SOP Grade (K_2SO_4) (kg/m^3)	SOP Mass (Mt)
LAKE RASON INFERRED MINERAL RESOURCE						
Surficial	Inferred	306	2,290	0.7	5.1	1.56
Crete	Inferred	351	2,330	0.82	5.2	1.83
Mixed	Inferred	23	2,390	0.05	5.3	0.12
Basal Sand	Inferred	214	2,390	0.51	5.3	1.14
Saprolite	Inferred	84	2,210	0.19	4.9	0.41
Saprock	Inferred	186	2,050	0.38	4.6	0.85
Total		**1,160**	**2,280**	**2.65**	**5.1**	**5.91**

Source: TMG Scoping Study 5 October 2021

Our valuation has not placed any value of Lake Rason. It is too distant from Lake Throssell to contribute to that project, and because Lake Throssell is the main focus of the company, and the driver of the company's share price, Lake Rason is unlikely to see much activity. While the Resource in this deposit would have a positive value, that value would only be realised if the company were to farm out or sell the property as Kalium Lake did with its Carnegie property in 2017.

INFRASTRUCTURE

The Lake Throssell Project requires infrastructure similar to other remote resource projects throughout Western Australia. The following infrastructure will be constructed to support operations:

- Power station, including a solar farm and power distribution
- Raw water supply and water treatment
- Accommodation village
- Airstrip and roads
- Offices, stores, and workshop
- Communications
- Bulk fuel storage

Trigg will obtain power from a Independent Power Provider (IPP) through a 10-megawatt (MW) power station with a 5MW solar farm. Initial analysis has determined the power station will use trucked liquified natural gas (LNG). An all-in levelised electrical price (inclusive of fuel cost) of $0.18/kWh has been estimated for the Project.

A desktop study has been completed on potential raw water sources for the Project. It has been assumed for the purposes of the Scoping Study a raw water borefield will be located 30km from the SOP process plant with sufficient capacity to provide 2.5GL pa of brackish water. A program of work is currently being planned to drill a number of identified water targets from the desktop study.

The planned accommodation village has a total capacity of 120 rooms to support operations. The Project will operate on a 24hr, 7-day basis assuming a 2 weeks on / 1 week off roster for shift personnel and an 8 days on / 6 days off roster for day shift roles. A gravel airstrip will be constructed to support a twin prop air service from Perth to Lake Throssell for shift change overs. The airstrip will be suitable for an ATR 42 seat or ATR 72 seat aircraft.

Bulk fuel will be delivered to site and stored in a 550kL bulk fuel farm, which has sufficient diesel for 21 days. A site fuel truck will distribute and refuel generators for the bore field. The next study phase will look at the cost of reticulating power along the lake to reduce diesel consumption. Pricing for bulk fuel delivery to site was obtained and a price of $0.82/L (excl GST, plus rebate) used for the study.

The greenhouse gas (GHG) emissions have been estimated on an annual basis. With a 15-20% renewable energy penetration the GHG emissions are estimated to be approximately 42,500t CO2e per annum or 173kg/t of SOP at nameplate capacity.

MINING

In Years 1 to 6 the brine will mostly be sourced from the surficial aquifer using a network of trenches across the lake surface. The cost of brine extraction for this period is lower than the overall LOM costs. Approximately 80% of SOP production for the first five years of operation will be sourced from the surficial aquifer. Bores will be progressively installed to supplement brine feed as the flowrate from the surficial aquifer declines.

In Year 1, the pond system will be constructed, and an initial salt floor grown in Year 2. First SOP production occurs in Year 3, coinciding with first salt harvest. From Year 5 onwards, the plant will operate at full nameplate production target of 245ktpa of SOP.

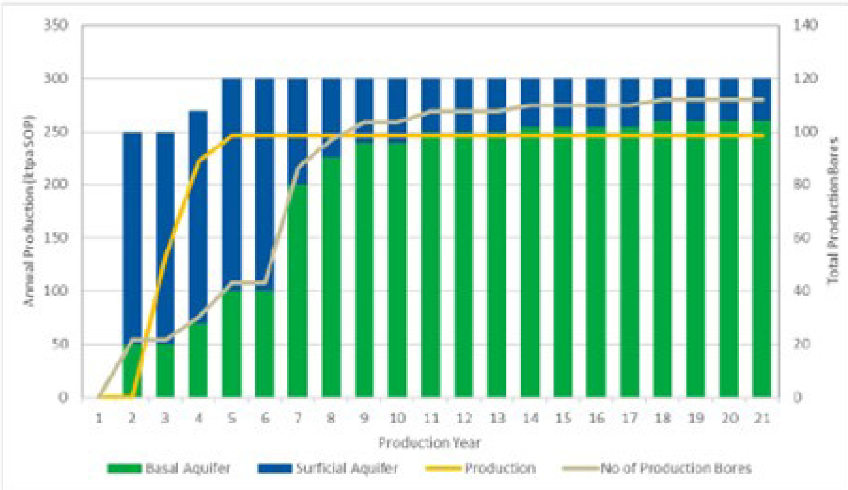
Mining of a brine resource occurs via pumping of the brine from groundwater aquifers to the halite crystallisers. Brine will be pumped via two methods – from trenches excavated into the lake surface and from production bores targeting the deeper basal aquifer.

Solute transport groundwater modelling has been completed to simulate abstraction and potassium grade of the trenches and production bores. The model is considered to be sufficiently accurate for this Study to determine the production target and change of abstraction rates over time using reasonable aquifer parameters.

The trench model uses the results from the trench pumping tests as a guide to the average aquifer properties of the surficial aquifer (TMG release on 7 July 2021).

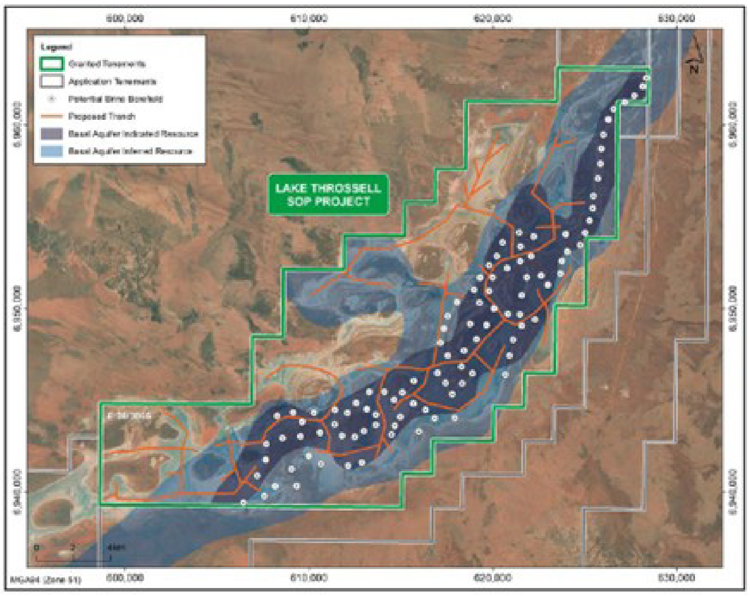
The basal aquifer uses the geology from the resource model with aquifer properties based on desktop and publicly available data from locally similar projects within the region. The groundwater model is a solute transport model and simulates brine potassium grade change over time from each abstraction point.

Figure 7 Scoping Study production (bars are SOP contained in bumped brine, yellow line is final product)



Source: TMG Scoping Study Fig 29

Figure 8 Trench and bore locations



Source: TMG Scoping Study Figure 28

The initial brine grades in the model were imported from the resource block model. The model does not include any recharge and the islands have been assigned zero grade, which are outside of the resource model; therefore, abstraction is purely from groundwater storage, reflecting the Mineral Resource.

The results from the groundwater modelling enabled a mine plan to be developed by Aquifer Resources to determine the Production Target of 245ktpa SOP for the Scoping Study.

Installation of test production bores and test pumping is required to facilitate conversion to Ore Reserves and validation of the mine plan using more refined groundwater models. The Project proposes to construct a network of surficial trenches totalling 110km in length across Lake Throssell.

These trenches will flow by gravity to two collection sumps where brine will be pumped into the halite crystalliser feed channel.

METALLURGY

Alternative Process Flowsheets

Trigg has observed the commissioning delays and ramp-up challenges encountered by the first movers in the nascent Australian SOP industry. Some of these difficulties have been observed in managing the final stages of the evaporation process to produce sufficient quantity and grade feed salts or "ore" for the process plant.

It has also been observed that other projects around the world have established the evaporation process successfully, but it is acknowledged that it takes significant time to establish equilibrium as the projects are scaled up from laboratory and small-scale field trials to full-scale commercial production.

In response to the challenges faced by the first-movers, Trigg, as part of the ongoing PFS, is investigating alternatives to the pond evaporation process and exploring other methods of optimising the natural endowment of the Project.

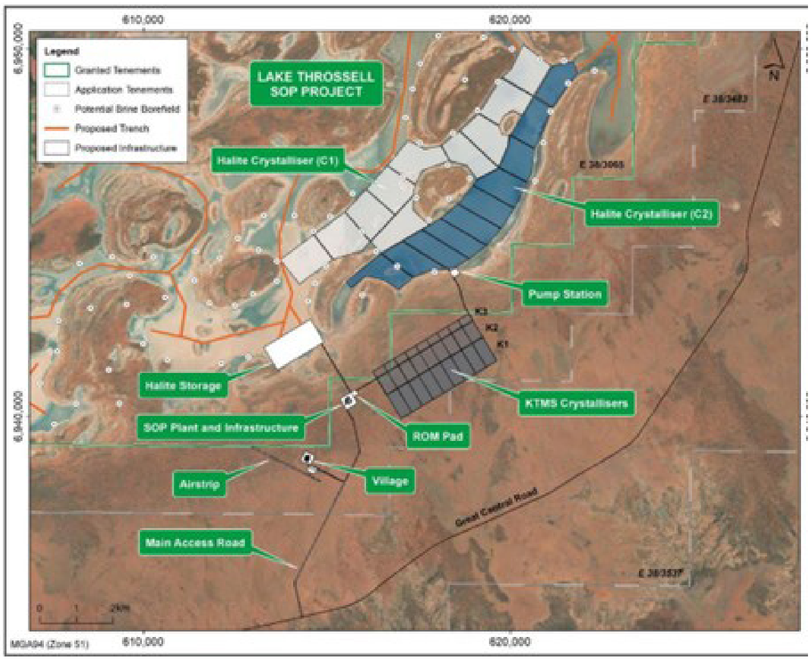
This study of alternative processes is also occurring in the lithium industry and there may be transferable learnings in lithium brine processing of relevance to potassium brine processing.

Scoping Study Flowsheet

The Scoping Study has adopted a conventional flow sheet as a base case. However, Trigg management have indicated that as part of the PFS, alternative processing paths will be considered, including the production of by-products including magnesium based products.

Production from hypersaline brine hosted SOP is typically undertaken through the abstraction of mineralised brine water, concentration using solar evaporation in evaporation ponds at this stage located on the salt lake, then crystalised in ponds off-lake. The off-lake ponds are lined with a waterproof membrane to prevent product loss (Figure below).

Figure 9 Evaporation and crystallisation pond layout



Source: TMG Scoping Study Fig 8

The evaporation rate at the Lake Throssell SOP Project is estimated to be approximately 3,200mm per year.

Operation of ponds

Brine will be pumped from the collection sumps and channels on Lake Throssell to the first stage of the solar pond system. The pond system consists of two parallel trains of 10 cells per train of preconcentration (Halite Ponds), followed by 9 parallel trains of three Kainite Type Mixed Salt (KTMS) ponds placed in series. The mixed salts consist of kainite, leonite, halite, carnallite, and hexahydrite.

