

Orocobre Limited Porvenir Historical Estimate Upgraded to JORC Compliant Resource

02.04.2014 | [ABN Newswire](#)

Brisbane, Australia (ABN Newswire) - [Orocobre Ltd.](#) (ASX:ORE) (TSE:ORL) ("Orocobre" or "the Company") is pleased to announce the upgrade of a historical estimate to a Measured and Indicated Resource for the Porvenir borate deposit in Jujuy Province, Argentina. The resource is located in the Cauchari salar, within 39 mining leases owned by the 100% Orocobre subsidiary Borax Argentina. Within the Cauchari salar, the company's 85% subsidiary, South American Salars also owns mining properties which host a lithium resource announced by the company on the 22nd of October, 2012.

Highlights

- Measured and Indicated Resource of 2.3 million tonnes at 20.4% B₂O₃ is estimated at the current 16% B₂O₃ mining cut-off grade.
- Resource estimate in line with superseded historical estimate at the same cut-off.
- The resource extends to a maximum depth of approximately 3 m and is easily exploited by low cost strip mining.
- A Measured and Indicated resource of 6.9 million tonnes of 14.9 % B₂O₃ is estimated at a 9% B₂O₃ cut-off, a value appropriate for processing of the ore at a potential new boric acid plant at Olacapato.

Independent Qualified/Competent Person Murray Brooker has estimated a Measured and Indicated resource of 2.3 million tonnes at 20.4% B₂O₃ at the current mine cut-off grade of 16% B₂O₃ or 6.9 million tons of 14.9 % B₂O₃, at a cut-off grade of 9 % B₂O₃, a value appropriate to processing the ore at a possible new boric acid plant at Olacapato to a maximum depth of 2.9 m.

This compares to a superseded historical estimate of 2,417,099 tonnes at 20.2 B₂O₃ calculated at a cut-off between 14% and 19% B₂O₃, depending on the mineralisation style. The superseded historical estimate was originally reported on the 21st of August 2012, at the time of the announcement of the Company's purchase of Borax Argentina. The majority of the ulexite is hosted within a sand matrix, which is easily separated from the ulexite by screening after drying. The screened ulexite from this operating mining operation is then available for processing into Boric acid.

The company is in the process of upgrading the historical estimates (refer to Appendix 1 below) of the different Borax Argentina mining properties to JORC/NI43-101 compliant mineral resources. This Porvenir resource estimate, calculated in accordance with the requirements of JORC 2012, is the first re-evaluation of the Company's borate resource base. Geological interpretation and re-estimation of the resources at the Diablillos and Tincalayu projects is currently underway. The historical estimate (now superseded) of the Porvenir deposit was only a small part (14% of contained B₂O₃) of the overall quantum of the historical estimates of the mineralisation on Borax Argentina properties.

Introduction

Borax Argentina SA, including the Porvenir ulexite mine, was acquired by Orocobre from Rio Tinto Minerals in August 2012. Borax Argentina has been in operation for over 50 years and operates open pit mines in Tincalayu, Sijes, and Porvenir. There are concentration plants in Tincalayu, Sijes and Porvenir (not currently used) and refinery facilities in Campo Quijano. Additionally, the large deposit at Diablillos is essentially undeveloped although some ulexite is mined for processing into boric acid.

There are presently three product streams. Firstly, the mineral tincal is mined and concentrated at the Tincalayu mine and then carted approximately 350kms to produce the range of Borax chemicals at Campo Quijano. Secondly, ulexite is mined, mainly at Porvenir, and transported to Campo Quijano to produce Boric Acid. The third product stream, hydroboracite and colemanite are mined at Sijes and concentrated to produce mineral concentrates for direct sale.

At Porvenir, ore is currently selectively mined at 21% B₂O₃ and then transported to drying areas where it is

spread in windrows, to a height of approximately 20 cm. The windrows are turned regularly by hand rakes over a 3 week period to increase drying by the sun and wind and to remove sand and clay from the ulexite resulting in a feed grade of 26% B₂O₃. Following drying, the material is loaded into trucks and transported to the company's current operating Boric Acid plant in Campo Quijano, 300kms to the south-east. This boric acid plant has a capacity of 9,000tpa and was designed to process a high grade ore feed.

