

MARCH 21, 2023

CORPORATE RELEASE

## Impact Minerals to acquire advanced HPA Project in WA

- Impact to acquire an 80% interest in the Lake Hope Project, an advanced High Purity Alumina (HPA) project located near Hyden, in the Tier One jurisdiction of Western Australia.
- Lake Hope, a dry playa lake, contains a globally unique deposit of extremely fine-grained (<16 microns), very pure, high-grade aluminous clays in the top few metres of the lake bed.
- An Exploration Target for contained HPA alumina ( $\text{Al}_2\text{O}_3$ ) in the top 0.5 m to 1.5 m or so has been calculated from initial drill results of between 2.6 million to 4.7 million tonnes at a grade of between 24.3%  $\text{Al}_2\text{O}_3$  and 26.7%  $\text{Al}_2\text{O}_3$  for a contained 0.63Mt to 1.25Mt of  $\text{Al}_2\text{O}_3$ .  
*Investors should be aware that the potential size and grade of the alumina deposit at Lake Hope are conceptual in nature. Insufficient work has been undertaken to estimate a JORC 2012-compliant Mineral Resource Estimate, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.*
- The deposit remains open at depth and further drilling is in progress.
- The unique geological properties of the Lake Hope deposit allow for a shallow, very low-cost, free-digging operation only a few metres deep and with offsite metallurgical processing at an established industrial site.
- The proposed operation would have a small environmental footprint and low carbon emissions.
- Bench-scale metallurgical test work has produced alpha-HPA on representative material via a disruptive sulphuric acid hydrometallurgical process likely to be cost-competitive with other producers and developers in Australia and globally.
- Impact will focus its immediate activities on the lodgement of a Mining Lease Application by mid-2023. This work includes the definition of a maiden Mineral Resource Estimate, completing a Scoping Study and commencement of a Pre-Feasibility Study to include baseline environmental studies and continuing discussions with the Ngadju First Nations group on their involvement.
- Impact aims to bring Lake Hope into production to deliver high-margin end-products into a rapidly expanding global market with a forecast average price for 4N HPA (99.99%  $\text{Al}_2\text{O}_3$ ) and related products of about US\$20,000 per tonne.
- The work programme will be led by experienced geologist Roland Gotthard who discovered the Lake Hope deposit and pioneered the metallurgical process. He is the major shareholder of Playa One Pty Limited.
- Exploration to continue at Broken Hill under the BHP Xplor programme and the Arkun battery metals project in Western Australia.

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Impact Minerals Limited (ASX: IPT) is pleased to announce that it has signed a binding term sheet with Playa One Pty Ltd, an unrelated private company, to earn an 80% interest in the advanced Lake Hope High Purity Alumina (HPA) Project in Western Australia.

The Project offers Impact the opportunity to be a low-cost entrant into the HPA chemical market, a high-margin business forecast to grow strongly over the next decade.

The Project contains a globally unique deposit of high-grade aluminium clay minerals in the top few metres of a playa lake, which has unique physical and chemical properties that allow for low-cost mining and offsite metallurgical processing via a novel and cost-disruptive acid leaching process. Preliminary economic studies indicate that the production of HPA and related products from Lake Hope will be cost-competitive with current producers and other developers in Australia and globally.

Impact's Managing Director, Dr Mike Jones, said: *"This is a watershed day for Impact Minerals and its shareholders. We believe the Lake Hope project presents an unrivalled opportunity to put the company firmly on the path to low-cost production in the rapidly expanding and high-margin HPA business. Combining a globally unique deposit within the top few metres of a playa salt lake and a straightforward metallurgical process offers a disruptive entry into the HPA space.*

*The deposit was discovered in the past two years by Roland Gotthard, the major shareholder of Playa One, in a classic case of lateral thinking about the nature and source of aluminium-bearing minerals. In addition, he has developed a breakthrough metallurgical process. We had been following Roland's work for some time. We were intrigued enough to contact him and evaluate the project, only to be astounded at what had been discovered and the potential for the project to be a significant contributor to the global HPA market.*

*We are pleased to welcome Roland on board at Impact as Project Manager to lead the company towards production from Lake Hope over the next few years. We believe that the unique properties of the deposit will allow for fast-tracking of the statutory approvals process for both mining and processing, and we aim to lodge a mining lease application by mid-year. We will also be building out our capabilities in metallurgical processing and end-product development to cater for the specialist requirements of the end users of HPA.*

*I believe this to be a transformational acquisition for Impact, and myself, the Board and the entire Impact team are looking forward with great enthusiasm to the challenge that awaits us and ensuring that Impact Minerals is the next "playa" in HPA."*

## Key Terms of the Binding Term Sheet

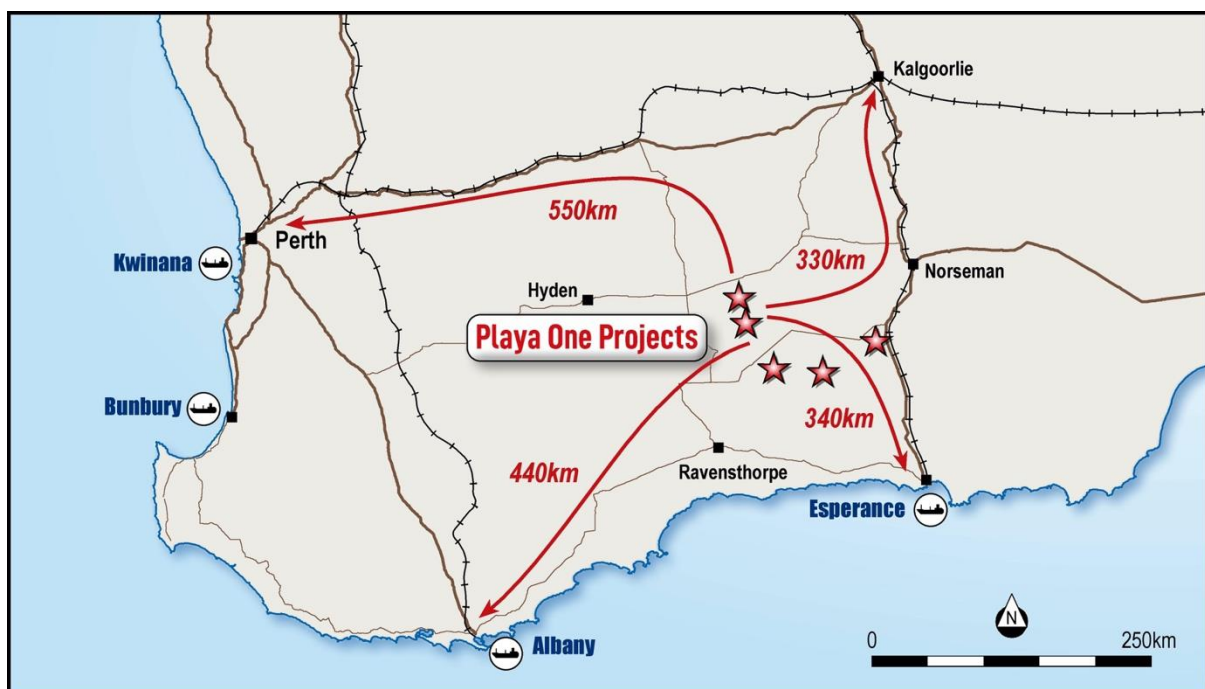
Impact may earn an interest in Playa One Pty Ltd in stages according to the following terms:

1. Impact to make a \$25,000 cash payment for a six-week option to complete due diligence.
2. If satisfied with due diligence, Impact will exercise the option and earn the right to sole fund a Pre-Feasibility Study (PFS) by paying \$175,000 cash, issuing 50 million fully paid ordinary shares (escrowed for 12 months), and issuing 30 million unlisted options exercisable at 1.125c, vesting 12 months from the date of issue and expiring on 1 December 2025, to the shareholders of Playa One.

