

## Large-Scale, 28-Year Kaolin Project; Growing Multitude of Uses Globally

Andromeda Metals (ADN) is advancing towards construction of the Great White Kaolin Project (GWKP) in South Australia, a Tier-One mining jurisdiction. An optimised definitive feasibility study (DFS), completed in April 2022, outlined a robust project with modest capex requirements, strong local infrastructure links and a sensible phased development plan. The GWKP has a rapid payback period and is situated close to the primary seaborne kaolin markets in Asia. Our risked NPV/share of A\$0.19 compares favourably to the current share price of A\$0.08.

### Premium Kaolin; Strong Management

Kaolin is a white clay material used in hundreds of industrial applications, primarily in coatings, polymers, ceramics, concrete and paper. The deposit at GWKP includes a relatively rare form of kaolin (halloysite-kaolin) which typically attracts premium prices due to its tubular morphology, which makes the product suitable for high demand premium ceramic porcelain products and high growth emerging nanotechnology applications. ADN is in the process of advancing further offtake agreements, and we expect strong interest for the product from industrial customers given the high-quality material and long-life mine. ADN’s CEO James Marsh is a 30-year kaolin industry veteran, with an exceptional knowledge of customer specifications and product acceptance.

### Near-Term Timeline to Production

With the recent release of the DFS and the South Australian government’s grant of the Mining Lease for the project in December 2021, the project could start mining CY 2023 if offtake negotiations are successfully completed and the requisite approvals and financing for project construction are secured. This would put the project on track for first sales of finished product in FY24. Given the unique nature of the project, its excellent location, and the company’s experienced management team, we think ADN is in a strong position to successfully navigate the remaining hurdles to get the project into production and cash generation.

### Valuation: A\$0.19 We See Good Potential Upside; Lots of Catalysts

Our risked NPV for ADN is A\$0.19/share (fully diluted). ADN is relatively unique for its underlying kaolin exposure. We believe this provides a favourable outlook given the use of kaolin in established global industrial end-markets and emerging growth markets. The company has a number of crucial milestones over the next several months, which represent major de-risking events. Further offtake agreements will be a positive catalyst and should be wrapped up by Q3CY2022. We expect secondary project approvals late CY2022, with financing and FID to follow and construction begin shortly after that. Key risks include project delays, escalation in capital costs and inability to secure required offtakes.



Andromeda Metals (ASX: ADN) is an Australian company with a vision to lead the world in the sustainable supply of superior quality industrial minerals and advancement of nanotechnologies, starting with halloysite-kaolin. ADN seeks to build long-term relationships with customers globally, supporting them to produce premium products and clean technologies. The company’s core assets include the Great White Kaolin Project as well as Mount Hope, in which it has 100% interest, and Eyre Kaolin, which it is earning into.

Stock	ASX: ADN
Price	A\$0.08
Market cap	A\$258m
Valuation (per share)	A\$0.19

#### Next steps

Secure offtake agreements (Q3CY22); Secondary project approvals (Q4CY2022)

Complete financing; FID (Q4 CY2022)

Commence mining and construction

[Click Here - Interview with James Marsh Andromeda Metals CEO](#)

ADN share price (A\$) – 1 year



Source: Factset  
Michael Bentley  
michael.bentley@mstaccess.com.au

## Exhibit 1 – Andromeda Metals: company summary – year-end 30 June

ANDROMEDA METALS LIMITED						ADN.AX
<b>Year end 30 June</b>						
<b>MARKET DATA</b>						
Share Price	A\$/sh					<b>0.08</b>
52 week high/low	A\$/sh					0.25 - 0.07
Valuation	A\$/sh					0.19
Market Cap (A\$m)	A\$m					258
Net Cash / (Debt) (A\$m)	A\$m					36
Enterprise Value (A\$m)	A\$m					222
Shares on Issue	m					3,180
Options/Performance shares	m					94
Other Equity	m					217
Potential Diluted Shares on Issue	m					3,491
<b>INVESTMENT FUNDAMENTALS</b>						
		Jun-20	Jun-21	Jun-22e	Jun-23e	Jun-24e
Reported NPAT	A\$m	(3)	(6)	(13)	(7)	36
Underlying NPAT	A\$m	(3)	(6)	(13)	(7)	36
EPS Reported (undiluted)	¢ps	(0.2¢)	(0.3¢)	(0.5¢)	(0.2¢)	1.0¢
EPS Underlying (undiluted)	¢ps	(0.2¢)	(0.3¢)	(0.5¢)	(0.2¢)	1.0¢
Underlying EPS Growth	%	0.0%	0.0%	47.0%	-59.0%	-618.0%
PIE Reported (undiluted)	x	n/m	n/m	n/m	n/m	7.9
PIE Underlying (undiluted)	x	n/m	n/m	n/m	n/m	7.9
Operating Cash Flow / Share	A\$	(0.00)	(0.00)	(0.00)	(0.00)	0.01
Price / Operating Cash Flow	x	(117.6)	(126.4)	(44.0)	(63.9)	6.6
Free Cash Flow / Share	A\$	(0.00)	(0.00)	(0.00)	(0.03)	0.01
Price / Free Cash Flow	x	(35.1)	(29.1)	(16.2)	(2.5)	7.9
Free Cash Flow Yield	%	-2.9%	-3.4%	-6.2%	-40.7%	12.6%
Book Value / Share	A\$	0.01	0.01	0.02	0.02	0.03
Price / Book	x	10.67	9.89	4.98	4.10	2.51
NTA / Share	A\$	0.01	0.01	0.02	0.02	0.03
Price / NTA	x	10.67	9.89	4.98	4.10	2.51
Year End Shares	m	1,533	2,161	3,180	3,491	3,491
Market Cap (spot)	A\$m	124	175	258	283	283
Net Cash / (Debt)	A\$m	3	5	32	(61)	(26)
Enterprise Value	A\$m	121	170	226	344	308
EV / EBITDA	x	n/m	n/m	n/m	n/m	3.8x
Net Debt / Enterprise Value		(0.0)	(0.0)	(0.1)	0.3	0.1
<b>PRODUCTION AND PRICING</b>						
		Jun-20	Jun-21	Jun-22e	Jun-23e	Jun-24e
Total Refined Kaolin Product	kt (dry)	-	-	-	-	153
Weighted Average Product Sale Price (A\$/dmt)		-	-	-	-	738
<b>12-Month Relative Performance vs S&amp;P/ASX Metals &amp; Mining</b>						
<b>Profit &amp; Loss (A\$m)</b>						
		Jun-20	Jun-21	Jun-22e	Jun-23e	Jun-24e
Sales		-	-	-	-	113
Expenses		(3)	(6)	(13)	(8)	(55)
<b>EBITDA</b>		<b>(3)</b>	<b>(6)</b>	<b>(13)</b>	<b>(8)</b>	<b>58</b>
D&A		(0)	(0)	-	-	(5)
<b>EBIT</b>		<b>(3)</b>	<b>(6)</b>	<b>(13)</b>	<b>(8)</b>	<b>53</b>
Net Interest		0	0	0	1	(2)
Profit Before Tax		(3)	(6)	(13)	(7)	51
Tax		(0)	(0)	-	-	(15)
<b>Underlying NPAT</b>		<b>(3)</b>	<b>(6)</b>	<b>(13)</b>	<b>(7)</b>	<b>36</b>
Exceptionals		-	-	-	-	-
<b>Reported Profit</b>		<b>(3)</b>	<b>(6)</b>	<b>(13)</b>	<b>(7)</b>	<b>36</b>
<b>Balance Sheet (A\$m)</b>						
		Jun-20	Jun-21	Jun-22e	Jun-23e	Jun-24e
Cash		3	5	32	25	61
Receivables		0	1	1	1	9
Inventory		-	-	-	-	6
PP&E		0	0	7	118	120
Other		9	14	14	14	14
<b>Assets</b>		<b>13</b>	<b>20</b>	<b>54</b>	<b>158</b>	<b>210</b>
Creditors		1	1	1	1	9
Debt		-	-	-	87	87
Leases		0	0	0	0	0
Provisions		0	0	0	0	0
Other		0	1	1	1	1
<b>Liabilities</b>		<b>1</b>	<b>2</b>	<b>2</b>	<b>89</b>	<b>97</b>
<b>Net Assets</b>		<b>12</b>	<b>18</b>	<b>52</b>	<b>69</b>	<b>113</b>
<b>Cashflow (A\$m)</b>						
		Jun-20	Jun-21	Jun-22e	Jun-23e	Jun-24e
Cash From Operations		(1)	(2)	(6)	(5)	60
Interest		0	0	0	1	(2)
Tax		0	0	-	-	(15)
<b>Net Cash From Operations</b>		<b>(1)</b>	<b>(1)</b>	<b>(6)</b>	<b>(4)</b>	<b>43</b>
Capex		1	(0)	-	(108)	(5)
Exploration		(3)	(5)	(7)	(2)	(2)
Investments		0	0	(3)	-	-
<b>Free Cash Flow</b>		<b>(4)</b>	<b>(6)</b>	<b>(16)</b>	<b>(115)</b>	<b>36</b>
Equity		5	8	43	22	-
Borrowings		(0)	(0)	-	87	-
Dividend		-	-	-	-	-
<b>Net Increase / (Decrease) in Cash</b>		<b>1</b>	<b>2</b>	<b>27</b>	<b>(7)</b>	<b>36</b>

Source: ADN, MST Access.

## Investment Thesis: Rare Natural Kaolin Deposit; Value-Add-Focused DFS Complete and Moving Rapidly Towards FID

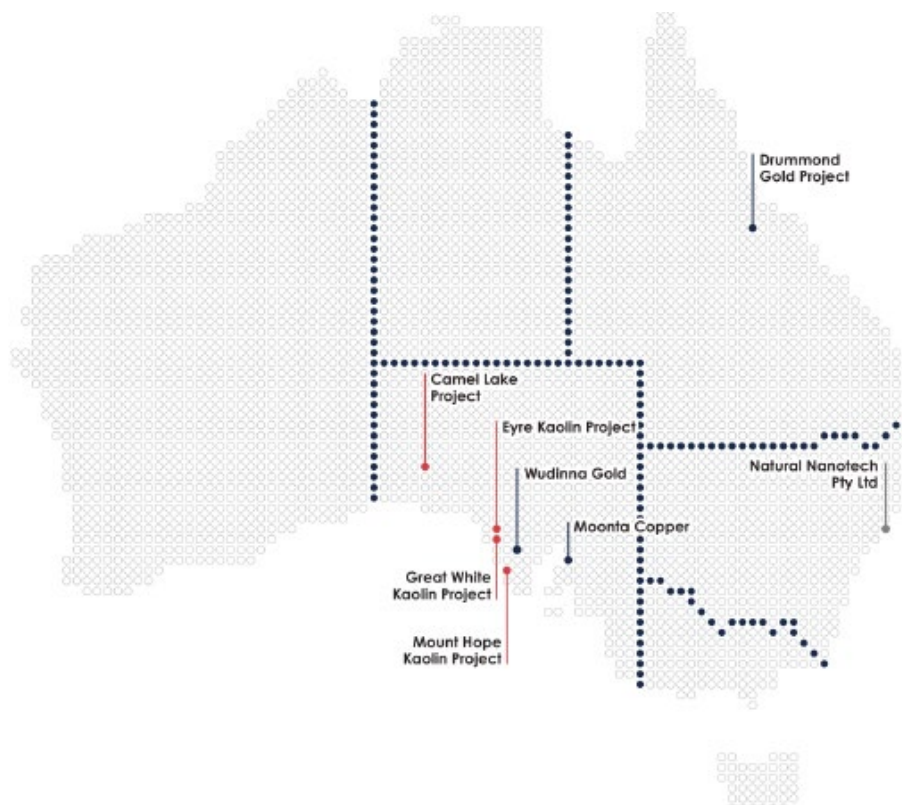
### Company Overview: Kaolin the Focus – Options in Portfolio

ADN’s corporate vision is to become a sustainable supplier of superior-quality industrial minerals and to develop products that advance nanotechnologies.

While the company has a number of projects in the pipeline, its primary focus is the Great White Kaolin Project (GWKP) in South Australia. This project is highly advanced, has just completed an optimised DFS, and has the potential to proceed into construction and commercial production near term. Successfully unlocking the expected high-margin cash flows at GWKP, which have a long mine life implied by the scale of the overall Ore Reserve currently defined (15.1mt), would position ADN to invest significantly in its broader portfolio.

In addition to the focus on Kaolin, mining projects include copper & gold projects. ADN also has an investment in a nanotechnology business, which is researching potential commercial uses for halloysite nanotubes (including carbon dioxide capture/conversion) as well as hydrogen and energy applications in which a suite of intellectual property has already been created.