A pre-feasibility assessment is currently underway regarding the construction of a new boric acid plant in Olacapato, only 40 km south of the Porvenir mining operations, to produce up to 25,000 tpa of boric acid (Figure 1). The design concept behind this plant is to process lower grade run-of mine ore produced by more mechanised and lower unit cost methods. The plant is being designed for a feed grade of approximately 18% B₂O₃. This allows a cut-off grade of 9%.

Location and Properties

Porvenir is located in the Cauchari salar (salt lake, Figure 1) in the south of the province of Jujuy. The project is in the Puna geographical region, at an altitude of ~3900 m above sea level, 160 km west-northwest of San Salvador de Jujuy, capital city of Jujuy province.

Porvenir lies approximately 20 km south of the paved highway (Figure 2) that passes through the international border with Chile, approximately 80 kilometres by road to the west (Jama Pass). That road continues on to the major mining center of Calama and the port of Mejillones in northern Chile, a major port for the export of mineral commodities and import of mining equipment.

Orocobre, through its 100% owned subsidiary Borax Argentina, owns thirty nine mining properties in the Cauchari salar (salt lake) that constitute the Porvenir project (Figure 2). The leases are located immediately south of the company's flagship Olaroz lithium operation and host shallow (current maximum depth 1.5 m) strip mining of ulexite, the dominant boron mineral in this salar. The company's 85% owned subsidiary, South American Salars, owns mining properties immediately east of the Borax Argentina properties and these host an inferred lithium brine resource previously reported by the company.

About borate mineralisation

Borates are the group of minerals which consist of boron bonded with oxygen and cations such as Ca, Mg and Na. Economic borate mineralisation largely consists of minerals such as ulexite (NaCaB₅O₆(OH)₆-5(H₂O)) and borax which were deposited in salar (salt lake)/playa-lake environments. The most significant borate deposits are located in Turkey, the USA and Argentina. These are regarded as industrial minerals and have a wide range of uses. These include use as fluxes in a wide variety of industrial applications, as frits for the glass industry and in industrial products such as fibre glass and flame retardants.

Boric acid is used in a wide variety of applications including glass, ceramics, fertilisers and wood preservatives. The market has a growth profile above world GDP growth. For industrial grade boric acid pricing has ranged approximately between US\$750/t to \$1,250/t CIF over the past 5 years. Boric acid is 56.3% B₂O₃.

Geology, Exploration Data and Interpretation

Exploration on the Porvenir leases has been undertaken by test pitting as the resource is very shallow and in general can be evaluated more effectively with pits rather than drill holes. A total of 3954 pits have been excavated across the Porvenir tenements, in 100 m spaced sampling lines, with pits spaced 100 m apart along the lines. These pits are mostly less than 2 metres deep (maximum depth 2.9 m), extending to the base of mineralisation. This sampling was undertaken in three programs between 2000 and 2004. Pits were sampled where significant ulexite mineralisation was noted. The geology of the pits and samples was described by Borax Argentina geologists under the supervision of the Chief Geologist, who has over 35 years' experience with borate mineralisation.

The ulexite most frequently occurs within sandy and clayey units as potato-sized clots which are referred to as papas (Figure 3). Sandy units are developed on the margins of the alluvial fans surrounding the Cauchari salar. Where boron-bearing groundwater is transported towards the salar, papas of ulexite grow/precipitate in these sandy units. Clayey units are developed outside the sandy channels and these host deposits of finer grained ulexite referred to as barras. Ulexite mineralisation is hosted in up to four different horizons, although 62% of test pits encountered a single ulexite horizon.

Correlation between test pits shows that in the northern (Mascota) group of properties the horizons of ulexite have the greatest lateral extent (Figure 4). In the southern properties the ulexite mineralisation is narrower

but often high grade. Overall, 75% of the global mineralisation is hosted in the Mascota and Grupo Cinco properties, where it is dominantly hosted by sandy material.