3. Upon completion of a PFS, Impact can enter an incorporated joint venture with the Playa One shareholders (through an entity representing them, Playa Two Pty Ltd). If so, it will acquire an immediate 80% interest in Playa One by issuing up to 120 million fully paid ordinary shares capped at a maximum value of \$8 million (based on the 5-day VWAP before the election) to the Playa One Shareholders.
4. Upon completion of a Definitive Feasibility Study to be sole-funded by Impact, Impact will issue up to 100 million fully paid ordinary shares capped at a maximum value of \$10 million (based on the 5-day VWAP before the ASX announcement of the completion of the DFS) to the Playa One Shareholders.
5. Playa One shareholders will be free-carried to a Decision to Mine. Impact will maintain all Playa One tenements in good standing during this time.
6. If a Decision to Mine is made, the Playa One Shareholders may contribute to mine development costs or be diluted. If their interest falls below 7.5%, it will convert to a 2% net smelter royalty.

### Project Details

The Lake Hope Project covers numerous prospective salt lakes between Hyden and Norseman in southern Western Australia, a Tier One jurisdiction (Figure 1). It comprises one granted exploration licence (E63/2086), covering the Lake Hope deposit already discovered, together with five further exploration licence applications (ELA63/2317, 2318 and 2319, and ELA74/673 and 764) which are poorly explored. The tenements cover about 238 km<sup>2</sup> and are all 100% owned by Playa One.



**Figure 1.** Location of Playa One tenements with options for trucking and off-site processing.

## Geology

The salt lakes of Western Australia are well known for their unique and complex hydrogeochemistry, which has led to the formation of a wide variety of economic minerals and brines within the playa systems. These include the world-class Yeelirrie uranium deposit (>100 Mlb  $U_3O_8$ ), significant resources of potash brines, gypsum and lime-sand.

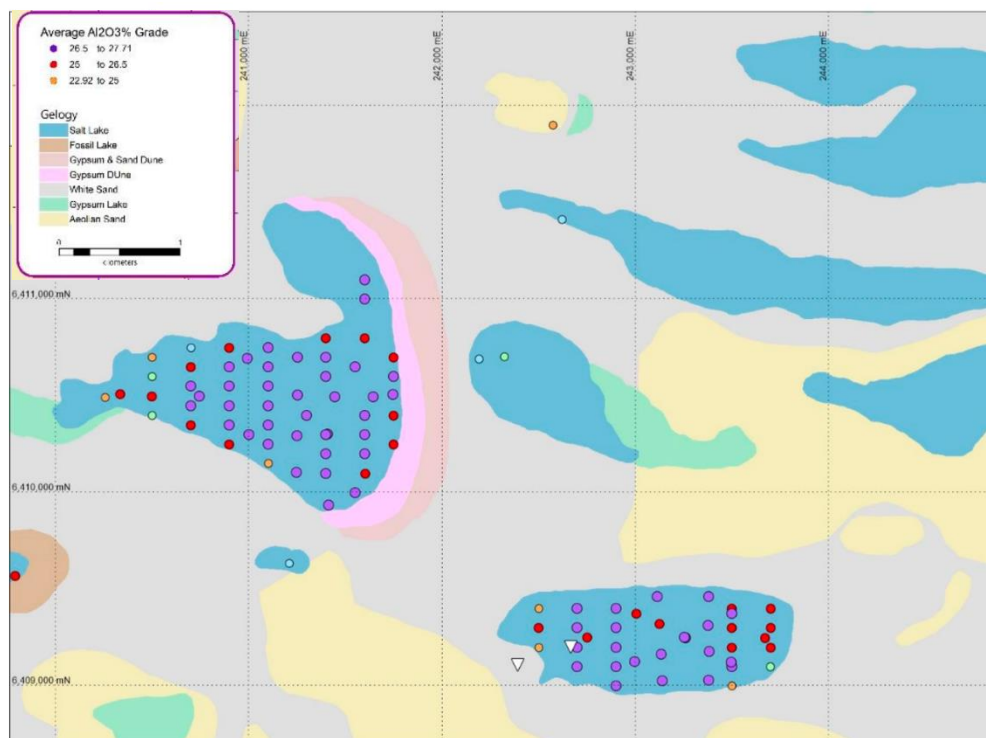
The Lake Hope area was identified by Playa One as having unique climatic and geological characteristics that have resulted in the formation of what is probably a globally unique deposit of aluminium-rich material within the surficial clay layers of two small salt lakes, or “pans”, in the Lake Hope playa system. These pans are called West Lake and East Lake (Figure 2).

The lake clays, which are only up to a few metres thick, have unique chemical and physical properties and consist almost entirely of aluminium-bearing minerals that are plasticine-like in consistency and can be easily sampled with hand-held augers and push tubes (Figure 3).

In addition, particle size distribution analysis demonstrates that virtually all the minerals are less than 16 microns, and from 60% to 80% of them occur at grain sizes of less than 5 microns (Figure 4).

These unique characteristics have produced a near-perfect mineral deposit: a very high-value end-product whose parent ore is:

- very soft and shallow, allowing for extremely cheap free-digging with limited infrastructure requirements, no pre-stripping, no selective mining, a tiny environmental footprint, and limited rehabilitation requirements.
- naturally fine-grained with no need for crushing and grinding, allowing for transport to an off-site processing facility that can be built on existing industrial sites (Figure 1). In essence, this is Direct Shipping Ore (DSO).
- comprised of a few minerals that require only simple washing before acid leaching, thus allowing for low-cost straightforward metallurgical processing.



**Figure 2.** Geology of the Lake Hope Project showing drill hole locations and average aluminium grade on East Lake and West Lake.



Figure 3. Lake Hope showing the push tube sampling method (!) and an example of the lake clay from the push tube.

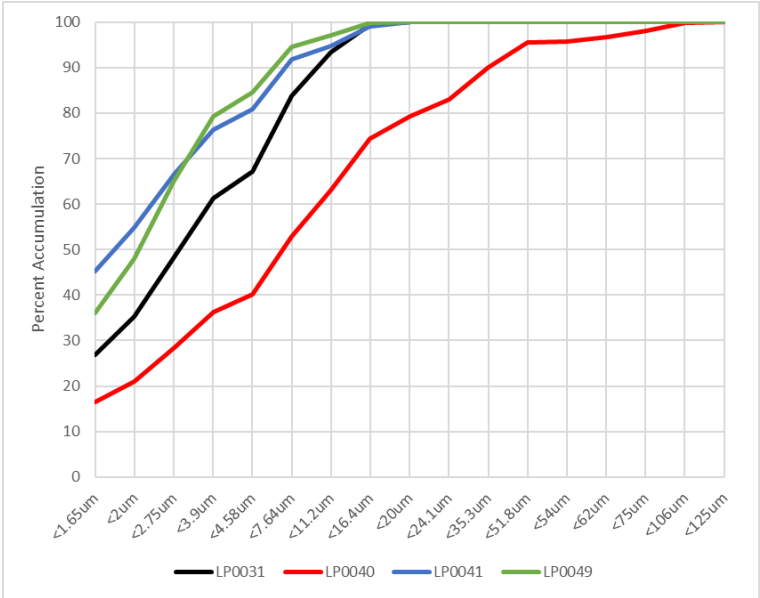


Figure 4. Particle size distribution analysis for four samples. Sample LP0040 contains sandy particles at the base of the deposit.

