

15 October 2014

## PHOSPHATE MARKET AND COMPANY UPDATE

### **Agua Update: New Sedimentary Phosphate Target Discovered at Rio Grande; Line of Credit Secured**

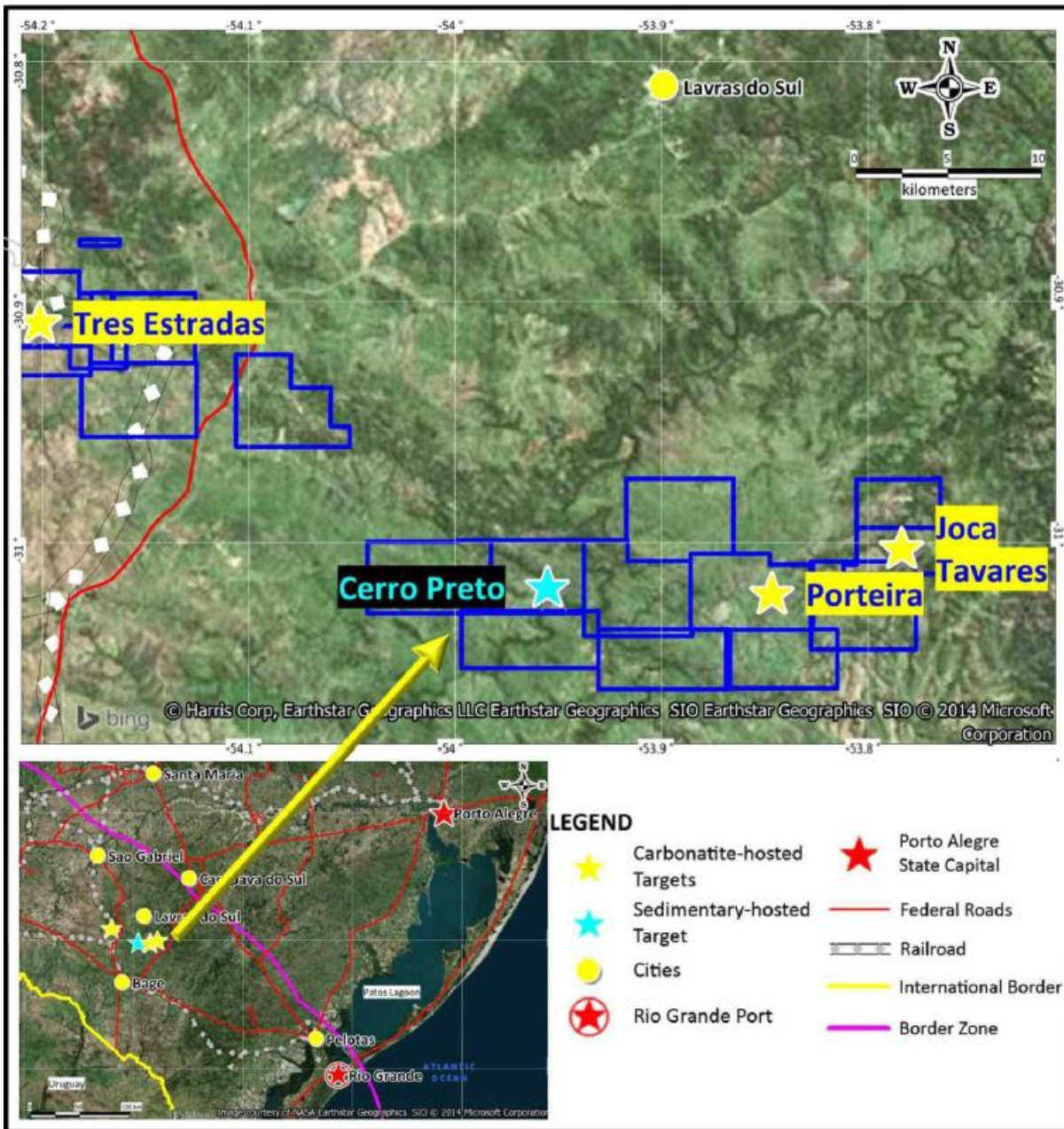
Agua recently announced the discovery of a sediment-hosted phosphate mineralization in the Rio Grande project named the Cerro Preto Target (between Três Estradas and Joca Tavares, both igneous-hosted phosphate mineralization). The new mineralization is related to black phosphorite beds that were found to occur in the Arrio Marmeleiro Formation, a Proterozoic shelf sequence that outcrops in an area that extends ~30km along strike by 5km wide. Three beds of black phosphorite have been mapped to date along strike lengths of between 700m and 5km with an apparent thickness of 50m to 200m. Systematic rock chip sampling, including assays, returned grades up to 20.4% P<sub>2</sub>O<sub>5</sub>. Two trenches have also been excavated: 1) Trench CH-02: 17.05m @ 10.3% P<sub>2</sub>O<sub>5</sub> (including 5m @15.52% P<sub>2</sub>O<sub>5</sub>), and 2) Trench CH-03: 2.0m @ 10.94% P<sub>2</sub>O<sub>5</sub> and 8.5m @ 9.83% P<sub>2</sub>O<sub>5</sub>. While the discovery is preliminary, further exploration work, including drilling, is being planned with the intention of delineating a resource.