Data Validation, QA/QC Results

The original 2000 to 2004 pit samples were analysed at the Borax Argentina company laboratory in Campo Quijano and this program did not include Quality Assurance or Quality Control (QA/QC) samples. Consequently, a program of re-assaying sample pulps from these original pit samples was undertaken at an independent laboratory as part of the resource estimation process. Analysis of borates is a relatively specialized procedure and the INTEMI laboratory in San Salvador de Jujuy was selected to carry out the analyses, as the laboratory has extensive experience analysing borate samples.

Six percent of the total original samples were re-assayed in the INTEMI laboratory, together with additional QA/QC samples. QA/QC analyses included the use of four standard samples of natural ulexite material at different B₂O₃ grades, with a frequency of standards greater than 1 in 20 primary samples (equivalent to 9.4 % of the primary samples analysed). Pulverised quartz vein material was used as blank samples (8% of samples analysed). Duplicates comprised 17% of the samples re-analysed and triplicates (analysed in the Borax Argentina laboratory) a further 5% of samples re-analysed. Neither the Borax Argentina nor the INTEMI laboratories are certified as commercial laboratories, however the Borax Argentina laboratory has operated under the ISO 9001 certification of the Borax Argentina quality system since 1996.

Analytical results for the standards show an overall acceptable distribution, despite some analyses exceeding 2 standard deviations from the nominal standard values. The re-analyses of a selection of samples shows an overall acceptable accuracy and precision in spite of a small number of re-analyses showing a poor correlation with the 2004 values. Overall, the original sample analyses are considered suitable for the purpose of this resource estimation.

The Resource Estimation Process

The total area covered by the Porvenir properties is 40.03 km², with the resource covering 17.5 km² within these properties and the area exploited by mining to date covering 1.34 km². As the Porvenir deposit is currently being mined areas of historical mining have been surveyed and removed from the resource calculated from the pit sampling. The resource estimate at Porvenir is compliant with the JORC 2012 code and is entirely based on pit sampling.

Mineralisation occurs in flat lying interlayered sand and clay units, with variations between the papa and barra styles of mineralisation within mineralised units generally corresponding to change in host lithology. As mineralised units cross host lithologies there has been no differentiation of areas/domaining of the resource based on lithology, as the resource is exploited in a bulk mining operation.

Density measurements were made by independent geotechnical laboratory, Tecnosuelo, using samples collected by Borax Argentina from sand and clay samples of the papa and barra mineralisation styles, with a range of B₂O₃ contents. As ulexite has a very low density the ulexite content is a major control on the overall sample density. A regression relationship between ulexite content and density in sand and clay units was derived from this data, and used to apply a dry density to each of the resource polygons.

Pit samples were taken over lithological intervals, rather than regular lengths (such as 1 m samples commonly used with reverse circulation drilling). Consequently, in the polygonal model used for resource estimation individual mineralised samples have been combined (to produce a length weighted average B₂O₃ % grade) for a combined total thickness at each mineralised pit location. This acts to smooth any individual high values, although in this industrial mineral deposit there is a general lack of extremely high "spiky" values and grade capping is not considered necessary. Compositing samples, as carried out with drill holes, is not practical, where the majority of pits are < 2 m deep, and 62% of pits have only one mineralised intersection.

Following database validation a polygonal resource was estimated for the Porvenir deposit as follows:

- A polygon was constructed for each pit dug as part of the sampling program (typically 100 x 100 m polygons). Each polygon had an associated area (restricted within property boundaries). Some pits have influence in several polygons, within different properties.
- The combined thickness of each mineralised interval was used together with the area of the polygon to calculate a polygon volume for ulexite mineralisation.
- The derived density, based on B₂O₃ % content and lithology, was multiplied by the polygon volume to

produce a tonnage (the densities were calculated based on the relative proportions of each sample interval in each pit)

- The polygon tonnages were then multiplied by the proportion of B₂O₃ % in each polygon and each polygon summed to provide a total tonnage of B₂O₃ and tonnage per property.