## Drilling and Assay Results

A total of 99 holes have been drilled by hand-held auger and push tube methods across the two lakes, with all samples submitted for assay at Intertek Laboratories in Perth (Figure 2 and see JORC Table for further details).

The drilling has defined a uniform and coherent layer of aluminium-bearing clay in both lakes that is up to 1.65 m thick in places but still open at depth in most areas.

The assays mainly returned very high grades of aluminium oxide (alumina-  $Al_2O_3$ ) of between 24.5% and 27.8%  $Al_2O_3$  and, significantly, with low amounts of potential contaminants such as CaO (0.05% to 0.08%),  $Fe_2O_3$  (2.4-3.2%),  $Na_2O$  (2-4%) and  $P_2O_5$  (0.05-0.07%).

High-grade assays with greater than 27%  $Al_2O_3$  are presented in Table 1, with a complete set of assays and drill hole collar information at the report's end. The distribution of aluminium in the lakes is shown in Figure 5.

A maiden Mineral Resource Estimate is currently being prepared in accordance with the JORC 2012 Code, with further infill drilling in progress.

HOLE_ID	MGA_E	MGA_N	METHOD	Interval	Al2O3	K2O	Na2O	CaO	Fe2O3	MgO	MnO	SiO2	Cr2O3	P2O5	LOI
LHP002	243134	6409163	PUSH	0.6	27.09	6.78	3.5	0.23	2.93	0.86	BDL	18.45	0.01	0.08	30.06
LHP004	243115	6409462	PUSH	0.6	27.53	7.1	3.46	0.08	2.86	0.81	BDL	17.13	0.008	0.08	29.25
LHP006	243380	6409461	PUSH	0.6	27.47	7.09	3.55	0.1	2.84	0.83	BDL	17.09	0.008	0.07	25.27
LHP007	243378	6409314	PUSH	0.6	27.23	5.54	3.47	0.13	2.99	0.78	BDL	17.98	0.009	0.07	31.15
LHP014	241247	6410105	PUSH	0.5	27.47	5.99	3.35	0.06	2.94	0.8	BDL	22.98	0.011	0.061	26.88
LHP015	241249	6410294	PUSH	0.5	27.71	5.99	3.48	0.06	2.88	0.84	BDL	22.38	0.01	0.059	29.27
LHP016	241253	6410504	PUSH	0.5	27.48	5.87	3.49	0.05	2.98	0.81	BDL	23.39	0.012	0.059	28.37
LHP019	241407	6410302	PUSH	0.5	27.29	7.44	3.35	0.06	2.71	0.74	BDL	15.84	0.008	0.068	33.4
LHP031	240900	6410450	PUSH	0.62	27.11	5.95	3.39	0.05	3.07	0.8	BDL	23.14	0.011	0.05	30.08
LHP038	241100	6410450	PUSH	0.6	27.42	5.91	3.24	0.05	3.25	0.79	BDL	23.16	0.011	0.058	30.75
LHP039	241100	6410550	PUSH	0.88	27.63	6.09	3.44	0.05	3.14	0.79	BDL	21.54	0.011	0.061	30.41
LHP040	241100	6410650	PUSH	0.85	27.16	5.91	3.46	0.05	3.2	0.78	BDL	23.1	0.013	0.061	30.85
LHP042	241300	6410400	PUSH	0.82	27.48	6.03	3.49	0.05	3.19	0.81	BDL	21.98	0.011	0.063	30.62
LHP045	241400	6410600	PUSH	0.82	27.66	5.9	3.56	0.05	3.29	0.83	BDL	22.37	0.012	0.062	29.55
LHP046	241400	6410700	PUSH	0.88	27.07	5.85	3.99	0.05	3.08	0.82	BDL	22.27	0.011	0.058	30.69
LHP049	241550	6410650	PUSH	0.88	26.98	5.78	3.73	0.06	3.14	0.83	BDL	23.34	0.012	0.06	30.19
LHP065	242700	6409300	AUGER	0.85	27.34	7.03	3.23	0.1	3.11	0.76	BDL	17.76	0.009	0.076	32.4
LHP068	242900	6409100	PUSH	0.78	27.02	7.16	3.37	0.16	3.13	0.8	BDL	17.11	0.009	0.072	32.7
LHP070	242900	6409300	AUGER	1	27.2	7.05	3.45	0.09	3.2	0.79	BDL	17.98	0.009	0.079	32.31
LHP083	242666	6409208	PUSH	0.4	27.04	6.96	3.26	0.16	3.02	0.78	BDL	18.69	0.009	0.074	31.24
LHP099	241400	6410300	AUGER	1.3	27.1	6.08	3.56	0.06	3.05	0.75	BDL	22.79	0.011	0.061	30.28