Exhibit 2 – ADN project portfolio locations



Source: Company reports.

## Flagship Project: The Great White Kaolin Project, South Australia

ADN recently completed and released a definitive feasibility study (DFS) on its flagship asset, the GWKP. The DFS outlined a project with features which support the development proposition of ADN's leadership team:

- very long operation life of 28 years, with established Ore Reserve of 15.1mt (34% Proved, 66% Probable)
- phased development approach over 4 stages to allow for a low-risk build of the end-market
- modest upfront capex of only A\$94m; minimal sustaining capex requirements of \$26m over life-of-mine
- simple open-pit operation with a low strip ratio of 2.3x
- continuous pit refill & rehabilitation program, boosting environmental credentials and local community relations
- high-value kaolin production for industrial usage in more established, less volatile ceramic, paint and other specialty industrial markets; high-quality products deliberately a focus for direct-to-market customers
- over A\$2bn of life-of-mine pre-tax cash flows projected based on a weighted average sale price of A\$653/dmt.

The DFS has been optimised to maximise value-capture from the large resource of high-value specialist kaolin products which are targeted from production at the project. Infrastructure requirements have been well defined and include a short mine access road to connect the mine site with existing local road infrastructure, mains water from the SA water network accessed from Poochera, and an LPG-fuelled turbine generator system for power supply.

The project is expected to generate strong EBITDA margins of 49% under the DFS (life-of-mine average), and given the significant established Ore Reserve we believe that expansion options will be considered over time to bring forward the projected cash flows from the operation as market conditions and customer demand allow.

## Kaolin Markets – Multiple Uses, Steady Growth, Sticky Customers

Kaolin is a white industrial clay consisting of the mineral kaolinite. Whiteness, brightness, opacity, electrical resistivity, low abrasion, high purity, consistency, and fine particle size are all qualities customers desire in high quality kaolin.

The total market for kaolin is approximately 30 million tonnes per annum with a wide array of kaolin products offered including unprocessed ore, with a variety of end-use markets. Within the broad end-use markets, there is significant spread in pricing based on the specific requirements of each application. ADN's products will be targeting the higher end of the market.

The increased demand for kaolin from end-use sectors such as paper, ceramics and sanitaryware, and coatings is driving overall market demand upwards. The outlook for global demand growth for kaolin between 2020 and 2025 is 4.3% CAGR.

Being an industrial mineral, kaolin has less cyclical pricing than base and other metals. Customer acceptance and specifications are crucial in the market, and consequently customers tend to be sticky once they have found a product suitable to their needs.

## Management - Strong Industry, Project Development and Operations Experience

The management team is highly qualified to bring the GWKP into production and the product to market. CEO James Marsh is a 30-year kaolin market veteran, while newly appointed chairman Mick Wilkes has developed and brought into production multiple mining projects in his career. Operations director Joseph Ranford has 25 years' experience in bringing mining operations into production and has strong knowledge of the South Australian mining approval process and stakeholder landscape.

## Recent Events – Steadily Tracking Towards Near-Term Commencement

Timing	Event
2022: May	Letter of intent signed for new GWKP concrete additive with the world's biggest distributor
April	DFS released
March	Maiden Tiger kaolin Resource
February	Compulsory acquisition of Minotaur to proceed
2021: December	Mining lease granted at GWKP
July	Completion of \$15m SPP – full amount raised
June	\$30m placement completed, \$15m SPP launched; 2nd GWKP binding offtake (70,000tpa @ US\$600/t)
May	HPA MoU signed with AEM Technologies
March	First customer binding offtake signed for GWKP (5,000tpa @ A\$700/t)

## Significant Near-Term Catalysts – Offtake Agreements Key

Timing	Significant near-term catalyst
Q3CY22	secure offtake agreements
Q4CY22	Receive secondary project approvals (PEPR);
Q4 CY22	Complete financing; final investment decision
Q1CY23	Commence mining and construction

## Valuation – A\$0.19/share – Numerous De-risking Catalysts in Sight

Our risked NPV for ADN is A\$0.19/share, fully diluted for remaining equity finance requirements to fund the project capital expenditure. Our key assumptions include an average realised product price of A\$686/t (escalated) and the mine development schedule as outlined in the DFS (i.e. a 4-phase development commencing at 300ktpa ore throughput and expanding to 600ktpa in Year 6). Our valuation indicates significant upside compared to the current share price.

Key near-term risks include project delays, escalation in capital costs, failure to obtain secondary approvals, inability to secure required offtakes, unavailability of attractive debt funding for project finance, and equity market volatility making future equity raisings more difficult. These risks are offset by a strong, respected management team and a highly credible Chairman who is well known within resources capital markets; attractive local infrastructure links; favourable location in South Australia; and the strong industrial commodity market outlook. ADN is subject to macro risks including kaolin prices, forex (particularly AUD/USD), and interest rates and the effects on discount rates.

## Financials – Funding Package Negotiations Underway

The strategic focus for ADN's leadership team now shifts to unlocking cashflows by securing the required financing to bring GWKP into production. ADN has flagged that it will consider a range of options within the financing process.

The DFS estimates initial capex required to complete the first phase of the project based on 300kpa ore throughput at A\$94m. We think GWKP will be well positioned to successfully secure a debt package of at least 80% of capex. We expect the balance to be secured from an equity raising, which looks achievable. We assume equity is raised at 10¢/share. Other potential sources of finance could include a sell-down in equity at the project level, customer prepayments as part of offtake negotiations and equipment finance packages.

Overall, we believe that ADN is strongly positioned to secure the project finance required to take GWKP into production in the near term. The company's end-March cash in hand of A\$35.5m provides ample funding for ongoing corporate expenses and early works while the broader project financing package is secured.



## The Great White Kaolin Project: Well-Located, High-Quality Operation

### Overview of ADN's Flagship Project, the Great White Kaolin Project (GWKP)

The Great White Kaolin Project (GWKP) will develop a world class kaolin deposit. Kaolin from the Great White Deposit is a fine white clay typically composed of 50% mineral kaolinite and 50% granitic sand, formed from the weathering of granite. GWKP contains several high-value deposits containing a naturally occurring blend of flat microscopic plates approximately 0.003 mm thick along with a rare tubular (nanotube) form called halloysite. The kaolinite is chemically inert and non-abrasive.

The project currently hosts a total Mineral Resource of 34.6mt, grading 5.3% halloysite. The Mineral Resource incorporates two subdomains of ore:

- the halloysite domain of 15.9mt grading 6.8% halloysite
- the ultra-bright domain of 1.2mt grading 0.8% halloysite (a high-purity kaolin material).

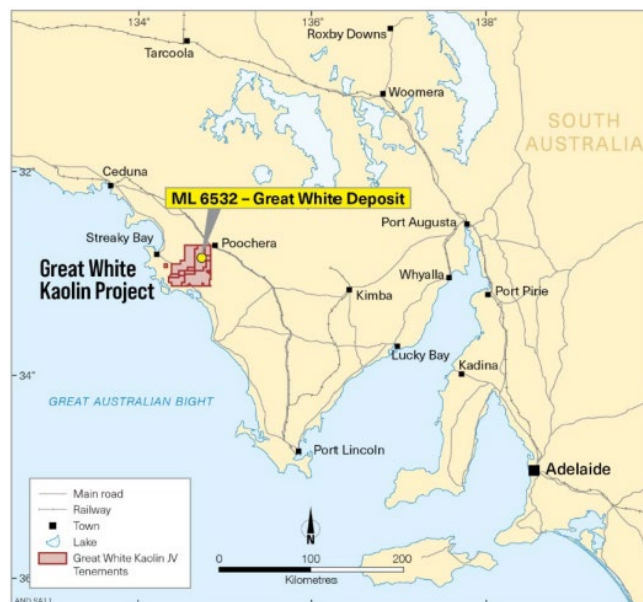
The project is ideally located near Poochera on the Eyre Peninsula, South Australia, close to a local skilled workforce, established infrastructure links and an easy route to seaborne export markets with end-users likely to be primarily industrial customers in Asia (see Exhibit 3).

ADN aims to develop the deposit into a world-class mining operation and produce the highest-quality halloysite-kaolin on the global seaborne export market and become a key supplier of kaolin minerals, which are integral to the production of many consumer durable goods (such as ceramics, coatings, polymers and paper).

Halloysite-kaolin has long been prized in the manufacture of high-grade porcelain. The use of high-grade kaolin in ceramic products brings improved strength and chip-resistance. The inclusion of halloysite increases structural integrity meaning that items hold their shape during production, resulting in a superior fired product.

The tubular halloysite formations are also suited to uses in nanotechnology, which may drive the advancement of many leading environmental technologies (such as carbon capture and conversion).

Exhibit 3 – Project location: regional map



Source: Company reports.

## DFS Provides High Confidence in Project Parameters and Development Pathway

### Staged development: a robust, long-life project

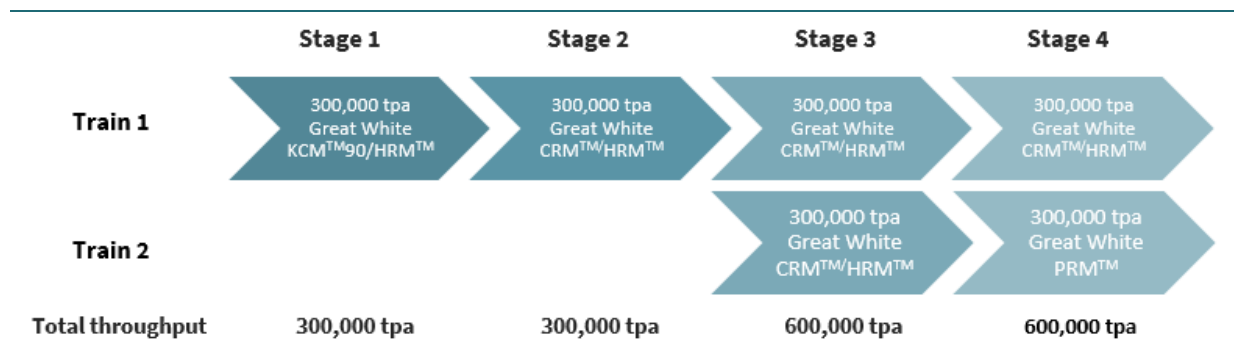
The project is proposed to be developed in a phased approach under the recent DFS, incorporating a total of four stages. Based on the currently defined Ore Reserve of 15.1mt, the project is expected to have a 28-year mine life. A summary of the staged development approach is illustrated in Exhibits 4–5.

Exhibit 4 – GWKP: proposed production stages

	Stage 1		Stage 2		Stage 3		Stage 4	
	Kaolin concentrate	semi-refined production	Fully refined production	kaolin	Fully refined production	kaolin	Fully refined production	kaolin
<b>Description</b>	1 x 300,000 feed tpa train Upgrade plant to produce refined kaolin CRMTM		1 x 300,000 feed tpa train Upgrade to 600,000 tpa capacity with construction of additional 300,000 tpa processing train		2 x 300,000 feed tpa trains Upgrade of one train to Great White PRMTM plant		2 x 300,000 feed tpa trains	
<b>Ore throughput (nominal)</b>	300,000 tpa		300,000 tpa		600,000 tpa		600,000 tpa	
<b>Production tpa (nominal)</b>	138,000 tpa Great White KCM™90 15,000 tpa Great White HRM™		130,000 tpa Great White CRM™ 35,000 tpa Great White HRM™		284,000 tpa Great White CRM™ 40,000 tpa Great White HRM™		56,000 tpa Great White PRM™ (6 years) 226,000 tpa Great White CRM™ (16 years) 40,000 tpa Great White HRM™ (2 years)	
<b>Timing</b>	2 years		2 years		2 years		22 years	
<b>Life-of-mine</b>	28 years (excluding development period)							

Source: Company reports, MST.

Exhibit 5 – GWKP: proposed production stages



Source: Company reports, MST.

### Rapid timeline to first production and cashflows

GWKP is well advanced and importantly has a current DFS and updated Ore Reserve in hand (April 2022). We estimate that the construction period would be approximately 7 months to reach first production, indicating that if the project financing phase is effectively completed in the near term, the project could be selling product and generating cash flows as early as CY2023. Given the current strength in commodities markets, we believe projects with a compressed timeline to production are advantageously positioned to generate strong early cash flows and this will support the phased development approach which has been established for GWKP.

## Modest pre-production capex requirements

The estimated initial capital cost for GWKP (April 2022 DFS) is A\$94m. The DFS estimated sustaining capital for the project at A\$26m which has been budgeted to be incurred during the fourth stage of the project (Year 6 onwards).

