



# ASX Announcement

28 July 2020

ASX: PWN  
FSE: 4IP

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## **PARKWAY MINERALS TO PRESENT AT STOCKPAL MINES UNEARTHED INVESTOR WEBINAR**

Parkway Minerals NL (ASX: **PWN**) (“**Parkway Minerals**” or the “**Company**”) is pleased to advise Managing Director, Bahay Ozcakmak, will be presenting at the StockPal Mines Unearthed Investor Webinar at 11:10am (AWST) on 28 July 2020.

Parkway Minerals will be presenting alongside three other ASX listed junior resource companies, with the StockPal Mines Unearthed Investor Webinar commencing at 10:30am (AWST).

To register for the StockPal Mines Unearthed Investor Webinar visit:

[https://us02web.zoom.us/webinar/register/3815941204358/WN\\_Y1jT6lnUROu8KsXkcpTxQQ](https://us02web.zoom.us/webinar/register/3815941204358/WN_Y1jT6lnUROu8KsXkcpTxQQ)

An updated Parkway Minerals Corporate Presentation to be presented at the investor webinar is attached.

Approved for release on behalf of Parkway Minerals NL, by Bahay Ozcakmak.

### **Additional Information**

For further information contact:

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# StockPal Mines Unearthed

28 July 2020

## Corporate Presentation

ASX:

PWN

[parkwayminerals.com.au](http://parkwayminerals.com.au)

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All securities transactions involve risks which include, among others, the risk of adverse or unanticipated market, financial or political developments.

Certain statements contained in this presentation, including information as to the future financial, technical, commercial or operating performance of Parkway Minerals NL ('Parkway Minerals' or 'the Company') and its projects and technologies, are forward-looking statements. Such forward-looking statements are necessarily based upon a number of estimates and assumptions that, while considered reasonable by Parkway Minerals, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies, involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements, and may include, among other things, statements regarding targets, estimates and assumptions in respect of proposed or projected project or transaction timelines, uncertainties and risks associated with the advantages and/or performance of the Company's projects and/or technologies, commodity and product production rates and prices, operating costs and results, capital expenditures, ore reserves and mineral resources and anticipated grades and recovery rates, and are or may be based on assumptions and estimates related to future technical, economic, market, political, social and other conditions including the satisfactory performance of certain technologies developed and/or acquired by Parkway Minerals, and uncertainties and risks regarding any envisaged timelines in relation to any results, milestones, partnerships, including but not limited to any milestones which may require obtaining approvals from third parties. Parkway Minerals disclaims any intent or obligation to update publicly any forward-looking statements, whether as a result of new information, future events or results or otherwise. The words 'believe', 'expect', 'anticipate', 'indicate', 'contemplate', 'target', 'plan', 'intends', 'continue', 'budget', 'estimate', 'may', 'will', 'schedule' and other, similar expressions identify forward-looking statements. All forward-looking statements made in this presentation are qualified by the foregoing cautionary statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and, accordingly, investors are cautioned not to place undue reliance on forward-looking statements due to the inherent uncertainty therein. Many known and unknown factors could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements. Such factors include but are not limited to: competition; mineral prices; ability to meet additional funding requirements; exploration, development and operating risks; new technology development and commercialisation related risks; uninsurable risks; uncertainties inherent in ore reserve and resource estimates; dependence on third-party infrastructure facilities; factors associated with foreign operations and related regulatory risks; environmental regulation and liability; currency risks; effects of inflation on results of operations; factors relating to title to properties; native title and Aboriginal heritage related issues; dependence on key personnel, and share price volatility. They also include unanticipated and unusual events, many of which it is beyond the Company's ability to control or predict.

## KARINGA LAKES POTASH PROJECT (KLPP) – RESOURCE DESCRIPTION

### RESOURCE STATUS

On 20 February 2014, Verdant Minerals reported an in-situ SOP resource (in accordance with the 2012 JORC Code) for the Karinga Lakes Potash Project (KLPP). The 2014 resource is calculated using total porosity (total brine content) of the host rock. Subsequent to this resource estimate, in April 2019, the reporting requirements for brine resources under JORC have been updated, with a new set of requirements, which have been outlined in an AMEC (Association of Mining and Exploration Companies) publication titled, *Guidelines for Resource and Reservice Estimation of Brines*.

The updated brine reporting guidelines can be downloaded from the AMEC website:

<http://www.amec.org.au>

The guidelines recommend the use of drainable porosity of the host rock (brine content that can be drained by gravity). The 2014 resource is not consistent with the new guidelines in this regard. Revision of the resource estimate to be consistent with the guidelines will result in a reduction of the total reported resource. The 2014 resource estimate is comparable to other brine potash resources reported in accordance with the JORC Code 2012, that are calculated based on total porosity. During the transition to the new guidelines it has been common for companies to report both estimates calculated on total porosity and calculated on Drainable Porosity.

### ADDITIONAL INFORMATION

Detailed hydrogeological studies at the KLPP have been based on significant datasets including drill hole, trench, production tests and monitoring data over several years provide confidence in the project. In collaboration with CPC's joint venture partner Verdant Minerals, the KLPP joint venture will determine an appropriate work program, (as part of a feasibility study) to to revise the resource estimate for the KLPP. As a result, investors are cautioned not to make investment decisions based on the presently reported and publicly available mineral resource for the KLPP.

# Overview

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# The Mining Industry at a Crossroads

## Exclusive: Germany's Volkswagen and Daimler push for more 'sustainable' Chile lithium

Dave Sherwood



SANTIAGO (Reuters) - German automakers Volkswagen (VOWG\_p.DE) and Daimler (DAIGn.DE) have launched a study to push for more "sustainable" lithium mining in Chile, according to lobbyist filings reviewed by Reuters, a sign of growing supply chain concerns ahead of an expected electric vehicle boom.



miningnews.net

### Friedland says ESG will change the way metals are priced

"Tesla will give you a giant contract for a long period of time if you mine nickel efficiently and in an environmentally sensitive way."  
Elon Musk, 22<sup>nd</sup> July 2020



## The Extractive Industries and Society

Volume 7, Issue 2, April 2020, Pages 263-266



Viewpoint

## Mining needs new business models

W. Scott Dunbar <sup>a</sup>, Jocelyn Fraser <sup>a, b</sup>, Andy Reynolds <sup>c</sup>, Nadja C. Kunz <sup>a, b</sup>

Show more ▾

<https://doi.org/10.1016/j.exis.2019.07.007>

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### Highlights

- A growing population and a desire for decarbonisation is driving mineral demand.
- At the same time, mining is confronted with technical and social challenges.
- Current business models are not suited to this social and technical complexity.
- New business models are needed to deliver value to mining and society.

## Emerging Challenges

- Mining operations are increasingly accountable for their "externalities" such as:
  - Depletion and/or contamination of **water resources**, and
  - Carbon footprint and even downstream implications, of mineral utilisation.
- Mining activities, subject to adopting **sustainable resource exploitation strategies**.