Table 1. Drill hole results with assays greater than 27%  $Al_2O_3$

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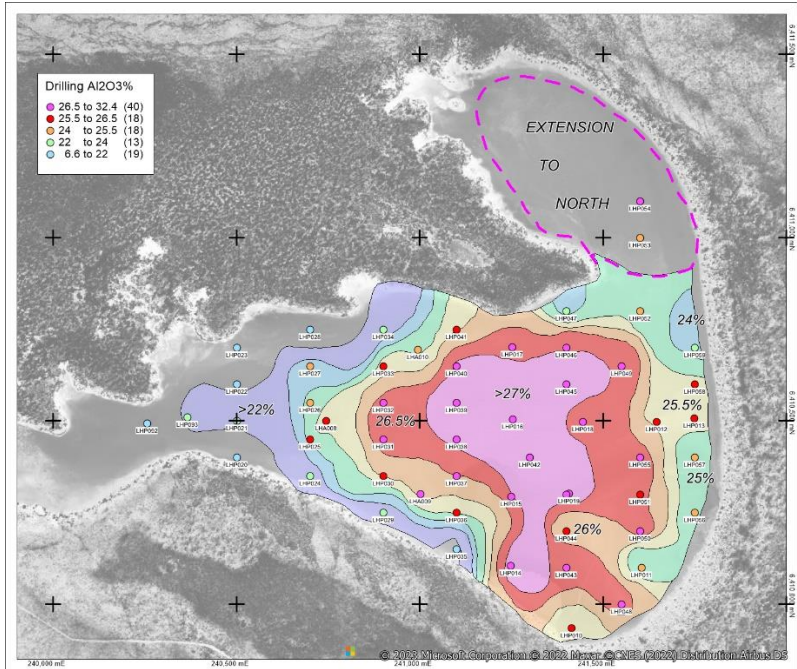
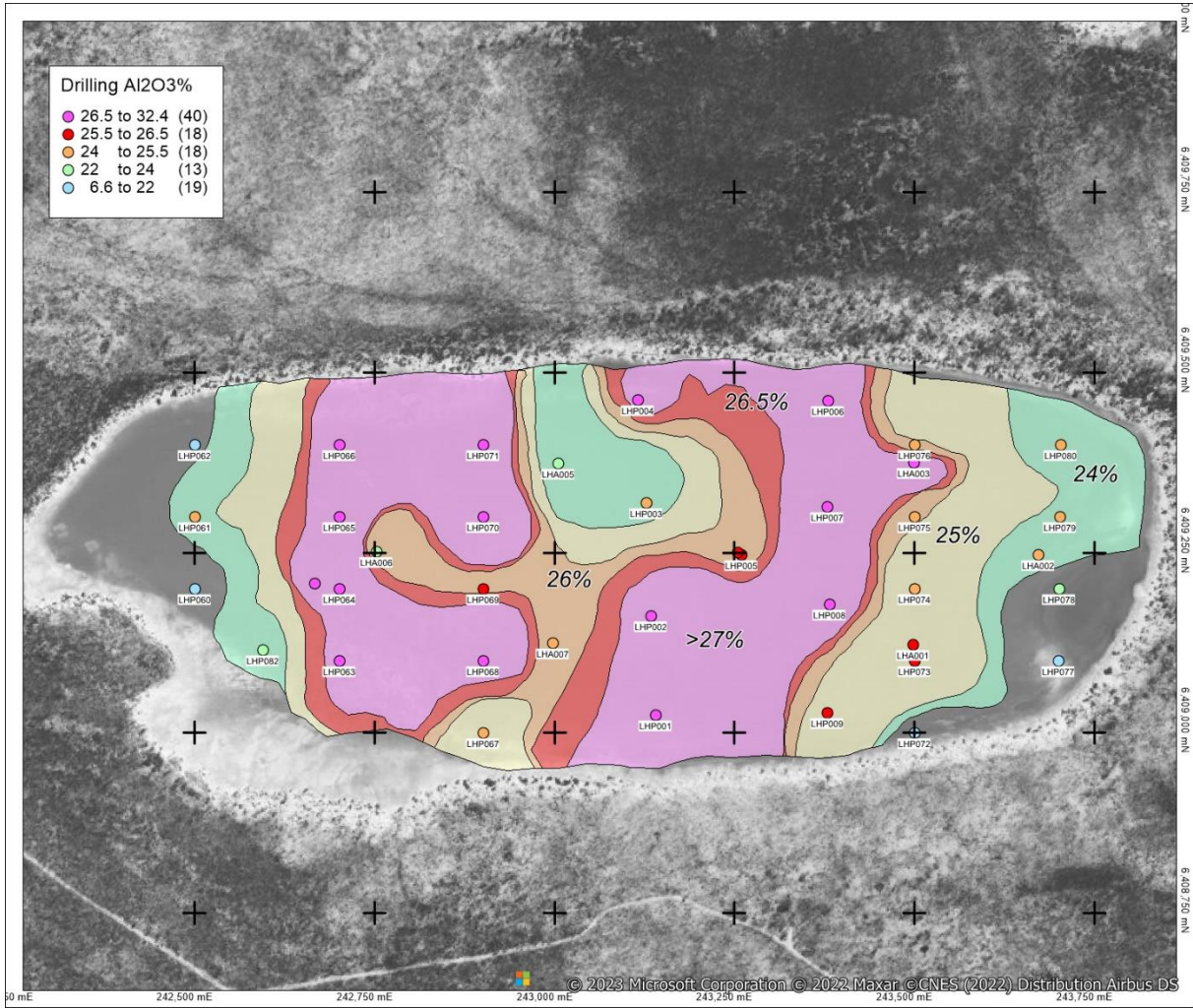


Figure 5. Drill results showing the average Al<sub>2</sub>O<sub>3</sub> grade for West Lake (top) and East Lake (bottom) at the same scale.

## Estimates Of Tonnes and Grade

An Exploration Target for alumina has been calculated for the mineralisation discovered thus far, highlighting Lake Hope's significant exploration potential.

### West Lake

1.65 million to 3.3 million tonnes at a grade of between 24.5% Al<sub>2</sub>O<sub>3</sub> and 27% Al<sub>2</sub>O<sub>3</sub>, containing between 403kt Al<sub>2</sub>O<sub>3</sub> and 895kt Al<sub>2</sub>O<sub>3</sub>.

### East Lake

0.93 million to 1.39 million tonnes at a grade of between 24% Al<sub>2</sub>O<sub>3</sub> and 26% Al<sub>2</sub>O<sub>3</sub>, containing between 223Kt Al<sub>2</sub>O<sub>3</sub> and 362Kt Al<sub>2</sub>O<sub>3</sub>.

### Total

2.59 million to 4.74 million tonnes at a grade of between 24.3% Al<sub>2</sub>O<sub>3</sub> and 26.7% Al<sub>2</sub>O<sub>3</sub> containing between 0.63Mt and 1.25Mt of Al<sub>2</sub>O<sub>3</sub>.

Table 2 highlights the key statistics for the deposit.

Lake	Surface Area m <sup>2</sup>	Thickness	Tonnage Range		Al <sub>2</sub> O <sub>3</sub> Grade		Contained Alumina	
			Min	Max	Min	Max	Min	Max
West	1,300,000 m <sup>2</sup>	0.4 to 1 m	1,650,000 t	3,310,000 t	24.5%	27.0%	403,000 t	895,000 t
East	685,000 m <sup>2</sup>	0.4 to 2 m	930,000 t	1,390,000 t	24.0%	26.0%	289,000 t	360,000 t
Combined			2,590,000 t	4,740,000 t	24.3%	26.7%	629,000 t	1,250,000 t

**Table 2.** Lake Hope Exploration Target, 2022. Columns may not sum correctly due to rounding.

### EXPLORATION TARGET DISCLAIMER

*Investors should be aware that the potential size and grade of the alumina deposit at Lake Hope are conceptual in nature. Insufficient work has been undertaken to estimate a JORC 2012-compliant Mineral Resource Estimate, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.*



## About the Exploration Target

The Exploration Target was calculated via the gridding of the drill results from each lake using a straightforward Inverse Distance Squared Function (IDW) with a 25 m x 25 m cell size and a search radius of 200m around the data points. The input data comprised composited length-weighted assays. The minimum thickness interval is 25 cm or is otherwise based on the thickness of mud intersected.

The volume estimation was calculated via an isopach (thickness) grid constrained to known thickness only. Tonnage was calculated by multiplying the volume by the specific gravity. Specific gravity was measured via volumetric methods as 1.93g/cm<sup>3</sup>. Dry metric tonnage is estimated based on the average moisture content of 26.73%. Grade estimation was achieved by gridding the average grade of each hole into a 25 m x 25 m cell grid, with contained alumina calculated on the tonnage within the grid cell multiplied by the assay grade.

The minimum bound to the Exploration Target is constrained by the known thickness and extent of the mineralisation based on current drilling information.

The upper bound to the Exploration Target has been derived from assumptions about an increase in the thickness of the clay layers, which comes from ongoing drilling where the aluminium-rich clays are visually very obvious. In the north of the West Lake, there are visual indications of mineralisation at surface down to at least one metre below the surface. Given this, there is reasonable scope to double the thickness of portions of other parts of the West Lake clays from 0.6 metres to 1.2 metres and from 1.0 metres to 2.0 metres in parts of the East Lake.

Further work is currently underway to convert the Exploration Target into a Mineral Resource Estimate. This work includes additional drilling to establish the true thickness of the aluminous mud, an increase in the drill density from 200 m by 100 m to at least 100 m x 100 m, further measurements of the bulk density and accurate topographic control via DGPS survey.

### Metallurgy

Playa One has developed a novel, relatively low-cost hydro-metallurgical process to convert mineralisation of a type as found on Lake Hope into HPA with the potential to produce a purity exceeding 99.99% (4N HPA), generally taken as the industry standard purity for product comparison.

