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## CONCENTRATE LEACHING RESULTS MEET EXPECTATIONS

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### Highlights

- **Piloting of the continuous leaching circuit yields positive results**
- **Post leach concentrate easily meets key specifications for ferro-niobium production**
- **Concentrate grade increased by 4% to 6%, as planned**
- **Ferro-niobium to be produced later this month**

Cradle Resources Limited is pleased to announce the completion of the continuous leaching testwork program on the concentrate produced during the previous flotation work at SGS Canada. The basic flowsheet for the leach process consists of:

- An acid pre-leach
- Residue filtration for solution recovery
- Caustic leach
- Residue washing and filtration for reagent recycling

The primary function of the leaching process is to reduce the phosphate and silicate levels in the concentrate to below the impurity limits for the converter (being the final stage of ferro-niobium production). At the same time, the process allows the concentrate to be upgraded as a result of the mass loss during leaching. This process does not result in any niobium losses.

The program of work used samples generated from previous flotation pilot plant runs and has validated the results previously achieved in the bench scale batch process.

A summary of the results from the piloting campaign is shown in the Appendix. The plant performed well, meeting the required targets for the entire duration of the campaign. Silicate and phosphate grades in the final product averaged 1.9% and 0.02% respectively which are well below the targeted grades of <3.5% and <0.15%.

In addition, the niobium grade in the concentrate was increased by about 4% to 6% (absolute) during the leaching process. The project flow sheet also includes a magnetic separation step which is expected to reduce the iron content and thereby increase the niobium grade in concentrate by a further 2% to 3% (absolute).

Accordingly, these results verify that a target final concentrate grade for the converter of 47-50% Nb<sub>2</sub>O<sub>5</sub> will be achieved based on a post flotation concentrate grade of 41-45% Nb<sub>2</sub>O<sub>5</sub>.

These results provide further positive confirmation of the technical parameters of the Panda Hill Project, in particular the ability to produce a concentrate that meets the specifications for the converter process which will produce the ferro-niobium end product.

The next and final step in the pilot testwork program is to use the post leaching concentrate to produce ferro-niobium in a benchscale converter. This will be completed later this month.

## Appendix

The results of the leaching process are shown in Table 1 below. The plant was operated for a period of five days, was easy controlled, and met the required results throughout the run. A full analysis from Run 2 is shown in Table 2. *It is worth noting that due to material availability the testwork used a slightly lower grade concentrate (39% Nb<sub>2</sub>O<sub>5</sub>) as the feed, rather than the post flotation concentrate target of 41-45% Nb<sub>2</sub>O<sub>5</sub>.*

**Table 1: Leaching Performance**

		Leach Feed			Leach Residue (Converter Feed)		
		%Nb <sub>2</sub> O <sub>5</sub>	%SiO <sub>2</sub>	%P <sub>2</sub> O <sub>5</sub>	%Nb <sub>2</sub> O <sub>5</sub>	%SiO <sub>2</sub>	%P <sub>2</sub> O <sub>5</sub>
Continuous Piloting Testwork	Converter Feed Targets				>46%	<3.5%	<0.15%
	Run 1	39.3	6.75	1.24	43.3	1.88	0.05
	Run 2				45.6	1.54	0.02
	Run 3				43.1	1.67	0.02
	Run 4				43.3	1.82	0.02

**Table 2: Typical Leach Produce**

	Leach Residue (Converter Feed)						
	%Nb <sub>2</sub> O <sub>5</sub>	%SiO <sub>2</sub>	%P <sub>2</sub> O <sub>5</sub>	%FeO	%CaO	%MnO	%TiO <sub>2</sub>
Typical Converter Feed Specs	>45%	<3.5%	<0.15%	<20%	<12.5%	<0.8%	<6%
Run 2 Product	45.6%	1.5%	0.02%	19.0%	8.8%	0.1%	6.6%

*By order of the Board*

For further information, please visit [www.cradleresources.com.au](http://www.cradleresources.com.au) or contact:

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