### Exhibit 6 – Capital cost estimate

Capital Costs	Stage One	Stage Two	Stage Three	Stage Four
	AUD million			
Approvals, Design, & Construction	75.87	10.16	66.42	19.49
Operations Readiness	4.43	0.32	1.19	7.15
Mine Development	2.19	0.00	0.00	0.00
Rehabilitation	5.50	0.00	2.50	0.00
Sales and Marketing	0.34	0.00	0.00	0.00
<b>Total (excluding contingency and sustaining capital)</b>	<b>88.33</b>	<b>10.48</b>	<b>70.11</b>	<b>26.64</b>
Contingency	5.46	0.55	3.72	1.69
Sustaining Capital	0.00	0.00	0.00	26.01
<b>Total Capital Expenditure</b>	<b>93.79</b>	<b>11.03</b>	<b>73.83</b>	<b>54.34</b>

Source: GWKP DFS April 2022.

The relatively low pre-production capital expenditure requirement for the project is driven by the staged project development strategy, the simple processing facility, and the presence of favourable local infrastructure links given the project's location in South Australia close to the coast.

The overall project development plan consists of four stages, each with a separate capital expenditure budget. However, Stage 1 is the largest component of the overall capital expenditure required, with Stage 2 requiring only modest incremental capital (A\$11m), while Stages 3 and 4 require a budgeted A\$74m and A\$54m respectively (A\$128m in total). Our estimates suggest that capital expenditure requirements beyond Stage 1 can be easily funded from mine operational cash flows. We note that on our assumptions the project is expected to generate average annual EBITDA of A\$100m and during Stage 1 and 2 average annual EBITDA is estimated at A\$225m.

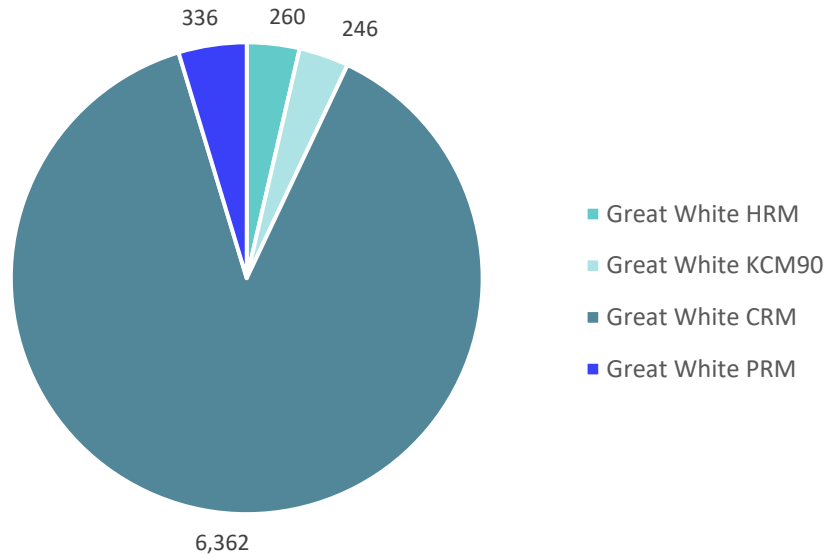
## High projected cash margins

The GWKP is expected to produce four separate products (see Exhibit 7 for total life-of-mine product sales scheduled under the DFS). ADN has noted that it regards the CRM and PRM products as high quality and expects them to achieve a weighted average price of A\$560–A\$826/t (CIF) depending on the application for which the product is purchased. The DFS adopts a weighted average product price of A\$653/dmt which provides for very strong overall EBITDA margins of close to 50%. Note the DFS indicates that operating costs vary by product (as shown in Exhibit 8).

- **Great White CRM:** a refined, dried, bagged product for use by end-users in the high-end ceramics market. This product, representing the overwhelming majority of product sales, records an AISC estimate of A\$344/dmt.
- **Great White PRM:** a refined, dried, and bagged product for use by end-users in coatings and polymers markets
- **Great White HRM:** a refined kaolin for sale for use as an additive in the concrete industry and other associated applications
- **Great White KCM90:** a semi-refined, high-quality kaolin concentrate for sale for direct use, further refinement by other parties or to upgrade their resources.



Exhibit 7 – Product breakdown GWKP ('000 tonnes)



Source: GWKP DFS April 2022.

Exhibit 8 – Operating cost estimates

Item	Unit	Great White HRM	Great White KCM90	Great White CRM	Great White PRM	Total
Final Product Sold	dmt	260,000	246,202	6,361,644	336,371	7,204,217
Mining	AUD/dmt	33	36	32	32	32
Processing	AUD/dmt	106	90	104	115	104
General & Admin	AUD/dmt	20	24	17	17	17
Trucking	AUD/dmt	0	49	44	44	43
Transport & Shipping	AUD/dmt	9	126	124	127	120
Royalties	AUD/dmt	31	5	17	20	17
Corporate & Other	AUD/dmt	5	6	2	4	3
<b>Total Operating Costs</b>	<b>AUD/dmt</b>	<b>204</b>	<b>336</b>	<b>340</b>	<b>359</b>	<b>336</b>
Sustaining Capital	AUD/dmt	1	0	4	4	4
<b>AISC</b>	<b>AUD/dmt</b>	<b>205</b>	<b>336</b>	<b>344</b>	<b>363</b>	<b>340</b>

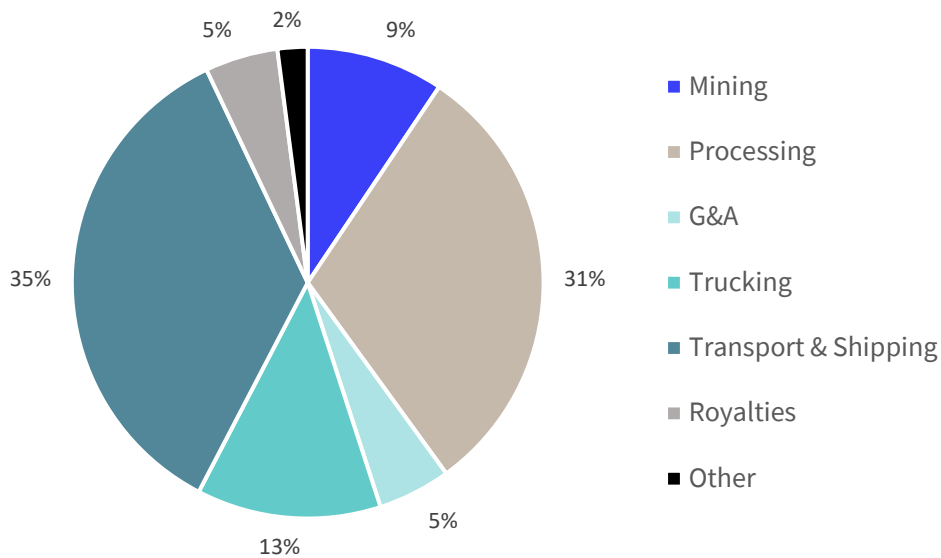
Source: GWKP DFS April 2022.

The project has a number of notable advantages which underpin its high-margin, low-cost nature, specifically:

- the high-brightness, very consistent kaolin clay deposit which is shallow lying
- conventional open-pit mining which is predominantly free dig and has a projected strip ratio of <2.3x
- a simple wash and separation-based processing method to produce concentrate
- workforce availability in the local communities with little reliance on FIFO employees
- transport route via truck from the mine site to port, with options including Thevenard, Whyalla and Lucky Bay with other options in planning stages across the Eyre Peninsula
- mains water supply available from established supplies at Poochera (transport initially via tanker until SA Water installs a pipeline)
- LPG turbine generation power supply which provides generation exhaust heat which can be recycled and used on process plant dryers reducing gas requirements by ~25%.

Overall processing and transport/shipping are the largest components of the operating costs. The current budgeted transport/shipping costs are based on sea freight charges of (A\$77/t) which are currently very high. We see potential for these costs to be further optimised and reduced as the project advances towards FID in coming months.

Exhibit 9 – Operating cost breakdown Labels next to pie slices



Source: GWKP DFS April 2022.

### Mining lease secured and in hand

Crucially, the GWKP has already secured the required Mining Lease from the South Australian Government (issued December 2021), indicating strong support from the local authorities. While a number of secondary approvals are required in order to commence construction, these mainly relate to the conditions established under the existing Mining Lease and provide ADN with clear parameters through which to proceed and confirm the commencement of the project. The project is located in South Australia, which has a very significant established mining industry. While GWKP is located closer to the coastline than many larger-scale mines in remote locations of South Australia, we regard the mine’s location as highly fortunate given the knowledge and capability which exists in the local area, as well as broad government support for resources industry projects.

Note that Native Title has been extinguished on the GWKP mining lease on which the project sits, which represents a total area of 319ha.

## Forward work plan – next steps to progress GWKP

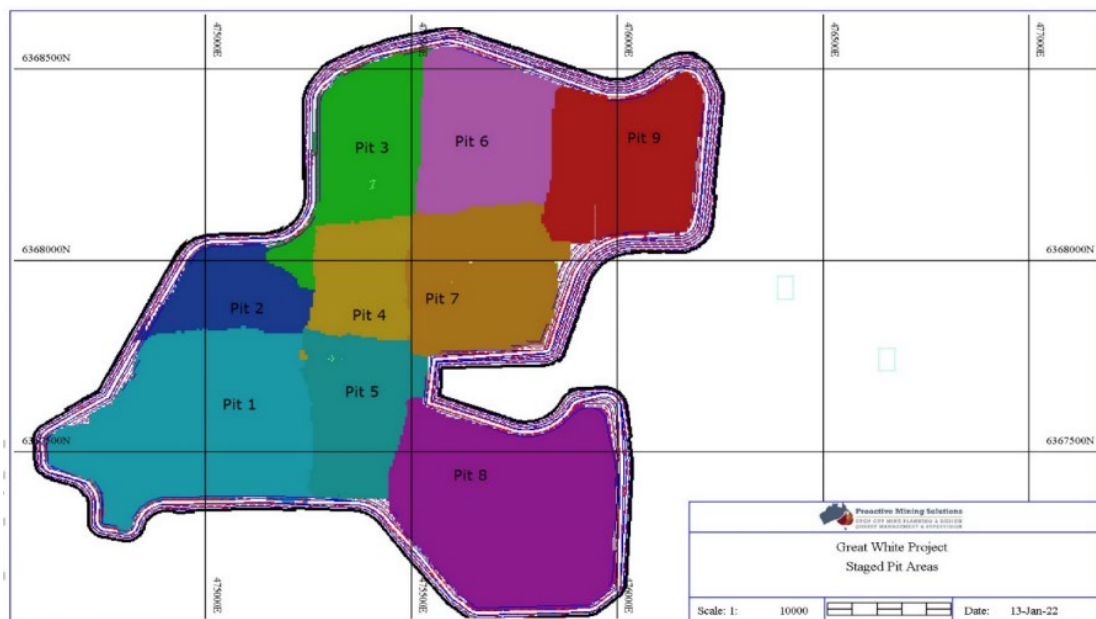
- Marketing – secure binding offtake for initial production (Q3CY22)
- Confirm secondary approvals – EPA works approvals, local council, dangerous substance storage licences and significant environmental benefit measures confirmation (Q4CY22)
- Finalise financing process – secure debt and define remaining equity component (Q4CY22)
- Order long-lead time items
- Commence preparatory mining works (Q4CY22 / Q1CY23)
- Further optimise DFS, potential for bankable feasibility study
- Final Investment Decision and commence construction
- Other opportunities: DSO, high-purity halloysite – resource and/or purification, additional kaolin/halloysite resources, nanotechnology commercialisation, high-purity alumina – feasibility studies.

## Mining and Processing

### Mining method

The GWKP mine is an open-pit operation, with conventional load-and-haul mining methods with excavator and off-road trucks supported by ancillary equipment. The initial pit, expected to be 250m x 200m, will be developed in stages as the operation progresses with a program of backfill and rehabilitation to occur continuously as the clay material is removed, processed and exported. The full extent of the currently defined mining area is 2km x 1.2km. The deposit is predominantly free dig and is relatively shallow with the maximum pit depth expected to be only 40m from surface.

Exhibit 10 – GWKP pit design noting the various stages



Source: Company reports.

The project site is flat and weather conditions typically arid with seasonal rainfall; however, this is not expected to interrupt mining operations.

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#### Exhibit 11 – GWKP site topography

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Source: Company reports.

The DFS proposes using contract mining, which reduces the capital investment in equipment but presents an opportunity for incremental operating cost reductions in the future.

The kaolin deposit is represented in a layer of 9m on average thickness. The material in-situ contains ~50% sand (in coarse form), which is removed during the processing phase and returned to the mining void after washing.

We believe the mining method defined for GWKP is very straightforward and presents relatively low levels of potential risks which typically arise in many open-pit mining operations such as unforeseen geotechnical issues, unstable ground or variability in the orebody which may give rise to dilution and higher costs. ADN is therefore in a strong position in conjunction with a partner mining contractor to deliver steady and predictable mine performance to feed material into the process plant.

