# Olaroz resource increases 27% to 20.7 million tonnes LCE

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HIGHLIGHTS

- Olaroz resource increases 27% to 20.7 million tonnes ("Mt") lithium carbonate equivalent ("LCE"), comprising 7.6 Mt of Measured Resource, 7.1 Mt of Indicated Resource and 6 Mt of Inferred Resource
- Total resources in the Olaroz-Cauchari basin are now 27 Mt LCE in all resource categories, confirming the basin's status as hosting one of the largest lithium resources in the world
- The lithium grade of the Olaroz salar Measured Resource is 657 mg/l lithium, with the underlying Indicated Resource and Inferred Resource 612 mg/l and 604mg/l lithium respectively
- The recently acquired Maria Victoria property in the north of Olaroz contributed 2.8 Mt of the increase in resources, with the difference relating to expansion of the resource to the south following completion of the expansion drilling
- The resource estimate is restricted to directly beneath the Olaroz salar surface, except for the area at the south, where influence from expansion hole E26 extends the resource beneath gravels to the west of the salar and towards the Cauchari resource
- The Olaroz basin has significant exploration potential with extensive areas to the north of the salar surface currently untested by drilling and also extensions towards the Cauchari Resource and to the west of the salar
- The increased Olaroz resource, together with the Cauchari Resource, support expansion from Stage 1 and 2 lithium carbonate production capacity (combined 42,500 tpa) and will form the basis for the Olaroz Stage 3/Cauchari expansion studies.

Allkem Managing Director and CEO, Martin Perez de Solay said, "*This significant increase in the resource, and the upgraded resource classification, confirms the world class status of Olaroz.*

*"The combined 27 Mt resource across Olaroz and Cauchari supports future material expansion of production and will form the basis for the Olaroz Stage 3/Cauchari expansion studies currently underway. Further exploration will be required to fully test the significant potential of the Olaroz/Cauchari basin."*

"*Olaroz is complemented by the company's high-quality Sal de Vida and James Bay Projects in Argentina and Canada. These projects will produce lithium chemicals for use in the EV supply chain in areas of low or no water stress, while contributing to the local economy and communities," Mr Perez de Solay said.*

2023 OLAROZ RESOURCE UPGRADE

Estimated Resources

The resource estimate is outlined in the following tables presenting the lithium and lithium carbonate tonnages. The resource is broken out by property ownership, with the bulk of the resource owned by the Sales de Jujuy joint venture ("SdJ JV") comprising Allkem (66.5%) Toyota Tsusho (25%) and Jujuy Energía y Minería Sociedad del Estado (8.5%) ("JEMSE"). Allkem holds additional 100% owned properties to the north of Olaroz, including the recently acquired Maria Victoria property. These other properties have been subject to limited exploration and currently have small resources defined.

Table 1: Lithium Resource Estimate - March 2023

Table 2: March 2023 Lithium Resource Estimate by Owner

- Allkem SdJ is owned 66.5% by the Allkem group. Olaroz Lithium and Maria Victoria are owned 100% by the Allkem group.
- JORC definitions were followed for mineral resources.
- The Competent Person for this Mineral Resource estimate is Murray Brooker, MAIG, MIAH.
- No internal cut-off concentration has been applied to the resource estimate. The resource is reported at a zero mg/l cut-off, given the consistent grade of the deposit, with brine extending beyond the edge of the salar.
- Numbers may not add due to rounding.
- Lithium is converted to lithium carbonate (Li2CO3 = LCE) with a conversion factor of 5.32.
- The upper 100 m of sediments in the gravel area off the salar west of E26 is excluded from the resource, as lithium concentrations to this depth are <100 mg/l Li, before rapidly increasing in concentration below this depth.
- The resource estimate is limited at depth by the sediment-basement contact interpreted from the gravity geophysical survey conducted over the basin. Drilling suggests this interpretation underestimates the basin depth.

Project background

An estimate of the Olaroz salar resource was undertaken in 2011 as part of the project Feasibility Study, prior to commencement of construction of Stage 1 of the Olaroz Lithium Facility. That estimate identified a Measured and Indicated Resource of 6.4 Mt of LCE over an area of 93 $km^2$ from surface to a maximum depth of 200 metres (the 2011 Resource).

Following installation of the 200m depth Stage 1 production wellfields at Olaroz several deeper wells were installed up to 350m in depth and subsequently utilised for Stage 1 production. This deeper drilling intersected high porosity and permeability sand units, with flow rates of over 30 litres per second (l/s) and this highlighted the deeper resource potential of the basin. Information from these wells was used to provide an Exploration Target in October 2014, outlining between 1.6-7.5 Mt of LCE located below the 200m level (the 2014 Exploration Target) in the salar.

As previously stated, Allkem's Cauchari properties, (100% owned through South American Salars), are contiguous to the south of the Olaroz properties. In 2019 a further 4.8 Mt of Measured and Indicated Resource and 1.5 Mt of Inferred Resource was estimated in this area (the 2019 Cauchari Resource). The 2019 Cauchari Resource is interpreted to occupy the southern continuation of the same aquifers present in the Olaroz salar, which are connected beneath gravel alluvium (the gravel area where the Olaroz ponds and plant are located). The Cauchari Resource is not extracted as part of the Olaroz Stage 2 development.