There is a total of 21.5 km^2 of evaporative area required for the Project.

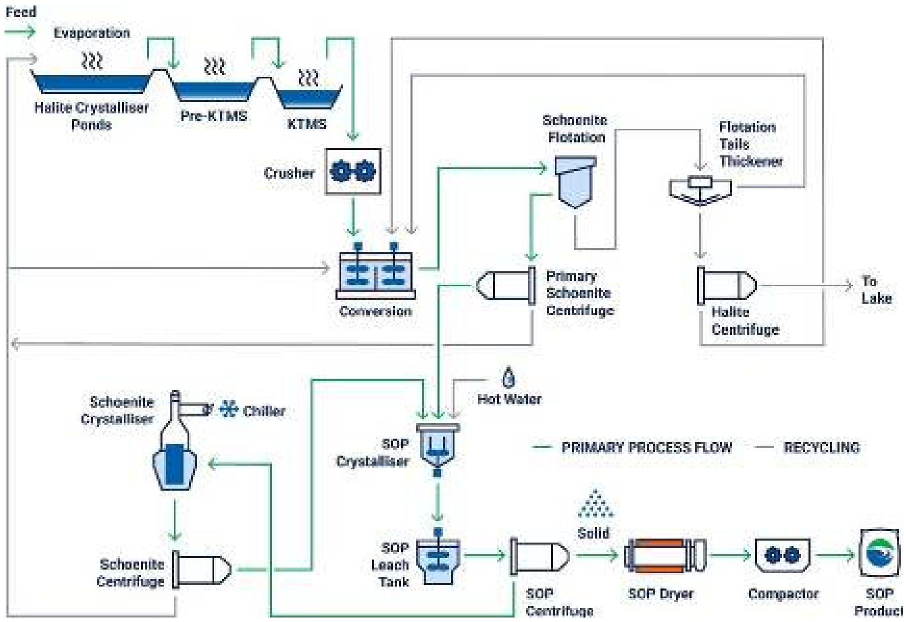
The brine initially enters the Halite Ponds where the evaporation of water results in the crystallisation of halite (NaCl). At a specified brine concentration, the brine is pumped to the next stage of the ponds where additional evaporation occurs and other salts such as epsomite ($MgSO_4$) along with halite precipitate.

The make-up of the precipitated salts is different in each stage of the ponds. The height of the embankments for the Halite Ponds are increased every 8-10 years to increase the storage volume of halite. The cost associated with these civil earthworks has been included in the sustaining capital schedule within the operating cost estimate.

At the KTMS crystalliser ponds, feed brine is mixed with SOP recycle brine that is returned from the process plant to improve the $K:SO_4$ ratio which will improve the overall potassium recovery. Brine remaining after the final solar production pond is intended to be returned to Lake Throssell. Precipitated salts are harvested from the final evaporation pond stages and are blended on the run-of-mine (ROM) pad to provide a homogenous feed to the processing plant. It is planned for the pond system to be commissioned 12-18 months ahead of first production to grow an initial salt floor to support heavy mobile equipment and first KTMS for commissioning.

Pond losses can occur due to brine leaking out of the floor of the on-lake, unlined evaporation ponds. The off-lake crystallisation ponds which hold the much more valuable KTMS solution would be lined to prevent leakage losses.

Figure 10 Scoping Study process flow sheet



Source: TMG Scoping Study 5 October 2021

Operation of processing plant

The purification plant converts harvested KTMS from the solar ponds to an intermediate product (schoenite) in conversion tanks, and then separates the schoenite from halite using flotation.

After the flotation step, the schoenite concentrate is decomposed using hot water and recrystallised to potassium sulphate (K2SO$_4$ or SOP). The SOP crystals are then dewatered and dried in a fluid bed dryer, compacted, screened and loaded into bags for shipment.

The mother liquor from the SOP crystalliser is treated by cooling the liquor to recover additional schoenite, while excess mother liquor is pumped back to the solar ponds to maximise potassium recovery.

The higher the schoenite grade the better the recovery. Plant performance depends on maintaining a constant chemistry, including potassium grade, and also the mineral makeup.

Potential by-products

The project could produce table salt and Epsom salts. The global price for table salt is less than the cost of transport to port, so is unlikely to ever be a commercial proposition. Epsom salt has potential to be a byproduct.

Mineral terminology used:

- Halite: sodium chloride, otherwise known as table salt - NaCl
- Epsomite: magnesium sulphate, otherwise known as Epsom salts - $MgSO_4$
- Kainite: a hydrated potassium magnesium sulphate chloride double salt - $KMgSO_4Cl{\cdot}3H_2O$
- Leonite: a hydrated potassium magnesium sulphate double salt - $K2SO_4{\cdot}MgSO_4{\cdot}4H_2O$
- Carnallite: a hydrated potassium magnesium chloride salt - $KMgCl_3{\cdot}6H_2O$
- Hexhydrite: a magnesium sulphate salt - $MgSO_4.6H_2O$
- Schoenite: a hydrated potassium magnesium salt - $K_2Mg(SO_4)_2{\cdot}6(H_2O)$.

CAPITAL COST

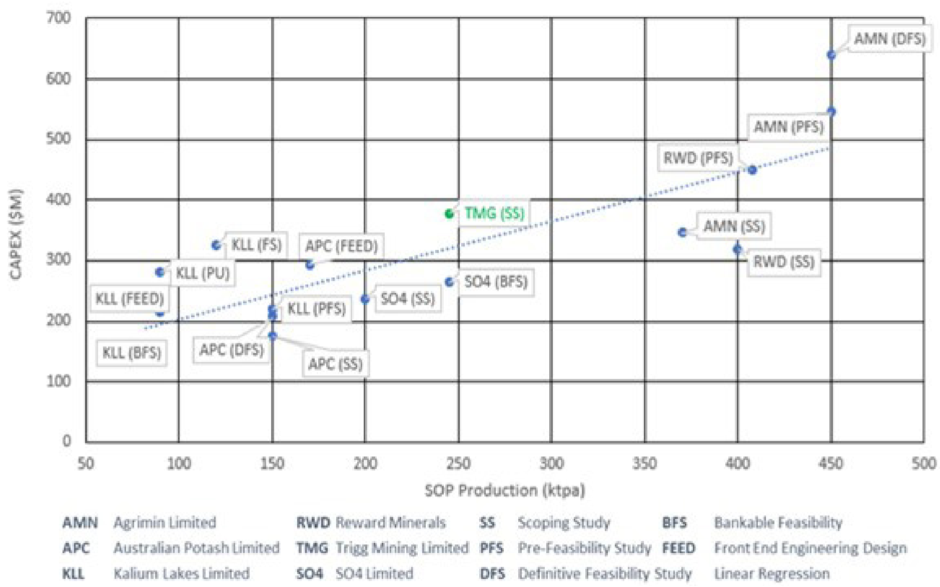
The capital cost from the Scoping Study has an accuracy of +/-25-35%, which is a very large range. However, the estimate of A$378M appears high for a plant of 245ktpa capacity compared to other projects, including those that have completed costings to Bankable Feasibility or Front End Engineering and Design (FEED) stage, and are therefore costed to as low as +/-5% accuracy.

Table 13 Pre-production capital costs including working capital during ramp up

Capital Cost	A$M
Brine Extraction	11.0
Crystalliser Ponds	109.9
SOP Process Plant	109.2
Infrastructure	30.9
Mobile Plant & Equipment	7.9
Total Direct	268.9
Indirect Costs	22.7
Owners Costs	17.0
Total Indirect	39.7
Contingency	69.5
Total Capital Cost	378.1
Initial Working Capital (six months operating costs during ramp up	34.0
Peak Funding	412.1

Source: TMG Scoping Study 5 October 2021

Figure 11 Comparison of Lake Throssell unit capital costs to peers at the various projects' stages



Source: TMG Scoping Study 5 October 2021 p18

OPERATING COST

Table 14 Lake Throssell operating costs

Operating Cost	A$Mpa	A$/t SOP
Labour	21.9	91.6
Power	13.1	54.8
Maintenance	7.5	31.5
Reagents & Consumables	9.8	41.2
Harvesting, Haulage & Logistics	25.8	108.1
General & Administration	3.4	14.1
Total Cash Cost	81.5	341.3
Sustainable Capital	7.1	30.1
Royalties at A$0.73/t	0.2	0.7
All In Sustaining Cost	88.8	372.1

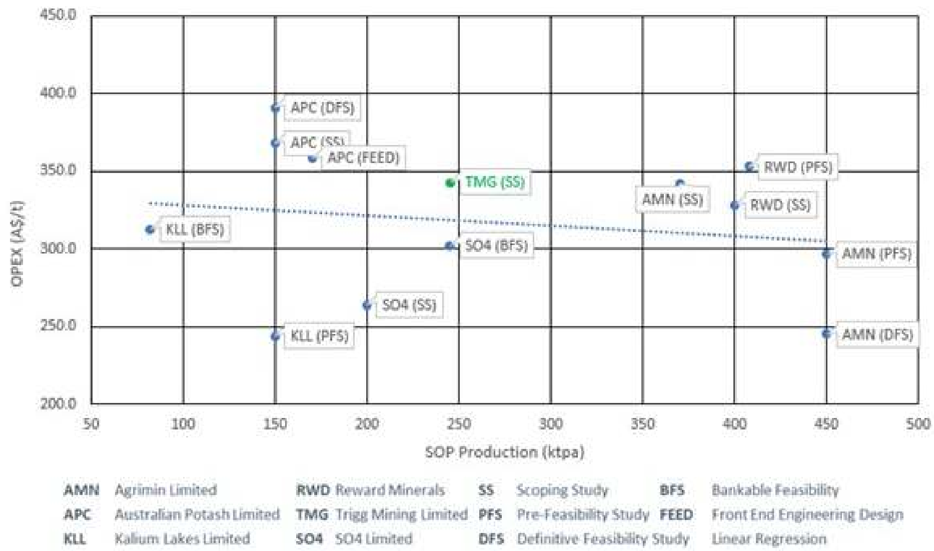
Source: TMG Scoping Study 5 October 2021

The Scoping Study had assumed a royalty of A$0.73/t product which is the royalty on industrial minerals. The Western Australian Government has hit Kallium Lakes with a 5% Revenue Royalty which has been used in the NPV valuation in this report.

The industry is pushing back against this increase, and may get it reduced, but in an era of budget repair, we do not expect much improvement.

The operating cost in A$/t appears to be consistent with the higher cost projects among the peers, even though Lake Throssell has a SOP grade of 10.4 kg/m^3 compared to Agrimin (AMN) 7.3kg/m^3 and Australian Potash (APC) 7.5kg/m^3. Note that Agrimin's costs fell as it moved from Scoping Study (SS) to Bankable Feasibility Study (BFS) by almost A$100/t.

Figure 12 Comparison of Lake Throssell unit operating costs to peers at the various projects' stages



Source: TMG Scoping Study 5 October 2021 p19

OUTLOOK FOR SULPHATE OF POTASH (SOP) PRICES

Potassium is one of the big three macronutrients that make up fertilizers.

Commercially, potassium is always combined with other elements, the most common being Potash, Murate of Potash (MOP) and Sulphate of Potash (SOP). One tonne of potash contains the same weight of potassium as 1.58 tonne of MOP or 1.41 tonne of SOP.