## Implications

- Mining companies will have to share benefits and **pay the "true cost" of their operations, including for water**.
- UBC Journal publication can be accessed at: <https://doi.org/10.1016/j.exis.2019.07.007>



## FitchRatings

### NON-RATING ACTION COMMENTARY

## Water Scarcity Is Greatest Risk to Metals and Mining

Wed 08 Jul, 2020 - 5:21 am ET

**Related Fitch Ratings Content:** [Increasing Water Risks in Metals and Mining - Low-Carbon Technology Supply Chains Face Growing Constraints](#)

Fitch Ratings-London-08 July 2020: The 2020 metals and mining survey, 'Emerging ESG Risks in the Metals and Mining Value Chain' - a collaboration between Fitch Ratings and CRU - highlighted water scarcity as the greatest emerging risk to the metals and mining sector, according to investors. Pressures such as localised water shortages and competition for water are likely to increase in the coming decades, causing increasing challenges for battery and low-carbon technology production.

Mining often faces operational risks with regard to water supply, and is one of the most water-intensive industries. Although efforts have been made to increase the efficiency with which the industry uses water, more and worse droughts and greater competition for water resources are posing growing challenges. The industrial utilisation of water is often constrained before the water demands of other sectors, such as agriculture.

Overall demand is forecast to rise by as much as fivefold for some metals by 2025, according to CRU, driven by increased applications in batteries, renewable energy and other green technologies. However, there are growing social and environmental constraints on production that threaten to make many projects unviable in the coming years. These may begin to disrupt dependent supply chains and products - a particular concern given the time and costs required to develop large-scale solutions such as desalination and wastewater recycling.

A major emerging concern for the sector is the management of mine tailings and its storage in tailings dams. A number of high-profile mine disasters from tailings dams highlight the need for the

### Key Points

- Overall **water demand is forecast to rise by as much as 500%** for some metals by 2025, driven by increased applications in batteries, renewable energy and other green technologies.
- However **growing ESG constraints** on production that threaten to make many projects unviable in coming years.
- Water scarcity is the **greatest emerging risk** to the metals and mining sector.
- Compounding water challenges, **wastewater storage** in tailings dams is accounting for a **growing portion of total operating costs**.

When a major credit ratings agency outlines material risks to a sector, it's worth paying attention.



Failure to act, will increase funding costs and eventually render certain assets/companies un-investable, particularly for institutional investors.

### The Only Viable Solution



Is to ensure the more efficient use of water, which requires the development and adoption of **fit-for-purpose technologies** which:

1. Enable more water efficient operations / mineral processing, and
2. Recycling of wastewater from operations.

Our  
Mission



Slide 8

For more information:

<https://www.fitchratings.com/research/infrastructure-project-finance/water-scarcity-is-greatest-risk-to-metals-mining-08-07-2020>

# Generalised Water Balance – Mining Industry

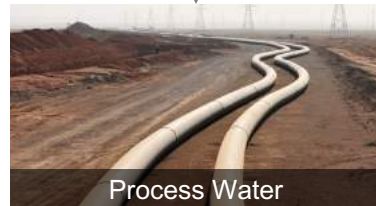


**Waste Brine**  
- chemicals  
- salt  
- water

1

## Desalination Waste Brine\*

- For every litre of freshwater output, desalination plants produce on average 1.5 litres of brine.
- World's ~16,000 desalination plants discharge **142 million m<sup>3</sup>/day of brine daily**.
- Brine management can represent up to 33% of a desalination plant's cost and ranks among the biggest constraints to more widespread development.
- Almost 22 million m<sup>3</sup>/day of brine is produced at a distance of greater than 50km from the nearest coastline. Despite the large volume of brine produced in these areas, **very few economically viable and environmentally sound brine management options exist**.



**Brine Feedstock**  
- minerals  
- salt  
- water

2

## Brine Mining Feedstock

- Primary brine projects include playa hosted brines to produce predominantly potash and lithium.
- Solution mining (ISL/ISR) techniques are also utilised to produce potash and other valuable mineral products.



**Waste Stream**  
- minerals  
- reagents  
- water

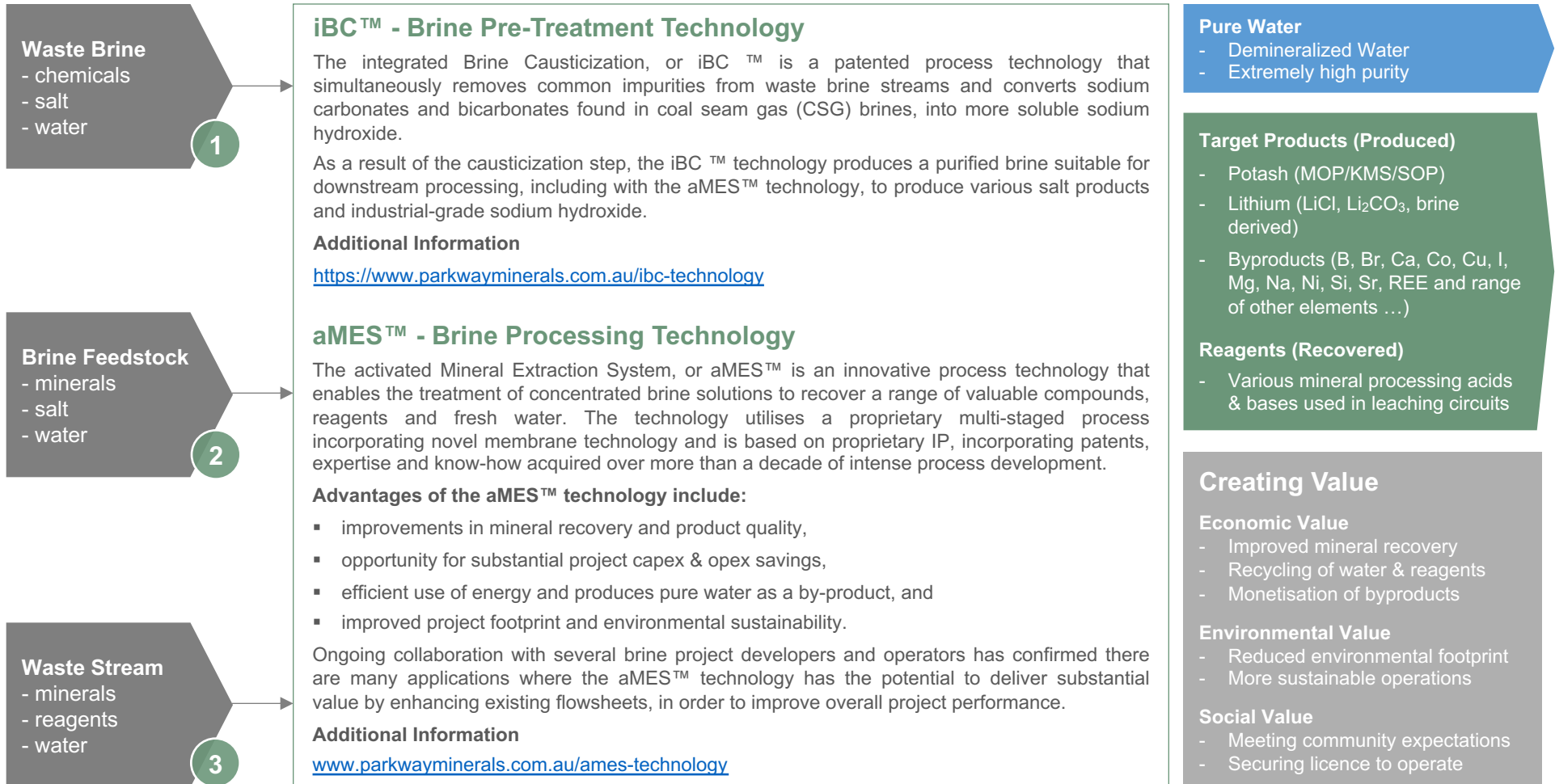
3

## Tailings Waste Streams

- Typically have a large footprint and represent substantial environmental risks including community concerns.
- Tailings storage facility (TSF) construction, operation and maintenance represent significant costs and risks.
- Treatment of tailings solutions is a high growth sector.