Table 3: Cauchari April 2019 Resource Estimate

- JORC and CIM definitions were followed for mineral resources.
- The Competent Person / Qualified Person for this Mineral Resource estimate is Frits Reidel, CPG.
- No cut-off concentrations have been applied to the resource estimate
- Lithium is converted to lithium carbonate (Li2CO3) with a conversion factor of 5.32.

Since 2011, material amounts of new information have been obtained from exploration and production activities at Olaroz. This included geological and production data from Stage 1 production and monitoring holes generally drilled to 200m, with some to 350m and 450 m; and the Stage 2 expansion production and monitoring holes to depths of between 450 and 650 metres. Additional information has also come from drilling in Cauchari, a 1,408 m deep exploration hole north of the production holes in Olaroz and geophysical surveys over the whole basin.

Stage 2 work program

Much of the technical detail in this release was previously provided in April 2022 in the Interim Resource Estimate. The last of the 15 wells for Stage 2 production (Figure 3) was completed late in 2022. These production wells are now installed to depths between 450 m and 650 m (with one hole, E15, to 751 m) and produce brine from these deeper levels on a 1 km north-south spacing in the central to eastern area of the salar, between the original Northern and Southern wellfields. In addition to the production wells a number of diamond drill holes provided core and brine samples and have allowed the installation of monitoring wells. The Stage 2 production wells are currently producing a combined flow of approximately 396 l/s, at an average per well of 28 l/s, since beginning operation. This is considerably higher than the Stage 1 wells, which have averaged 11 l/s per well since the beginning of 2017.

Samples from the wells were sent to external and internal laboratories for chemical analysis. This information and downhole geophysics (from a borehole magnetic resonance tool, part of a broader suite of geophysical tools) were used to update the geological model, which supports the resource estimate upgrade.

The lithium concentrations from the Stage 2 wells have recorded an average lithium grade of 643 mg/l and varied from 544 mg/l to 789 mg/l lithium. Further drilling information and analytical results are displayed in Appendix A below.

Property position

Allkem holds an extensive property position across the Olaroz and Cauchari basins (Figure 1). At Olaroz, Allkem owns 66.5% of properties via Sales de Jujuy SA , a joint venture company with Toyota Tsusho Corporation (25%) and JEMSE (8.5%).

Properties held by SDJ in the north of the Olaroz salar have had minimal drilling, limited to several 54m deep holes drilled in initial exploration in 2010. Resources have not yet been defined in these properties.

In addition to its ownership interests via SDJ, Allkem also owns, via Olaroz Lithium, 100% of five additional properties in the north of the Olaroz salar, which have also not yet been drilled. The recently acquired, strategically located, Maria Victoria property in the north of the Olaroz salar is 100% owned through Allkem subsidiary La Frontera Minerals S.A and contributed 2.7 Mt LCE to this resource upgrade.

Allkem owns properties in the east and west of the Cauchari basin immediately to the south of the Olaroz resource. A pre-feasibility study ("PFS") was completed in 2019 by South American Salars (now 100% Allkem) with resources and reserves.

Olaroz Basin geology

Exploration activities, since Allkem acquired the properties in 2008, have consisted of extensive geophysical programs and drilling over the Olaroz basin. Geophysical programs have included AMT electrical surveying, and vertical electrical soundings to define the lateral extents of the brine beneath alluvial sediments, around the margins of the salar. This is important in order to constrain the geological and hydrogeological models and assess areas for brine prospectivity off the salar. The northern SDJ and 100% Allkem properties have been subject to minimal exploration to date. However, electrical geophysics indicates prospectivity for brine beneath alluvial and deltaic sediments north of the Olaroz salar in the Cateo 498 and other properties. This has also recently been confirmed by drilling by a third party with properties extending off the salar in the north of the basin.

Figure 1: Distribution of the new holes for Stage 2 production

Additional geophysics has included an extensive gravity and magnetic survey across the basin, that provided information on the basin depth and corroborated the early geophysical interpretation which indicated the basin is more than 1 km deep.

Since the exploration drilling for the 2011 Resource estimation, conducted between 2008 to 2011, more extensive drilling undertaken for exploration and production well installation has provided information to depths of 751 m in Olaroz (generally 400 to 650 m) and better defined the basin geology. Additionally, one deep exploration hole has been drilled at the north end of the production area to a depth of over 1400 m, without intersecting basement rocks. This drilling led to development of a mixed salar basin model, with five separate geological and hydrogeological (hydrostratigraphic) units above the basement, defined by geological and geophysical logging of holes (refer to Figures 2 and 3) as previously presented.