Results were verified by comparison with a polygonal resource estimate carried out in Mapinfo software, with little difference between the two polygonal estimates (Table 1).

Table 1: Comparison of resource estimation methodologies

Resource estimation method	Global tonnage	B ₂ O ₃ %
Excel polygonal	11,220,000	11.4
Mapinfo polygonal	11,490,000	11.5

The global resource tonnage (i.e with no cut-off applied) is 11.2 Mt of dry, in-situ ulexite material containing 11.4 % B₂O₃ (stated as % B₂O₃ equivalent).

The resource classification is primarily based on interpretation of the continuity of mineralisation, as the sample spacing (100 m spaced pits, with more closely spaced pits along property boundaries) is essentially uniform across the deposit. Sampling and analysis is considered to have been adequately carried out, based on the available documentation and re-analysis of 6% of the primary pit samples. Overall, the original pit assays are considered to be of adequate quality for this resource estimate.

- In the northern properties (Mascota Group, Grupo Cinco), where mineralisation shows a high level of north to south and east to west continuity, mineralisation is classified in the measured category.

- Where mineralisation is less continuous and is generally restricted to three or less adjacent pits on a cross section mineralisation has been classified as indicated (in the Central and Southern groups of properties).

Cut Off Grade and Resource

Resource estimates at two cut-off grades have been considered. The first is based on the current mining cut-off which is appropriate to the current mining and processing operation. The second is based on an economic cut-off grade of 9 % B₂O₃ which takes into account the anticipated total operational costs of the Porvenir mine, the contemplated Olacapato processing plant and the approximate current spot price of US\$720/t boric acid (FOB).

A comparison of the historical and new resources estimates at a mining cut-off grade of 16% is presented in Table 2. At the same cut-off the estimates are similar, although the new estimate is 15% smaller, reflecting mining of the resource between 2004 and the present. A drop in cut-off to 9% significantly increases the size of the resource and provides potentially much greater resource extraction.

Management Commentary

Orocobre's Managing Director, Richard Seville, stated: "The completion of this Porvenir resource estimate marks the first step in bringing all the historical estimates up to JORC compliance. Over the coming year, we will also complete the resource estimates on the more significant Dialbillos ulexite mineralisation, the Tincalayu tincal mineralisation and the Sijes hydroboracite mineralisation.

The work on Tincalayu is well advanced, but we brought the Porvenir resource forward so that it could provide an input for the possible new boric acid plant at Olacapato, 40 km south of Porvenir on which we are currently undertaking a PFS. The Porvenir resource is sufficient to support more than 20 years of mine life, for annual production of 25,000 tons of boric acid."

To view all figures and tables, please visit:

<http://media.abnnewswire.net/media/en/docs/ASX-ORE-791172.pdf>

About Orocobre Limited:

[Orocobre Ltd.](#) is listed on the Australian Securities Exchange and Toronto Stock Exchange (ASX:ORE, TSX:ORL), and is building a substantial Argentinian-based industrial minerals company through the construction and operation of its portfolio of lithium, potash and boron projects and facilities in the Puna region of northern Argentina. The Company is building in partnership with Toyota Tsusho Corporation the first large-scale, "greenfield" brine based lithium project in 20 years at its flagship Salar de Olaroz resource, with projected production of 17,500 tonnes per annum of low-cost battery grade lithium carbonate scheduled to commence at the end of Q2, 2014. The Company also wholly-owns Borax Argentina, an important regional borate producer. Orocobre is included in the S&P/ASX 300 Index and was named 2012 Mining Company of the Year by Argentine mining magazine Panorama Minero and the Fundacion para el Desarrollo de la Mineria Argentina ("Fundamin" or Foundation for Development of Argentina Mining).

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Die URL für diesen Artikel lautet:

<https://www.rohstoff-welt.de/news/170103--Orocobre-Limited-Porvenir-Historical-Estimate-Upgraded-to-JORC-Compliant-Resource.html>

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