#### Processing method

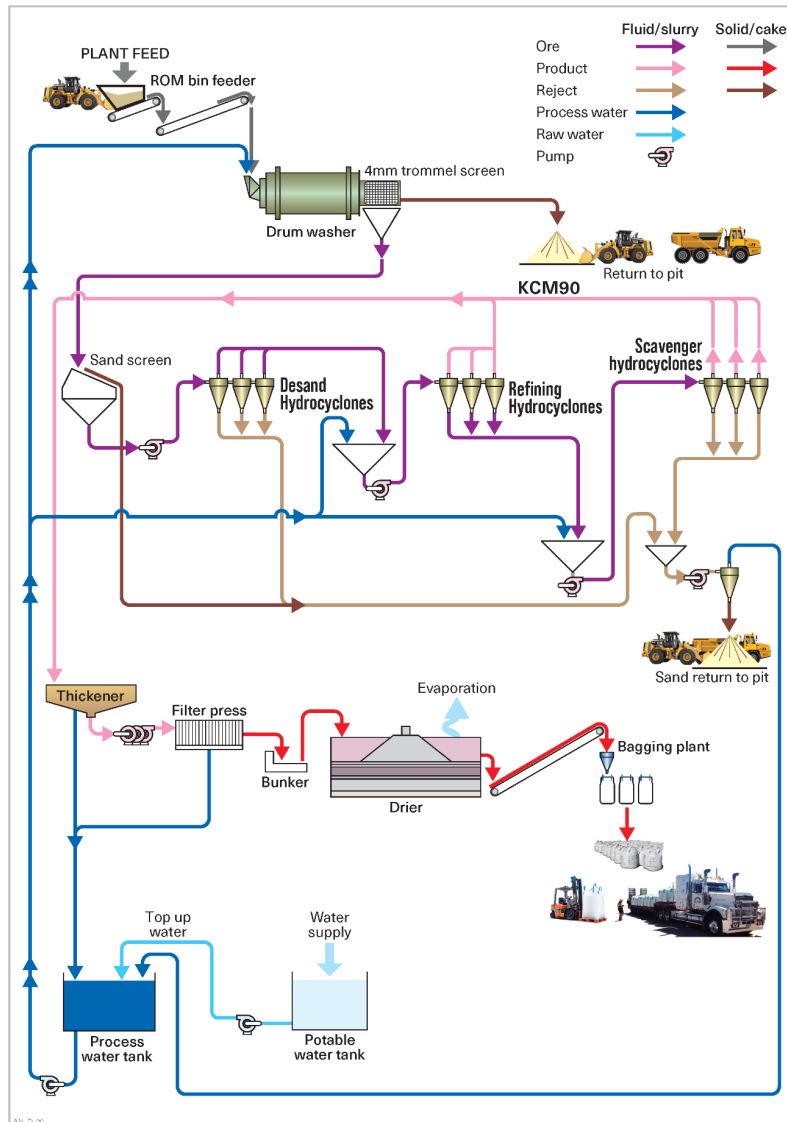
The mined material that represents feed for the processing plant consists of the kaolin clay and coarse sand in roughly equal proportions. The feed material is fed into the processing plant using a front-end loader, and no crushing is required. The goal of the process plant is essentially to separate the sands from the clay material and produce a concentrate.

The concentrating process is a simple washing system that liberates the clay from the sand. Hydrocyclones are then used to further refine the concentrate. The higher-quality products are further refined to meet high-end customer specifications. The final product is dried and packaged for delivery to end-users.

The GWKP deposit has been subjected to significant historical metallurgical testwork which underpins the currently defined process flowsheet in the DFS. The material is not easily separated using normal gravity processes and following testwork including a pilot plant, wet processing has been determined to be the preferred process methodology. This includes the following steps as outlined in the DFS:

- mixing the raw kaolin into a slurry
- adjusting the particle size distribution of the product using hydrocyclones to meet customer specifications
- further reducing the content in the product of coarser-grained minerals and minerals containing deleterious elements such as iron
- drying the kaolin
- bagging the product for distribution and sale to regional and export markets.

Exhibit 12 – Diagram of proposed process plant flow sheet KCM90



Source: Company reports.

The DFS is built around a ‘value-optimisation’ approach which depends on achieving certain product specifications which will be crucial to attain in order to meet the requirements of potential off-takers. The mine schedule is predicated on ensuring a blended feed material on this basis with key specifications including:

- brightness (as defined by iron content and other impurities which are deleterious to the end product)
- halloysite grade
- minus 45µm (micrometre) yield.

As such, while the processing is relatively simple, the front-end blending is where a strong operational performance will be crucial to ensuring that the project value is optimised via achieving product specifications and by extension price and margins.

## Resources and Reserves

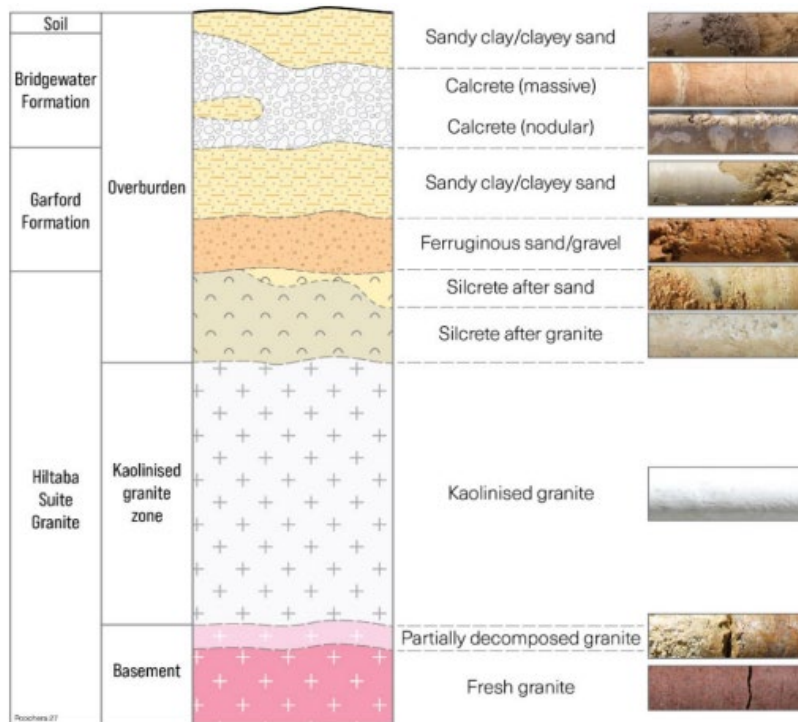
The GWKP project development plan is based on a single deposit which contains a total Ore Reserve of 15.1mt. The deposit has been sub-categorised into two separate feed materials which have characteristics suited to the production of different end materials. However, the Great White CRM Feed represents most of the feed (13.7mt of the 15.1mt total: see Exhibit 13).

Exhibit 13 – GWKP Mineral Resources

Class	Mt	PSD -45 µm (%)	Kaolinite (%)	Halloysite (%)
Measured	5.7	50.2	39.5	6.9
Indicated	14.2	51.1	42.0	5.0
Measured + Indicated	20	50.8	41.3	5.6
Inferred	14.7	49.3	40.3	4.9
<b>Total</b>	<b>34.6</b>	<b>50.2</b>	<b>40.9</b>	<b>5.3</b>

Source: Company reports.

Exhibit 14 – GWKP Formation



Source: Company reports.



## Exhibit 15 – Ore Reserve – GWKP

Ore Feed Category	Reserve Category	Tonnes	Yield		Halloysite	Brightness (R457)	Fe2O3
			Great White PRM	Great White CRM			
		(Mt)	(% of whole rock)		(% in -45 µm fraction)		
Great White PRM Feed	Proved	0.4	27	18	3	87	0.3
	Probable	1.1	24	16	1	87	0.3
	Subtotal	1.5	25	17	2	87	0.3
Great White CRM Feed (Great White KCM & Great White HRM)	Proved	4.8	-	45	15	84	0.5
	Probable	8.9	-	46	11	83	0.5
	Subtotal	13.7	-	46	12	83	0.5
<b>Total</b>		15.1	-	-	-	84	0.5

Source: Company reports.

### Mine Life Utilises 99% of Ore Reserve

The production target incorporated in the project scenario defined in the DFS (28-year operation life) utilises 99% of this Ore Reserve with an additional 1% of material coming from Inferred Resources. The very low reliance of the mine plan on Mineral Resources outside the Ore Reserves is a strong indication of the detailed knowledge which has been established about the deposit and provides a high degree of certainty underpinning the currently defined project parameters.

## ADN's Other Projects – A Quick Snapshot

The key to ADN's value is the GWKP and the company is focused solely on the development and growth of the project in the short-medium term.

ADN has a number of other projects covering kaolin and other metals which give the company some longer term options. Below in Exhibit 15 we give a brief summary of the portfolio.

Exhibit 16 – ADN Project Portfolio

Asset	Location	Equity interest and JV partner	Status
<b>Great White Kaolin Project</b>	South Australia	100%	DFS, Offtake agreements in place, Funding process in place, production 2023
<b>Eyre Kaolin Project</b>	South Australia	Earning 80%	The Eyre Kaolin Project is comprised of four exploration tenements totaling 2,799km <sup>2</sup> on the Western Eyre Peninsula, South Australia in close proximity to the existing Great White Kaolin Project. Andromeda can earn up to 80% interest in the tenements through sole-funding expenditure of \$2.75 million over six years from the commencement of the Joint Venture
<b>Mt Hope Kaolin Project</b>	South Australia	100%	18mt inferred resource, Infill drilling targeting the thicker, kaolinised weathered gneiss at the southern half of the Mount Hope resource was completed. Results from the drilling will inform an updated Mineral Resource Estimate.
<b>Camel Lake Halloysite</b>	South Australia	TBA	Identified in the 1970s, the Camel Lake halloysite has long been of interest in the industrial minerals field. The clay is close to 100% halloysite. Andromeda representatives have met with Maralinga Tjarutja representatives at Camel Lake and begun to discuss terms of a land access agreement
<b>Moonta Copper</b>	South Australia	100% (Enviro Copper earning)	Resource of 66.1mt@0.17% for 114kt Cu, Assessing 100% owned tenements, reviewing potential
<b>Wudinna Gold</b>	South Australia	Cobra Resources earning 75%	Resource of 211koz Au, drilling programmes to advance gold, IOCG and rare earth targets
<b>Drummond Gold</b>	Queensland	100%	Negotiating with interested parties

Source: Company reports.

## Kaolin: What it Is?

### What Is Kaolin?

Kaolin is a white industrial clay consisting of the mineral kaolinite. Whiteness, brightness, opacity, electrical resistivity, low abrasion, high purity, consistency, and fine particle size are all qualities customers desire in high quality kaolin.

Kaolin is used as a filler, additive, and pigment in a variety of industries.

The total market for kaolin is approximately 30 million tonnes per annum with a wide array of kaolin products offered including unprocessed ore, with a variety of end-use markets. Within the broad end-use markets, there is significant spread in pricing based on the specific requirements of each application.

All kaolin resources are different, customers that have developed a 'recipe' for kaolin tend to stick to the same method and tend to not change from one kaolin product to another.

Kaolins are produced in three basic forms:

#### Hydrous

Hydrous kaolin is characterized by its fine particle size, plate-like or lamellar particle shape, and chemical inertness. All naturally formed kaolins, no matter the final form, start by being in the hydrous state (Halloysite kaolin is a relatively rare form of kaolin, which has a significant halloysite (kaolin nanotube) content that is highly desirable in some applications where it attracts a premium price).

#### Meta-kaolin

Metakaolin is derived from hydrous kaolin by applying temperatures of 750 - 800C in a calcination process, which drives away the bound water to give a loosely crystalline reactive material that is mainly used in the polymer and construction sectors.

#### Fully calcined

Calcined kaolin is derived from hydrous kaolin by a high temperature (1000 - 1100°C) calcination process, which drives away the bound water and turns it into an amorphous material with a fused structure. This product is mainly used in the paper, ceramics, polymer, and coatings sectors.