1. UH1 - Upper evaporite deposits, porous halite, clay, sand and silt
2. UH2 - Alluvial fans on the western and eastern margins of the salar, which contain brine beneath brackish water off the salar (as defined by production well E26)
3. UH3 - Mixed sediments with clay and sand intervals
4. UH4 - Evaporite deposits, principally halite, with clay silt and sand interbeds
5. UH5 - Sand units, interbedded with clay and silt. Sandy material is sourced from the historical western margin of the basin and becomes progressively deeper in the east of the basin

Drilling has not intersected the basement rocks beneath the salar and it is possible that additional units will be intersected in future deeper drilling. In the central eastern part of the salar unit UH4 is thicker, reflecting the nucleus of the salar in this area.

The geological interpretation across Olaroz is also consistent with the independent interpretations on adjacent projects based on drilling conducted by Allkem in Cauchari and the work conducted by Lithium Americas Corp. (Exar) in Cauchari, being the southern continuation of the Olaroz structural basin.

Figure 2: Geological model of the Olaroz salar

Hydrogeology sampling background

Allkem began exploration of the Olaroz project in 2008 and has built up extensive knowledge of the salar since that time. Resource definition drilling on the project included twenty sonic holes drilled to a depth of 54 m across the salar, with six diamond holes to 200 m depth. All these drill holes were geophysically logged and porosity samples were taken every 1.5 to 6 m for systematic characterisation of the different geological units.

Systematic interval brine sampling was also undertaken in the holes drilled for the original resource using bailer equipment, showing low coefficients of variation (averaging 0.18 over the 200m deep exploration holes and 0.19 for 54 m deep sonic drill holes on the salar). Two test production wells were installed for the feasibility study. One of these wells (PD02) was subsequently incorporated into the southern wellfield for Stage 1 production. Pumping since 2013 has confirmed the original pumping test results from this site.

Northern and southern wellfields for Stage 1 were established with wells installed on a 1 km spacing, generally to a depth of 200m, but with some later holes to 350m, with wells pumped since 2013. The brine flows from the production wells have sustained stable lithium brine grades over this period with brine grades generally consistent with the results of the 2011 exploration drilling and characterisation of brine grades across the salar. Brine grades on the salar do not show major changes by lithology type, with the most significant changes related to the halite units and concentration of sulphate and boron.

Stage 1 production wells and exploration holes showed a systematic variation in brine grade laterally across the salar with higher grades in the central part of the salar and lower grades towards the west. However, recent deeper production wells (from 450 to 650 m deep) for Stage 2 have encountered higher grade brine in some holes in the west of the salar (E12, E17 and E19 averaging 768, 692 and 752 mg/l respectively - see Figures 3) than the shallower 200m exploration drilling in the same area. All production wells are subjected to pumping tests to establish the well hydraulic parameters in addition to measurements from geophysical logging prior to beginning production from the wells.

Olaroz is a mixed salar predominantly consisting of clastic sediments with a surficial and a deeper halite layer. The sequence is considered to act as a leaky aquifer with the entire sequence of sediments contributing brine flow to wells, with lower relative contributions from compact halite material. Higher brine flows are obtained from intervals with high sand content and higher permeability, with the brine grades generally comparable between geological units based on the diamond drill sampling and low CV values of lithium brine results from this historical sampling. Despite small scale variability in the sedimentation the five hydrostratigraphic units in the salar display fairly consistent porosity characteristics internally based on the geophysical logging.

Historical diamond drilling showed lithium brine concentrations have a low variability (CV) vertically down hole, with systematic variation across the salar and with lower brine grades generally closer to the salar margins. Test pumping from the 2011 feasibility study for Stage 1 of the Olaroz Lithium Facility has been confirmed by long term pumping from well PD02 (Southern wellfield) and adjacent wells in the wellfield. Consequently, the pumping results of production wells are considered a reasonable and reliable substitute for systematic down hole interval brine samples, given the accumulated knowledge at Olaroz and higher density of data at the project relative to pre-development projects. However, further diamond drilling is recommended in new areas and areas of the salar before the installation of production wells.

Figure 3 - Olaroz well locations

Brine sample quality control

Brine samples have been collected from the wells in production once they are fully installed. This follows flow tests, carried out to determine the potential production flow rates and to confirm pump selection for holes and long term operation. Samples were taken in triplicate with the primary sample analysed at the Olaroz Lithium Facility laboratory where they were analysed with AA equipment for lithium, and ICP equipment for other major cations and anions.

Brine standard samples and field duplicate samples were included with the sample batches. These QA/QC measures were included to check the performance of the Olaroz and external laboratory. Alex Stewart Argentina in Jujuy, Argentina was selected as the primary external laboratory to assay the brine check samples. That laboratory is ISO 9001 accredited and operates according to Alex Stewart Group standards consistent with ISO 17025 methods at other laboratories.

Porosity sample quality control

Three diamond holes were completed for the expansion program. Cores were collected systematically through these holes with samples collected in transparent polycarbonate (Lexan) tubes. These tubes were retrieved from the core barrel and stored in core trays prior to the laboratory sample being cut from the base of the tube, with 30 cm core subsamples sent to the Geosystems Analysis (GSA) laboratory in the USA.

