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ASX Release

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## MORE POSITIVE METALLURGICAL RESULTS

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### Highlights

- **Locked cycle tests confirm average recoveries of approximately 62% niobium with an expected 50% grade in final concentrate**
- **Weighted average recoveries are slightly better than those used in the Scoping Study**
- **Higher confidence in recoveries achieved across different material types and using alternative processing paths**
- **Test work confirmed similar recoveries in single stage flotation process, with potential to thereby reduce capital and operating costs**
- **Optimisation work to continue on preferred processing path with results due early 2015**

Cradle Resources Limited (“Cradle”) is pleased to announce that the first phase of the flotation test work being carried out as part of the Pre-feasibility Study at SGS Canada is nearing completion.

This first phase of the program focused on testing each of the major material types identified in the deposit through a variety of different flotation processes. The majority of the work was carried out on two alternative flow sheets:

1. A two-stage flotation process as used in the Scoping Study (and similar to the Niobec process); and
2. A simplified direct (one-stage) flotation process

In addition work was done using gravity/density to reject some gangue minerals prior to direct flotation.

86 open circuit batch flotation tests and 8 locked cycle tests have been completed as part of this first program. The flotation test work was carried out on eight different material types which together make up the three zones identified within the deposit, namely, the fresh/lightly oxidised material zone, the transition/moderately oxidised zone and the weathered/strongly oxidised zone.

The results from a selection of these locked cycle tests (LCT) are shown in the Table 1 below. The majority of the LCT tests were carried out on fresh material or strongly oxidised material, which represent the extremes of the carbonatite materials.

Table 1: Locked Cycle Test Results

Test No.	Zone Represented	Flotation Circuit Product	Conc Grade % Nb <sub>2</sub> O <sub>5</sub>	% Recovery Nb <sub>2</sub> O <sub>5</sub>
<b>Fresh Carbonatite</b> (LCT2)	Fresh Zone	Nb <sub>2</sub> O <sub>5</sub> Final Concentrate	41.9	67.8
<b>Strongly Oxidised Carbonatite</b> (LCT4)	Weathered / Strongly Oxidised Zone	Nb <sub>2</sub> O <sub>5</sub> Final Concentrate	41.4	52.0
<b>Fresh Sovite</b> (LCT6)	Fresh Zone	Nb <sub>2</sub> O <sub>5</sub> Final Concentrate	53.6	72.3

Note: the concentrate grades in the table are prior to phosphates and carbonate removal which increases Nb<sub>2</sub>O<sub>5</sub> concentrate grades to between 45% and 55%, the standard for the niobium aluminothermic process.

An interpretation of the overall recoveries for the various zones of carbonatite material in the Panda Hill resource is shown in Table 2 (the total resource is currently 82Mt at 0.52% Nb<sub>2</sub>O<sub>5</sub> inferred, at a 0.3% cut-off). These results are based on the locked cycle tests, supported by the open circuit tests. The results are for the carbonatite material contained within each of the zones, the weathered material (non-carbonatite) having been excluded in this analysis. Niobium recoveries of 45 to 50% from the weathered material (non-carbonatite) can be achieved but in a different type of circuit to that considered in this analysis.

Table 2: Metal Recovery by Zone

Zone	Approximate Metal Split between Zones	% of Carbonatite Material within Zone*	Calculated Recovery from Carbonatite Material in Zone
Fresh/Lightly Oxidised	57%	90%	67%
Transition/Moderately Oxidised	32%	85%	56%
Weathered/Strongly Oxidised	11%	50%	51%

\* Note: The additional material within each zone is made up of weathered materials (non-carbonatite) that have lower recoveries, which are planned to be selectively mined and separately treated.

The weighted average calculated recovery for all carbonatite material is 62%, which compares favourably with the recoveries estimated for existing Niobium producers (see Table 3 below).

Table 3: Niobium Recovery Comparison<sup>#</sup>

Operation / Project	Estimated Recovery*
Panda Hill	62%
Catalão (Anglo American)	54%
Niobec (IamGold)	57%

\* Note: The estimated recoveries for Catalão and Niobec are based on information provided in the Quarterly Production Reports which are available on their parent company websites.

The results from this program of test work demonstrate that:

- All major material types defined within the deposit can produce high grade concentrates at varying recoveries. The recovery depends upon the level of weathering/oxidation.
- The direct (one-stage) flotation process has similar recoveries to the two-stage process and might be a better processing option taking into account operating and cost considerations.
- Laboratory scale test work using gravity tables shows recovery to a gravity concentrate of between 55% and 70% on a range of materials. The flotation recovery on these gravity concentrates is significantly higher than pre-concentrate with lower reagent consumption. This might be an option for the highly weathered material.
- Overall recoveries are expected to be marginally higher than those used in the Scoping Study.