A comprehensive drill program is being programmed to validate the resource at Três Estradas South. Initial shallow auger drilling at Três Estradas South has returned excellent results with grades up to 20%+ P<sub>2</sub>O<sub>5</sub> (16m @ 14.4% P<sub>2</sub>O<sub>5</sub> from surface, including 6m @20.1% P<sub>2</sub>O<sub>5</sub>; 10m @12.6% P<sub>2</sub>O<sub>5</sub> from surface, including 6m @15.5% P<sub>2</sub>O<sub>5</sub>; 15m @ 13% P<sub>2</sub>O<sub>5</sub> from surface, including 2m @ 21.4% P<sub>2</sub>O<sub>5</sub>; and 15m @ 10.4% P<sub>2</sub>O<sub>5</sub> from surface). Agua also plans to undertake delineation drilling of the neighbouring Joca Tavares project with the objective of outlining potentially 100 million tonnes of phosphate mineral resources between the two deposits. The reader is cautioned that the potential quantity and grade estimates are conceptual in nature; that there has been insufficient exploration to define a mineral resource; and that it is uncertain if further exploration will result in the determination of a mineral resource. Once this work is completed, it is expected that an update of the conceptual mining study (from September 2014) will be prepared and the preliminary economic assessment (PEA) will be published.

Agua is currently planning a pilot plant test program, which includes column flotation to optimize the global recoveries of the phosphate mineralization from TE. Column flotation has been a crucial step to demonstrate recoveries above 70% and increased concentrate grades at all operating phosphate mines in Brazil.

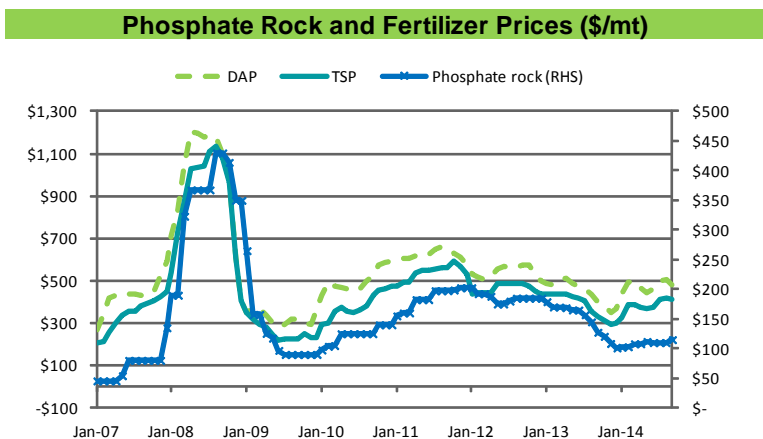
On September 25, Agua announced that it had secured a line of credit to support its ongoing operations in Brazil. A total of A\$1 million is available (secured, 1% interest rate). Agua's Board is

currently reviewing a number of funding options for the next phase of the exploration and project development that are expected to be announced shortly.