Table 15 Chemical formulae and weights of major commercial forms of potassium

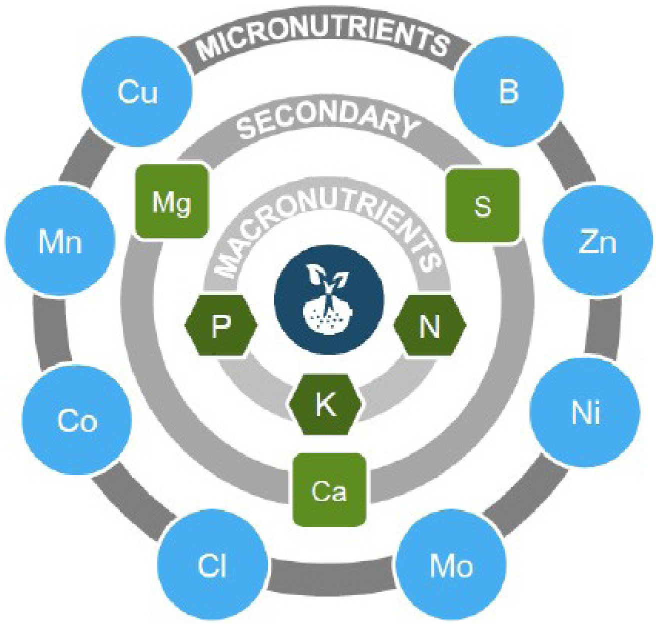
Potash	Potash	MOP	SOP
Formula	K_2O	2KCl	K_2SO_4
Atomic Weight	94.2	149.1	133.2
Conversion Factor	1.00	1.58	1.41

Source: Periodic Table

The increasing demand for food is increasing the demand for fertilizers of which potassium (atomic symbol K) is one part. Potassium is classed as a major nutrient, as opposed to a trace element, and is required in quantity. In regions of heavy cropping, potassium is required each cropping cycle.

In 2015, FAO estimated demand for nitrogen was 288Mt (as N), phosphate 64.7Mt (P_2O_5) and potassium 64.7Mt (as K_2O or potash). Of the secondary elements, sulphur consumption as fertilizer was 16Mt in the same year (The Sulphur Institute).

Figure 13 Required Crop Nutrients



Source: Compass Minerals' 2016 Annual Report

POTASSIUM PLAYS MANY DIFFERENT ROLES IN PLANTS:

In photosynthesis, potassium regulates the opening and closing of stomata, and therefore regulates CO_2 uptake.

Potassium triggers activation of enzymes and is essential for production of Adenosine Triphosphate (ATP). ATP is an important energy source for many chemical processes taking place in plant tissues.

Potassium plays a major role in the regulation of water in plants (osmo-regulation). Both uptake of water through plant roots and its loss through the stomata are affected by potassium. Increased potassium is known to improve drought resistance.

Protein and starch synthesis in plants require potassium as well. Potassium is essential at almost every step of the protein synthesis. In starch synthesis, the enzyme responsible for the process is activated by potassium. Potassium has an important role in the activation of many growth-related enzymes in plants.

POPULATION GROWTH DRIVES DEMAND FOR FOOD

Population increasing, while land per person declines

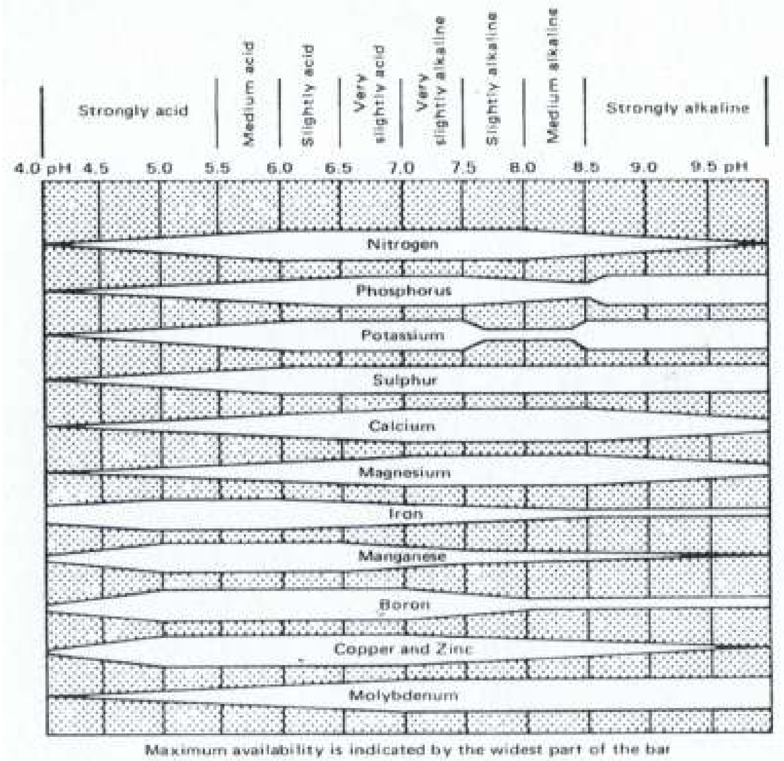
- Global food consumption is projected to grow at 2%pa
- The available land under agriculture per head of population is declining, and that decline will continue
- Fertilizer application essential to increasing land productivity

Within Food consumption, the trend is to more fruit and vegetables

- Worldwide exports of fresh fruit and vegetables increased 115% between 2000 and 2018
- Younger consumers increased fresh fruit and vegetable consumption 50% between 2006 and 2016
- General trend away from meat, dairy and processed foods

EFFECTIVE NUTRIENT DELIVERY DEPENDS ON BALANCE

Figure 14 Effect of soil acidity on the take up of minerals



Source: Discovering Soils CSIRO 1977

When applying fertilizer, more is not necessarily better, and this is where SOP has special advantages. Soil acidity and competition for uptake between competing elements affect the plants' ability to absorb specific minerals, and different fertilizer products release their minerals over different time frames (eg slow release fertilizer products).

The figure above demonstrates the impact of acidity on mineral uptake. In acid soils (pH below 5.5) the plant's ability to absorb nitrogen, phosphorus and potassium is reduced, and ability to take up iron, manganese and boron is increased, reducing yield and in extreme cases rendering the plant poisonous. Where acidity is an issue, SOP is preferred over MOP because of the absence of chloride. The chlorine turns into hydrochloric acid. Soil acidity is cumulative, and very expensive to reduce, so cumulative build-up is to be avoided.

There is also some strange behaviour if the soils become too alkali, and at marginally alkali levels of over 7.5, the take up of potassium is severely restricted. Alkalinity can be increased by the presence of ions like calcium (adding calcium carbonate is the most common way to reduce acidity or increase alkalinity). We will discuss polyhalite later, but the calcium in polyhalite could be a problem in some soils, preventing the take up of potassium.

Table 16 Crops that consume SOP in preference to MOP

Chloride Sensitive Crops	High Sulphur Demand	High value crops that typically prefer SOP
Potatoes	Soybeans	Alfalfa
Tobacco	Peanuts	Cotton
Avocado	Sunflower	Stone fruits
Citrus	Canola	Coffee
Berrries		Apples and pears

Source: 5E Advanced Materials Form 10 25 February 2022 p18

Fertilizer is a cost to farmers, so there can be a preference for applying the minimum as late in the cropping cycle as possible. That typically means application during the period of peak growth, and only apply the minerals required. In the potash context, this factor is why MOP is generally preferred because it is the simplest and most concentrated form of potassium available if the soil and plant chemistry allows its use.

SOURCES OF POTASSIUM TO AGRICULTURE

Muriate of Potash (MOP) the dominant source of potash

The major sources are Muriate of Potash (MOP) and Sulphate of Potash (SOP). Other sources available to agriculture include Nitrate of Potash (NOP), and potash in various forms with trace elements like magnesium (SOPM). Polyhalite is a new product that emerged in 2011.

When we refer to the relative costs of different fertilizers, we are assuming the historically normal pricing relationships, not the current prices where the disruption due to war in Ukraine has compressed price differentials.

Historically, MOP has been the cheapest source of potash, and has the greatest market share.

Sulphate of Potash (SOP) is used when soil acidity or chlorine intolerance is an issue

Where soil chloride levels are higher than 600 mg/kg in the top 30 cm, the use of MOP should be avoided. The acidity issue means that SOP is effectively serving a separate market to MOP. Generally, the more arid the environment, the bigger an issue chlorine and acidity becomes.

Some crops are chlorine intolerant such as avocados, coffee beans and cocoa. The chlorine results in leaf or root burn.

SOP also provides sulphur, which is also essential for plant growth.

SULPHATE OF POTASH SOP PRODUCTS AND APPLICATIONS

Table 17 SOP product specifications and uses

Name/Grade	Min. K_2O	Min. SO_4	Max. Cl	Applications
Compass Minerals USA				
Soluble Fines SOP Organic	50.0%	17.0%	0.8%	For liquid fertilizer solutions and suspensions.
Standard Fines SOP	50.0%	17.0%	0.8%	For solutions that will either be decanted or filtered.
Standard Fines SOP Organic	50.0%	17.0%	0.8%	For solutions that will either be decanted or filtered.
Industrial Fines SOP	50.0%	17.0%	0.8%	A sugar- fine crystalline SOP used industrial applications.
Greensgrade SOP	50.0%	17.0%	0.8%	For micro-sized blends or direct application (eg golf greens).
Choice Granular SOP	50.0%	17.0%	0.8%	Typically used by the turf and ornamental markets.
Choice Granular SOP Organic	50.0%	17.0%	0.8%	Typically used by the turf and ornamental markets.
Mid Granular SOP	50.0%	17.0%	0.8%	Sized for use by turf and ornamental markets.
Mid Granular SOP Organic	50.0%	17.0%	0.8%	Sized for use by turf and ornamental markets.
Ag Granular SOP	50.0%	17.0%	0.8%	For agricultural grade nutrient sources in broadcast spreaders.
Ag Granular SOP Organic	50.0%	17.0%	0.8%	For agricultural grade nutrient sources in broadcast spreaders.
K&S Germany				
Sulphate of Potash granular	50.0%	18.0%	1.0%	For mechanised spreading and bulk blending
Sulphate of Potash standard	50.0%	18.0%	1.0%	For manufacture of compound fertilizers
Sulphate of Potash low chloride	51.0%	18.0%	0.5%	For horticulture and making compound fertilizers
HORTISUL	52.0%	18.0%	0.5%	Virtually free of chloride for fertigation and foliar spray
Tessendelo Chemie Belgium				
SOP Standard	50.3%	52.6%	2.1%	For direct application or manufacture of compound fertilizers
GranuPotasse	50.3%	52.6%	2.1%	For bulk blending or for direct application
SoluPotasse	50.9%	55.8%	0.6%	A fast dissolving highly soluble form for fertigation
K-Leaf	52.0%	55.8%	0.2%	A very fast dissolving, highly soluble for foliar application
SQM Chile				
Agricultural Grade - Granular	51.0%	54.0%	1.5%	Agricultural Grade - Granular
Soluble Grade – Crystallized	51.0%	54.0%	1.0%	Soluble Grade - Crystallized
Ultrasol SOP-52	52.0%	53.0%	1.0%	Ultrasol SOP-52

Source: http://www.sopib.com/characteristics.html with Compass maximum chloride adjusted to reflect Compass specification.