\* Adapted from: "UN Warns of Rising Levels of Toxic Brine as Desalination Plants Meet Growing Water Needs", UNU-INWEH Study (14 Jan 2019).

# Creating Value Through Brine Processing Technology





# Our Mission



Parkway Minerals is commercialising **a world-class technology portfolio** to provide long-term sustainable solutions for processing complex brines, in the energy, mining and wastewater industries.

## PROPRIETARY TECHNOLOGY PORTFOLIO

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**iBC**<sup>TM</sup>

Brine Pre-Treatment Technology

+

**aMES**<sup>TM</sup>

Brine Processing Technology

+

**knowhow**

For Processing Complex Brines

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# BPaaS

Brine Processing as a Solution<sup>TM</sup>

# Building a Brine Processing Technology Platform

## High Value – Brine Processing Opportunities

### High Value Applications

- Very large addressable markets
- Well placed to be part of the **long-term solution** for processing **complex brines**
- Existing industry relationships
- Ongoing business development – both in-house and through partners

### Unique Technology Portfolio

- Portfolio of proprietary process technologies include:
  - iBC<sup>TM</sup>
  - aMES<sup>TM</sup>
  - ongoing R&D
- Technologies provide a **clear value proposition**, where mature low-cost alternatives do not exist

### Proprietary Process Solutions

- In-house process engineering team
- State-of-the-art process design and simulation capabilities
- Technoeconomic models to support **business-case development**
- In-house scoping studies support project evaluation

### Technology Solution Validation

- Capacity to rapidly **validate process performance** at a range of scales from benchtop through to larger **pilot plants**
- Process piloting supports feasibility studies
- Pilot plants installed at Victoria University

### Project Feasibility & Delivery

- Strong EPC support from **global engineering company**, underpins commercialisation of aMES<sup>TM</sup> technology
- Capacity to deliver tier-1 feasibility studies & EPC/M
- innovative revenue sharing model

## STRATEGIC PARTNERSHIPS



Strategic Collaboration Agreement to develop, optimise and commercialise brine technology

### Technology Optimisation

### Established Relationships

Strong relationships with key equipment (OEM) vendors and other partners important in successful project development and technology delivery

### Technology Commercialisation



Global Strategic Cooperation Agreement to commercialise aMES<sup>TM</sup> technology

## BPaaS - Brine Processing as a Solution<sup>TM</sup>

Innovative Business Model

**Parkway Provides**  
Process Technology Package

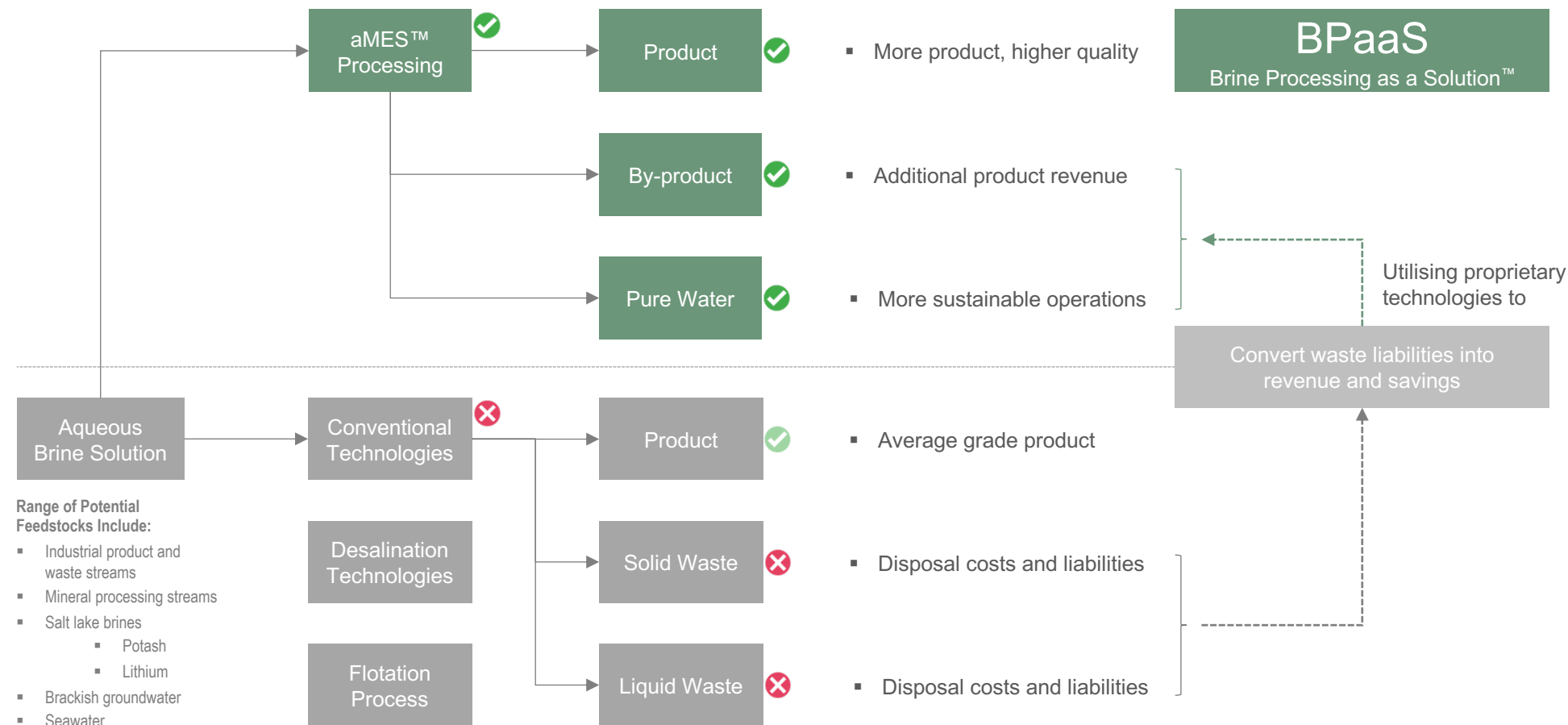
**Partners Deliver**  
Integrated Process Technology Solution

Creating Significant Value

# Advantages of Brine Processing as a Solution

## In Simple Terms

- The BPaaS technology offering, enables the conversion (processing) of otherwise waste brine and salt streams, into additional product (**by-product revenue**) and improved environmental sustainability (**savings from disposal related costs**). A more detailed explanation is provided in *Appendix 1C*.