Initial bench-scale metallurgical test work on representative material, process design, flow sheet design, and process engineering studies have been completed, leading to significant breakthroughs in mineral processing technology, including proprietary technologies.

Figure 6 illustrates the basic process steps in a simplified schematic flow sheet.

Impact's review of this novel process indicates that together with the unique physical and chemical characteristics of the Lake Hope clays, using the Play One metallurgical process may offer a breakthrough in HPA production with potentially significant cost advantages compared to the processing of kaolin, which is commonly proposed as a source of ore for HPA and is the subject of several on-going studies by other companies.

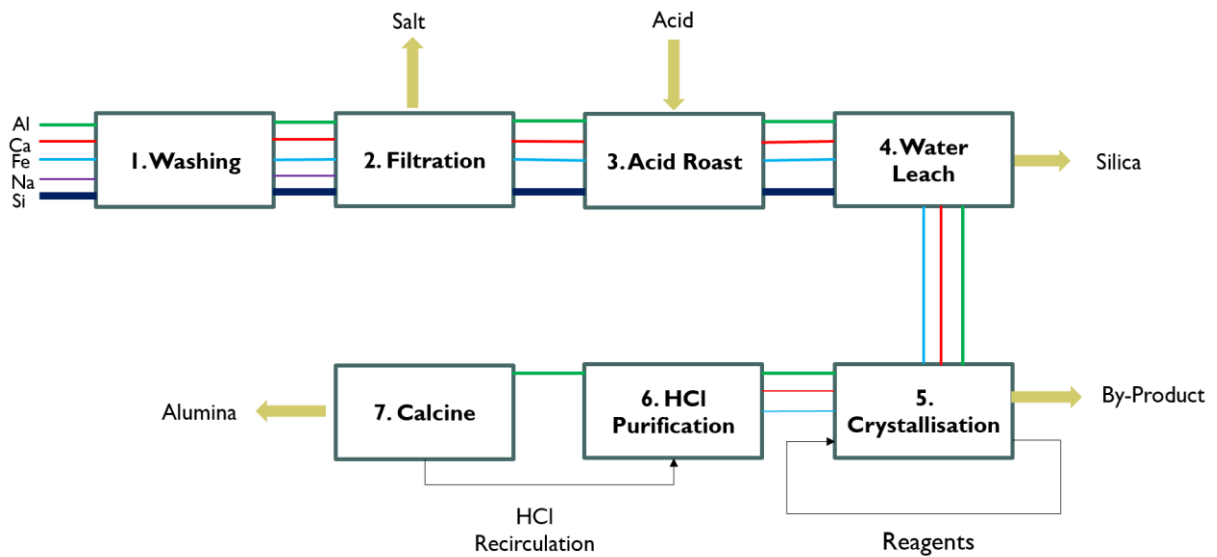


Figure 6. Schematic flow sheet.

These advantages include the following:

- the naturally occurring micron-sized particles and relatively homogeneous ore require no comminution, grinding, classification, or wet-dry screening.
- a simple wash and filtration circuit for upfront processing.
- a low-temperature sulphuric acid leach, a generally readily available and cheaper acid than others.
- Eliminating the front-end energy-intensive calcination required in the kaolin process, thus significantly reducing energy costs, the flow sheet complexity and CO<sub>2</sub> emissions.
- Relatively benign waste products.

Optimisation of the processing flow sheet will be a key focus of the Pre-Feasibility Study (PFS) to be commenced immediately by Impact.

The expected relatively low cost of mining also allows for significant optionality for the location of the metallurgical plant, which is likely to be located in one of four main population centres (Figure 1).

## Production of 4N HPA

Playa One's sulphate metallurgical process has successfully produced >99.99% Al<sub>2</sub>O<sub>3</sub> (nominally 4N HPA) with purities of 99.994% to 99.996% in initial assays. These assays have been done on the product from the bench scale test work, with further details in the JORC Table at the end of the report. As well as the Al<sub>2</sub>O<sub>3</sub> assay (with all other major elements being below detection), total contaminants are about 41 ppm, representing 99.996% alumina (Al<sub>2</sub>O<sub>3</sub>) with the primary contaminants being Fe (2.08ppm), K (7.94ppm), Mg (7.23ppm) and Na (6.61ppm). This compares favourably with the purity of other HPA products published in the public domain (Table 3).

Element	Playa One	KRR	FYI
	Sulphuric	HPA7	5N
As	0.69	NR	NR
Ag	NR	NR	0.1
B	NR	NR	NR
Ba	0.2	0.516	0.5
Ce	BDL	NR	0.34
Ca	2.57	<0.06	NR
Cr	0.7	2.76	5
Co	0.15	0.046	0.1
Cs	0.02	<0.01	0.03
Fe	2.08	6.2	BDL
Gd	BDL	NR	0.01
Ga	2.01	0.809	NR
K	7.94	17.4	NR
La	BDL	NR	0.2
Mg	7.23	0.603	NR
Mn	2.74	0.138	1
Mo	0.33	0.052	NR
Na	6.61	8.59	0
Nb	0.01	3.01	NR
Nd	NR	NR	0.15
Ni	0.11	0.377	BDL
P	3.45	1.74	NR
Pb	0.76	<0.01	NR
Pr	BDL	NR	0.04
Rb	0.26	<0.01	0.1
Sc	BDL	NR	0.1
Si	3.05	15.8	4.67
Sm	BDL	NR	0.02
Sn	BDL	NR	0.8
Sr	0.2	0.053	0.2
Ti	0.08	0.695	NR
U	BDL	NR	0.01
V	0.01	<0.02	0.3
W	BDL	NR	0.1
Zn	0.15	0.488	NR
Zr	BDL	NR	NR
<b>TOTAL</b>	<b>41.35</b>	<b>59.28</b>	<b>13.67</b>

**Table 3.** Minor element results for Lake Hope HPA compared with results from King River Resources Ltd (ASX:KRR 25<sup>th</sup> March 2021, 30<sup>th</sup> April 2021) and FYI Resources Ltd (ASX:FYI 13<sup>th</sup> March 2019).

*Assay methods vary between individual data sources, and direct comparisons should be cautiously viewed.*

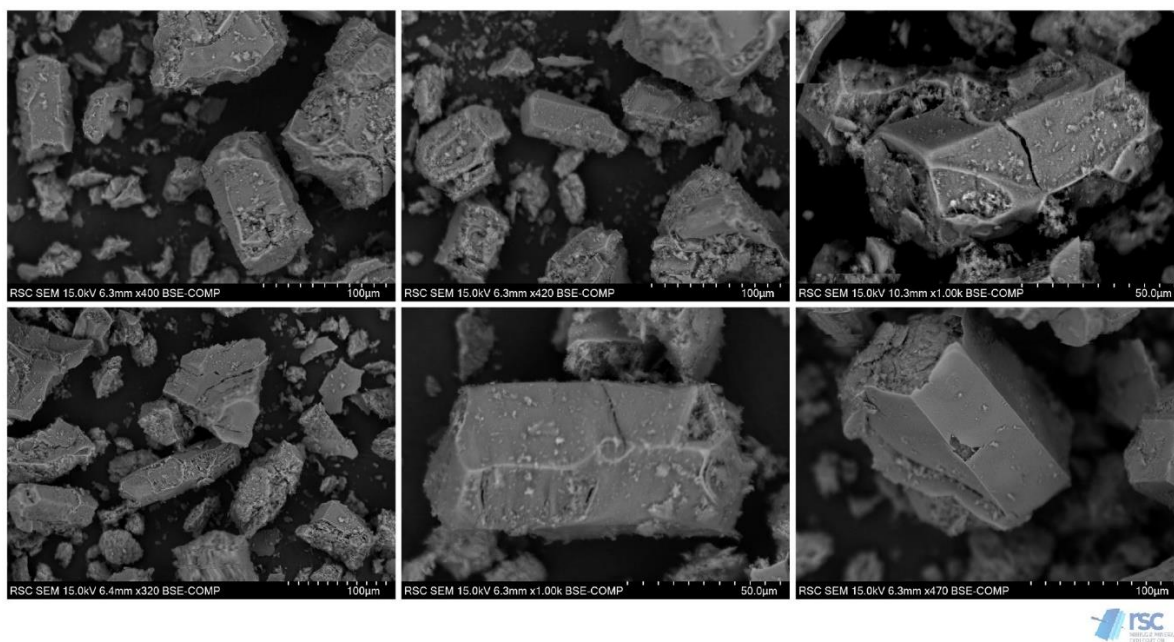
*Some elements were omitted for brevity and are reported as "Others\_ppm".*