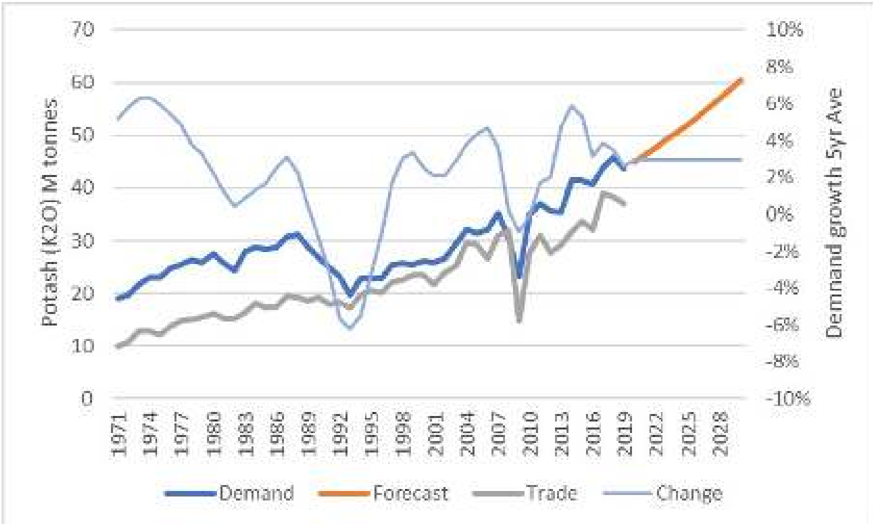
SOP is a combination of the two essential nutrients, potassium and sulphur, forming a highly concentrated fertilizer. As both nutrients are soluble in water SOP is considered as a quick acting fertilizer to prevent potassium and sulphur undersupply, to correct existing nutrient deficiencies in crops, and imbalances in soils.

In the soil, sulphate of potash immediately dissociates into the cation K+ and the anion SO_4^{2-} nutrient forms which are readily available for plant uptake. As no oxidation or reduction processes are involved to release these nutrients into the soil an application of SOP has no impact on soil pH.

All grades and forms of SOP offered in the market have a maximum content of 1% chloride which makes SOP the best source of potassium for chloride sensitive crops and intensive cropping systems. Examples of the specifications of various commercial SOP products are detailed in the table below.

POTASH DEMAND

Figure 15 Potassium demand in agriculture has almost doubled from 2000 to 2019 - (one tonne of potash or K_2O is equivalent to 1.41 tonnes of SOP)



Source: History https://www.fao.org/faostat/en/#data/RFN, Forecasts IIR

There are three outstanding features of the global Potash demand in the chart above:

- The clear trend growth since 1993 at 3.08%pa to 2019, which we have adopted as our growth forecast.
- The occasional large or very large downturns in demand every 3 or so years. The large downturn in 2009 was related to a price spike in that year similar to the one in evidence today (from US$200/t MPO to US$750/t). The end users of fertilizer are farmers, and worldwide they are used to cycles. Sudden large price rises see demand destruction as farmers stop using fertilizer. However, a year of under-usage is generally followed by catchup demand in the following years after prices have stabilised.
- Almost all of the global consumption of potash is in a different country from the country where it was produced and evidenced by the volume of trade being almost the same as the volume of demand. Russia, Belarus (combined 30%) and Canada (32%) account for 60% of global supply.

POTASH SUPPLY

Additions to Mannheim capacity not included in our forecasts

- 35% of existing supply comes from primary sources (Trigg 4 April 2022), and most of the balance comes from conversion of MOP into SOP using the Mannheim process.
- The Mannheim process combines MOP (KCl) with sulphuric acid (H_2SO_4) in a reactor heated to ~800°C so is very energy intensive.
- The process produces 1.2t Hydrochloric acid (HCl) for each tonne of SOP (K_2SO_4), and the restrictions on disposal of this byproduct is getting progressively tighter globally adding to the conversion cost.

- Because this is a conversion process that requires MOP, we focus our supply assessment on the supply of raw material ie MOP/SOP/Polyhalite, and do not include any forecast increases in Mannheim capacity.

Available capacity of proposed projects to 2030 total 29.4Mtpa

- The planned new supply that has been identified in the table below totals 29.4Mtpa. The table includes both committed and potential projects. Those with question marks in the start column have been around for a while and appear to have stalled, due to unresolved technical issues, funding difficulties, or concern over the arrival of BHP's Jansen project. Jansen itself is likely to take a number of years to ramp up to 10Mtpa, due to both operational and marketing factors.

Table 18 Identified new supply

Owner MOP Supply	Project	Country	Capacity Mtpa MOP	Start
Uralkali	Solikansk-3	Russia	0.60	2022
Uralkali	Ust-Yayvisky	Russia	2.50	2023
Uralkali	Solikansk-2	Russia	1.20	2024
Slavkali	Nezhinsky	Belarus	1.10	2024
Eurochem	Usolskiy Phase 1.1	Russia	0.18	
Eurochem	Usolskiy Phase 2	Russia	2.00	2025
Eurochem	Volgakali	Russia	2.10	2.24
Acron	Talitsky	Russia	2.00	2025
Total			**11.68**	
Nutrien	Various	Canada	1.00	2022
APC	Safi Phase 2	Jordan	0.14	2023
Lao Kalyuan	Longhu	Laos	0.50	2023
BHP	Jansen	Canada	10.00	2027
Vale	Kronau	Canada	2.90	?
Nutrien	Various	Canada	3.00	?
Total			**17.54**	
MOP Combined			**29.22**	
SOP Supply	**Project**	**Capacity Mtpa SOP**	**Equivalent Mtpa MOP**	**Start**
Kalium Lakes	Beyondie	0.08	0.09	2022
Kalium Lakes	Beyondie	0.04	0.04	2023
Agmin	Lake McKay	0.45	0.50	2024
Aust. Potash	Lake Wells	0.12	0.13	2024
Peak Minerals/EMR	Sevior	0.34	0.38	2025
Trigg	Lake Throssell	0.25	0.27	2026
Yara	Dallol	0.60	0.67	?
Danakali/Eurochem	Colluli Phase 1	0.47	0.53	?
Danakali/Eurochem	Colluli Phase 2	0.47	0.53	?
Total		**2.82**	**3.16**	
Polyhalite Supply	**Project**	**Capacity Mtpa SOP**	**Equivalent Mtpa MOP**	**Start**
Anglo American	Woodsmith	10.00	2.21	2026+
All sources			**34.59**	

Source: Anglo American 2021 annual report, Australian companies ASX releases, websites of Uralkali, Eurochem, Acron, Nutrien, Peak Minerals, Yara, Vale Canada, and trade news posting for APC and Lao Kalyuan.

SUPPLY DEMAND BALANCE TO 2030

If world potash demand trend growth continues at 3%pa, 26Mtpa of additional potash will be required. By 2030.

Table 13 has identified 34.6Mtpa of MOP equivalent capacity addition including:

- Expansions in Russia and Belarus of 11.7Mtpa MOP
- Very large projects including BHP's Jansen 10Mtpa and Anglo's Woodsmith 2.2Mtpa
- The experience of the FAO is that global capacity operated at 85% utilisation, which if applied to the capacity growth reduces the likely production to 29.4Mtpa.
- Over the last decade, the industry has lived with constant oversupply of around 7Mtpa after allowing for the 85% utilisation, and supply has been idled to balance the market. 4mtpa of that 7Mtpa is included in our list in Table 13. The balance is either in Russia/

Belarus and unlikely to restart in the currently sanctioned environment or is too old to be reactivated.

Table 19 Supply demand balance – The world needs Russian supply

Million tonnes	2019	2030	Change
Demand by 2030			
Potash	43.6	60.0	16.4
SOP Equivalent	61.6	84.8	23.2
MOP equivalent	**69.0**	**95.0**	**26.0**
Supply by 2030 (MOP equivalent)			
MOP Russia/Belarus			11.7
MOP Rest of World			17.5
SOP Australia			3.2
Polyhalite (Woodsmith)			2.2
Total			34.6
Average capacity utilisation (refer Table 15)			85%
Available Supply in MOP equivalent			**29.4**

Source: Demand Figure 14, supply Table 13

On these numbers, the supply demand appears to be balanced from an overall potash perspective, and could get tight if a number of these projects are delayed, have slow ramp ups, or if the number of countries sanctioning Belarus and Russia increase over time.

SUPPLY DEMAND FORECAST FOR POTASH IN ALL FORMS

Table 20 Global potash supply demand balance

	2017A	2018A	2019A	2020F	2021F	2022F
WORLD						
Potash - capacity	58455	61951	62055	63467	63513	64553
Potash - supply capability	46284	49422	51373	52752	53664	54197
Potassium - other uses	5752	5876	5993	6112	6237	6363
Potassium - fertilizer demand	36349	37171	37971	38711	39473	40232
Potassium - total demand	42101	43047	43964	44823	45710	46595
Potassium - potential balance	4183	6375	7409	7929	7954	7602
Capacity Utilisation	79.2%	79.8%	82.8%	83.1%	84.5%	84.0%
Non Fertilizer Demand	13.7%	13.7%	13.6%	13.6%	13.6%	13.7%
OCEANIA						
Potash - capacity	0	0	0	0	0	0
Potash - supply capability	0	0	0	0	0	0
Potassium - other uses	9	9	9	9	9	9
Potassium - fertilizer demand	431	430	434	438	440	443
Potassium - total demand	440	439	443	447	449	452
Potassium - potential balance	-440	-439	-443	-447	-449	-452

Source: Food & Agriculture Organization of the UN – World Fertilizer Trends and Outlook to 2022 (2019) – The document is unclear which are actual years and which are forecast. The FAOSTAT database number for actual 2019 global demand is 43,662,838 tonnes vs the combined fertilizer and other demand of 43,964,000 tonnes above, so it is assumed that the 2019 data in this and the two following tables are actuals.

The Food & Agriculture Organization of the United Nations provides forecasts of fertilizer supply demand and capacity each year. We have included the 2020 forecast in the Tables 20-22, however, given the dynamic market conditions, these numbers are unlikely to be reliable due to the impact of COVID. These tables are included as a data source for investors, but as in 2009, when there is a dramatic increase in potash prices, the current leap in prices is likely to cause a dramatic fall in fertilizer demand.

Table 21 Potash supply demand balance for Asia and the Americas

	2017A	2018A	2019A	2020F	2021F	2022F
ASIA						
Potash - capacity	11137	11163	11697	11914	11940	11940
Potash - supply capability	10789	10784	10903	11047	11197	11197
Potassium - other uses	2849	2913	2967	3025	3085	3144
Potassium - fertilizer demand	18411	18889	19381	19813	20235	20679
Potassium - Total Demand	21260	21802	22348	22838	23320	23823
Potassium - potential balance	-10471	-11018	-11445	-11791	-12123	-12626
West Asia						
Potash - capacity	3935	3935	3955	3985	3985	3985
Potash - supply capability	3858	3858	3877	3906	3906	3906
Potassium - other uses	123	126	129	133	136	139
Potassium - fertilizer demand	298	301	301	304	308	312
Potassium - Total Demand	421	427	430	437	444	451
Potassium - potential balance	3437	3431	3447	3469	3462	3455
South Asia						
Potash - capacity	65	65	65	65	65	65
Potash - supply capability	33	33	33	33	33	33
Potassium - other uses	315	322	323	327	333	337
Potassium - fertilizer demand	3404	3494	3710	3900	4099	4306
Potassium - Total Demand	3719	3816	4033	4227	4432	4643
Potassium - potential balance	-3686	-3783	-4000	-4194	-4399	-4610
East Asia						
Potash - capacity	7137	7163	7677	7864	7890	7890
Potash - supply capability	6898	6893	6993	7108	7258	7258
Potassium - other uses	2411	2465	2515	2565	2616	2668
Potassium - fertilizer demand	14709	15094	15370	15608	15828	16062
Potassium - Total Demand	17120	17559	17885	18173	18444	18730
Potassium - potential balance	-10222	-10666	-10892	-11065	-11186	-11472
AMERICAS						
Potash - capacity	25828	26433	26513	26693	26693	26823
Potash - supply capability	17015	19461	20425	20705	20860	20979
Potassium - other uses	1920	1959	2001	2042	2085	2130
Potassium - fertilizer demand	12590	12800	13018	13225	13452	13672
Potassium - Total Demand	14510	14759	15019	15267	15537	15802
Potassium - potential balance	2505	4702	5406	5438	5323	5177
North America						
Potash - capacity	23768	24373	24453	24633	24633	24763
Potash - supply capability	15421	17867	18831	19111	19266	19385
Potassium - other uses	1260	1294	1330	1366	1403	1441
Potassium - fertilizer demand	5136	5184	5220	5235	5255	5269
Potassium - Total Demand	6396	6478	6550	6601	6658	6710
Potassium - potential balance	9025	11389	12281	12510	12608	12675
Latin America & Caribbean						
Potash - capacity	2060	2060	2060	2060	2060	2060
Potash - supply capability	1594	1594	1594	1594	1594	1594
Potassium - other uses	660	665	671	676	682	689
Potassium - fertilizer demand	7454	7616	7797	7990	8196	8402
Potassium - Total Demand	8114	8281	8468	8666	8878	9091
Potassium - potential balance	-6520	-6687	-6874	-7072	-7284	-7497