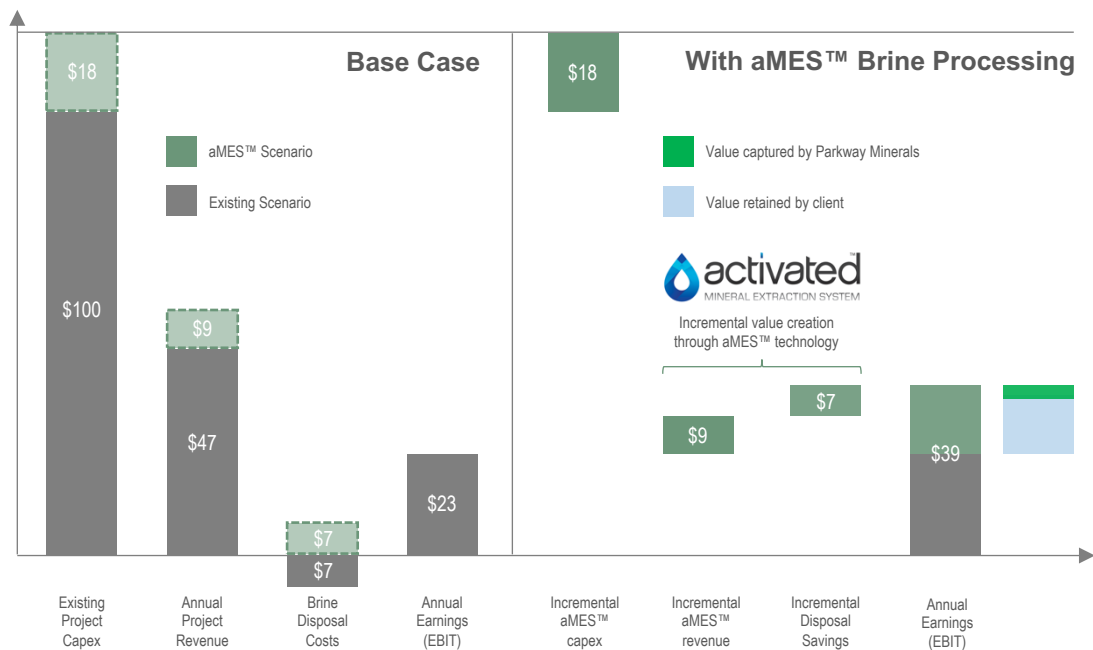
# Innovative Business Model – Leveraging Technology

## Leveraging Technology

- Through the proprietary Technology Platform, Parkway Minerals is in the process of establishing itself as a leading **brine technology solution provider**.
- Enabling Parkway Minerals, together with its strategic partners, to offer:
  - BPaaS** – Brine Processing as a Solution™.

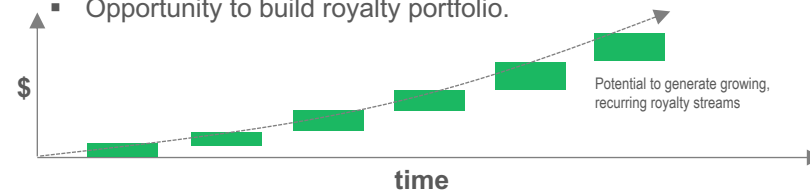
## Creating Sustainable Value

- Focus on large, high-value, brownfield opportunities, requiring process improvement.
- Clear value proposition based on processing complex waste brine streams.
- Processing reduces waste disposal costs, generates revenue and improves ESG.



## Illustrative Case-Study – Conceptual

- Incremental capex for aMES™ plant has short payback (<3yr).
- Significant return on invested capital (ROIC), particularly for incremental capex, enables a **modest royalty (5-20%)** to be justified, given the client is sharing incremental value creation.
- Feasibility study related costs and project capex to be incurred by the client, with the aim of Parkway Minerals recovering all business development and evaluation related costs.
- Upfront and **recurring royalties are highly value accretive** to Parkway Minerals, given significant investment is not required.
- Opportunity to build royalty portfolio.



IMPORTANT NOTE: The descriptions, graphics and numbers outlined on this slide are conceptual in nature and do not relate to specific projects and/or opportunities, do not represent any form of financial forecast by the Company whatsoever, and should not be relied on for any purpose. Refer to the Disclaimer slide (page 2) for further information.

# Methodical Execution of Corporate Strategy

## Current Focus

### ▪ Building the Technology Platform:

- Execution of state-of-the-art aMES™ pilot plant strategy
- Commenced KLPP-PFS (sulphate of potash pre-feasibility study, PFS)
- Alignment with leading EPC and OEM partners
- Development of modular aMES™ processing plant design to enable **accelerated project evaluation and eventual roll-out**.

### ▪ Implementing Innovative Business Model:

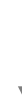
- Executing the core foundations of the Technology Platform, to enable Parkway Mineral to deliver Brine Processing as a Solution – **BPaaS**, to clients.

### ▪ Advancing Business Development Opportunities

- Business development project pipeline includes:
  - Potash (MOP/SOP/KMS), both greenfield and operational projects.
  - Lithium, several greenfield projects.
  - Hydrometallurgical refineries, producing range of products including cobalt & nickel.
  - Industrial waste streams including brines.
  - Oil and gas projects including in the coal-seam gas (CSG) industry producing brines.
  - Desalination plant brine from industrial operations (excluding seawater reverse osmosis, SWRO).
  - Several other potential opportunities.



**The Foundations**  
“How we design and deliver”



**The Business**  
“How we make money”



**The Opportunity**  
“The problems we seek to solve”



**Corporate Strategy**  
“Creating value through execution”



# Building Strategic Capability

## Critical Technology Scale-Up Work Underway

- KLPP-PFS and aMES™ Pilot Plant Program currently underway, **fully-funded, approaching half-way mark.**
- Important steps in establishing the broader aMES™ technology platform through:
  - Construction and commissioning of a state-of-the-art aMES™ pilot plant.
  - Flowsheet optimization, validation and key equipment/vendor qualification.
  - Providing a practical demonstration of the advantages of the aMES™ technology over conventional brine project development concepts.

## Karinga Lakes Potash Project – Pre-Feasibility Study (KLPP-PFS)

- In May 2020, Parkway Minerals announced commencement of the KLPP-PFS.
- Being delivered under the Global Strategic Cooperation Agreement with Worley.
- An overview of the Karinga Lakes Potash Project is outlined in *Appendix 1G*.
- The KLPP-PFS is evaluating the merits of developing the KLPP based on the innovative application of the aMES™ technology.

## aMES™ Pilot Plant

- **Plant Design** – based on scaled-up version of proven proprietary aMES™ process plant designs, tested extensively at smaller scale in recent years.
- **Process Engineering** – designed internally and incorporates increased sophistication including important instrumentation and controls.
- **Process Simulation** – detailed process simulations performed in “digital pilot plant” to identify bottlenecks and performance optimisation opportunities.
- **Procurement** – following vendor qualification, long-lead items including pumps, vessels and heat-exchangers ordered with key items arriving progressively.