*Total ppm is the sum of all elements reporting above the detection limit.*

*BDL = below the detection limit. NR = Not Reported.*

Samples of an example precursor product and final calcined HPA produced using the metallurgical process were analysed using SEM and EDS microscopy by RSC Mineral Consultants, Perth, Western Australia. Precursor salts (before calcination) were imaged as agglomerations of micron-sized particles of alumina. The final calcined HPA product was imaged as corundum crystals and fused aggregates up to 200 microns in size (Figure 7). X-Ray diffraction studies have confirmed that the final product is alpha-HPA, the desired form of alumina.

It should be noted that the precipitation of the crystals occurred with little or no control over temperature and pressure. In addition, work has yet to be done on refining the final HPA product, for example, jet milling or developing intermediate saleable products that the end-users require. This critical capability needs to be built out by Impact, and this will be another area of focus in the PFS using material produced from the bench-scale test work.



**Figure 7.** Backscattered scanning electron micrographs of final calcined alumina showing corundum crystals and nanoparticles (Sample HY11558).

### Preliminary Economic Considerations

Playa One has completed a high-level review of the mining and chemical processing costs associated with a preferred development concept of the lake clay-sulphate process.

Impact has reviewed this concept in detail and has concluded that it represents a possible compelling path forward to production with the potential to be cost-competitive with existing and proposed HPA operations within Australia and internationally.

Impact is completing the work required to produce a Scoping Study to confirm Playa One's review. This will include the maiden Mineral Resource Estimate.

A logistics option study identified Kwinana, Albany, Esperance and Kalgoorlie as possible locations for a processing plant. They are all roughly equidistant from Lake Hope and easily accessible via road, rail, and ports for reagent supply and product export (Figure 1).

The unique geological properties of the Lake Hope deposit mean that trucking and mining costs are likely to comprise a small percentage of the overall operating cost estimate, with the clay to be trucked via conventional road trains to the processing facility.

### About High Purity Alumina and the market for its products

High Purity Alumina is aluminium oxide (“alumina” -  $\text{Al}_2\text{O}_3$ ) with a generally accepted purity that exceeds 99.99%, or “4N” (four nines).

HPA has superior physical and chemical properties, such as high brightness, superior hardness, and superior corrosion resistance. It has traditionally found applications in:

- LED bulbs are a growth market for HPA as they substantially replace incandescent lighting systems because they are sustainable, durable, and safe.
- Protective coatings (in powdered form) as an inert, incombustible and non-conductive ceramic filler in electronics applications.
- Anode-cathode coatings and separators in lithium-ion batteries.
- Phosphor substrate material in plasma displays.
- Semiconductor substrates.
- A precursor for sapphire glass, optical lenses and specialty ceramics used in high-technology imaging and bio-medical devices.
- Defence and protective uses as a hard, chemically resistant and inert barrier.

In addition to the HPA, the final calcined ceramic form of the mineral, various precursor aluminium salts, including sulphates, nitrates, chlorides, and silicates (clays), also have important end-market uses. These uses, which include critical parts of the lithium-ion battery manufacturing process, are summarised in Table 4.

### Aluminium Chemicals Overview

<b>Aluminium Oxide</b>	$\alpha\text{-Al}_2\text{O}_3$
<ul style="list-style-type: none"> <li>• Calcined alumina: HPA. Typical product target 99.99% purity</li> <li>• LEDs, sapphire, LiB, Catalysts, Abrasives</li> </ul>	
<b>Aluminium Nitrate</b>	$\text{Al}_2(\text{NO}_3)_2 \cdot 9\text{H}_2\text{O}$
<ul style="list-style-type: none"> <li>• Precursor chemical; Requires 4N to 5N purity</li> <li>• Cathode cementation, stabilisation, electrolyte chemical, etc</li> </ul>	
<b>Hydroxides</b>	$\text{Al}_x[\text{OH}]_y$ variations
<ul style="list-style-type: none"> <li>• Precursor chemical to alumina; Requires 5N or better</li> <li>• Catalysts, electrolytes, precursor feedstock for HPA</li> </ul>	
<b>Chlorides</b>	$\text{Al}_2\text{Cl}_6 \cdot 12\text{H}_2\text{O}$
<ul style="list-style-type: none"> <li>• Precursor chemical – not traded in bulk; Requires 5N to produce 4N HPA</li> <li>• LiB electrolytes, specialty chemicals</li> </ul>	
<b>Sulphates</b>	$\text{Al}_2[\text{SO}_4]_3$
<ul style="list-style-type: none"> <li>• Industrial chemical flocculant, and by-product</li> <li>• Mining by-product used for HPA in China (3N usually)</li> </ul>	
<b>Silicates</b>	$[\text{K},\text{Al}]_2\text{Si}_2[\text{OH}]_5$
<ul style="list-style-type: none"> <li>• Sourced from granites, sediments</li> <li>• Chemically stable, require 2 calcination; Hydrochloric acid route only</li> </ul>	

**Table 4.** End uses of HPA and precursor chemicals

Growing awareness of ultra-high purity (UHP) intermediate aluminium salts and hydroxides as a revenue opportunity has been shown in ASX releases by Alpha HPA Ltd.

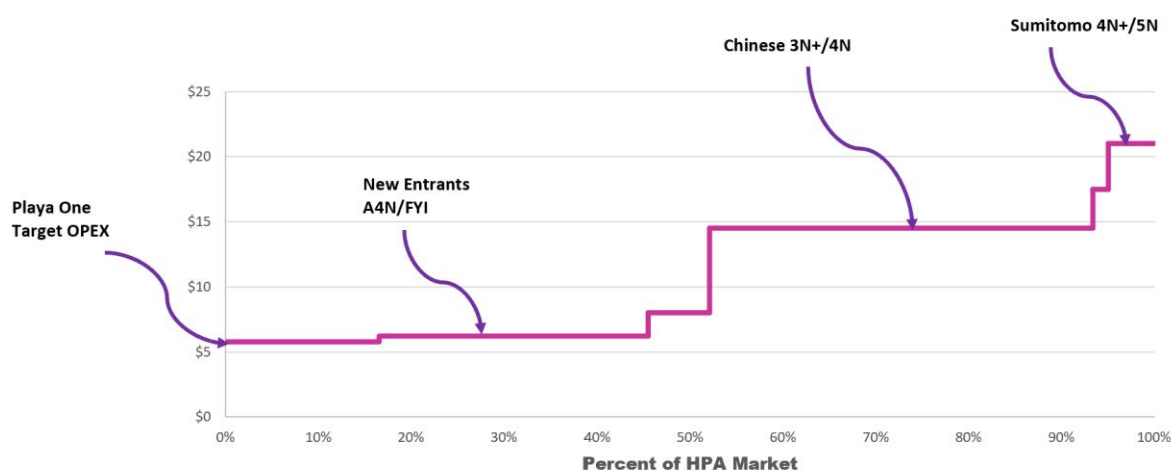
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## Market Forecast for HPA: demand and price

The consensus amongst analysts and the industry is for 4N HPA and related products to command prices between US\$15,000 and US\$32,000 per tonne, with a median conservative price assumption of US\$20,000 per tonne. These figures are borne out by ongoing sales of small quantities of HPA and precursor products reported by Alpha HPA Limited (ASX: A4N Release 24<sup>th</sup> February 2023).