**Figure 1** – Regional location map showing the Cerro Preto sediment-hosted mineralization relative to the Trê Estradas and Joca Tavares Carbonatites.

**Phosphate Rock Prices Rising but Fertilizer and Ag Commodity Prices Falling; Stock Prices Remain Under Pressure**



Phosphate rock prices were up 5% m/m in September to \$115/t while DAP and TSP prices softened 5% and 2%, respectively, m/m. Phosphate rock, DAP and TSP prices are now up 14%, 30% and 37% YTD. As indicated in our previous

Source: Worldbank

updates, prices rebounded in H1 14 off 3-year record lows in November 2013 and due to strong global demand (in a lean distribution system), plant outages (some planned, some not), harsh weather in North America and Morocco, and higher sulphur prices, notably in China. DAP and TSP prices are starting to see some pressure despite high ammonia and sulphur input prices. Commodity agriculture prices have been declining with soybeans, corn and wheat all down ~22% y/y and -24%, -17% and -24%, respectively YTD in 2014, indicating softer farmer demand in 2014/15 and contributing to the pressure on fertilizer prices (which prompted MOS to recently announce a curtailment of phosphate production in Q3 14). Regardless, global phosphate fertilizer demand is still expected to remain relatively strong overall (+2% y/y to ~65mlnt DAP/MAP/TSP in 2014 as per Mosaic).

Stock prices have declined over the last month in line with declining crop and nutrient prices (as well as the broader market). The “P-centric” producers – Mosaic (MOS), Phosagro (PHOR), and Jordan Phosphate Mines (JOPH) – have responded -10%, -1%, and -2%, respectively. Stock prices of junior mining companies continue to fall as well. The group is down 25% m/m and is now down 33% y/y YTD. The exception is Brazilian-based DuSolo Fertilizer (DSF-V), which is up 6% m/m and +57% y/y YTD.

### **Brazil Imports Drop in August due to Seasonality and Lower Commodity Prices but Remain Above Average**

Data from ANDA and Mosaic indicates phosphate shipments in Brazil were up 11% m/m but down 1% y/y in August (584,000MT). YTD, P2O5 shipments are up 5% y/y to 2.9 million MT. Production of phosphate fertilizer (MAP and TSP) in Brazil improved in August. Production of MAP/TSP was up 3% m/m (152,000MT) but down 3% y/y YTD to 1.34 million MT. Production of SSP was up 2% m/m (451,000MT) but down 11% y/y YTD to 3.05 million MT. Reduced production y/y is primarily due to beneficiation issues at a number of Brazilian mines.

Imports of DAP/MAP/TSP were down 7% m/m and 9% y/y in August (468,000MT). YTD, P2O5 imports are up 3% y/y.

### **Monthly Phosphate Focus: Digging Deeper on Rock Quality**

In general terms, 'rock quality' refers to the grade of concentrate rock produced from a mine (in % P2O5), which can be produced with or without beneficiation. The global benchmark is set by Morocco (OCP), which primarily exports phosphate rock at grades of 29%-33% (32% P2O5 is the benchmark). Adjustments above and below the benchmark price are adjusted for differences in grade and impurities, which impacts processing capabilities.

Impurities come in many forms and depend on the host rock type (sedimentary/igneous/biogenic), mineralogy, and geological setting (weathering, alterations, etc.). Almost all phosphate rock and upgraded product includes a form of the mineral Apatite, or Calcium-Phosphate. A few of the phosphate minerals having diverse chemical and physical properties are presented below including phosphorous content (i.e. grade), which is measured in phosphorous pentoxide (P2O5). Note that there are more than 100 phosphate bearing minerals.