GSA utilized the Rapid Brine Release method (Yao et al., 2018) to measure drainable porosity and the total porosity. The Rapid Brine Release (RBR) method is based on the moisture retention characteristics (MRC) method for direct measurement of total porosity (Pt, MOSA Part 4 Ch. 2, 2.3.2.1), specific retention (Sr, MOSA Part 4 Ch3, 3.3.3.5), and specific yield (Sy, Cassel and Nielson, 1986). A simplified Tempe cell design (Modified ASTM D6836-16) was used to test the core samples. Brine release was measured at 120 mbar and 330 mbar of pressure for reference (Nwankwor et al., 1984, Cassel and Nielsen, 1986). Bulk density, particle size analyses and specific gravity were also determined on selected core samples.

For quality control, a collection of paired samples representative of the range in lithology types were selected for testing using other laboratory techniques also used to measure drainable porosity. These are the Relative Brine Release Capacity (RBRC, Stormont et. al., 2011) method of the DB Stephens Laboratory and the Centrifuge Moisture Equivalent of Soils (Centrifuge, ASTM D 6836-16) method by Core Laboratories (Houston, Texas). These methods provide an estimate of variability in the definition of the drainable porosity across different laboratory methods.

Geophysical Logging

Drill holes in the Stage 2 expansion campaign were geophysical logged by contractor Zelandez, with a number of geophysical tools (natural gamma, resistivity, conductivity, borehole magnetic resonance, ultrasonic borehole images) in order to maximise the collection of data from the drilling. Borehole Magnetic Resonance (BMR) is a geophysical tool that was developed by the oil industry to measure porosity and permeability in-situ in wells to assist reservoir studies. The Borehole Magnetic Resonance tool was designed and built in Australia to operate in highly saline environments like salars.

The BMR tool used for the drilling campaign is purpose-built for logging of exploration diameter drill holes. The tools are factory calibrated in Australia and maintained regularly by the service provider. The data acquisition and processing methodology gives information on the total porosity, drainable porosity (specific yield), specific retention and provides a computation of permeability and hydraulic conductivity with a vertical resolution varying from 5-15 cm, providing much more information than individual core samples analysed for porosity with a spacing every 3 or more metres.

Porosity cores from the three diamond holes drilled for the Stage 2 expansion were analysed in the Geosystems Analysis laboratory in the USA. This laboratory has extensive experience analysing salar cores having undertaking analyses on numerous salar projects. Porosity values from the laboratory sampling were compared to the BMR porosity log. While some differences are noted the general ranges of porosity values for the different hydrostratigraphic values are considered comparable.

Salar sediments display short range vertical and lateral variability (within a metre or over metres to 10's of metres) due to changes in the depositional environment over time. This results in vertical and lateral changes in drainable porosity. BMR drainable porosity (Specific yield) measurements were often lower than corresponding laboratory measurements. BMR porosity values are considered to be more conservative than laboratory measurements, as cores can be disturbed during transportation to the laboratory.

Salar sediments are subject to compaction as they are buried with compaction generally resulting in a decrease in total and drainable porosity with depth although not all sediments are affected equally by compaction.

Holes drilled for the original feasibility study were logged with a neutron tool, as borehole magnetic resonance technology was not available to the lithium industry in 2011. The neutron tool measures the hydrogen index of the formation (solids and brine). Neutron porosity is the result of applying a simple equation using the neutron measurement and two parameters. For the 2011 Resource neutron log data was compared with laboratory data to develop an algorithm for porosity across the resource area. BMR technology is considered more accurate for porosity definition in the salar environment and has superseded use of neutron logs.

There are some differences observed between porosity measurements made with the neutron and BMR logs through comparable sediments. The drainable porosity of this upgraded resource is lower than the 2011 Resource, partly due to the greater depth of this resource and some compaction of sediments, the geological intervals intersected (greater thicknesses of halite) and due to a reduction in comparable porosity values due to the type of geophysical logging.

The ongoing drilling for the Stage 2 expansion has defined the full thickness of the evaporite/halite unit UH4. This unit has a generally lower porosity than overlying and underlying clastic sedimentary units due to the compaction of halite with depth. Similarly clastic units also undergo some compaction with depth and consequently the overall porosity of the newly estimated resource is lower compared to the original resource in the upper 200 m of the salar.

Estimate data sources

Average production well brine chemistry values, from throughout pumping of the wells, have been used as inputs for the resource estimation, in addition to the interval samples historically collected in the upper 200 m. This is considered an acceptable approach in this situation, given the level of information available in the Olaroz salar, hydrogeological continuity between drill holes, comparison between historical interval samples and pumped brine concentrations and the history of pumping data available. Additional 650 m deep diamond drilling is recommended for future resource evaluations and to allow installation of additional deep monitoring wells.

Geophysical logging in the deeper holes has confirmed generally consistent drainable porosity and permeability characteristics throughout the clastic sediments with higher porosities and permeabilities associated with thicker more sand dominated intervals.