Although data are scarce, in-house analysis of industry performance indicates a notional cost curve with the bulk of incumbent producers at US\$11,000 to US\$15,000 per tonne for 4N HPA. New entrants, such as Alpha HPA Limited, who produce HPA from a chemical feedstock, and the kaolin developers are forecasting production at a disruptive cost of US\$6,000 to \$7,000 per tonne (Figure 8: ASX: A4N Release 7<sup>th</sup> February 2023 and 17<sup>th</sup> March 2020).

A preliminary review of the economic factors affecting the development of Lake Hope indicates the Project may be cost-competitive with these new hydrometallurgical processes.



**Figure 8.** An indicative cost curve for global HPA production. Note the disruptive nature of the cost of production for new entrants using hydrometallurgical techniques versus the incumbent processes dominated by the Bayer process.

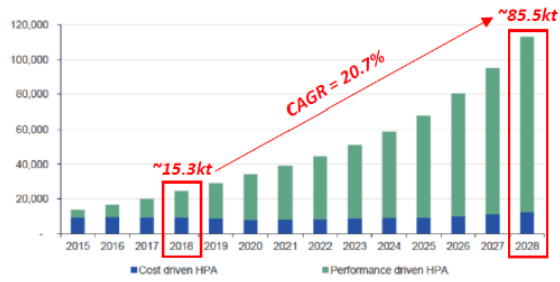
Overall annual demand for HPA is predicted to increase from 45,000 to 50,000 tonnes in 2021-22 to about 250,000 tonnes by 2030 (Figure 9).

An increase in LED demand will mainly drive this growth together with lithium-ion battery uses, both underpinned by global decarbonisation and electrification initiatives.

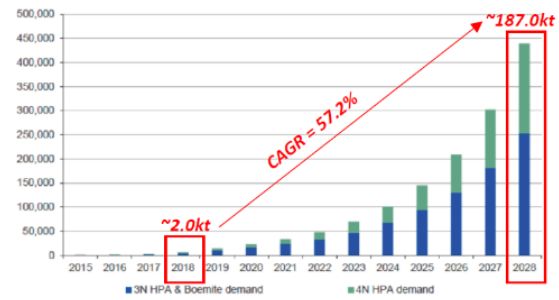
LED growth has experienced between 13% and 18% Compound Annual Growth Rate (CAGR) over the past ten years, and this is predicted to continue, driven by increased installation capacity of LED's and increased demand for environmentally friendly lighting in domestic and commercial properties.

The fastest-growing end-use demand sector in recent years has been in lithium battery separators, which grew at a CAGR of 26%, reaching 5,000 tonnes in 2018 (latest data available). Continued significant growth is predicted in this market, given the uptake of lithium battery technology.

**4N HPA DEMAND: LED SECTOR  
2015-2028 (TONNES)**



**3N & 4N+ HPA DEMAND: LITHIUM BATTERY SECTOR  
2015-2028 (TONNES)**



**4N+ HPA DEMAND: SCRATCH RESISTANT GLASS APPS.  
2015-2028 (TONNES)**

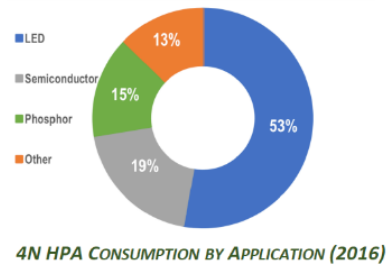
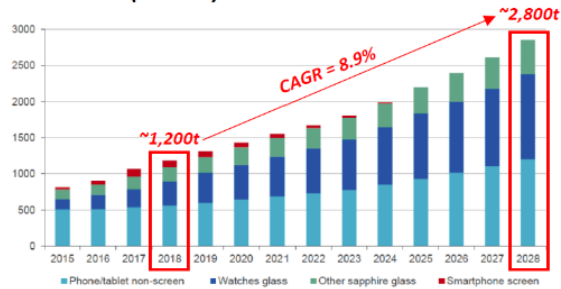


Figure 9. Forecast growth in HPA demand to 2030 (Commodity Research Unit report 2020).

Demand for sapphire glass, although accounting for a relatively small share of the overall market, is also growing at 8% to 10% CAGR. Sapphire glass has precise input tolerances, and a small number of market participants dominates production.

In addition, as noted above, other uses for Ultra High Purity precursors are also likely to be realised in the coming years.

In Asia-Pacific, government funding has fuelled the manufacturing capacity investments for electronic companies, which in turn is expected to fuel the demand for HPA over the next decade.

## Summary and Next Steps

The unique nature of the Lake Hope deposit, which allows for very low cost, low environmental footprint quarrying, combined with straightforward metallurgical processing, presents a clear path to producing high purity alumina products that command high margins in a global market forecast to expand over the next decade dramatically.

As such, the Lake Hope Project presents a compelling opportunity for Impact Minerals and its shareholders. The company will move towards production as quickly as practicable over the next few years.

A detailed work programme, budget and timeframe are currently being prepared. However, Impact is now working towards the following goals over the next three to six months:

- Calculation of a maiden Mineral Resource Estimate.
- Completion of a Scoping Study.
- Baseline environmental studies.
- Baseline heritage surveys and continued discussions with the Ngadju First Nations Group, in particular, the application for the Mining Lease. Investors should note that an agreement with the Ngadju Group will be required to gain access for mining.
- Lodgement of an application for a Mining Lease.
- Commencement of a Pre-Feasibility Study.

The Lake Hope Project will become the main focus of Impact's activities going forward. The PFS and DFS are estimated to cost about \$2.5 million over the next two years. This relatively low cost for feasibility studies compared to other more conventional projects will allow exploration to continue at Impact's other projects, in particular the Arkun project in the emerging mineral province of southwest Western Australia. In addition, work will also continue at Broken Hill under the BHP Xplor programme (ASX Release January 17<sup>th</sup> 2023). Statutory commitments are also expected to be maintained on the company's other projects.



Some of the Impact Minerals Team playing around at Lake Hope.