Raw brine abstraction from the KLPP



Crude potash salt production from the KLPP



High purity sulphate of potash (SOP) from the KLPP

## Building the Technology Platform

### OBJECTIVE 1

#### Process Optimisation

Optimise aMES™ flowsheet and validate major equipment (and key vendor) performance

### OBJECTIVE 2

#### KLPP PFS Validation

Generate plant performance data to support PFS related engineering and techno-economic studies

### OBJECTIVE 3

#### Support Technology Scale-Up

Enable the evaluation of plant modularisation approaches to support rapid technology scale-up

# Investment Case

## BUILDING AN ATTRACTIVE BUSINESS

### 1) Unique Technology

- Proprietary aMES™ technology platform – patented IP & knowhow
- Acquisition of patented iBC™ technology – undergoing optimisation studies
- Building **world-class brine processing IP portfolio**

### 2) Very Large Addressable Markets

- Global Mining, Energy, Desalination & Industrial waste brine streams
- All represent **multi-billion dollar opportunities** for the right technologies
- Strong economic, regulatory and ESG drivers supporting change

### 3) Focus on High Value Applications

- High margin opportunities where a mature low-cost alternative doesn't exist

### 4) Working with Leading Strategic Partners

- Partnering with **tier-1 EPC (engineering)** and OEM (equipment) partners

### 5) Highly Attractive Business Model

- **Capital-light business model** enables rapid roll-out and FCF generation
- **Recurring revenues** based on technology licensing related fees
- High barriers to entry enable **significant value capture** without ownership

### 6) Attracting Interest of Major Industry Players

- Performing pilot studies and in discussions with **prospective tier-1 clients**

## OUR MISSION



# BPaaS

Brine Processing as a Solution™

# Corporate Snapshot

As at 27 July 2020

Capital Structure	Current
Ordinary Shares (PWN) on issue	1,716,514,776
12-month Trading Range	\$0.003 - \$0.013
<b>Market Capitalisation (at \$0.006)</b>	<b>\$10.3 million</b>
Partly Paid Shares (PWNCA, \$0.019 unpaid)	246,600,643
Unlisted Options (\$0.02, 17 Aug 2020)	55,126,000
Unlisted Options (\$0.02, 16 Dec 2022)	303,166,664

Major Shareholders	%
Lions Bay Capital (LIC)	13.0%
Holdings associated with MD	12.5%
Other T20 Shareholders	~32%
<b>Top 20</b>	<b>~58%</b>

Funding	\$
Debt	nil
<b>Cash (at 30 June 2020)</b>	<b>\$2 million</b>

Marketable Securities	Value (\$A)
34,267,700 units ASX: DAV @ \$0.040	\$1.37 million
7,142,850 units ASX: DAVO \$0.004	\$0.03 million
<b>Total</b>	<b>~\$1.40 million</b>

## EXPERIENCED AND MOTIVATED TEAM

### 1) Experienced Team

- Strong industry and **technology commercialisation experience**
- Track-record of licensing technologies to majors and accretive transactions

### 2) Strong Alignment

- Board, management and engineering team **are aligned with shareholders**, given share/option ownership
- Insiders and associates control significant proportion of share register
- Company run with “owner mindset” with tight cost control and reluctance to dilute shareholders unless linked to significant value accretive initiative/s

### 3) Generating Corporate Traction

- Increasingly being approached by credible sophisticated and **institutional investors** that have experienced success in the innovation, junior tech, water-tech space, interested in exploring strategic opportunities.

## Directors & Management

**Adrian Griffin** – *Non-Executive Chairman*

**Bahay Ozcakmak** – *Managing Director*

**Richard Beresford** – *Non-Executive Director*

**Patrick Power** – *Non-Executive Director*

**Robert van der Laan** – *Chief Financial Officer*

**Amanda Wilton-Heald** – *Company Secretary*

## Stock Symbols



ASX:  
**PWN**



Frankfurt:  
**4IP**

Join us on our journey, by following us on [LinkedIn](#).

# Appendices

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# Access to Freshwater – A Rapidly Growing Challenge

## Overview

- Increasing demand for freshwater, and reduced tolerance for wastewater generation and storage, is creating opportunities for new wastewater processing technologies.

### i) Water Crisis

Global population growth and rapid economic development is putting pressure on limited freshwater resources with:

- ~1.1 billion people worldwide lacking access to water.
- ~2.7 billion find water scarce for at least one month of the year.

### ii) Competing Uses for Water

- The agriculture, energy and mining sectors are amongst the largest consumers of water, globally.
- Access to freshwater is becoming increasingly challenging.

### iii) Need for Improved Sustainability

- It is estimated that, **less than 5%** of liquid wastes from the **mining industry** undergo any form of processing to **recover freshwater**.
- Permitting new mines (and operation of existing mines) that require freshwater is increasingly complex and challenged.

### iv) Desalination Plants

- Rapidly growing market to meet major global water challenges.
- The ~16,000 operating desalination plants produce more than **140 million cubic metres (m<sup>3</sup>) of waste brine, daily**.



## The Basis of Water Sustainability

- Reduce** – use of water efficiency technologies
- Reuse** – requires capturing waste streams
- Recycle** – requires processing of wastewater

## Recycling Water

- Water recycling provides the greatest opportunity to concurrently:
  - Reduce wastewater storage, and;
  - Recover freshwater
  - Converting a liability into an asset**

## Total Dissolved Solids (TDS, salts) in Feedwater & Wastewaters

- Low TDS - feedstocks are readily recycled with conventional desalination technologies, primarily reverse osmosis (RO).
- High TDS – feedstocks, from industrial operations, including in the energy, mining and fast-growing desalination sector produce over **250,000,000m<sup>3</sup> of concentrated brine, daily**.
  - Conventional technologies for processing these high-TDS brine streams are inefficient and costly.

## Innovative Processing Technology

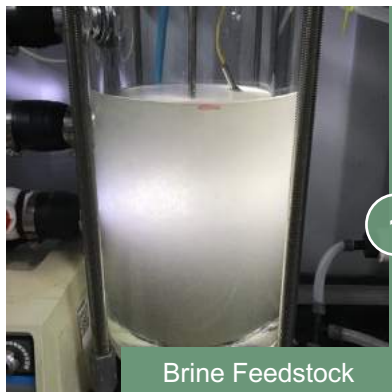
- Opportunity to process high TDS brine streams.



# Processing Brine with Proprietary Technology

## Processing Range of Brines and Salts

- Globally, more than **250,000,000m<sup>3</sup>** of **concentrated brine** is **produced daily**, more than half of the brine is produced by **desalination plants**.
- Large amounts of primary and waste brines are also produced from **mining** (potash, lithium), **energy** (oil, gas, power generation) and other major industries.
- Processing and disposal of these brines is often complex, problematic and expensive. Processing **costs can exceed \$10/m<sup>3</sup>**, providing an attractive opportunity.



1

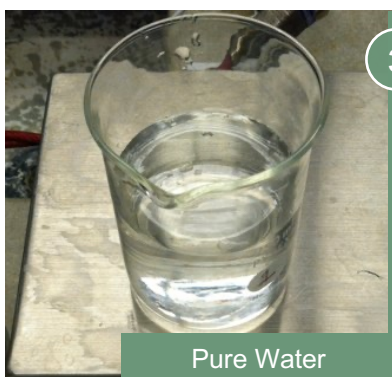
## Economic Brine Processing

As a **mining technology company**, Parkway Minerals is focused on recovering valuable minerals from these brines, whilst reducing waste volumes.