Mineral Resources

Estimation of a brine resource requires definition of:

- The aquifer distribution (in this case restricted to the salar outline, except around hole E26 in the south)
- The distribution of drainable porosity (specific yield) values
- The distribution of lithium and other elements in the brine defined by drilling
- The external limits (geological or property boundaries) of the resource area

The resource grade is a combination of the aquifer volume, the drainable porosity (portion of the aquifer volume that is filled by brine that can potentially be extracted) and the concentration of lithium in the brine.

The Olaroz aquifer system is not a conventional water supply style aquifer, based on a discrete geological unit, but rather a layered sequence of sediments that contributes brine flow to production wells. More permeable sand and gravel units provide relatively higher flows. The surface outline of the salar is used to delimit the area of the resource estimate (except for the off-salar extension around E26). The 2023 resource covers 147.9 $km^2$, larger than the original 2011 Resource area (93 $km^2$).

The expanded area reflects inclusion of the Olaroz Lithium and Maria Victoria properties, which were not part of the original property holdings, and the area around E26. The resource has been further expanded by the drilling of hole E26, allowing definition of resources beneath the alluvial gravels south of the salar (Figure 3). Brine saturated sediments are known to extend beneath alluvial sediments surrounding the salar and this was confirmed in drilling of hole E26 on the edge of the gravels beside the salar, which continued to 510 m in sandy and gravel material.

The resource estimate is limited laterally by the boundaries (Figure 3) with adjacent property owner Exar, in the salar to the east and north of the properties owned by Allkem and SDJ entities. The resource estimate is limited at depth by the sediment-basement contact interpreted from the gravity geophysical survey conducted over the basin. Drilling suggests this interpretation underestimates the basin depth.

Within the salar the three-dimensional distribution of the different hydrostratigraphic units was defined using Leapfrog 3D software, with these units based on geological and geophysical logging observations. The resource is entirely within the salar, except in the gravel area extending west from production hole E26. This is the only location where brackish water overlies brine within the resource estimate. The upper 100 m of this area off the salar has been excluded from the resource estimate, because it is not brine. Conversion of the resource to reserve in this area will evaluate extraction of this brine for future production. In all other areas within the resource brine begins from the salar surface.

The porosity data set consisted of interval porosity samples analysed in an independent laboratory for the upper 200 m and the BMR downhole geophysics from 200 to > 650 m. These were used to generate a block model across the salar area, applying ordinary kriging to the composited drainable porosity data.

The distribution of lithium and other elements was estimated from point sampling data from the upper 200 m of the model, where samples are typically spaced every 6 m in the 200 m holes and 3 m or less in the 54 m holes. Below the upper 200 m the resource was estimated based on the pumped samples from the production wells, with a single value per hole representing the average pumped lithium value, assigned to the areas with screens in the production wells.

The block model was constructed with 500 by 500 m blocks, with a 20 m vertical extent (Figure 4 and Figure 5). Only the portion of the block inside the salar outline is reported in the resource (with the exception of the area around E26). The resource estimate was undertaken using Datamine software, with variograms developed for the point samples from the upper 200 m. Estimation was undertaken using ordinary kriging. The ordinary kriging method is the most commonly used kriging method. In areas of sparse data around the model edges Nearest Neighbour estimation was used.

The resource was estimated using four passes in the search strategy. The results of the first two passes are nominally equated to blocks classified as Measured and Indicated, with the latter two passes equating to blocks classified as Inferred. The resources were defined across the salar outline and extension around E26, defined over different depths, reflecting drilling density and confidence. Future drilling on the salar may bring additional resources into the Indicated and Measured classification.

Figure 4: Lithium grades (mg/L) at 100 m (left) and 250 m below surface (right)

Figure 5: Resource blocks in lithium mg/l, showing the salar edge (red), alluvial zone (green) in the south and the muddy marginal zone outline (between red and blue outlines)

Measured Mineral Resources

*A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.*

*Geological evidence is derived from detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes, and is sufficient to confirm geological and grade (or quality) continuity between points of observation where data and samples are gathered.*

*A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Ore Reserve or under certain circumstances to a Probable Ore Reserve.*

Extraction of brine is ongoing from 1 km spaced, 200 m deep, production wells pumping for a period of over eight years. Wells have a drilling density of approximately 1 per 2 $km^2$ in the production well field areas. Extensive exploration drilling was previously conducted across the salar to 200 m depth. The Measured Resources are almost all within 2.5 km from drill holes across the salar, as suggested by Houston et. al., 2011 as an appropriate drilling spacing for Measured Resources in clastic salars. On the basis of the available data the resource to 200 m depth is classified as a Measured Resource.

An additional area of Measured Resources has been defined around the three diamond drill holes on the eastern margin of the project, south of the deep hole E1. An extension of 2.5 km from the property boundary has been applied for definition of this Measured Resource, consistent with the suggestion of Houston et. al., 2011. This is considered a reasonable basis for extension of the resource to 650 m depth in this area, surrounded by Indicated Resources.