Source: Food & Agriculture Organization of the UN – World Fertilizer Trends and Outlook to 2022 (2019)

Key points emerging from the FAO tables:

- The data are in tonnes of Potash, and one tonne of potash has the same potassium content as 1.58 tonnes of MOP or 1.41 tonnes of SOP.
- Global demand for Potash (K_2O) in 2019 was 44 Mt which in MOP equivalent would be 71Mt.
- SOP is 7Mtpa and MOP is 64Mtpa (Agrimin presentation 21 September 2020)

- The Australian market is 700Ktpa MOP basis entirely supplied by imports. The Australian domestic demand is around 70Ktpa of SOP (and New Zealand 25Ktpa). Kalium Lakes is targeting that market for its initial 80Ktpa of production.
- Capacity utilisation is estimated each year by the FAO calculated on reported production compared to nameplate capacity. It appears that global utilisation is around 85%.

Table 22 Potash supply demand balances for Europe and Africa. Eastern Europe includes Belarus and Russia

	2017A	2018A	2019A	2020F	2021F	2022F
EUROPE						
Potash - capacity	21490	24355	23845	24860	24880	25790
Potash - supply capability	18480	19177	20045	21000	21607	22021
Potassium - other uses	779	797	815	832	850	869
Potassium - fertilizer demand	4121	4227	4278	4334	4405	4453
Potassium - Total Demand	4900	5024	5093	5166	5255	5322
Potassium - potential balance	13580	14153	14952	15834	16352	16699
Central Europe						
Potash - capacity	0	0	0	0	0	0
Potash - supply capability	0	0	0	0	0	0
Potassium - other uses	26	26	27	27	28	28
Potassium - fertilizer demand	839	847	859	874	900	914
Potassium - Total Demand	865	873	886	901	928	942
Potassium - potential balance	-865	-873	-886	-901	-928	-942
West Europe						
Potash - capacity	4620	4545	4035	4110	4010	4050
Potash - supply capability	3768	3606	3318	3355	3313	3344
Potassium - other uses	550	564	578	592	607	623
Potassium - fertilizer demand	2151	2160	2163	2167	2173	2177
Potassium - Total Demand	2701	2724	2741	2759	2780	2800
Potassium - potential balance	1067	882	577	596	533	544
East Europe and Central Asia						
Potash - capacity	16870	19810	19810	20750	20870	21740
Potash - supply capability	14712	15571	16727	17645	18294	18677
Potassium - other uses	203	207	210	213	215	218
Potassium - fertilizer demand	1131	1219	1256	1294	1332	1362
Potassium - Total Demand	1334	1426	1466	1507	1547	1580
Potassium - potential balance	13378	14145	15261	16138	16747	17097
AFRICA						
Potash - capacity	0	0	0	0	0	0
Potash - supply capability	0	0	0	0	0	0
Potassium - other uses	195	198	201	204	208	211
Potassium - fertilizer demand	796	825	860	901	941	985
Potassium - Total Demand	991	1023	1061	1105	1149	1196
Potassium - potential balance	-991	-1023	-1061	-1105	-1149	-1196

Source: Food & Agriculture Organization of the UN – World Fertilizer Trends and Outlook to 2022 (2019)

SULPHATE OF POTASH SUPPLY DEMAND

- Global demand in 2019 was 7Mtpa.
- If demand grows at the 3% rate, an additional 2.5Mtpa of capacity will be required by 2030.
- The identified SOP capacity addition in Table 14 is 2.8Mtpa to which needs to be added a component of polyhalite supply when is estimated in the discussion below at 340Ktpa SOP equivalent, giving a total supply of 3.1Mtpa of which Dallol and Colluli account for 1.5Mtpa. Those projects have not progressed much in the last four years.

- SOP demand growth has the potential to grow faster than the growth of potash overall, and there are execution concerns over a significant part of the potential new supply. As will be discussed in the pricing section, with 65% of SOP supply coming from high cost conversion sources like Mannheim, any imbalance between new primary capacity and demand is likely to be resolved by a reduction in Mannheim production.
- On these numbers, there appears to be plenty of room in this decade for new primary suppliers like Trigg.

Polyhalite – a risk to supply, but a manageable risk

Polyhalite is typically 6-10% water in the crystal lattice with 14% potash (K_2O) 19% sulphur, 6% magnesia (MgO) and 17% calcium oxide (CaO). Polyhalite contains virtually no chloride.

Some polyhalite was produced in the US during World War II but ceased when MOP became plentiful. The only operating polyhalite mine in the world at present in the Boulby operation of ICL in the UK. This mine started potash production in 1969. It first produced a polyhalite product in April 2011, and reached one million tonnes of cumulative production in August 2017. Boulby is ramping up from 130Ktpa to 600Ktpa, and produced 450Ktpa in 2017.

Anglo American's Woodsmith project will be a major nutrient supplier

In 2020, Anglo American took 100% ownership of the 10Mtpa Woodsmith polyhalite project started by Sirius close to Boulby and has reported negotiating 3.6Mtpa in take or pay contracts. In its 2017 prospectus, Sirius indicated it intended to sell its product at US$130-160/t FOB Teeside. At 14% potash, that is around US$1000/t of contained potash (K_2O) vs US$320/t for potash in MOP and US$1200/t for potash in SOP.

Sirius was starting to have difficulties funding the massive capital cost of the project. Since taking over, Anglo American is progressing the project, but in early 2022 indicated that is likely redesign elements of the project and has yet to state a new timetable for the start of production. Ramp up is likely to be a number of years away.

Polyhalite's place in the market

The availability of polyhalite is likely to create new markets for fertilizer. Polyhalite sells itself as a package of minerals (potassium, sulphur, magnesium, calcium) and for certain applications it should be a very useful product. An example may be the very sandy and highly leached soils in the Brazilian Amazon Basin, where polyhalite may have a role as a relatively cheap, complete soil builder, and a supplier of a large range of minerals missing from the native soil.

Sirius has established the Poly4 website with technical studies of polyhalite application and benefits. From a review of this site, a large number of studies appear to be targeting MOP markets. The strategy appears to be to recommend a blend of MOP and polyhalite (in say a 75:25 split). The polyhalite inclusion would reduce the MOP usage and add a number of other elements to the soil, and it is this overall balance that produces higher crop yields. This would impact the MOP market rather than the SOP market.

However, in a number of environments, the high calcium content may take the soil into the alkali range where uptake of potassium is virtually shut down.

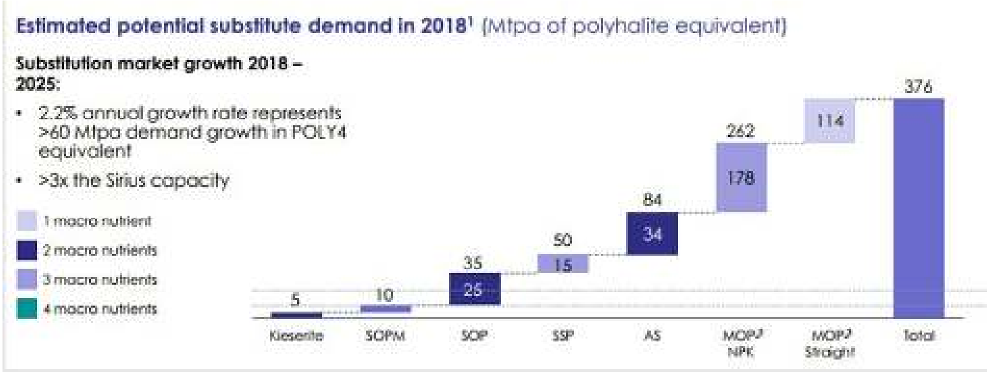
If a grower is seeking potassium specifically, MOP and SOP are still likely to be preferred. MOP is a significantly cheaper source of potassium, and while SOP is currently comparable to polyhalite in cost of contained potassium, it is a third of the volume so cheaper to handle and spread, and it does not have the additional elements that could damage soil chemistry.

Polyhalite is less soluble than MOP or SOP. There are some applications where this could be a major issue, but for most applications, solubility rate is less of an issue as long as differences in application timing and technique are adjusted. (https://juniperpublishers.com/artoaj/pdf/ARTOAJ.MS.ID.555690.pdf).

Woodsmith at its full 10Mtpa would supply the SOP market with the equivalent of 340Ktpa SOP

Sirius has made their own estimates of where the substitution markets may be, as shown in the figure below. They estimated that total polyhalite equivalent demand in 2018 would have been 376Mt, of which the SOP + SOPM markets would amount to 45Mt of polyhalite or 12%. If Sirius' full production is placed on this basis, 12% of the initial 10Mtpa would be 1.2Mtpa of polyhalite, or 340ktpa of SOP equivalent directed at existing SOP users, which the SOP market would find very manageable in our view.

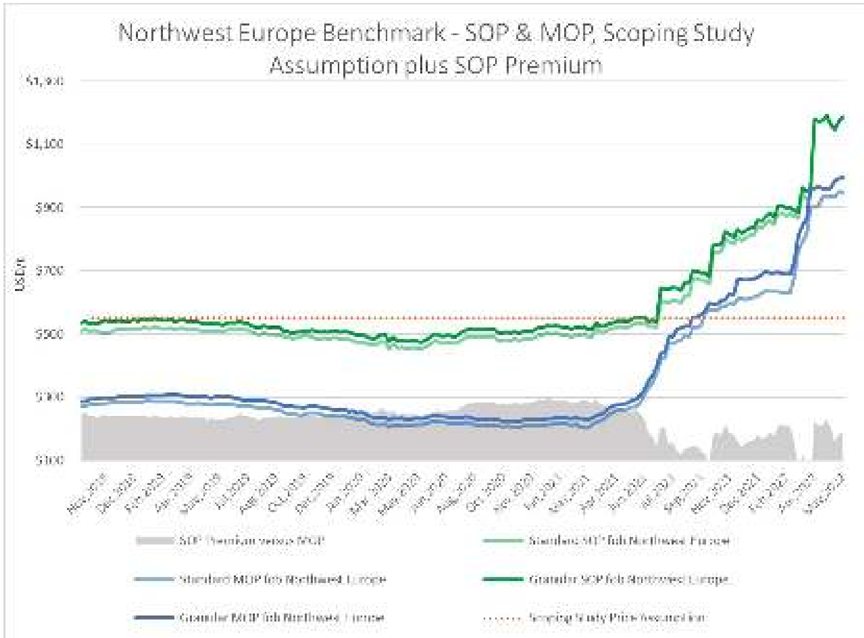
Figure 16 Sirius estimate of substitute demand for polyhalite



Source: Sirius presentation September 2017

SULPHATE OF POTASH (SOP) PRICE OUTLOOK

Figure 17 Sulphate of Potash (SOP) prices vs Muriate of Potash (MOP) prices



Source: TMG presentation 3 June 2022

SOP premium over MOP likely to rise over the decade

The SOP price is likely to be priced relative to the cost curve, which will be set by the high cost Mannheim process producers, and the cost of those producers will be set by the price of input MOP, the price of input sulphuric acid (generally a waste product from some other process) and the cost of transport. Transport costs are driven by oil prices and the world does not appear to be handling the transition to the carbon free economy, so the bias is for the margin between MOP and SOP to rise over the decade.