### In simple terms, we:

- 1) Take waste brine streams (feedstock).
- 2) Process the brine with our [aMES™ technology](#).
- 3) Recover very pure fresh water, and
- 4) Produce range of **high-purity minerals** including potash (MOP, KMS, SOP), Mg/Li & other salts.

## aMES™ – Proprietary Brine Processing Technology



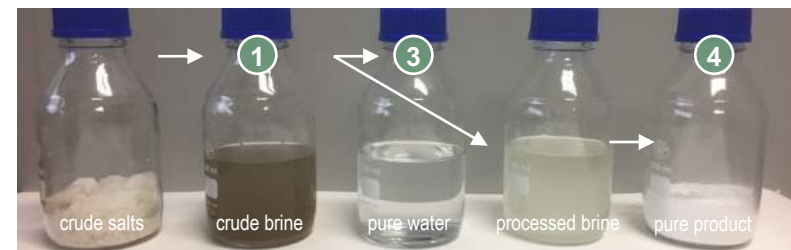
3

## Production of High-Purity Salts



4

## Processing Range of Brines and Salts



# Advantages of Brine Processing as a Solution

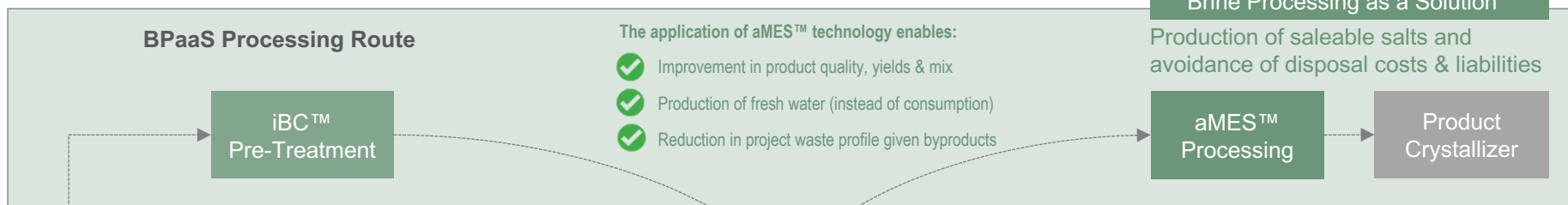
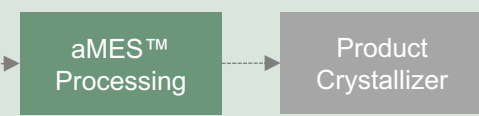
## In More Detail

- Conventional technologies for processing aqueous solutions are mature, and increasingly, **no longer fit-for-purpose**, particularly in terms of process performance (product recoveries, purity and environmental credentials).

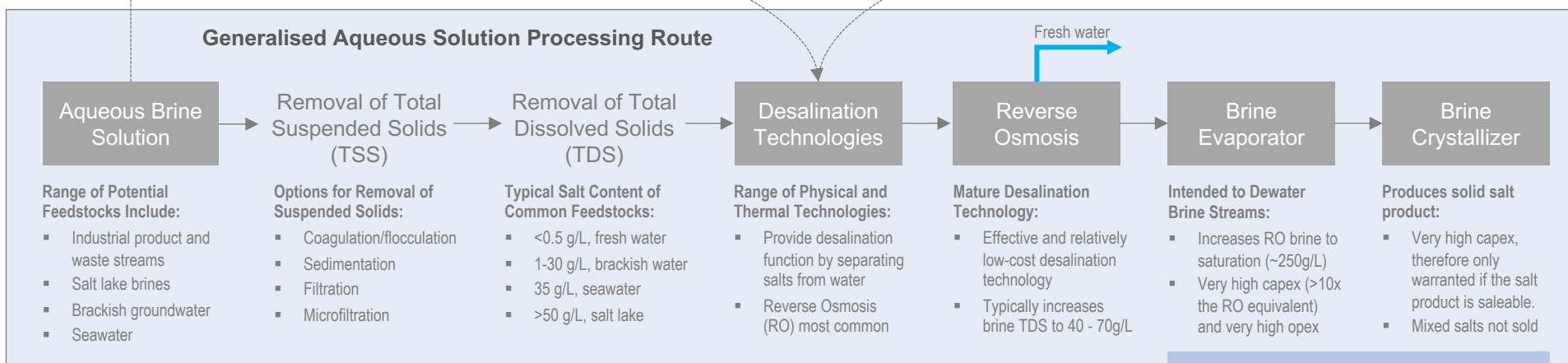
### BPaaS ✓

Brine Processing as a Solution™

Production of saleable salts and avoidance of disposal costs & liabilities



- The application of aMES™ technology enables:
- ✓ Improvement in product quality, yields & mix
  - ✓ Production of fresh water (instead of consumption)
  - ✓ Reduction in project waste profile given byproducts



Expensive, yet problematic, as salt product cannot be sold ✗

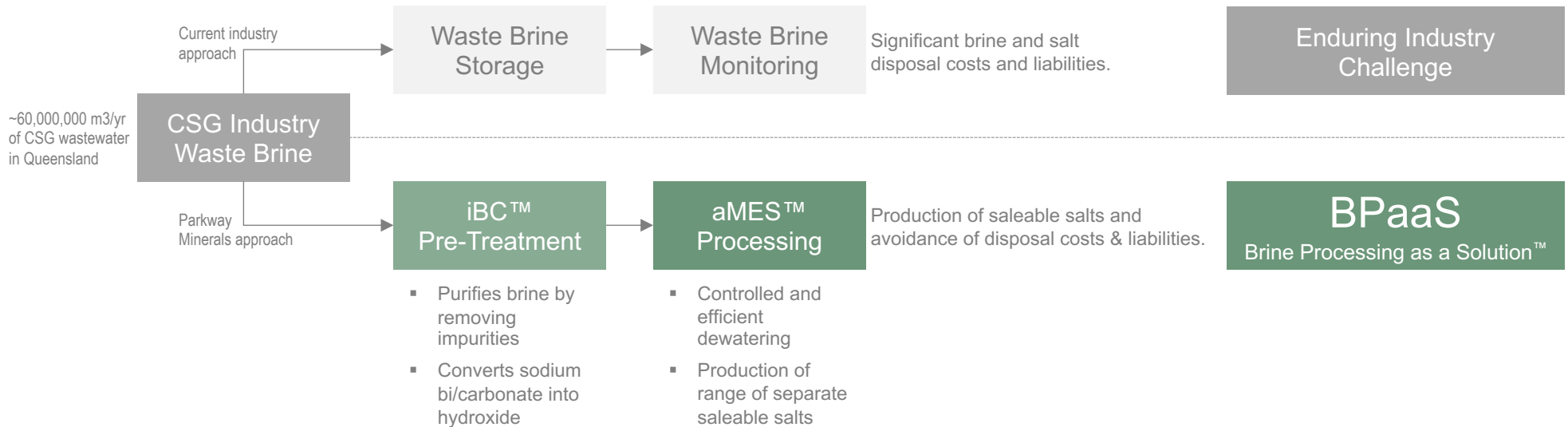


# iBC Technology™ – The CSG Opportunity

>> Additional Information: [iBC™](#)

## Overview

- Significant associated water is produced by the Coal Seam Gas (CSG) industry in Australia. It's estimated 60 GL of associated water containing almost 200,000 tonnes of salts is produced in Queensland, annually. With the recent news (April 2020), that Arrow Energy was proceeding with the development of a \$10 billion CSG project in the Surat Basin in Queensland, the scale of the problem in processing waste brines, is anticipated to increase further.
- On [15 May 2020](#), Parkway Minerals announced it had acquired the integrated Brine Causticization (**iBC™**) technology.
- The acquisition includes the process patent, associated knowhow and a pilot plant based on the iBC™ technology.
- The iBC™ technology purifies typical CSG industry brines and effectively integrates with the aMES™ technology, enabling the subsequent production of saleable products from these pre-treated waste brine streams, which would otherwise require storage and disposal.