The Measured resource is reported at a zero mg/l lithium cut-off, as the entire Olaroz salar contains brine with an elevated lithium concentration to the salar boundary.

Indicated Mineral Resources

*An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.*

*Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes, and is sufficient to assume geological and grade (or quality) continuity between points of observation where data and samples are gathered.*

*An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Ore Reserve.*

Geological continuity established by deeper drilling below 200 m, geophysical logging of holes, and gradual changes in lithium concentration provide the basis for classifying the brine between 200 and 350 m below surface in the north of the salar (with lesser drilling density) and south off the salar around hole E26 as Indicated to this depth. In the more central part of the salar the resource is defined as an Indicated resource (with greater drilling density) between 200 and 650 m depth.

Laboratory porosity samples are relatively limited below 200 m, however similar sediment intervals are present above 200 m at Olaroz, where porosity characteristics have been established from hundreds of laboratory analyses. Extensive porosity samples from similar sediments are also available from the Allkem Cauchari properties. Ongoing extraction by pumping of brine from wells up to 450 m deep since 2014 and from 650 m depth for up to 3 years, provides confidence as to the extractability of brine from the resource to this depth.

BMR porosity data was collected below 200 m depth, providing extensive porosity data in the Stage 2 holes. Future drilling below 200 m provides the opportunity to upgrade Indicated Resources to Measured status.

Inferred Mineral Resources

*An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade (or quality) are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade (or quality) continuity. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.*

*An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to an Ore Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*

The Inferred Mineral Resource is defined between 350 m and 650 m off the salar to the north and south. Within the salar Inferred resources are defined below 650 m and the base of the basin. The base of the basin is defined by the gravity geophysical survey, with areas significantly deeper than 650 m defined. There are currently 19 production wells installed to 350 m or below, with production wells for the Olaroz Expansion Project installed between 400 and 751 m deep between the existing northern and southern wellfields. The deep hole drilled in the north of the salar confirms locally the salar sediments extend to below 1400 m depth. Drilling has not intersected the base of the salar sediments, where the geophysical estimated basement depth has been reached, suggesting the basin may be deeper than estimated from the gravity survey. Brine samples were completed in this deep hole.

Taking account of the distribution of brine grade and porosity to date (as determined by BMR geophysics) there is a sufficient level of confidence to classify the resources extending to the bottom of the basin as Inferred Resources. It is likely that additional drilling could convert these to a higher confidence resource classification.

Figure 6: Distribution of resource categories

Further exploration potential

The resource is open laterally over an extensive area to the north off the salar, and to the south and west, beneath sands and gravels that surround the salar.

To the south, previous limited drilling and geophysical surveys indicate the brine body is likely to extend south to link with the Cauchari Resource (Allkem 100%). Similarly, brine extends west of the salar. The greatest potential, based on work by Allkem and 3rd parties, is over the extensive area to the north under the Rio Rosario delta, where future drilling is required to define resources. The resource may also extend at depth beyond the base of the basin interpreted by gravity geophysics. To date no Allkem drilling in the Olaroz basin has yet intersected the basement, allowing for significant future additions to the company's resource base. Consequently, there is substantial potential to add additional resources in the project.

This release was authorised by Mr Martin Perez de Solay, CEO and Managing Director of Allkem Limited.


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| Allkem Limited | | |
| | Investor Relations & Media Enquiries | Connect |
| ABN 31 112 589 910 | Andrew Barber | info@allkem.co |
| | +61 418 783 701 | +61 7 3064 3600 |
| Level 35, 71 Eagle St | Andrew.barber@allkem.co | www.allkem.co |
| Brisbane, QLD 4000 | | |


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This investor ASX/TSX release (Release) contains general information about the Company as at the date of this Release. The information in this Release should not be considered to be comprehensive or to comprise all of the material which a shareholder or potential investor in the Company may require in order to determine whether to deal in Shares of Allkem. The information in this Release is of a general nature only and does not purport to be complete. It should be read in conjunction with the Company's periodic and continuous disclosure announcements which are available at allkem.co and with the Australian Securities Exchange (ASX) announcements, which are available at www.asx.com.au.

Technical Information and Competent Persons' Statements

The information in this report that relates to Olaroz Exploration Results and Mineral Resources is based on information compiled by Mr Murray Brooker, a Competent Person who is a Member of the Australian Institute of Geoscientists, a 'Recognised Professional Organisation' (RPO) included in a list posted on the ASX website from time to time. Mr Brooker is an independent consultant employed by Hydrominex Geoscience Pty Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. He is also a "Qualified Person" as defined by Canadian Securities Administrators' National Instrument 43-101. Mr Brooker consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

Any information in this release that relates to Cauchari Project Mineral Resources is extracted from the release entitled "Cauchari JORC Resource increases to 4.8 million tonnes Measured + Indicated and 1.5 million tonnes Inferred LCE" released on 19 April 2019 and the report entitled "NI43-101 Technical Report Cauchari JV Project - Updated Mineral Resource Estimate" which is available to view on www.allkem.co and www.asx.com.au. The Competent Person for this technical report and Mineral Resource estimate was Mr Frits Reidel, CPG, of Atacama Water (Formerly FloSolutions Chile). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the Mineral Resource and Ore Reserve estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