### Composition of Phosphate Minerals

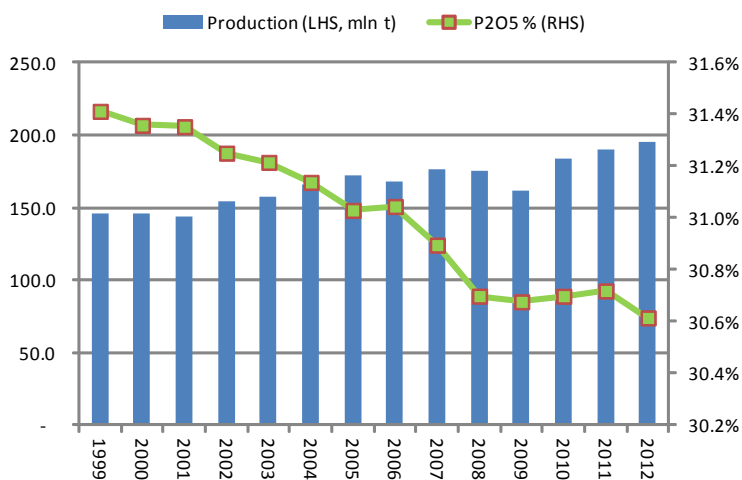
Mineral Name	Formula	Primary Environment	Oxide %				
			CaO%	P2O5%	H2O%	CO2%	F%
Fluor Apatite	Ca5(PO4)3F	igneous and metamorphic	55.60%	42.22%			3.77%
Hydroxy Apatite	Ca5(PO4)3(OH)	biogenic - bones	55.82%	42.39%	1.79%		
Carbonate Hydroxy Apatite	Ca5(PO4,CO3)3(OH)	biogenic - guano	57.83%	36.60%	1.86%	4.54%	
Francolite	Ca5(PO4,CO3)3F	sedimentary/marine	57.60%	36.45%		4.52%	3.90%

Source: FAO, webminerals.com

Impurities can be removed from the ore to increase the concentration of the phosphate rock although some processes are expensive and potentially uneconomical (notably calcination). Types of impurities/issues that can impact processing include: clay (fines), siliceous ores, carbonates, iron, aluminium, magnesium, fluorine, salts, chlorides, carbon/organic matter, sulfides, heavy metals (i.e. cadmium) and radionuclides (i.e. uranium).

There are parameters set for the acceptable level of these impurities in phosphate rock concentrate, which vary depending on the end product (phosphoric acid, SSP or TSP). For phosphoric acid, the critical factor is carbonate substitution (CaO/P2O5 should be under 1.55), which controls the consumption of P2O5 acid and cooling requirements. Metallic impurities, often determined by the minor element ratio (MER = (Fe2O3+Al2O3)/P2O5 should be less than 10%, 2-3% preferred), indicates if the concentrate can be used to produce DAP and/or MAP. The filtration rate (which involves many different chemical combinations and ranges between 2.5t to 12-15t P2O5/m2/D) impacts capex/opex and recovery efficiency. Reactivity is determined by the level of isomorphic substitution (exchange of a carbonate ion in the place of a phosphate ion) with higher substitution resulting in higher reactivity.

### Phosphate Rock Production and Grade - Global 1999-2012



Source: IFA

Overall, 'rock quality' in terms of grade has been declining over time. Data from IFA supports this with the average P2O5 grade of global phosphate rock declining 80 bps (from 31.4% to 30.6%) between 1999 and 2012.

The majority of global phosphate rock production (55%) has a P2O5 grade of 29.8%-31.5% (66-68% BPL, bone phosphate of lime). Of note, China is the largest producer of phosphate rock in the world (39% world share, internally consumed) and produces this grade as well as Morocco (14% of world production and the largest exporter). Rock quality in the US (the world's second largest producer at 15%) is typically lower (below 29.8% P2O5). Russia (Kola, high grade igneous deposit) produces the

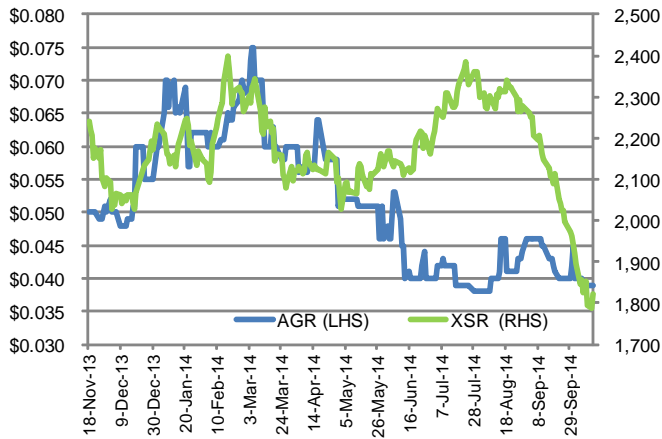
majority (59%) of the high grade phosphate rock concentrate (35.7%+ P2O5). In the export market (~30 million tpa, or 15% of the global market), Morocco and Jordan are known to have 'good' quality rock. Egypt (4.1 million tpa exported) is generally lower quality and sold at a discount. The table below summarizes the varying quality of phosphate rock produced and exported by countries of significance.