## Next Steps

- Parkway has been approached by several CSG industry participants, including operators, to explore options, as conventional approaches are inadequate.
- As part of the acquisition of the iBC™ technology, a pilot plant has been relocated to Victoria University, where a **technology optimisation and integration program is underway** to support ongoing business development activities in the CSG industry and assist in the commercialisation of the technology.

# Global Strategic Cooperation Agreement – Worley

## Overview

- Alignment with an experienced **global engineering company** has been a key priority for building the next stage of the aMES™ Technology Platform.
- On [8 May 2020](#), Parkway Minerals entered into a Global Strategic Cooperation Agreement to enable provision of engineering, procurement and construction (EPC) support to contracts executed under the agreement.
- The Global Strategic Cooperation Agreement provides Parkway Minerals with **EPC support, underpinning ongoing efforts to commercialise the aMES™ technology platform**.
- The agreement incorporates an innovative revenue sharing model and mutual exclusivities, ensuring **strong alignment between both parties**.

## Key Terms of Agreement

- The other party to the agreement is with a subsidiary of the **Worley Group**.
- **Joint Projects** – The parties will nominate joint projects envisaging use of the aMES™ technology (including projects the parties are already involved with) to each other, and once declared a joint project, will pursue such project exclusively with each other.
- **Exclusivities** – In addition to joint projects, the parties have agreed to certain exclusivities, non-compete and first right of refusal arrangements.
- **Revenue Sharing Model** – The parties have agreed to an innovative revenue sharing model, where Parkway Minerals retains all preliminary evaluation and upfront licensing fees, with recurring licensing fees, and other revenues/margins, shared by the parties on a predetermined formula.
- **Intellectual Property** – All intellectual property relating to the aMES™ technology platform, including any improvements, will remain the exclusive property of Parkway Minerals.
- **Term** – Initial term of 3 years.

## aMES™ Project Opportunities

### Parkway Minerals Project Portfolio

- Parkway Minerals has identified several potential aMES™ opportunities in its existing business development portfolio, that are likely to be assessed for suitability under this agreement.
- Parkway Minerals intends to put forward several advanced-stage third-party projects for evaluation. Several of these projects have undergone substantial process evaluation (including **successful aMES™ based piloting**) and are operated by **globally significant mining companies**.
- On [11 May 2020](#), Parkway Minerals announced it had commenced the Karinga Lakes Potash Project – Pre-Feasibility Study (KLPP-PFS). The **KLPP-PFS** is being delivered under the Global Strategic Cooperation Agreement (Worley acting as study manager) and is intended to form the basis for **joint capability development**.

### Worley Project Portfolio

- Significant depth of opportunities within Worley's global network, with several potential aMES™ opportunities identified.

### Global Opportunities

- Given the significant scale of addressable markets for the aMES™ technology, particularly in the energy and mining sectors, the parties have identified potential opportunities to deploy core capabilities.

## Additional Details

- The parties are evaluating various options for **joint marketing** including a Capability Statement, to provide further details about the collaboration and efforts in advancing the aMES™ technology platform.

# aMES™ Case Study: SOP Production

## Overview

- There is growing demand for sulphate of potash (SOP), however, bringing new production online through conventional means, faces significant challenges.

### 1) Process Water

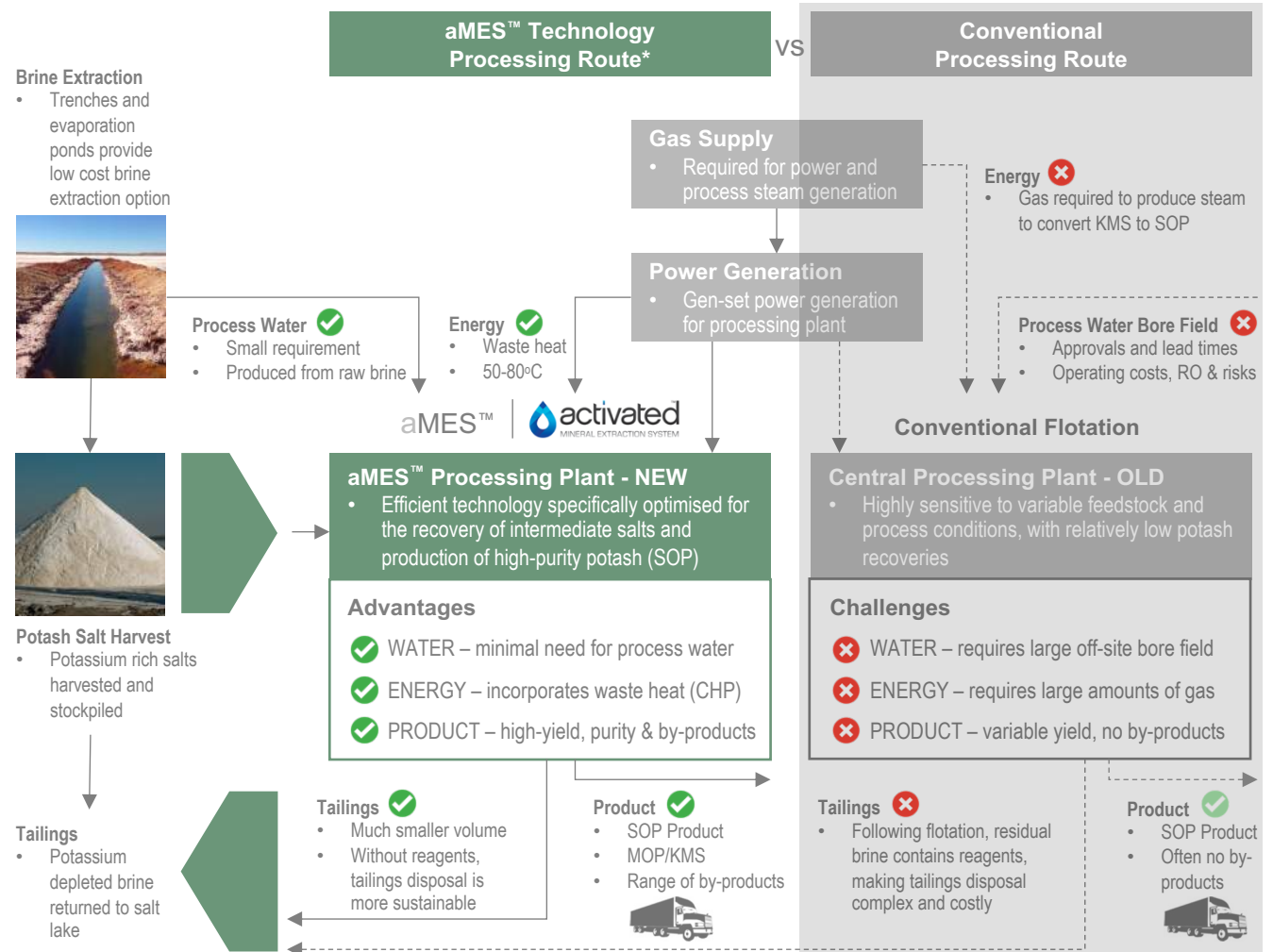
- Depending on the specific flowsheet, the production of 1 tonne of SOP can require in excess of 10m<sup>3</sup> of fresh process water.
- The aMES™ technology recovers and recycles high-quality process water.**