Bumpy transition to carbon free transport is likely to add to logistics costs over the decade

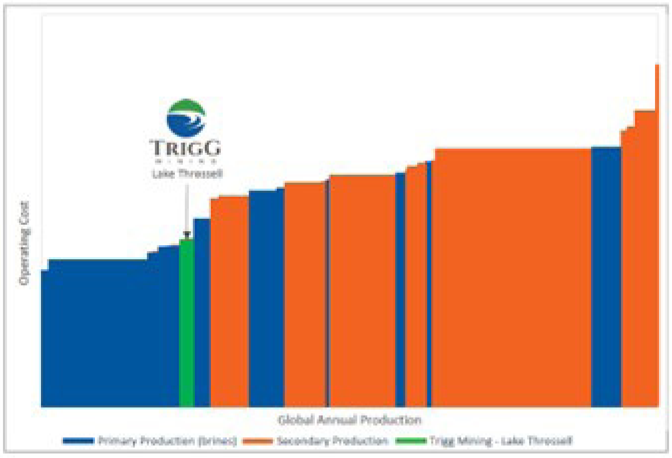
The issue will be that in the transition to carbon free travel, there is little incentive to invest in new oil production and refining capacity The current high prices would normally trigger investment, but with the push to zero, the 20 year investment horizon that is applied to capital projects like oil refineries looks risky.

What that means is that under the currently chaotically managed transition, the world is likely to see shortages of current sources of energy, before the new energy supplies, alternative supply infrastructure, and transport option are sufficiently developed.

The margin between SOP and MOP has collapsed recently but this is temporary

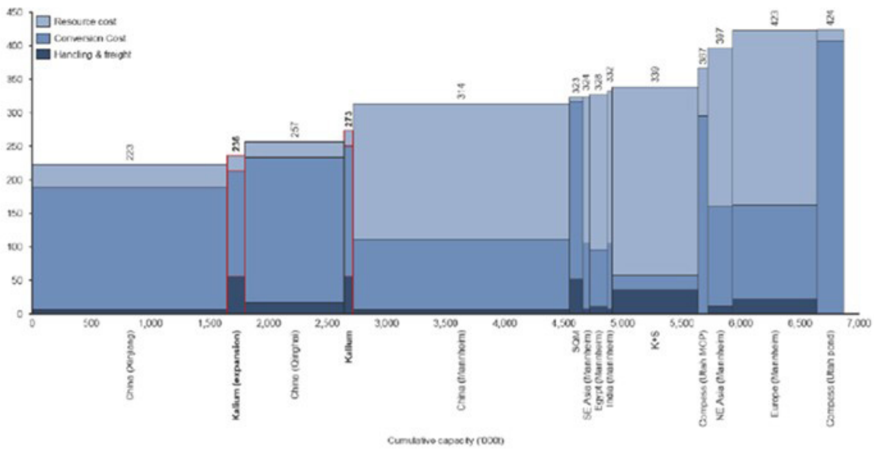
Historically the prices of SOP MOP and the price differential have been relative stable (Figure 17). The recent history has been very different with a reduction of supplies from Russia (Uralkali) and Belarus (Beloruskali). Those supplies were typically MOP, causing a major squeeze in the MOP market and the closing of the MOP SOP premium to around zero. This is unsustainable, and the correction is underway to the upside.

Figure 18 SOP cost curve with the cost axis missing. Trigg's operating cost is A$341/t SOP so the higher cost third of the supply curve would be between A$500-600/t or US$375-450/t to which transport costs must be added.



Source: TMG Scoping Study 5 October 2021 Figure 12

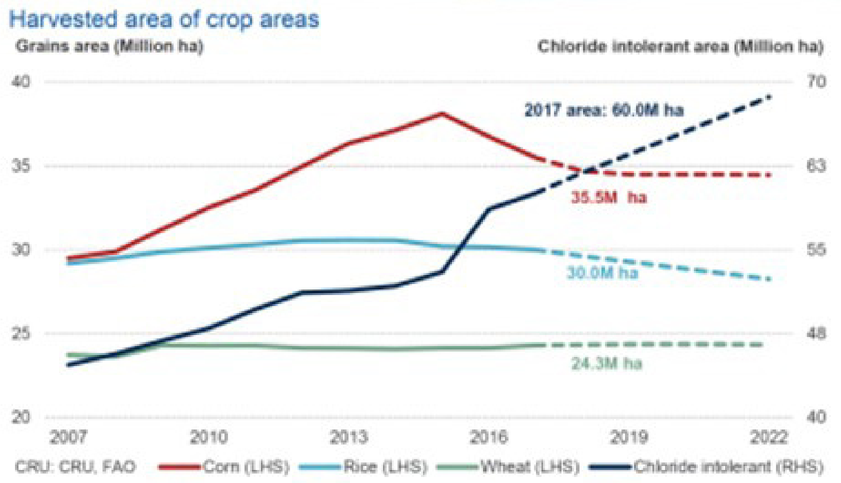
Figure 19 SOP cost curve in US$/t SOP from 2018 - Trigg's operating cost is A$341/t SOP (US$242/t)



Source: Kalium Lakes BFS 18 September 2018 p129, TMG Scoping Study 5 October 2021

SOP DEMAND COULD GROW FASTER THAN MOP ADDING TO THE PREMIUM

Figure 20 Growth in harvested acreage highlights strong relative growth of SOP consuming crops

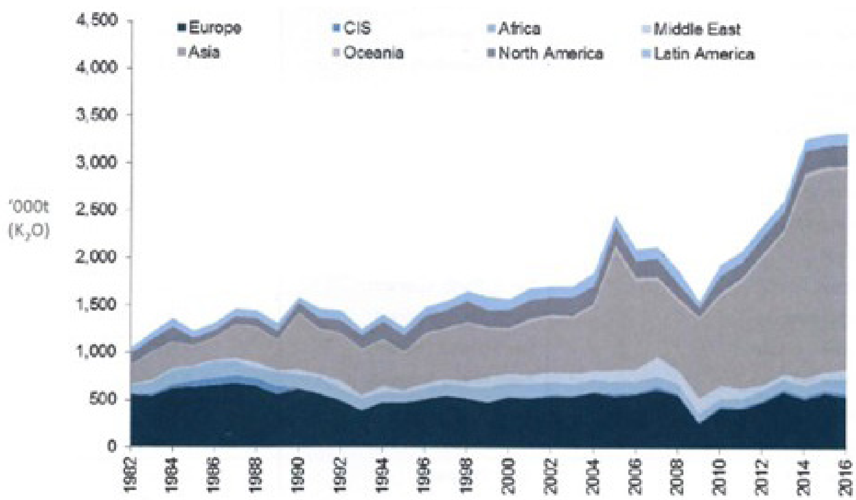


Source: Agrimin presentation March 2019 from CRU

If the projections in the figure above are correct, there will be a structural shift in the potash market in favour of chlorine free potash resulting in higher demand for SOP compared to MOP. At the margin, this could result in more Mannheim plants to convert MOP into SOP. If those plants were less optimally located than the current plants (ie in tougher pollution regulation regions) the result will be to shift the SOP premium over MOP to higher levels.

SOP demand has historically been driven by Asia and that is likely to continue.

Figure 21 SOP demand in Potash equivalent tonnes by region with Asia the big growth driver



Source: Fertecon, from Agrimin presentation 4 August 2017

PRICE OUTLOOK FOR MOP

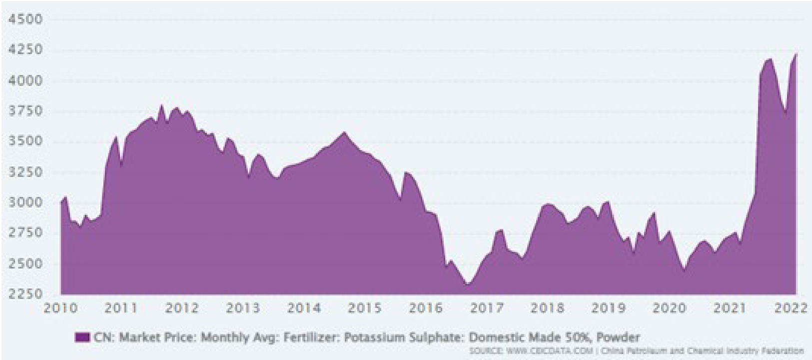
Forecasting prices for the next 12 months is very difficult. Expect extreme volatility to continue

The expectation for MOP prices over the next 12 months is a very wide band that appears to quickly get out of date as there is another sanction announcement, or MOP price move that resets the forecasters ranges of what might be possible.

History of MOP prices

Until 30 July 2013, major and low cost MOP producers Uralkali and Belaruskali were part of a common marketing agreement (BCP). That agreement ended on that date, and the impact of the collapse on supplier discipline resulted the MOP price weakness in subsequent years, at least until 2022.

Figure 22 Chinese SOP price history (RMB/tonne)



Source: eicdata.com

eicdata.com/en/china/china-petroleum--chemical-industry-association-petrochemical-price-fertilizer/cn-market-price-monthly-avg-fertilizer-potassium-sulphate-domestic-made-50-powder

The chart of Chinese SOP prices above shows price lows of RMB2500/tonne for SOP (A$525/t, US$372/t), to which varying transport costs need to be added. The current spot price is RMB4250/t (A$892/t, US$634/t).

The price outlook relevant to Trigg is the medium to long term

Trigg will not be in production until the middle of the decade, so the note focuses on a world that is post the Ukraine War and the near term effect of sanctions.

However, the issue of supply relationships will be in sharp focus for the rest of the decade. The era of globalisation where every country was part of the same story may be over.

Global trade may shift to a new world order that is less low cost, less optimal

The new world order may see the world splits into two loose camps. There will be one camp centred about Europe and North America with energy supply and raw material links to suppliers that can be relied upon to respect the United Nations and international rule of law, and those countries that do not.

Countries like Russia and China that have territorial ambitions will seek to have their raw materials suppliers and customers in countries that are unlikely to sanction them if they use what they see as necessary force in their national interest.

This is likely to be a subtle but disturbing feature of global trade in the future, and the change will add to the cost of everything. As a result, we have probably seen the long term price lows for MOP.

CAPITAL STRUCTURE

Table 23 Capital structure at 16 February 2022

	Exercise A$/sh	Issued M	Cash on exercise A$M	Directors
Ordinary Shares		170.01		13.33
Options				
31-Oct-22	0.25	14.02	3.50	
15-Jul-23	0.20	20.70	4.14	
7-Jan-23	0.23	2.00	0.46	
16-Feb-24	0.15	30.67	4.60	
23-Nov-26	0.15	3.22	0.48	
Perf		2.12	0.00	
Total		72.72	13.18	7.404
Diluted Capital		242.73	13.18	20.74

Source: TMG release 16 February 2022

Table 24 Major shareholders

Major Shareholders	Shares M	%
M&S Ralston	6.29	3.7%
Susetta Holdings	5.10	3.0%
J&I Stephens (One Way)	6.01	2.9%
KP Consulting	3.57	2.1%
Top 10 Shareholders	35.70	21.0%
Total	170.01	100.0%

Source: TMG presentation 4 April 2022

The share register is very open with the top ten major shareholders owning only 21.0% and the directors owning 8.1% of the shares and 10.2% of the options and performance rights.