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#### Exhibit 17 – Kaolin Refined Product

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Source: Andromeda

## The Kaolin Market: Growing Portfolio of Uses and Expanding Markets

### Drivers from paper to building materials to pharmaceuticals all contribute

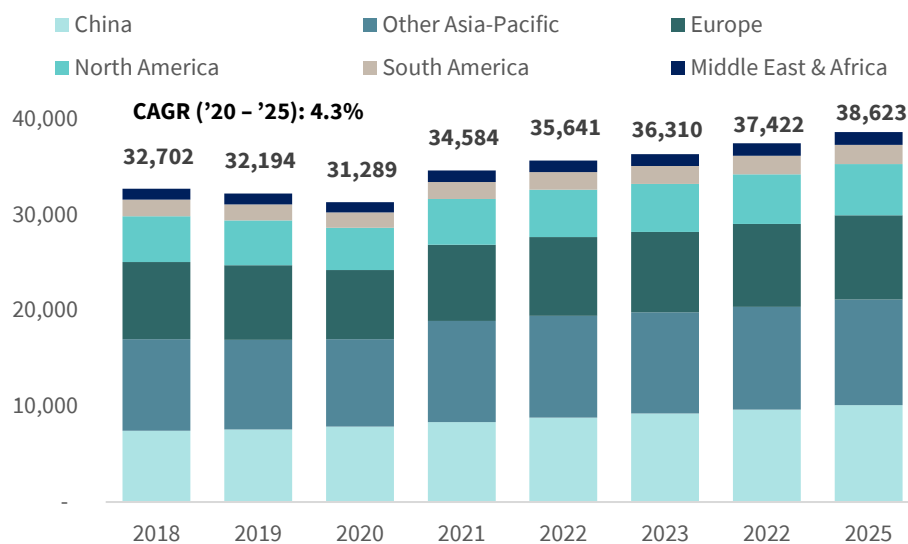
The increased demand for kaolin from end-use sectors such as paper, ceramics and sanitaryware, and coatings is driving overall market demand upwards. Paper demand has increased primarily due to increased e-commerce activity. The ceramics, coatings, fibreglass and plastics markets are driven by strong demand in the building sector of densely populated nations with increasing urbanisation rates such as India and China, as well as high demand in mature markets like Europe and North America where real-estate churn and economic growth are robust. In pharmaceutical and cosmetics goods, high-quality kaolin is utilised as an inert filler and active ingredient and these markets command some of the highest prices. The ceramics sector has shown the strongest growth for kaolin use in recent years and has just surpassed paper as the biggest application for the first time ever.

New uses for Kaolin are also being examined including nanotechnology and High Purity Alumina (HPA)

### Global demand growth looks strong, driven by China, ceramics and paper

The outlook for global demand growth for kaolin between 2020 and 2025 is 4.3% CAGR (in tonnes terms) (see Exhibit 18), adding 7.3 million tonnes to the market over this period. In 2021, the ceramics industry was estimated to account for 33% of the global market for kaolin, closely followed by the paper sector with 31%. China is expected to lead 2020–2025 global growth for kaolin, closely followed by the Middle East and Africa, albeit off a significantly smaller base. The mature economies of Europe and North America are expected to see robust growth on the back of strong consumer and business activity.

Exhibit 18 – Global kaolin demand by region, 2018–2025



Source: ADN

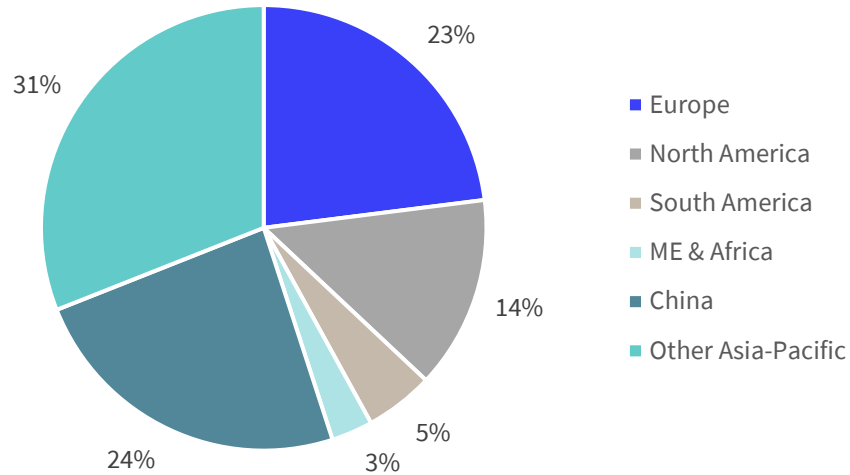
### A Closer Look at Growing Demand – Global CAGR of 5.5% (is US\$ terms)

#### Demand by region: Asia-Pacific region leads global demand, with China the key

The kaolin market is estimated at US\$3.1 bn in 2020 and is projected to reach US\$4.1 bn by 2025 (a CAGR of 5.5%). Asia Pacific accounted for the largest share of the overall market. At a country level, China dominates, accounting for 24% of global demand.

Increased demand within Asia Pacific is attributed to its fast growth resulting from industrial development and improving economic conditions, as well as the availability of kaolin reserves within the region.

Exhibit 19 – Kaolin demand by region: market size (US\$m) 2021



Source: Markets and Markets, Kaolin Market Global Forecasts.

**A bit more detail on China Demand:** Given its proximity to the largest market for kaolin, and a decreasing domestic supply in terms of volume and quality, ADN is very well positioned to provide high-quality kaolin in the Chinese market.

China’s middle class has tremendous purchasing power, demanding a wide array of goods and services containing kaolin. Dislocation of manufacturing from mature economies to China has slowed in recent years, but China is expected to remain one of the largest global manufacturing hubs for the foreseeable future.

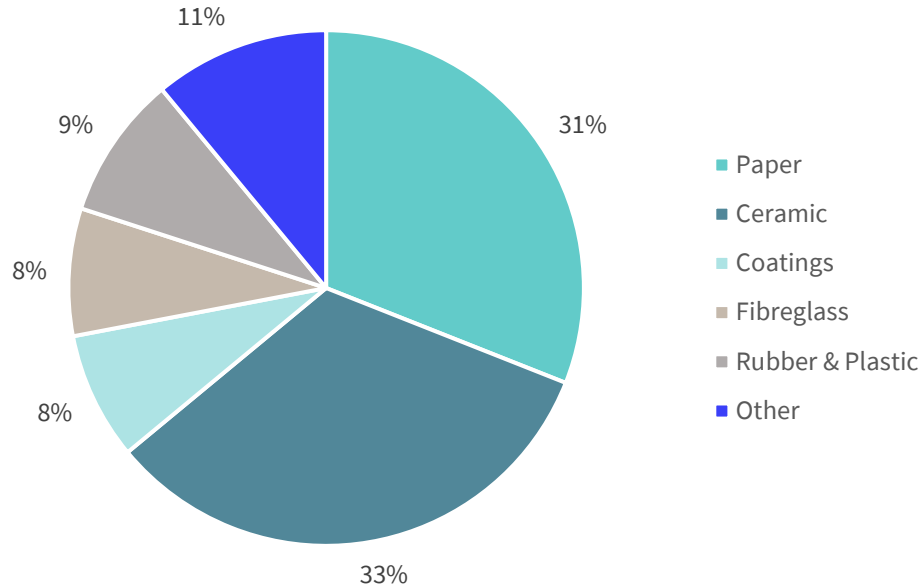
Industry consultant TZMI has performed an in-depth study of the Chinese kaolin market and considers it is significantly larger than has previously been reported. A significant supply deficit has been unfolding since 2019. In 2021, TZMI estimates 1.56m tonnes of kaolin were imported into China, a near 15% CAGR from 2017. While demand growth is expected to be strong, domestic sources are limited and product quality tends towards the lower end of the market.

TZMI has identified the aggregate total addressable Chinese market for ADN’s kaolin products to be approximately 1.6m tonnes in 2021. By 2025, TZMI estimates China will require an additional 1.3m tonnes of imported high-quality kaolin.

### Demand by sector: growth fuelled by paper, ceramics, paints industries

The kaolin market is projected to reach 38.6mt by 2025, growing at a CAGR of 4.3% (2020–2025). This growth will be primarily driven by rising demand from end-use industries including paper, ceramics & sanitaryware, and paints & coatings.

Exhibit 20 – Paper segment leads kaolin demand: kaolin market breakdown, 2021



Source: ADN

**Paper:** Demand for paper packaging has been fuelled by increased e-commerce activities. The paper segment accounted for the largest share of 37.6% of the kaolin market in 2019. The growth of this segment can be attributed to the high demand for paper board and paper packaging in e-commerce activities across the globe. The increasing demand for paper in print media in emerging countries in the Asia-Pacific region is driving the growth of the paper industry. The rise in demand for paper packaging will be offset by the decline in demand for fine paper as businesses continue to rely more heavily on digital resources.

**Ceramics and sanitaryware:** High demand for ceramic tiles in the construction sector of highly populated and emerging economies such as India and China and high demand for ceramics in Europe and North American regions are driving the ceramics and sanitaryware industry. The ceramics, coatings, fibreglass and plastics markets are driven by strong demand in the building sector of densely populated nations with increasing urbanisation rates such as India and China, as well as high demand in mature markets like Europe and North America where real-estate churn and economic growth is robust. The ceramics and sanitaryware segment is projected to grow at the highest CAGR during the forecast period. Kaolin is used in bricks, tiles, sanitaryware, and tableware.

**Pharmaceuticals:** High-quality kaolin is used in pharmaceutical products and cosmetics goods as an inert filler and active ingredient, and these markets command some of the highest prices. The spread of COVID-19 has fuelled the demand for medicines and other pharmaceutical products, which is expected to drive the growth of kaolin in the healthcare industry during the forecast period.



**Coatings:** Kaolin is used in the paints and coatings industry as a functional filler and extender. Relative to other components in the formulation, it is inexpensive but for kaolin producers it is seen as a highly profitable sector. Kaolin provides the following benefits to coatings: cost savings; brightness; durability; opacity (mainly calcined kaolin); viscosity control and spreading properties; chemical and heat resistance; and good suspension (non-settling) properties. High quality kaolin demand is expected to increase with its intensity of use in many paint products, offsetting some of the much higher cost of titanium dioxide, the primary opacifier used in paint manufacture. The Great White PRM™ paint grade is shown in comparison to market leading competitive products in Table 18.

**Catalysts:** The largest use of kaolin in catalyst substrates is the catalytic cracking of petroleum where halloysite content is especially valued due to its effectiveness. Kaolin is also used to synthesis zeolite and as a source of alumina.

**Fibreglass:** Kaolin is used as a filler in fibreglass to reinforce the fibres embedded in the material, hence providing the essential strength and longevity. The fibreglass market has seen strong growth from applications in wind power, new energy, electronic appliances, and the transportation sectors.

**Rubber & Plastics:** Hydrous kaolin is used to increase the tensile strength, abrasion resistance and modulus of rubber composites as well as improving processing and reducing cost. Kaolin elastomer applications include the manufacture of footwear, conveyor belts, rubber seals, flooring, cables and tyres. Kaolin works as a rheological modifier and functional filler in many polymers. Among its numerous uses metakaolin is added to PVC cables. Surface treated calcined kaolin is a common addition used in the production of vehicle components made of engineering thermoplastics.