### 2) Mineral Processing

- Mineral recoveries associated with flotation and other conventional processes are sensitive to feedstock composition.
- The aMES™ technology achieves high recoveries including of by-products.**

### 3) Waste Brine Disposal

- Various mineral processing stages associated with flotation, leaching and purge solutions, generate substantial waste brine streams.
- Disposal of these waste brine streams is often both complicated and costly.
- The aMES™ technology can process & recover products from these streams.**



\* - The proposed aMES™ processing route outlined herein, has potential applications for the Karinga Lakes Potash Project (KLPP).



# Karinga Lakes Potash Project (KLPP) – Overview

>> Additional Information: [KLPP](#)

## Introduction

- Parkway Minerals (CPC) has earned initial 15% interest in the KLPP and has the right to acquire up to 40% through staged investment.
- CPC holds a conditional option to acquire additional 10.1%.
- In February 2019, CPC delivered a Scoping Study to the project operator, Verdant Minerals, investigating a potential **development scenario for the KLPP based on the aMES™ technology**.
- CPC has established a JV with Verdant Minerals to pursue feasibility studies regarding potential project appraisal and development.

## Geology & Infrastructure

- The project consists of a chain of dry salt lakes and is located within the Central Australian Groundwater Discharge Zone.
- Brine lake system located in prime geological setting on pastoral land in Central Australia (Northern Territory).
- Ideally located, with major road and rail infrastructure located in proximity to the project, with regional gas options also available.

## Extensive Resource Evaluation Studies

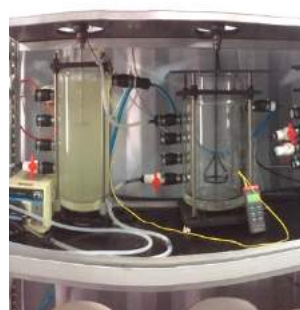
- Extensive resource appraisal studies have been performed by Verdant Minerals since 2010.
- If reviewing historically reported resource evaluation, this information should only be considered in conjunction with the clarifications outlined in the *Resource Status* section of the *Disclaimer* (page 2).

## Forward Plan

- Recently announced [Commencement of a Pre-Feasibility Study](#) for the KLPP, based on an aMES™ development concept (KLPP-PFS).
- A tenure consolidation process is currently underway by the operator.



(A) KLPP Regional Infrastructure (Northern Territory). (B.i) Lake Mingere Trial Trench, (B.ii) Lake Mingere Brine & Salt Samples, (B.iii) SOP produced from Lake Mingere salts. (C) KLPP Exploration Licence Map. Maps and associated details are illustrative only and not to scale.



KLPP - potash brine preparation & extraction for aMES™ processing

## aMES™ Application Rationale

- Potential to develop a more capital efficient and sustainable potash production operation compared to conventional development pathways.
  - The aMES™ pathway potentially eliminates the requirement for flotation, process steam, gas pipeline and smaller freshwater bore field, which collectively represent major costs in the traditional SOP production flowsheet previously evaluated.
  - Potential to recover magnesium salts as a by-product.
- >> Refer to *Appendix 1F*, for SOP aMES™ Case-Study.

# New Mexico Lithium Project (NMLP) – Overview

>> Additional Information: [NMLP](#)

## Introduction

- Parkway has acquired an initial 70% interest in the NMLP and has the right to acquire up to 100% through staged investment.
- Project covers ~40km<sup>2</sup> of federal BLM claims – no royalties payable.
- Project ideally located, with major road, rail, gas and power infrastructure passing through or adjacent to the project area.

## Lordsburg Playa

- The project displays important geological components including:
  - i) “source” - lithium bearing volcanic rocks.
  - ii) “scale” - large catchment area to accumulate lithium.
  - iii) “concentration” - located in a geothermally active region.
  - iv) “trap” - closed central playa in an arid environment.



[A] Map of the United States of America. [B] Map of New Mexico (N.M.). [C] NMLP Claim Map. Maps and associated details are illustrative only and not to scale. Map does not reflect recent claim consolidations.

## Right Geology for Lithium Brine

- Basin and Range extensional faulting - actively defines subsiding closed basin.
- Volcanic source rock include lithium bearing rhyolites.
- Region of high heat flow including hot springs to leach lithium from rhyolites into brines in the closed Lordsburg basin.
- Basin morphology provides large catchment area for groundwater and brine recharge. Long lived basin for enrichment of lithium brines.

## Forward Plan

- Permits for exploration program secured, awaiting access permit.
- Evaluating **prospect of exploration hole** in August 2020 (<\$80k).



Lithium brines processed with aMES<sup>TM</sup> technology, as a pretreatment.

## aMES<sup>TM</sup> Application Rationale

- Potential to **direct process the brine with aMES<sup>TM</sup>** technology, therefore eliminating or reducing the need for evaporation ponds.
- Potential to rapidly develop a more capital efficient and sustainable lithium production operation compared to conventional development pathways.
- Potential to produce a range of additional compounds including **REE and potash as a by-product**.
- Third-party interest in the NMLP, with potential synergies with adjacent & regional resource projects.

# Davenport Resources (ASX: DAV)

>> Additional Information: [DAV](#)

## Overview

- Davenport Resources is a pure-play potash company with a globally significant potash resource inventory, in an established potash mining district of South Harz in Central Germany.

## PWN Shareholding

PWN is the largest shareholder in Davenport Resources holding:

- 34,267,700 shares (~18.4% issued capital) and 7.14 million options (DAVO)
- Value of shareholding **\$1.4 million** (based on recent price of \$0.04/share)

## Potash Resource

- Davenport controls over 5.27 Billion tonnes (average grading 10.8% K<sub>2</sub>O) of JORC Inferred Resource from its portfolio of mining and exploration licences, including significant sylvinitic and carnallitic resources.
- Davenport's portfolio of resources represents **Western Europe's largest potash inventory** and contains several stand-alone projects.

## Corporate Opportunities

- Parkway Minerals has previously performed testwork to demonstrate the suitability of the aMES<sup>TM</sup> technology to process primary and waste brine streams from similar potash projects.
- Parkway Minerals and Davenport Resources have explored potential pathways for adding value to the Davenport Resources project portfolio, and/or unlock value in a corporate transaction, which may involve:
  - Introduction of JV partner/s and/or strategic investors, or
  - Sale of non-core project to raise funds for core projects, or
  - Dual-listing of the company on a major European exchange.