## JORC Code, 2012 Edition – Table 1

### Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li>Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>Description of 'industry standard' work</li> </ul>	<ul style="list-style-type: none"> <li>Auger and push-tube drilling</li> <li>Bulk sampling</li> <li>Mineralisation was logged visually</li> <li>Samples are considered representative of the lake clays as drilled</li> <li>Particle size analysis</li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</li> </ul>	<ul style="list-style-type: none"> <li>Auger drilling using a 70mm hand auger with spoon bit within dry clay horizons</li> <li>Push tube drilling using 55mm and 65mm PVC tubes hammered into clay and core sampled from inside</li> <li>Core is unoriented</li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</li> </ul>	<ul style="list-style-type: none"> <li>Auger sample quality is considered good to excellent based on moisture content</li> <li>Push tube sample quality is considered excellent</li> <li>Lower grades of auger holes may be due to drilling method but insufficient data exists to confirm this determination</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</li> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	<ul style="list-style-type: none"> <li>100% of holes logged visually on 5-10cm increments for colour, mineralogy, grain size, moisture and stiffness</li> <li>Logging is qualitative</li> </ul>
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</li> <li>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> <li>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> <li>Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.</li> <li>Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>	<ul style="list-style-type: none"> <li>0.5m sampling intervals were utilised where practicable</li> <li>Whole intervals were submitted for analysis</li> <li>Samples were dried, pulverised to 80% passing 75 microns, which homogenised the clay</li> <li>Field duplicates were taken</li> <li>2 auger holes were twinned by push tube holes and are comparable in grade</li> <li>Samples were assayed via lithium borate fusion and XRF quantification via FB1/XRF10 or FB1/XRF30</li> <li>Assays of high purity alumina were performed at Labwest via ICP-MS and ICP-OES</li> <li>Moisture LOD/GR1 on 34 samples</li> <li>Sample size is appropriate to grain size</li> </ul>

## JORC CODE, 2012 EDITION – TABLE 1

### Section 1 Continued

Criteria	JORC Code explanation	Commentary
<b>Quality of assay data and laboratory tests</b>	<ul style="list-style-type: none"> <li>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</li> <li>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</li> <li>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</li> </ul>	<ul style="list-style-type: none"> <li>3 duplicate samples were conducted on auger holes and showed acceptable deviance</li> <li>Certified Reference Materials were inserted in the sample runs but insufficient numbers to allow valid statistical treatment; results appear acceptable but are not necessary at this stage of exploration</li> <li>Internal laboratory checks were within acceptable variability</li> <li>This level of QAQC is commensurate with the early-stage nature of investigations</li> </ul>
<b>Verification of sampling and assaying</b>	<ul style="list-style-type: none"> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	<ul style="list-style-type: none"> <li>Drill holes were logged in the field on 5-10cm basis with data recorded into a notebook and transcribed into digital format</li> <li>Data is stored in excel spreadsheets and backed up regularly</li> <li>Assays were verified by company personnel</li> <li>LHA004 was twinned by LHP005 and results were in reasonable agreement (26.47% vs 27.47%)</li> <li>Discrepancies between auger and push tube holes are considered related to drilling method as well as assay methodology</li> </ul>
<b>Location of data points</b>	<ul style="list-style-type: none"> <li>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</li> <li>Specification of the grid system used.</li> <li>Quality and adequacy of topographic control.</li> </ul>	<ul style="list-style-type: none"> <li>Commercial handheld GPS</li> <li>Datum is MGA 2020 Zone 51 South</li> <li>Topographic control on RL is adequate for exploration results</li> <li>RL will not affect the position of the drilling results (lake bed is nearly perfectly flat)</li> </ul>
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>Data spacing for reporting of Exploration Results.</li> <li>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</li> <li>Whether sample compositing has been applied.</li> </ul>	<ul style="list-style-type: none"> <li>Spacing is a nominal offset 200m x 100m grid</li> <li>Good grade continuity exists</li> <li>No Mineral Resource has been estimated</li> <li>All samples in each hole are composited into the reported intersection</li> </ul>

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<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</li> </ul>	<ul style="list-style-type: none"> <li>Vertical drilling of flat lake beds results in orthogonal penetration</li> <li>Down hole widths are true widths, by definition</li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>The measures taken to ensure sample security.</li> </ul>	<ul style="list-style-type: none"> <li>Samples were delivered to the laboratory by company personnel</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>The results of any audits or reviews of sampling techniques and data.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

## Section 2 Reporting of Exploration Results

Criteria listed in the preceding section also apply to this section.

Criteria	JORC Code explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</li> <li>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</li> </ul>	<ul style="list-style-type: none"> <li>E63/2086 Lake Hope</li> <li>E63/2317</li> <li>E63/2318</li> <li>E63/2319</li> <li>E64/673</li> <li>E64/674</li> <li>100% Playa One Pty Ltd</li> <li>Native Title Agreements are in place with Native Title parties</li> <li>No known impediment to exploitation is known</li> <li>No national parks, nature reserves or other licenses interact with E63/2086</li> </ul>
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	<ul style="list-style-type: none"> <li>Nil</li> </ul>
<b>Geology</b>	<ul style="list-style-type: none"> <li>Deposit type, geological setting and style of mineralisation.</li> </ul>	<ul style="list-style-type: none"> <li>Lacustrine evaporite clays hosted within flat-lying salt lake deposits</li> </ul>
<b>Drill hole Information</b>	<ul style="list-style-type: none"> <li>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: <ul style="list-style-type: none"> <li>easting and northing of the drill hole collar</li> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> <li>down hole length and interception depth</li> <li>hole length.</li> </ul> </li> <li>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>All drill hole information is included in the Appendix (Table 3)</li> <li>Holes have no down hole surveys as deflection is negligible over 1-2m</li> <li>All holes are drilled vertically</li> <li>Interception depths are from surface</li> <li>All interception lengths are full interceptions as measured downhole with a tape measure</li> </ul>
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>Where aggregate intercepts incorporate short lengths of high-grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</li> <li>The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	<ul style="list-style-type: none"> <li>Intersections containing multiple samples are weighted by length into a total intersection</li> <li>No lower cut-off grade is used at this time</li> <li>No upper cut-off is used as the material is homogeneous</li> </ul>

## JORC CODE, 2012 EDITION – TABLE 1

### Section 2 Continued

Criteria	JORC Code explanation	Commentary
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>• These relationships are particularly important in the reporting of Exploration Results.</li> <li>• If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</li> <li>• If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').</li> </ul>	<ul style="list-style-type: none"> <li>• All intervals are true width as they are vertical holes drilled into flat-lying mineralisation</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</li> </ul>	<ul style="list-style-type: none"> <li>• A map showing tenement locations has been included</li> <li>• Maps showing exploration results are provided</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</li> </ul>	<ul style="list-style-type: none"> <li>• All assay data is reported in the Appendix, <b>Error! Reference source not found.</b></li> </ul>
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</li> </ul>	<ul style="list-style-type: none"> <li>• Metallurgical testing was undertaken by ISO accredited metallurgical testing laboratories</li> <li>• Commercially sensitive data on metallurgy is not reported</li> </ul>
<b>Further work</b>	<ul style="list-style-type: none"> <li>• The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>• Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	<ul style="list-style-type: none"> <li>• Drilling</li> <li>• Resource Estimation</li> <li>• Further engineering &amp; economic studies</li> </ul>

Authorised by the Board of Impact Minerals Limited



Dr Michael G Jones

Managing Director

#### Competent Person Statement

##### Exploration Results

The review of exploration activities and results, the Exploration Target and the metallurgical test work contained in this report is based on information compiled by Roland Gotthard, a Member of the Australian Institute of Mining and Metallurgists. He is an employee of Impact Minerals Limited. He has sufficient experience which is relevant to the style of mineralisation and types of deposits under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code). Mr Gotthard has consented to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Impact Minerals Limited Interactive Investor Hub

Engage with us directly by asking questions, watching video summaries, and seeing what other shareholders have to say about this and past announcements at our Investor Hub

<https://investors.impactminerals.com.au/welcome>