## New Markets – Nano Technology and High Purity Alumina

### Nano Technology and Kaolin – ADN Invested in Research

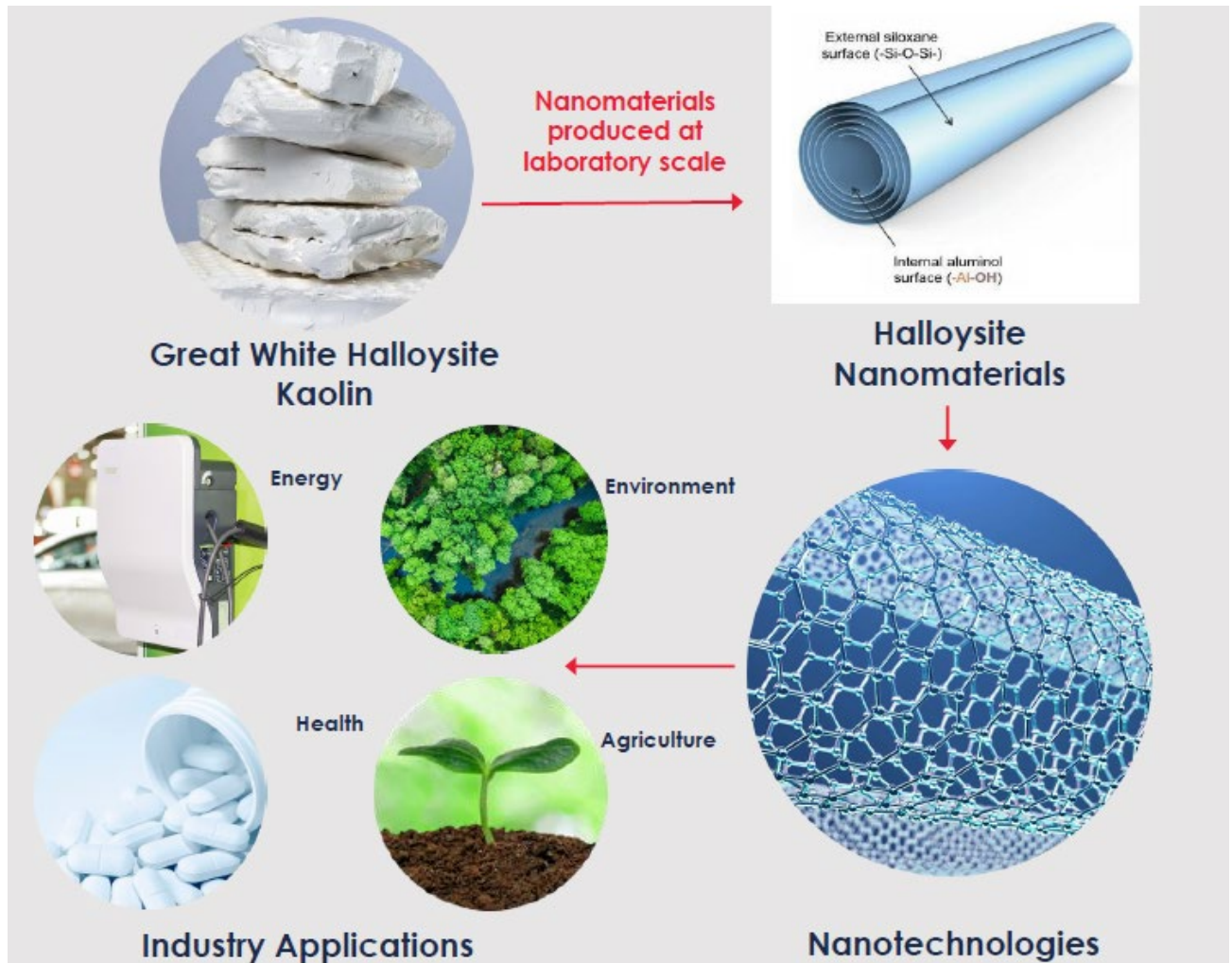
The tubular halloysite formations are also suited to uses in nanotechnology, which may drive the advancement of many leading environmental technologies (such as carbon capture and conversion).

The field of Halloysite Nanotube Technology (HNT) has been growing with new applications creating a demand for these microscopic materials. Andromeda's 100% owned subsidiary Natural Nanotech Pty Ltd is investing in this research, in partnership with the University of Newcastle's Global Innovative Centre for Advanced Nanomaterials

Halloysite-kaolin can be used to manufacture nanocarbon material as a low cost and more effective replacement for carbon nanotubes in high-tech applications such as hydrogen storage, water purification, carbon capture, soil remediation and renewable energy. The unique halloysite nanotube component surface structure and chemistry can also be functionalised to give excellent performance in many nanotechnological applications.

Research into new applications for halloysite-kaolin includes in essential products in healthcare, agriculture (slow-release fertiliser), and construction industries. Its use assists in the delivery of targeted drugs for cancer, improved properties for implants in dentistry and orthopaedics, and the control of pests on food crops.

Exhibit 21 – Nano materials – Potential Uses for GWKP Kaolin



Source: ADN

### High Purity Alumina and Kaolin

High-Purity Alumina (HPA) is a high-purity form of aluminium oxide (Al<sub>2</sub>O<sub>3</sub>). It is a bright and non-metallurgical alumina product is non-corrosive

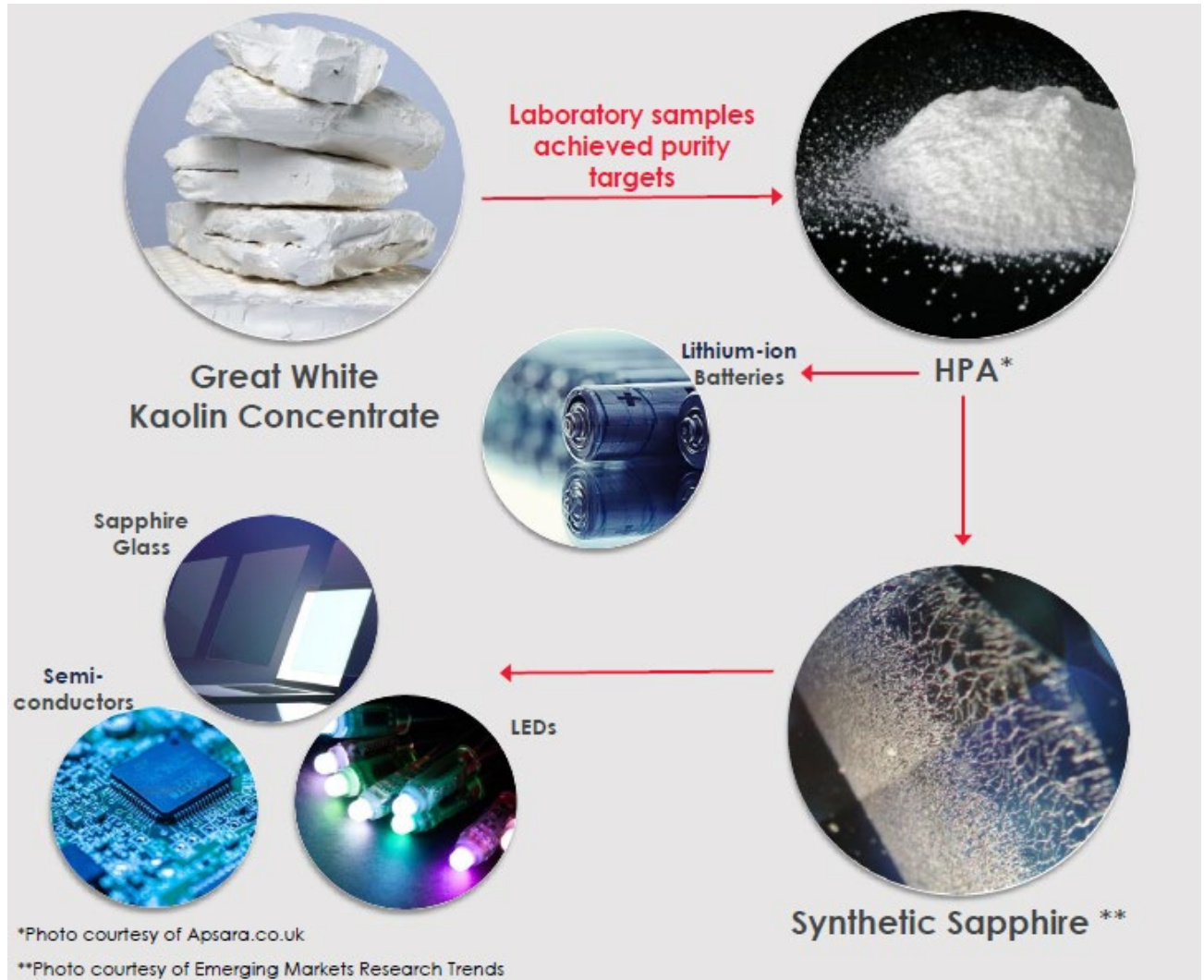
This high-value product has extensive applications in manufacturing artificial sapphire substrates, Light-emitting diode (LED) lights, semiconductor wafers, ceramics, phosphors, synthetic gemstones, smartphone components, and glass for wristwatches, optical windows and televisions. It is important to note that there is no substitute material for HPA in the manufacture of synthetic sapphire.

Increasingly, HPA is seeing strong demand for use in lithium-ion (Li-ion) batteries, where it is used as a coating on the ceramic cathodic separator sheets.

Potential for the recovery of HPA from GWKP concentrate is being researched by Andromeda and would add a high margin product to the GWKP product suite.

A patent application was made in July 2022 for a novel manufacturing process for HPA and Smelter Grade Alumina (SGA) using kaolin as a feed material.

Exhibit 22 – HPA – Potential Uses for GWKP Kaolin



Source: ADN

## A Closer Look at Supply – Producers and Competitive Landscape

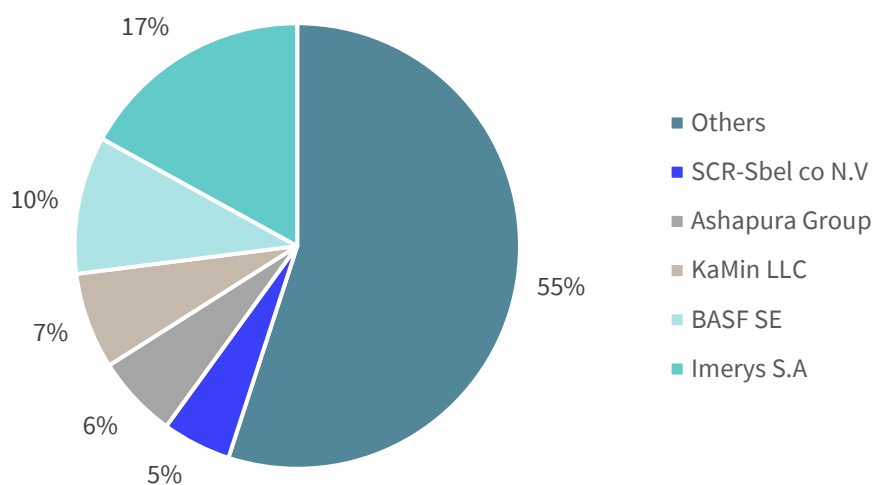
### International producers

The kaolin market is fragmented, owing to the presence of established and several regional and domestic players. Many small and large companies are engaged in the exploration and mining of kaolin. Consumers of lower quality kaolin can select from a variety of alternatives. Kaolin buyers can select a product based on its price, type/grade, and mechanical/physical attributes that are appropriate for the product they are manufacturing.

However, in the market for consistent high quality kaolin the options are significantly reduced. Kaolin processing and value adding require technical expertise. Several companies collaborate to explore, mine, and process kaolin into a final product, which is further used by several end-use industries.

Imerys (France), BASF (Germany), Ashapura Group (India), SCR-Sibelco (Belgium), and KaMin (US) lead in the market and are recognised as the visionary leaders in this industry (see Exhibit 20 for market share breakdown).

Exhibit 23 – Market share of key kaolin market players, 2019



Note: Some of the major kaolin companies included in 'Others' are: EICL (India), Thiele Kaolin (US), LASSELSBERGER (Hungary), Quarzwerke (Germany), Sedlecký kaolin (Czech Republic), 20 Microns (India), Shree Ram (India), KERAMOST (Czech Republic), Uma Group of Kaolin (India), Jiangxi Sincere Mineral Industry (China), Active Minerals International (US), Burgess Pigment (US), Kaolin (Malaysia), Kerala Clays & Ceramic Products (India), Mota Ceramic Solutions (Portugal), Manek Group (India). Proscor Resources (Ukraine) has ceased production as a result of the conflict with Russia.  
Source: Press MarketsandMarkets, MST Access.

## ASX-Listed Companies with Kaolin Strategies

There are a number of Kaolin focused companies listed on the ASX. We give a summary of them below. The differing strategies of the companies mean that they are not perfectly comparable to ADN but show that there are some other players in the local market.

ADN's key attributes are its large resource located in a tier 1 mining jurisdiction and the advance stage (DFS level).

### Suvo Strategic Minerals Limited (SUV.AX) - \$31m Market Cap

An Australian hydrous kaolin producer and exploration company focused on the production and expansion of its 100%-owned hydrous kaolin operations located in Pittong, Victoria. In WA, it has a kaolin resource at Gabbin for which it has started a pre-feasibility study, as well as two silica assets at the scoping and concept study stages of development at Eneabba and Muchea.

### Altech Chemicals (ATC.AX) - \$129m Market Cap

A speciality alumina technology and production company that has finalised Stage 1 and Stage 2 construction of its high-purity alumina plant in Johor Malaysia. Altech aims to become one of the world's leading suppliers of 99.9% high-purity alumina. Feedstock for the plant will be sourced from the company's 100%-owned near-surface kaolin deposit in Meckering, WA and then shipped to Malaysia. The company is also researching and developing its downstream alumina coating technology used to improve the battery life and performance of lithium-ion batteries. Altech's alumina coating technology is successful on both silicon and graphite particles, typical of those used in the anode of lithium-ion batteries, particularly with the expanding electric vehicle industry. In addition, Altech has a PFS underway for the construction of a high-purity alumina battery materials coating plant in Saxony, Germany. The PFS is being undertaken by Altech's 75% owned German subsidiary, Altech Industries Germany (AIG).