BOARD AND MANAGEMENT

Michael Ralston - Non-Executive Chairperson

Mr Ralston is a qualified Chartered Management Accountant and an experienced mining executive (previously undertaking roles as chairman, managing director and chief financial officer) having worked for four junior ASX-listed resource companies over the last 17 years.

He has experience across the board having taken two listed companies from early stage through feasibility and into production but his particular expertise is in all matters corporate, specifically finance, funding (debt and equity), strategy, marketing, and shareholder relations. His experience covers both ASX and LSE (Australia and UK) and he has delivered projects in multiple locations including Australia, Africa, Europe, and Asia.

He was appointed to his current position on 22 May 2017. The Board considers that Mr Ralston is not an independent director. He has a BComm/CMIA (UK).

Keren Paterson - Managing Director & CEO

Ms Paterson is an externally recognised and awarded mining industry leader with more than 20 years' international experience spanning the entire mining value chain. She has led successful exploration discoveries, feasibility studies, mine development, operations management, and M&A across numerous operations in precious, base, energy and agricultural minerals.

Prior to founding Trigg Mining, Keren held senior leadership and operational roles with Fortescue Metals Group, CopperCo, Resource Capital Funds, Mines and Resources Australia (Areva), MPI Mines, Outokumpu, Goldfields and RGC.

Ms Paterson is a Mining Engineer from the Western Australian School of Mines and holds an MBA in economics, a WA First Class Mine Manager's Certificate, and is a Fellow of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Company Directors. Ms Paterson is a director of the Association of Mining and Exploration Companies (AMEC).

She was appointed to her current position on 26 February 2014 The Board considers that Ms Paterson is not an independent director.

Maree Arnason - Non-Executive Director

Maree is an experienced director and senior executive whose career has spanned 30 years in the natural resources, energy and manufacturing sectors with companies including BHP, Carter Holt Harvey, Svenska Cellulosa AB and Wesfarmers, working across commodities including gold, iron ore, copper, coal, timber, mineral sands and natural gas.

A Non-Executive Director of ASX-listed Gold Road Resources Limited, Maree Chairs its Risk and Sustainability Committee and is a Co-Founder/Director of Energy Access Services which operate an independent Western Australian focused digital trading platform for wholesale gas buyers and sellers.

Maree, who was recognised as one of the Top 100 Global Inspirational Women in Mining in 2018, serves on the Australian Securities and Investment Commission Corporate Governance Consultative Panel and is an Australian Institute of Company Directors Fellow and WA Division Councillor.

She was appointed to the board on 17 December 2021. Her qualifications include a BA, and membership of FAICD.

William Bent - Non-Executive Director

Mr Bent has 25 years' international experience in resources and corporate advisory. He is a Director of Mainsheet Capital and was the Managing Director of Chalice Gold from 2012 to 2014 where he led the acquisition of exploration and development projects for the company.

Prior to Chalice, he was Chief Development Officer at Mirabela Nickel for 3 years, as part of the operational ramp-up and the refinancing and restructuring team. His advisory experience includes 10 years in strategy and M&A for the mining resources and utility sectors in both Australia and UK. Mr Bent started his career as a metallurgist for AngloGold in South Africa before moving to Genesis Oil & Gas Consultants as a process engineer, during which time he became a Chartered Engineer with the Institute of Chemical Engineers (UK). His qualifications include a BSc, and an MBA

He was appointed to his current position on 22 May 2017. The Board considers that Mr Bent is not an independent director BSc, MBA

Rod Baxter - Non-Executive Director

Mr Baxter is a highly experienced Director and Business Executive with extensive international and multi-sector experience in the mining and resources, engineering and construction, and manufacturing sectors in Australia and overseas. He brings valuable global business experience, strong commercial acumen, and a wide contact network.

He has been Managing Director of listed, private, and family-owned companies, and he has operated and led businesses across a number of different industry sectors, both in Australia and internationally.

Mr Baxter's career has included business turnarounds as well as the delivery of substantial company growth and transformation strategies. He has been involved in IPO's and a number of transactions including acquisitions, takeovers, JV's and strategic investments.

He has also held non-executive director and Chair positions on public company boards and is an experienced Chair and member of board subcommittees. He is currently a non-executive director of Podium Minerals Limited.

He was appointed to his current position on 17 March 2021 The Board considers that Mr Baxter is an independent director. His qualifications include a BSc (Hons), a PhD, and an MBA.

Salina Michels – Company Secretary & CFO

Salina is a Certified Practicing Accountant with over 20 years' multi-sector experience. She has held senior leadership roles with a variety of junior and major mining and oil and gas companies in Australia.

She was most recently a Financial Controller within the Western Australian Division of Santos Limited, Corporate Accounting Manager for Quadrant Energy Limited and Financial Controller and Company Secretary for Strike Energy Limited. She was also a Group Finance Manager for 5 years at the Western Australian Grain Co-operative CBH Group.

She was appointed to this role on 15 November 2021. Her qualifications include a BSc, a BComm, a CPA, a Grad Dip Applied Corporate Governance, and membership of ACG.

Damian Fletcher – Exploration Manager

Damian has over 15 years' experience working in the exploration and mining industry, predominantly in gold exploration in Western Australia. His experience covers grassroots greenfields exploration through to brownfields development, pre-feasilbility and feasibility studies throughout Australia.

Damian has also been involved in land access and commercial negotiations along with executing 3D seismic surveys, implementing safety systems and interface management plans.

Damian has a BSc and is a member of MAIG.

Adam Lloyd - Consulting Hydrogeologist

Adam is a hydrogeologist with over 18 years of experience in hydrogeology, water management, exploration, and resource assessment. He has a BSc(hons) in Resource and Applied Geology and an MSc in Hydrogeology from the University of Birmingham, UK. Recently Adam has been involved in a number of salt lake brine resource developments specialising in resource exploration and estimation to JORC and NI43-101.

Laurie Mann - Principal Metallurgist

Laurie has over 50 years of senior process and project management experience in the international mining sector. He has held senior management roles for many major companies such as Normandy Poseidon, Shark Bay Salt, the Perth Mint, Normet and has more recently consulted to resource companies such as Newmont, BHP, Rio Tinto, Worley, Doray/Silverlake and GR Engineering.

His role at Trigg is to lead and assist in the conceptual and study design of all technical and operational aspects of the Lake Throssell SOP Project, to take the project through approval and into construction and operation.

APPENDIX – RISK MANAGEMENT LESSONS FROM AUSTRALIA'S FIRST TWO POTASH PROJECTS

Trigg is part of an industry that includes a number of peers. For the market and the industry, the elephant in the room is that the first into production, Salt Lake Potash Limited (ASX:SO4) is currently in receivership, and the next contender for first into production, Kalium Lakes (ASX:KLL), is expecting to start commercial production in September 2022, after a number of financing mis-steps, cost over-runs, and ramp up delays.

These two problematic cases have provided the rest of the industry with concrete examples of what can go wrong. In our discussions with the Trigg management, we have formed the view that Trigg is very focussed on the proper management of the relevant issues.

AUSTRALIAN POTASH IDENTIFIES POOR MANAGEMENT OF BRINE GENERATION AND CHEMISTRY

Australian Potash (APC) is another potential Australian brine producer. Managing Director and CEO, Matt Shackleton, in an APC release of 2 March 2022, commented on a number of lessons his company had drawn from the performance of SO4 and Kalium Lakes:

> "We have seen mistakes made in the initial control of the pre-concentration and harvest ponds that have resulted in salts precipitating that cannot be efficiently processed."

Brine Quality Management

> "APC places a critical level of importance on testing, planning and designing how to achieve a consistent plant feed grade and tonnage. Without the ability to match brine feed to variable evaporation rates, feed salts at other emerging SOP operations have been too high in sodium and too low in potassium. This has hindered plant commissioning and pushed back first SOP production and revenue.
>
> "A controlled supply of brine to the buffer pond, through a reliable bore network, enables the management of brine chemistry through the ponds thereby allowing appropriate feed salts to be precipitated in the harvest ponds for recovery and downstream processing."

Matt Shackleton emphasised that APC's project will use bores only, and appeared to imply that by doing so, APC would have better control over brine chemistry. The implication is that he believed that the brine generated by trenching is less controllable and introduces risk.

While we completely agree with Matt Shackleton's comments regarding the importance of testing and tight monitoring and process controls, we believe that trenches can produce the right quality brines if well managed.

Process plant fit for purpose

Shackleton has also commented on the use of funding tied to equipment supply.

> "APC is not reliant on debt or equity funding through any other sovereign export financing body, but instead has credit approved facilities with Australian institutions, so the project is not beholden to purchasing either technology or equipment that does not suit its purposes completely and without compromise."

Kalium Lakes received substantial funding support from German Import/Export funding related to its purchase of a process designed by K+S and plant supplied by German manufacturers.

Risks and Risk Management

Shackleton: "The major risk elements are the completion of financing, the delivery and performance of the project and the market and price for SOP. We take comfort in the due diligence required by the debt providers.

"We have chosen a low risk bore field development because we can see ample evidence of success pumping brine using bore fields elsewhere. "We have chosen a conservative pond model that allows us to control as best we can the rate of evaporation, impacting directly on how we control the volume and quality of plant feed stock. "We have gone with a successful, profitable and available flow sheet for our plant design. And we consider being in control of our options on technology and equipment gives us the ability to drive our own success without having to compromise."

WAS COVID A FACTOR?

A possible factor in both companies ramp up difficulties was that they both commissioned during the COVID lockdown when getting overseas technical experts into WA to advise on operational ramp up was frustrated by the strict WA border restrictions. Kalium Lakes says that it now has expert support that was not made available during the lock down period.

SO4'S LAKE WAY PROJECT FAILURE APPEARS RELATED TO POOR RESOURCE PERFORMANCE

With the benefit of hindsight, there were a number of warning flags, and the market was suspicious early.

SO4's flagship project was based on the Lake Wells Resource until it started the pivot to Lake Way announced on 20 June 2017, with the maiden Lake Way Resource announced on 18 March 2019, the Bankable Feasibility released on 19 November 2019, and the construction contract for the process plant awarded on 15 June 2020. Plant commissioning commenced in March 2021, company share trading was suspended on 27 July 2021 and receivers were appointed on 20 October 2021.

The stock market appeared to be detecting problems from September 2019 and didn't like the BFS which included the comment that the project would be importing MOP for upgrading to SOP to improve economics.

SO4's Lake Way project test feed came from dewatering an old gold mine open pit, so was unrepresentative of aquifer production. The core problem of the Lake Way project appeared to be the poor performance of the aquifer, and possibly over reliance of production from trenches. It may be that the aquifer is not able to support the operation, and that the plant will never operate economically.

For investors, the message appears to be that production from aquifers must be tested extensively to establish performance, and while speed of project generation and construction may appear attractive, it comes with severe downside implications.

KALIUM LAKES HAD PROBLEMS BUT APPEAR TO BE RECOVERING

Kalium Lakes' Beyondie Project was more carefully planned, but still had problems. The Final Investment Decision was announced on 3 October 2019, with first product expected by December 2020 and the ramp up to 90Ktpa to be completed by March 2021 at a pre-production cost of A$216M.