Technical information relating to the Company's Olaroz project contained in this release is derived from, and in some instances is an extract from, the technical report entitled "Olaroz Resource Update March 2023" (Technical Report) which has been reviewed and approved by Murray Brooker (Hydrominex Geoscience Pty Ltd) as it relates to geology, drilling, sampling, exploration, QA/QC, mining methods and mineral resources and Mr Mike Gunn (Gunn Metals) as it relates to site infrastructure, capital cost, operating cost estimates, mining cost, financial modelling and economic analysis in accordance with National Instrument 43-101 - Standards for Disclosure for Mineral Projects. The Technical Report is available for review under the Company's profile on SEDAR at www.sedar.com.

Forward Looking Statements

Forward-looking statements are based on current expectations and beliefs and, by their nature, are subject to a number of known and unknown risks and uncertainties that could cause the actual results, performances and achievements to differ materially from any expected future results, performances or achievements expressed or implied by such forward-looking statements, including but not limited to, the risk of further changes in government regulations, policies or legislation; the risks associated with the continued implementation of the merger between the Company and Galaxy Resources Ltd., risks that further funding may be required, but unavailable, for the ongoing development of the Company's projects; fluctuations or decreases in commodity prices; uncertainty in the estimation, economic viability, recoverability and processing of mineral resources; risks associated with development of the Company Projects; unexpected capital or operating cost increases; uncertainty of meeting anticipated program milestones at the Company's Projects; risks associated with investment in publicly listed companies, such as the Company; and risks associated with general economic conditions.

Subject to any continuing obligation under applicable law or relevant listing rules of the ASX, the Company disclaims any obligation or undertaking to disseminate any updates or revisions to any forward-looking statements in this Release to reflect any change in expectations in relation to any forward-looking statements or any change in events, conditions or circumstances on which any such statements are based. Nothing in this Release shall under any circumstances (including by reason of this Release remaining available and not being superseded or replaced by any other Release or publication with respect to the subject matter of this Release), create an implication that there has been no change in the affairs of the Company since the date of this Release.

Not for release or distribution in the United States

This announcement has been prepared for publication in Australia and may not be released to U.S. wire services or distributed in the United States. This announcement does not constitute an offer to sell, or a solicitation of an offer to buy, securities in the United States or any other jurisdiction, and neither this announcement or anything attached to this announcement shall form the basis of any contract or commitment.

APPENDIX A: DRILL HOLE COLLARS AND LITHIUM CONCENTRATION

*Average well flows from 12 January 2017 to 31 January 2023

APPENDIX B

JORC Table 1 - Section 1 Sampling Techniques and Data related to Olaroz Stage 2 expansion drilling

(Criteria in this section apply to all succeeding sections.)

| Criteria | JORC Code explanation |
|---|---|
| *Sampling techniques* | ● *Nature and quality of sampling (eg cut channels, random ch*<br>● *Include reference to measures taken to ensure sample repre*<br>● *Aspects of the determination of mineralisation that are Mate*<br>● *In cases where 'industry standard' work has been done this* |
| *Drilling techniques* | ● *Drill type (eg core, reverse circulation, open-hole hammer, r* |
| *Drill sample recovery* | ● *Method of recording and assessing core and chip sample re*<br>● *Measures taken to maximise sample recovery and ensure re*<br>● *Whether a relationship exists between sample recovery and* |
| *Logging* | ● *Whether core and chip samples have been geologically and*<br>● *Whether logging is qualitative or quantitative in nature. Core*<br>● *The total length and percentage of the relevant intersections* |
| *Sub-sampling techniques and sample preparation* | ● *If core, whether cut or sawn and whether quarter, half or all*<br>● *If non-core, whether riffled, tube sampled, rotary split, etc an*<br>● *For all sample types, the nature, quality and appropriatenes*<br>● *Quality control procedures adopted for all sub-sampling stag*<br>● *Measures taken to ensure that the sampling is representativ*<br>● *Whether sample sizes are appropriate to the grain size of th* |
| *Quality of assay data and laboratory tests* | ● *The nature, quality and appropriateness of the assaying and*<br>● *For geophysical tools, spectrometers, handheld XRF instrun*<br>● *Nature of quality control procedures adopted (eg standards,* |
| *Verification of sampling and assaying* | ● *The verification of significant intersections by either indepen*<br>● *The use of twinned holes.*<br>● *Documentation of primary data, data entry procedures, data*<br>● *Discuss any adjustment to assay data.* |
| *Location of data points* | ● *Accuracy and quality of surveys used to locate drill holes (co*<br>● *Specification of the grid system used.*<br>● *Quality and adequacy of topographic control.* |
| *Data spacing and distribution* | ● *Data spacing for reporting of Exploration Results.*<br>● *Whether the data spacing and distribution is sufficient to est*<br>● *Whether sample compositing has been applied.* |
| *Orientation of data in relation to geological structure* | ● *Whether the orientation of sampling achieves unbiased sam*<br>● *If the relationship between the drilling orientation and the ori* |

| | |
|---|---|
| *Sample security* | ● *The measures taken to ensure sample security.* |
| *Audits or reviews* | ● *The results of any audits or reviews of sampling techniques* |