### Latin Resources (LRS.AX) - \$92m Market Cap

An Australian-based mineral exploration company, with projects in Australia and South America, that is developing mineral projects in commodities that progress global efforts towards net zero emissions. The Australian projects include the Cloud Nine Halloysite-Kaolin Deposit. Cloud Nine Halloysite is being tested to identify and refine halloysite usage in emissions reduction, specifically for the reduction in methane emissions from cattle. The Cloud Nine Halloysite-Kaolin Deposit contains a large JORC-2012 compliant Mineral Resources of 207Mt of kaolin and halloysite. In Latin America, the company's focus is on its two lithium projects: the Salinas Lithium Project (in the state of Minas Gerais, Brazil) and the Catamarca Lithium Project (Argentina). Lithium is highly sought after as a critical mineral for electric vehicles and battery storage.

### PepinNini Minerals (PNN.AX) - \$25m Market Cap

A diversified exploration company focused on developing and discovering major new mineral deposits. The company has secured strategically located exploration tenements in Australia and Argentina with a focus on lithium in Argentina and nickel-copper in Australia. PNN acquired Hillside Minerals in April 2021, and work is underway on two key projects in the Eyre Peninsula in South Australia that focused on kaolin production. The acquisition transfers the company two exploration licence applications (ELA 2020/210 and ELA 2020/175) covering 1,129km<sup>2</sup> on the Eyre Peninsula in South Australia. Both ELAs have recorded occurrences of kaolin clay, and both are located directly adjacent to ADN's kaolin and halloysite projects.

**Source: Company Websites and Reports**



## Valuation: A Very Long-Life Project; Exposure to Industrial Minerals and Potential Project and Portfolio Optionality

We believe ADN's share price is currently trading at a substantial discount to fair value for the company based on our assessment of fundamental value of the GWKP, as well as the broader portfolio optionality in the ADN pipeline. The commercialisation of these projects has all the more potential based on the construction of GWKP, which will provide cash flow to reinvest in the most prospective projects over time.

### Valuation Summary: Our Analysis Suggests Strong Upside

Exhibit 24 – Base-case valuation summary

NPV OF PROJECTS	A\$M	EQUITY VALUE A\$/SHARE FULLY DILUTED	Valuation Methodology
Great White Kaolin Project	624	0.18	Risked Project NPV
Exploration and Investments	30	0.01	MST Estimate
<b>ENTERPRISE NPV</b>	<b>654</b>	<b>0.19</b>	
Add: Cash	36	0.01	MST Estimate
<b>EQUITY VALUE PRE SG&amp;A</b>	<b>690</b>	<b>0.20</b>	
SG&A	(25)	(0.01)	NPV of Corporate Costs
<b>EQUITY VALUE</b>	<b>665</b>	<b>0.19</b>	

Source: MST Access.

#### Base-case valuation – risked NPV of A\$0.19/share, fully diluted

GWKP has a substantial Ore Reserve capable of supporting a very long 28-year operation life based on the production rates defined under the DFS. With such a long operation life, further exploration upside, which would provide added Ore Reserve inventory and incremental operation life, would also marginally boost the valuation given the long-dated nature of those incremental cash flows. However, should market conditions support it, the current production profile could be brought forward, and an expanded operation could provide significant valuation upside.

We have applied a 100% risk-weighting to the project given the advanced stage of the development pending a financing solution and FID.

Given the importance and focus on the GWKP we have not performed a detailed valuation on the other assets in the portfolio and have simply applied a nominal value of A\$30m.



## Key assumptions to our NPV valuation

Our base-case NPV valuation is built upon a mine plan which aligns with that compiled by the technical experts under the recently published DFS. The key headline metrics are shown in Exhibit 25.

We have used a 10% discount rate and an escalated weighted average kaolin product price of US\$480 (A\$686)/dmt. We assume a project timeline which commences construction in late CY2022 and achieves first production in 1HFY24 after a construction period of approximately 18 months. We regard this timeline as reasonable given the location of the project and our knowledge of other mining projects in development.

We assume the initial project capital expenditure will be funded by a blend of 80% debt and 20% equity (at 10c issue price) with the following stages of capex to be funded via internally generated cash flows or additional debt facilities as required.

Our valuation does not incorporate the benefit of any additional project expansions (beyond that which is defined in the DFS) or exploration success which may increase the scale of such expansions or extend the operation life.

Our valuation assumes that ADN will pay tax from the first year of production. ADN have disclosed that they are currently reviewing the availability and useability of our carried forward tax losses. The quantum of the tax losses have not been disclosed by ADN as to this point that are not considered to be usable for tax purposes. This situation may change as the company brings GWKP into production.

We have also included shipping costs as per the DFS, which we consider to be high relative to normalised shipping costs and consider there to be upside to the valuation when shipping costs do return to more normalised levels.

### Exhibit 25 – DFS assumptions vs. key assumptions underpinning our base-case valuation

Assumptions	DFS	MST
<b>PROJECT ASSUMPTIONS</b>		
Project Ownership (%)	100%	100%
Strip Ratio (waste : ore)	2.3:1	2.3:1
Processing Plant Throughput (dmt, years 1-5)	300,000	300,000
Processing Plant Throughput (dmt, years 6-28)	600,000	600,000
Stage 1 Capex (A\$m, real)	94	103
Stage 2 Capex (A\$m, real)	11	12
Stage 3 Capex (A\$m, real)	74	81
Stage 4 Capex (A\$m, real)	54	60
Mine Life (years)	28	28
Final Product Sold (kdmt, life-of-mine)	7,204	7,296
Average Annual Product Sold (kdmt, life-of-mine)	257	261
Ore Reserve (mt)	15.1	15.1
<b>COST &amp; FINANCING ASSUMPTIONS</b>		
Discount Rate (%)	8.0%	10.0%
Inflation Rate (%)	0.0%	2.5%
Capital Cost, Stages 1-4 (A\$m, real)	167	181
Operating Costs (A\$/t feed, real)	159	159
AISC (A\$/dmt product sold, real)	340	346
Pre-Tax NPV (A\$m)	613	1,012
Post-Tax NPV (A\$m)	n/a	624
<b>PRICING &amp; EXCHANGE RATE ASSUMPTIONS</b>		
AUDUSD	0.74	0.70
Weighted Average Product Sale Price (A\$/dmt)	653	686
Royalty Rate (%)	3.5%	3.5%
Corporate Tax Rate (%)	30.0%	30.0%

Source: MST Access, ADN.

## Capital expenditure profile

The DFS provided a detailed breakdown of capital expenditure forecasts by Stage (1–4) as well as the various components including contingency and sustaining capex.

Exhibit 26 – Capital cost estimates for the GWKP

Capital Costs	Stage One	Stage Two	Stage Three	Stage Four
	AUD million			
Approvals, Design, & Construction	75.87	10.16	66.42	19.49
Operations Readiness	4.43	0.32	1.19	7.15
Mine Development	2.19	0.00	0.00	0.00
Rehabilitation	5.50	0.00	2.50	0.00
Sales and Marketing	0.34	0.00	0.00	0.00
<b>Total (excluding contingency and sustaining capital)</b>	<b>88.33</b>	<b>10.48</b>	<b>70.11</b>	<b>26.64</b>
Contingency	5.46	0.55	3.72	1.69
Sustaining Capital	0.00	0.00	0.00	26.01
<b>Total Capital Expenditure</b>	<b>93.79</b>	<b>11.03</b>	<b>73.83</b>	<b>54.34</b>

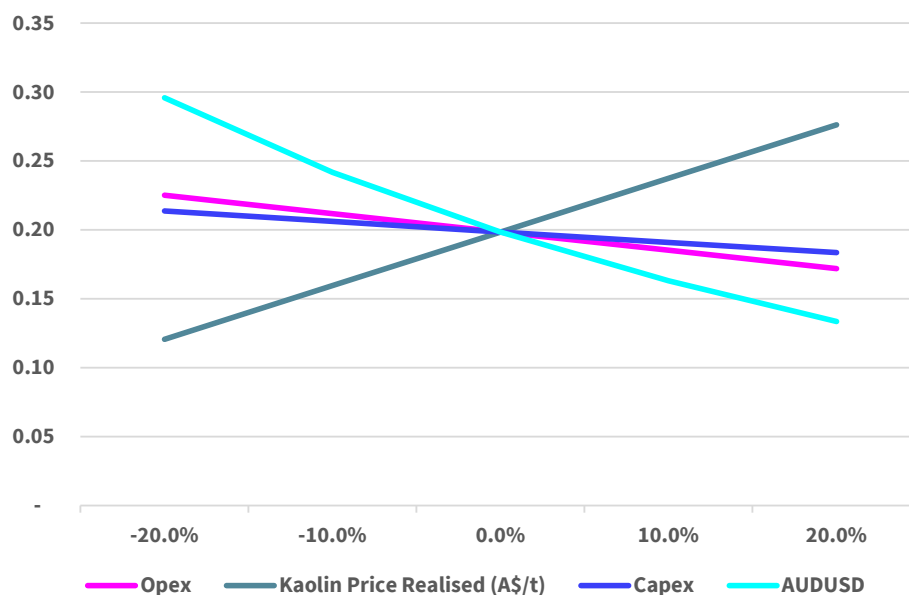
Source: ADN.

We have reviewed these capital expenditure estimates and note that, although we are in an inflationary environment, the published DFS estimates are recent. Overall we believe the estimates are reasonable; however, to be conservative, we have included a 10% escalation factor within our financial modelling.

## Key sensitivities

Our valuation is most sensitive to assumptions about the realised kaolin price and the AUD/USD exchange rate, as well as (to a lesser extent) capital and operating costs. Exhibit 27 shows how our base-case valuation would change from a variation in these assumptions.

Exhibit 27 – Sensitivity analysis to key financial modelling assumptions



Source: MST Access.

## Positive Catalysts for the Share Price and Valuation

### Binding offtake agreement

Any binding offtake agreements with firm visibility on volumes and prices would be a significant de-risking catalyst for the project.

### Funding of project

The funding of capital expenditure relating to major resource developments for small companies is always a major challenge and uncertainty. Delivery of a competitive funding package for the project would be a major de-risking catalyst for the stock.

### Further DFS optimisation

Any optimised DFS results that are in line with or better than expectations would be significant, providing investors with a clear understanding of the key project parameters and the underlying value of the project.

### Early project delivery

The early commencement of any of the projects would generate cash flows sooner and would reflect positively on management, which would likely boost the valuation.

### Resource development

Exploration success which leads to significant upside in available tonnes of ore, or significant discoveries at other key assets, would be a significant positive development for the prospects of the project and the overall company valuation.

### Further exploration success

We see significant potential for further exploration success, particularly across the broader project portfolio. Any material success would be positive for the stock.

### Joint venture agreements

JV agreements with large well-funded partners with specialist expertise in certain areas could add significant value to the portfolio of assets and substantially de-risk the development horizon.

### Price increases

The valuation is sensitive to the underlying kaolin price. Price increases would have a positive effect on the valuation and share price.

### Capital cost and/or operational cost savings

Capital and operational cost savings would benefit the valuation and would reflect positively on management.

## Risks to the Share Price and Valuation

### Balanced with Favourable Project Dynamics and Capable Company Leadership

We highlight the key risks to the share price and our valuation below, noting that early-stage mining projects have a number of key risks which need careful management and consideration.

#### Macro risks

- Approvals processes – the mining lease is in hand, but some secondary approvals are required
- Kaolin price decreases – this is the key valuation sensitivity
- Foreign exchange rates

#### Country-specific risks

Given the project is in South Australia and the mining lease has already been secured from the State Government of South Australia we regard these risks as low. However, ensuring the local community is supportive of the project is crucial given the coastal location. We also note there are no Native Title issues at site.

#### Company and project-specific risks

- **Offtake Risks:** Any binding offtake agreements with firm visibility on volumes and prices would be a significant de-risking catalyst for the project, lack of progress or failure to sign offtake agreements presents major risk to the project.
- **Delays to development:** the DFS is a major milestone for the company as it demonstrates the broad economics of the project. Any delays in moving into construction would be a negative for the stock and would gradually see the information from the DFS become less current and therefore less reliable.
- **Access to funding:** there is no guarantee that sufficient funding will be available to advance or develop the project. The inability to secure funding would be a major negative for the stock.
- **Reserves and resources risk:** the Ore Reserve may not translate into the mine scheduled under the DFS for a range of reasons, including dilution or geological factors.
- **Commercialisation risk:** an inability to commercialise projects, due to a failure to obtain final approvals, secure funding for construction or obtain access to key infrastructure, would undermine the viability of the business and have a negative impact on the share price.
- **Key person dependence:** This refers to individuals including the CEO whose relationships and experience may be critical to the advancement of the project. The loss of key personnel would significantly compromise the ability of the company to advance the project.
- **Cost inflation:** inflation is a significant emerging theme globally at present and is particularly acute with regards to the mining industry where commodity prices are strong, and profitability is healthy for operational projects. Any inflation in operational or capital costs without a corresponding increase in the commodity price will compress margins of the project and potentially undermine the economics and viability of the project.