Of note, Brazil produces higher grade phosphate rock (31.5%-33.4%), primarily due to the fact that the majority of its phosphate deposits are igneous. As per the discussion in our August update, igneous deposits generally have lower ore grades but can produce higher grade and quality concentrate as they typically contain a purer form of Apatite (less carbonate) and often have fewer contaminants.

Production and Export of Phosphate Rock - 2012						
Country	Total ('000 t)	Grade				
		BPL: under 65% P2O5: under 29.8%	66-68% 29.8-31.5%	69-72% 31.5-33.4%	73-77% 33.4-35.7%	78%+ 35.7%+
<b>Production</b>	<b>195,295</b>	<b>46,715</b>	<b>107,718</b>	<b>20,463</b>	<b>2,892</b>	<b>17,508</b>
% of global		24%	55%	10%	1%	9%
China	77,000		77,000			
USA	29,472	26,666	2,806			
Morocco	26,844	2,674	14,816	6,800	561	1,993
Russia	10,282	7				10,275
Jordan	6,382	464	3,229	1,808	881	
Egypt	6,239	3,557	2,587	94		
Brazil	6,094			6,094		
<b>Export</b>	<b>30,158</b>	<b>5,701</b>	<b>13,266</b>	<b>5,312</b>	<b>348</b>	<b>5,531</b>
% of global		19%	44%	18%	1%	18%
Morocco	9,593		4,673	3,011		1,909
Jordan	4,336		2,723	1,266	348	
Egypt	4,073	3,246	826			
Peru	3,218		3,218			
Russia	1,602					1,602
Syria	1,245	1,149	97			
Algeria	1,197	710	487			
Togo	1,033					1,033

Source: IFA

## Agua (AGR-AU) Stock Price Performance



## Capital Structure

Ticker - ASX	AGR
Shares Outstanding (Sept 29 2014)	213.9M
Market Cap at A\$0.039/share	A\$8.3M
Cash Balance (June 2014)	A\$0.5M
Unlisted Options (average price A\$0.27)	22.3M
Performance Shares (expire July 2016)	1.5M

Source: FT.com, AGR

strike length drilled to date. Joca Tavares (JT) is the second discovery approximately 40 km to the south. The site has excellent infrastructure (TE is less than 1km from all railway links to the Rio Grande port – one of only two ports in Brazil with an acid terminal).

## About Agua

Agua is currently focused on the flagship Rio Grande phosphate deposits in Rio Grande Do Sul (RS) state in south Brazil. The area is an established farming area (wheat, rice, soybean, corn, dry beans and lesser quantities of sugar cane and coffee) and currently imports 100% of its phosphate needs (~500,000tpa P2O5) as there are no existing mines operating in the area. The Rio Grande project is a collection of four new phosphate discoveries – Três Estradas (Nov 2011), Joca Tavares (June 2013), the Porteira target and the Cerro Preto target. The current focus is Três Estradas (TE), which has a 10MT indicated and 21MT inferred JORC resource (5.03% and 3.94% P2O5, respectively) with only 45% of the mapped

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**Competent Persons Statement**

The information is extracted from the report entitled Quarterly Report and Appendix 5B released on 31 July 2014, the Tres Estradas Phosphate Project released on 29 May 2014, the Mining Study – Tres Estradas Phosphate Deposit released on 16 September 2014, the New High Grade Phosphate Mineralization released on 8 October 2014 and the Funding Update released on 25 September 2014, which are available to view on [www.aguiareresources.com.au](http://www.aguiareresources.com.au). 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, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the 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.