The company now expects to be at 80Ktpa (the new full capacity apparently) in September 2022 for a pre-production cost including capitalised operating costs of over A$271M.

Financing mis-step costs A$50M and six months delay

On 9 December 2019 Kalium Lakes announced financial close and first drawdown. On 24 February 2020, the company hit the market for a surprise equity issue to fund an additional A$61M capital cost over-run which the company stated was due to:

- Design changes on the processing plant made to accommodate performance guarantees required by Secured Lender
- Design changes due to additional final product storage and treatment to meet product integrity specifications
- Underestimating the complexity to take a German based design to the desert in Western Australia
- Consequential flow on impacts of design changes to supply and construction costs of process plant, and site manning costs
- Actual operating bore performance showed brine extraction rates were lower than expected, requiring additional bores, pumps, pipelines and trenches
- Increased gas pipeline cost between FEED estimates and entering into a lump sum contract, due to geotechnical risk allocation and underestimation

- Foreign exchange changes, weather impacts (including 2 cyclone events), and underestimated insurance costs

The biggest misstep in that list was the need to make design changes to the plant to accommodate the performance guarantees including the issues related to building a German plant in the Australian desert. The banking syndicate appeared to believe that the plant construction contract included performance guarantees from the equipment supplier (K-UTEC) and constructor (Ebtec) when that was not in fact the case. For the constructor to provide the guarantees, the contract cost had to be increased by A$50M (21 May 2020 Issue Presentation), partly for design changes but also because guarantees just cost money.

At this point, the project was expected to produce first product in July 2021 at a pre-production cost of A$280M.

That was a basic contracting error, and one would hope that future project promotors and their banking syndicates do not repeat this level of misunderstanding.

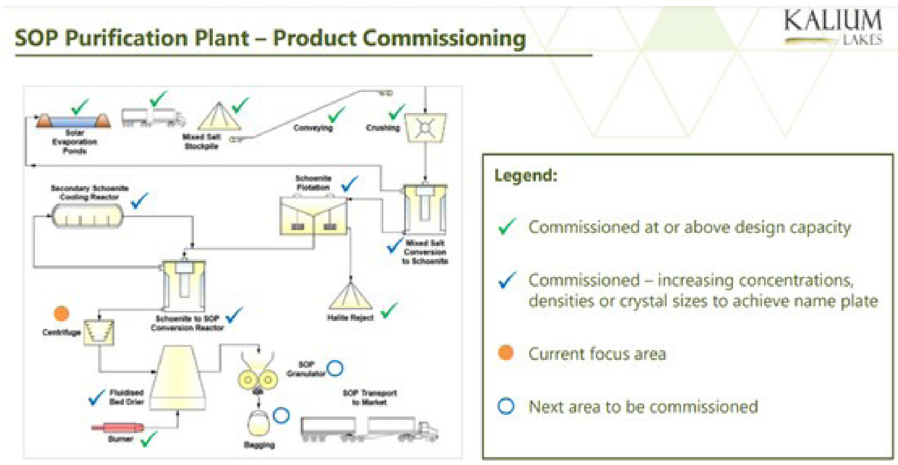
Brine quality control – cost over A$10M and nine months delay

The first product production was reported on 5 October 2021, which was claimed to be on schedule. The capacity of the plant was stated as 90Ktpa.

At this point, the project was within the revised budget. First sales were scheduled for the December 2021 quarter, with an expansion to 120Ktpa underway. The expansion was funded by an A$50M share issue announced on 14 October 2021.

In a presentation on 30 November 2021, a slide shows that the Centrifuge was still to be commissioned, so first sales by December 2021 was starting to look like at risk.

Figure 23 Beyondie Processing Plant commissioning at November 2021



Source: KLL AGM presentation 30 November 2021

On 22 December 2021, the company issued a release highlighting brine supply and quality issues. The supply related to issues that had prevented sufficient brine from being pumped into the primary evaporation ponds ahead of the summer peak evaporation period. These issues had been flagged in a previous release dated 3 November 2021.

The quality issues related to variability in the potassium grade of the salt being harvested.

On 31 January 2022, the quarterly activities statement provided a comprehensive coverage of the technical issues, which is repeated in full below. These issues line up with those that were identified by Matt Shackleton of APC, but our interpretation is that the key failure was in monitoring the chemistry of the various ponds and intermediate storage, rather than the use of brine from trenches. We also note that bore pump failures also contributed to brine supply problems.

On 1 March 2022, the company announced that it expected to reach capacity of 80ktpa (down from 90ktpa) by late in the September 2022 quarter, with commercial shipments of product expected from July 2022.

On 1 July 2022, delays were flagged blaming unseasonal rain events in May and June that delayed evaporation, and with further plant shutdowns, with the restart expected in September 2022, ramp up to 80Ktpa by March 2023, with 120Ktpa expected by September 2024, subject to additional financing.

Borefield and Trenching Operations and Brine Production

On 3 November 2022 the Company provided a commissioning update and noted that the trenches and bore fields had been impacted during late October because of silting and collapsing of trench walls in several places, as well as unexpected breakdowns of a few production bores. The addition of a third amphibious excavator to the trench maintenance fleet and expanded routine trench maintenance have delivered significant positive impacts.

The actions taken to optimise brine production levels continue to be a major focus area to manage flow rate demands and a more detailed review of current brine supply and evaporation pond dynamics has been initiated.

Pond Operations and KTMS Production

Preliminary analysis of the brine supply interruptions and the impact on evaporation pond performance indicated that less harvested potassium salts than initially targeted were likely to be produced during the summer period and therefore during CY2022.

Kalium Lakes has advised that its team continues to work with brine industry experts to quantify the likely impact on forecast CY2022 harvested potassium salt production. Forecast long term brine and harvested potassium salt output is not expected to be affected.

Purification Plant and SOP Production

Construction of the purification plant was completed during the quarter. Kalium Lakes reported on 5 October 2021 that it successfully achieved first production of SOP during the early stages of commissioning and that the commissioning activities would continue until its partner, EBTEC GbR completed its performance test.

Kalium Lakes provided an update on 3 November 2021 advising that product commissioning had entered the final stages where feed salt was being used to increase concentrations of the recirculating mother liquor required for continuous commercial production of SOP.

It was noted, at that time, that the process was trending slightly behind schedule and using more of the harvested salts than anticipated. In December (see ASX release dated 22 December 2021), the Company initiated a review of the SOP purification plant operations with early analysis identifying certain later-stage commissioning issues, most notably being initial variability in harvested potassium salt feed grades and process control.

Non-critical mechanical issues with some of the plant equipment also needed to be addressed and planning for the required rectification works begun.

Many of the variability issues, although initially impacting the commissioning and ramp-up programme, are expected to be readily managed under commercial operations.

Restricted availability of resources and logistical challenges in getting additional international experts of the original equipment manufacturers on site through the current COVID-19 requirements has also contributed to some of the challenges during commissioning of specific plant equipment.

The purification plant issues are expected to be fully resolved in accordance with the performance guarantees provided by EBTEC although, as previously announced, the status of commissioning and rampup at the BSOPP is expected to have an impact on the targeted dates for achieving nameplate production rates.

The Company also announced that it had successfully produced a small quantity of standard grade SOP, a practical achievement that validated the BSOPP process flowsheet.

Subsequent Events

On 25 January 2022 the Company released a BSOPP Activities Update which included the following information:

Borefield & Trenching Operations and Brine Production

Recent actions taken to optimise brine production levels have delivered significant positive impacts. De-silting works at 10 Mile and Sunshine are progressing well, with flow rates from trenches at 10 Mile now restored to design targets. Work at Sunshine continues with flow rates improving and target levels expected to be fully restored during the current quarter.

A third amphibious excavator has also been added to the trench fleet and additional routine trench maintenance programs implemented.

Bore pump station availability at both 10 Mile and Sunshine is improving through upgrading monitoring and maintenance programs, including the introduction of a telemetry system to improve response times to pumping system breakdowns.

As a result of these combined measures, the aggregate brine flow rate from the borefield and trenching operations to the pre-concentration ponds has now been restored to near the 90ktpa SOP target level. In addition, the 120ktpa expansion drilling program has commenced, and twenty-five new production bores are planned to be progressively brought online during the next 12 months.

There are currently twenty bores at 10 Mile and Sunshine. Aggregate brine supply continues to deliver potassium grades above design targets, partially offsetting some of the impact from previous lower flow rates.

Pond Operations and KTMS Production

As previously announced (KLL ASX releases dated 3 November 2021 and 22 December 2021), prior impacts to brine production rates ahead of the peak summer solar evaporation period are expected to result in less harvested potassium salt (KTMS) being produced during CY2022 than initially targeted.

Further investigation has revealed that these impacts to brine supply resulted in brine concentration in the Sunshine pre-concentration pond increasing above targeted levels, exacerbated by increasing evaporation rates with the onset of summer.

This more concentrated brine progressively resulted in gypsum and salt scaling within the transfer pipeline from the Sunshine pre-concentration pond to the primary evaporation ponds. The site team has implemented a range of interim initiatives in recent weeks to rectify these issues, including

- Closing half the Sunshine pre-concentration pond evaporative area to minimise the risk of overconcentration of the brine prior to transfer through the pipeline to the primary evaporation ponds. As brine volume in the Sunshine pre-concentration pond aggregates towards targeted levels, this offline pre-concentration pond area is expected to be progressively reactivated over coming months.
- Cleaning operations undertaken on the transfer pipeline and measures to minimise future scaling are in progress. Closer monitoring of pipeline operation and efficiency has been implemented.
- Closing two of the five primary evaporation pond trains to effectively manage pond operations under the reduced Sunshine pre-concentration brine volumes. Utilisation of these two trains is expected to be progressively reinstated in coming months as the aggregate Sunshine preconcentration brine volume increases.

In addition, a second transfer pipeline is to be installed in the current quarter as part of the 120ktpa SOP expansion program. This is expected to not only ultimately deliver the 120ktpa SOP extraction rate but also provide surplus transfer pipeline capacity in the near term, further de-risking brine transfer logistics.

A review of the potassium salt harvesting operations has highlighted the underlying factors that contributed to the variability in KTMS feed during the SOP purification plant commissioning in December. Harvesting of potassium salts is expected to recommence during the current quarter, with a greater focus on grade control and ROM stockpile management.

Purification Plant and SOP Production

Following the commissioning challenges faced due to initial variability in potassium salt feed grades, further review and consultation has confirmed that a consistently higher-grade potassium salt feed supply (higher than for normal operations) is required during commissioning. This approach is expected to enable the schoenite conversion, flotation, cooling crystallisation, centrifuges and fluid bed dryer to be commissioned at nameplate capacity.

The requirement for individual sections in the SOP purification plant to be commissioned on a staged basis over an extended time frame led to there being insufficient residual higher grade potassium salt feed available on the ROM stockpile to successfully complete commissioning and achieve continuous operation of the plant.

The rectification works identified as being beneficial to successful commissioning of the SOP purification plant (refer to KLL ASX releases dated 22 December 2021 and 25 January 2022) are underway, with the plant being idled while this work is undertaken and pending harvest of further high-grade potassium salts.

The plant rectification works are scheduled to be completed during March. The systematic recommencement of SOP purification plant operations as part of the commissioning process is being jointly planned by the Kalium Lakes and EBTEC/GBR teams in conjunction with international experts with SOP processing operations experience.

It should be noted that the ability to facilitate the arrival of additional specialist personnel to the Beyondie site remains constrained by ongoing Western Australian border restrictions.

Full nameplate operation of the plant is expected to be achieved in accordance with the performance guarantees provided by EBTEC, although the time frame for achieving nameplate production will be impacted by the issues encountered during commissioning.

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