Section 2 - Reporting of Exploration Results

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

| Criteria | JORC Code explanation |
|---|---|
| *Mineral tenement and land tenure status* | ● *Type, reference name/number, location and ow*<br>● *The security of the tenure held at the time of re* |
| *Exploration done by other parties* | ● *Acknowledgment and appraisal of exploration b* |
| *Geology* | ● *Deposit type, geological setting and style of mi* |
| *Drill hole Information* | ● *A summary of all information material to the un*<br>1. *easting and northing of the drill hole colla*<br>2. *elevation or RL (Reduced Level - elevatio*<br>3. *dip and azimuth of the hole*<br>4. *down hole length and interception depth*<br>5. *hole length.*<br>● *If the exclusion of this information is justified or* |
| *Data aggregation methods* | ● *In reporting Exploration Results, weighting ave*<br>● *Where aggregate intercepts incorporate short l*<br>● *The assumptions used for any reporting of met* |
| *Relationship between mineralisation widths and intercept lengths* | ● *These relationships are particularly important i*<br>● *If the geometry of the mineralisation with respe*<br>● *If it is not known and only the down hole length* |
| *Diagrams* | ● *Appropriate maps and sections (with scales) ar* |
| *Balanced reporting* | ● *Where comprehensive reporting of all Explorati* |
| *Other substantive exploration data* | ● *Other exploration data, if meaningful and mater* |

| | |
|---|---|
| *Further work* | ● *The nature and scale of planned further work (* <br> ● *Diagrams clearly highlighting the areas of poss* |

Section 3 Estimation and Reporting of Mineral Resources

| Criteria | JORC Code explanation |
|---|---|
| *Database integrity* | ● *Measures taken to ensure that data has not been corrupted by, for e* <br> ● *Data validation procedures used.* |
| *Site visits* | ● *Comment on any site visits undertaken by the Competent Person an* <br> ● *If no site visits have been undertaken indicate why this is the case.* |
| *Geological interpretation* | ● *Confidence in (or conversely, the uncertainty of ) the geological inter* <br> ● *Nature of the data used and of any assumptions made.* <br> ● *The effect, if any, of alternative interpretations on Mineral Resource e* <br> ● *The use of geology in guiding and controlling Mineral Resource estin* <br> ● *The factors affecting continuity both of grade and geology.* |
| *Dimensions* | ● *The extent and variability of the Mineral Resource expressed as leng* |
| Estimation and modelling techniques | ● *The nature and appropriateness of the estimation technique(s) applie* <br> ● *The availability of check estimates, previous estimates and/or mine p* <br> ● *The assumptions made regarding recovery of by-products.* <br> ● *Estimation of deleterious elements or other non-grade variables of ec* <br> ● *In the case of block model interpolation, the block size in relation to t* <br> ● *Any assumptions behind modelling of selective mining units.* <br> ● *Any assumptions about correlation between variables.* <br> ● *Description of how the geological interpretation was used to control t* <br> ● *Discussion of basis for using or not using grade cutting or capping.* <br> ● *The process of validation, the checking process used, the compariso* |
| Moisture | ● *Whether the tonnages are estimated on a dry basis or with natural m* |
| *Cut-off parameters* | ● *The basis of the adopted cut-off grade(s) or quality parameters appli* |
| *Mining factors or assumptions* | ● *Assumptions made regarding possible mining methods, minimum mi* |

| | |
|---|---|
| *Metallurgical factors or assumptions* | ● *The basis for assumptions or predictions regarding metallurgical ame* |
| *Environmental factors or assumptions* | ● *Assumptions made regarding possible waste and process residue di* |
| *Bulk density* | ● *Whether assumed or determined. If assumed, the basis for the assu*<br>● *The bulk density for bulk material must have been measured by met*<br>● *Discuss assumptions for bulk density estimates used in the evaluatio* |
| *Classification* | ● *The basis for the classification of the Mineral Resources into varying*<br>● *Whether appropriate account has been taken of all relevant factors (*<br>● *Whether the result appropriately reflects the Competent Person's vie* |
| *Audits or reviews* | ● *The results of any audits or reviews of Mineral Resource estimates.* |
| *Discussion of relative accuracy/ confidence* | ● *Where appropriate a statement of the relative accuracy and confiden*<br>● *The statement should specify whether it relates to global or local est*<br>● *These statements of relative accuracy and confidence of the estimat* |

Photos accompanying this announcement are available at:

https://www.globenewswire.com/NewsRoom/AttachmentNg/c8ebd1a1-e04e-423a-8e85-03c3e6b44039

https://www.globenewswire.com/NewsRoom/AttachmentNg/1ad108fe-950b-4859-a61d-a704c174a213

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