#### Mitigating factors

The project's location in South Australia close to port and other key infrastructure, as well as the simple shallow nature of the deposit and conventional processing, are all notable tailwinds for the project and provide an offset to the risk inherent to a mining development in general as well as project-specific risks identified for GWKP. These favourable factors provide confidence in the project potential and offset the risk profile by:

- providing certainty around the project timeline (approvals, availability of labour and equipment)
- reducing technical risks given the project's history and access to qualified local mining capability
- minimising political risks given the supportive State Government and local community
- benefiting from infrastructure tailwinds given the project's location close to the South Australian coastline.

## Financials: Funding Process to Unlock GWKP's Potential

With the DFS in hand, the strategic focus for ADN's leadership team now shifts to unlocking the project cashflows by securing the required financing to bring the operation into production. The company has flagged that it will consider a

range of financing options, which include the typical project finance options for large-scale mining operations. These were summarised in the DFS as follows:

- equity
- project finance
- partner finance
- offtake and working capital-related finance
- equipment and contractor finance
- access to government grants.

The DFS estimates the initial capital expenditure required to complete the first phase of the project based on 300kpa ore throughput at A\$94m. Similar mining industry projects typically attract debt funding in the order of 80% of the total pre-production capital requirements. We expect that GWKP will be well positioned to attract debt funding on favourable terms in line with this high-level expectation.

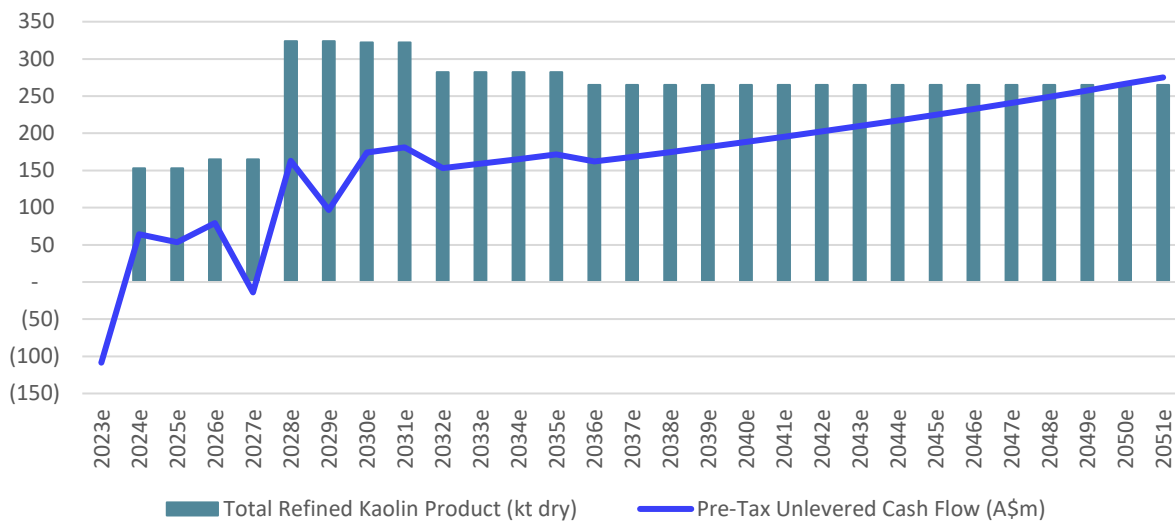
We expect the balance of funding to be secured from an equity raising, which looks achievable in the context of the balance of project funding of ~A\$50m and ADN’s current market capitalisation in excess of A\$230m. We assume the equity funding is raised at a share price of 10¢.

Other potential significant sources of finance could include a sell-down in equity at the project level, customer prepayments as part of offtake negotiations, and equipment finance packages.

Overall, we believe that ADN is well positioned to secure the project finance required to take GWKP into production in the near term. The company has cash in hand of A\$35.5m as at the end of the March quarter, providing ample funding to provide for ongoing corporate expenses and early works while the broader project financing package is secured.

We assume GWKP will commence production in FY24 with the Stage 1 capex incurred in the prior year (FY23).

Exhibit 28 – Production and cash flow



Source: MST Access.

## Environmental, Social and Governance (ESG)

ESG factors play an integral role in many investors' decision-making.

### Environmental

The mining proposal granted in Dec 2021 is for a Mining Lease (ML) and two Miscellaneous Purpose Leases (MPL) for a water pipeline from Streaky Bay Road to the ML and an access road to the ML from Poochera – Port Kenny Road. The second stage of the project's regulatory approvals process is the requirement for a Program for Environment Protection and Rehabilitation (PERP) in respect of the mining tenements to enable operations to commence.

The land on and surrounding the GWKP has traditionally been used by landowners for agricultural activities such as the grazing of sheep. A section of the MPL 164 is held under a Native Vegetation Heritage Agreement pursuant to the Native Vegetation Act 1991 in the name of the Minister for Environment and Water. The project land is zoned as 'rural', and assessment that was done under the Planning and Design Code concluded that the ML 6532 and MPL 163 (water pipeline) and MPL 164 (access road) are envisaged activities for the region.

Extensive environmental impact assessment has been undertaken by independent experts, who have concluded that any environmental impact will be minimal or minor. It is unlikely that the overburden material will generate acid as testing samples have exhibited to be non-acid forming (NAF) or 'low capacity' to release potential or actual acidity.

Modelling for air quality and noise has been undertaken to determine if the project has the potential to create nuisance dust that could have a health impact, as well as to assess the overall expected noise and vibration impacts. The current modelling displays that the air quality is in line with air quality standards throughout each of the project's stages. Furthermore, the noise level is assessed as compliant with the Environment Protection (Noise) Policy 2007. Blasting if required will be designed, adjusted, and monitored in accordance with the appropriate Australian Standards to ensure that the ground vibration and airblast overpressure criteria are achieved.

A Significant Environmental Benefit (SEB) expand will be required to clear the native vegetation which is required to undertake the project. ADN is committed to implementing design and control measures that ensure environmental impacts are reduced as much as reasonably practicable.

### Social

It is predicted that this project will employ 70 people. Employees will be primarily sourced from the local area with training provided to ensure the appropriate skills are obtained and maintained for employment on the project.

ADN will focus on creating and maintain indigenous employment opportunities at the GWKP

### Governance

Stakeholder participation is encouraged, and ADN is committed to effective, ongoing, and transparent consultation with stakeholders who are directly and indirectly impacted by the project.

### ASX Corporate Governance Council Principles and Recommendations

ADN has adopted a comprehensive governance framework in the form of a formal corporate governance charter together with associated policies, protocols and related instruments.

- The company has adopted the ASX Corporate Governance Council Principles and Recommendations, as published by the ASX Corporate Governance Council.
- The board's qualifications are appropriate for the business.
- The board has six members.
- The board has adopted a remuneration structure, risk assessment and policies that are predominantly in line with market practices. The Board has separate risk, nominations, remuneration and audit committees.

## Board of Directors and Key Management

The Board is responsible for the corporate governance of the company, developing strategies for ADN, reviewing strategic objectives and monitoring performance against those activities.



The five members of ADN's Board of Directors have many years of experience in the minerals industry and a strongly complementary range of technical, financial, managerial and directorship skills. We see the Board as appropriate given ADN's size and the skills of the Board, and with 50% of the board being independent the structure satisfies ASX guidelines.

#### Exhibit 29 – Board composition and skill matrix

Board Skill	Ind. Non-Exec Chair	MD	Ops Director	Non-Exec	Ind Non-Exec	Ind Non-Exec
	Mick Wilkes	James Marsh	Joseph Randford	Andrew Shearer	Melissa Holzberger	Austin Perren
Leadership	✓	✓	✓	✓	✓	✓
Strategy	✓	✓	-	✓	-	✓
Financial & Legal	-	-	-	-	✓	✓
Geology	✓	✓	✓	✓	-	-
Project Development	✓	✓	✓	-	-	-
Mining	✓	✓	✓	✓	✓	✓
International Experience	✓	✓	✓	✓	✓	✓
Health, Safety and Environment	✓	✓	✓	✓	✓	-
Stake Holder Management	✓	✓	✓	✓	✓	-
Corporate Governance	✓	✓	-	✓	✓	✓

Source: ADN, MST Access.

**Mick Wilkes – Independent Non-Executive Chair.** Mr Wilkes is an experienced mining executive and company director with more than 35 years of broad international mining experience coupled with a successful track record of leading the development and operation of greenfield mines. From 2011 to 2020, he was President and CEO of dual-listed (ASX and TSX) OceanaGold Corporation (ASX: OCG), where he led its transformation from a single-asset junior company to a multinational mid-tier producer with four operations across three countries. In previous roles he was Executive General Manager of Operations at OZ Minerals responsible for the development of the Prominent Hill copper/gold project in South Australia and General Manager of the Sepon gold/copper project for Oxiana based in Laos. Mr Wilkes is currently a Non-Executive Chair of Kingston Resources Limited (ASX: KSN), Non-Executive Director of Matador Mining Ltd (ASX: MZZ); Non-Executive Director of Dacian Gold Ltd (ASX: DCN); and a member of the Sustainable Minerals Institute's Advisory Board at the University of Queensland. He was previously the Chair of the Governance Committee and a member of the Administration Committee of the World Gold Council.

**James Marsh – Managing Director.** Mr Marsh is a highly qualified kaolin specialist with more than 30 years' industrial minerals experience, including notable, senior technical and marketing roles with two global market leaders. With experience at all levels of the industry from laboratory development through to market listing, Mr Marsh has been instrumental in developing new applications and markets for kaolin around the world. He spent 15 years working as Technical Manager for Imerys Minerals, the world leader in industrial minerals with a focus on kaolin, where he successfully assisted in developing and commercialising several new grades from projects around the world. He then worked for 9 years with Minerals Corporation in Australia as Marketing and Technical Director commercialising kaolin products from Australia and China and setting up a global network for sales and distribution. Mr Marsh then spent 7 years as Business Development Manager for Active Minerals International, a worldwide leader in the production and marketing of kaolin and attapulgite minerals.

**Joseph Ranford - Executive Operations Director.** Mr Ranford is a mining engineer with 25 years' senior management experience across both domestic and international mining companies. He has significant experience bringing mining operations into production within sensitive communities and considerable knowledge of the South Australian mining approval process and stakeholder landscape. Most recently, he held the role as Chief Operating Officer for Nordic Gold Inc., a Canada-based company. Prior to his role at Nordic Gold Inc, Mr Ranford was Operations Manager for Terramin Australia Limited where he managed all operational and technical aspects of the Angas Zinc mine and championed the evaluation and approval processes for the Bird in Hand Gold Project.

**Andrew Shearer - Non-Executive Director; Chair, Remuneration Committee; Chair, Technical Advisory Committee.** Mr Shearer has been involved in the mining and finance industries for 20 years. Coupled with geoscience and finance qualifications, he has experience from exploration through to production. A Non-Executive Director with ADN, Mr Shearer also holds company director positions with Investigator Resources and Resolution Minerals. He has been exposed to the global resources sector covering micro to mid-cap resources stocks; from exploration to producing companies, across a broad suite of commodities. He has held senior roles in the mining and finance industries with Pac Partners, Phillip Capital, Austock, the South Australian Government, Mount Isa Mines and Glengarry Resources.

**Melissa Holzberger - Non-Executive Director; Chair, Audit & Risk Committee.** Ms Holzberger is an experienced director and mining lawyer with over 20 years' experience in the international energy and resources sector. She brings a deep understanding of mining projects and operations, having previously worked with BHP and Rio Tinto. Her substantial experience extends to highly regulated industries, international commodity trade, corporate ethics, risk and compliance oversight, together with a focus on environment, social and governance (ESG) matters. Ms Holzberger is currently an Independent Non-Executive Director of Paladin Energy Ltd (ASX: PDN) and a member of the Federal Government's Australian Radiation Protection and Nuclear Safety Agency's Radiation Health and Safety Advisory Council.

**Austen Perrin - Non-Executive Director**

Austen Perrin is currently a non-executive director with AJ Lucas Group Limited and up until recently a non-executive director for Round Oak Minerals Pty Limited. Austen currently chairs the Audit and Risk Committee for AJ Lucas and previously for Round Oak Minerals Pty Limited. Austen previously worked as a group CFO/Finance Director for large ASX/ NZX Companies for nearly 20 years. He previously held the group CFO roles for the AJ Lucas Group, Whitehaven Coal, Asciano, Pacific National and Toll NZ Limited. Austen has had significant experience in developing capital management strategies and financing solutions to support corporate objectives including development of key infrastructure and transport projects and underground coal mines. He has a breadth of experience gained in a variety of industries including transport and logistics, ports, road and rail infrastructure, coal, copper and gold mining, unconventional shale gas, mining services, oil, gas and water pipeline construction, general building construction and insurance.

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