The second phase of the metallurgical test work program started in mid-October and will focus on optimising the selected process. The main areas of work will be around reagent consumptions, slimes losses and impurity rejection. This next phase of work will take approximately two to three months to complete.

**Grant Davey, the Managing Director of Cradle, commented:** *“The metallurgical test work is progressing well with these results further confirming that Panda Hill has excellent niobium recoveries. The next phase of the test work will place emphasis on both the single and two stage flotation processes with a focus on optimising opex and capex. The sizing and design of the plant will be similar to the Niobec mine which lamgold has recently sold for USD\$500 million. The Pre-feasibility study is on track for completion in the first quarter 2015.”*

### **Project Background**

The Panda Hill Niobium Project (Figure 1) is located in the Mbeya region in south western Tanzania approximately 650km west of the capital Dar es Salaam. The industrial city of Mbeya is situated only 35km from the Project area and will be a significant service and logistics centre for the Project. Mbeya has a population of approximately 280,000 people, located on the main highway to the capital Dar es Salaam and is completing the construction of a new international airport.

The Project is covered by three granted Mining Licenses (Figure 1) totalling 22.1km<sup>2</sup>, and has excellent access to infrastructure, with existing roads, rail, airports and 220kV power available in close proximity to the Project area. The three granted Mining Licenses are due for renewal in November 2016 and under Tanzanian Mining Legislation can be renewed for further 10 year periods on completion of the approved work programs on the Project.

The Panda Hill carbonatite intrusion has been subject to multiple phases of exploration work since the 1950s. This work has targeted the Niobium and Phosphate endowment of the deposit. From 1953 to 1965, the Geological Survey of Tanzania (GST) undertook mapping, diamond drilling and trenching (17 diamond holes for 1,405m) to assess the Niobium and Phosphate potential of the deposit.

From 1954 to 1963, the MBEXCO joint venture was formed between N. V. Billiton Maatschapij (Billiton) and Colonial Development Corporation, London. MBEXCO drilled 66 diamond holes for 3,708m, excavated numerous pits, sunk two shafts and undertook trial mining and constructed a trial gravity and flotation plant on site. Concentrate from site was sent to Holland for further processing, with positive early metallurgical test-work results noted.

From 1978 to 1980 a Yugoslavian State Enterprise (RUDIS) undertook a joint study in collaboration with the Tanzanian Mining Industrial Association and State Mining Corporation (STAMICO). This work included mapping, diamond drilling and pitting (13 diamond holes for 1,306m) to test the Niobium endowment of the deposit. Detailed reports have been secured from this program.

Cradle completed a 13 hole (1703m) diamond drilling programme in September 2013. This confirmed historical information and enabled Cradle to produce an updated Indicated and Inferred resources estimate. The initial independent Scoping Study undertaken was supported by a Board decision to progress the Project to a definitive feasibility study level.

Cradle entered into a project funding agreement with Tremont through which Tremont is able to acquire 50% of the Project by investing USD\$20 million to be used towards the definitive feasibility study as well as the initial project development costs. Tremont is an African focussed mining platform backed by Denham Capital, a leading energy and resources global private equity firm. Pangea Exploration, advisors to Tremont, is based in South Africa and led by Rob Still. Over the last 25 years Pangea’s team of technical and commercial experts have developed in excess of 16 projects in Southern and Eastern Africa at various stages of project de-risking, from exploration through to development and operations, in a variety of commodities including gold, vanadium, copper, titanium and coal.

In November 2011 Tremont raised USD\$200 million from Denham Capital to establish an African Mining Platform to target a wide range of opportunities in Africa. Denham has over USD\$7.9 billion of invested and committed capital in the metals and mining, oil and gas, and power sectors.

Cradle expects to complete a definitive feasibility study by 3<sup>rd</sup> Quarter 2015. The Pre-feasibility Study phase is well underway with completion on track for 1<sup>st</sup> Quarter 2015.

**Panda Hill Niobium Resource**

The Panda Hill Niobium Project has a global Indicated and Inferred Resource of 81.8Mt at 0.52% Nb<sub>2</sub>O<sub>5</sub> (76.4Mt at 0.41% Nb<sub>2</sub>O<sub>5</sub> Inferred and 3.2Mt at 0.52% Nb<sub>2</sub>O<sub>5</sub> Indicated above a 0.3% Nb<sub>2</sub>O<sub>5</sub> lower cut-off). The Resource was last updated in October 2013 by Coffey Mining and is currently the focus of an infill drilling program to increase the endowment of Indicated Resources. The 2014 field program is expected to produce a resource with a refined lithological and grade model.

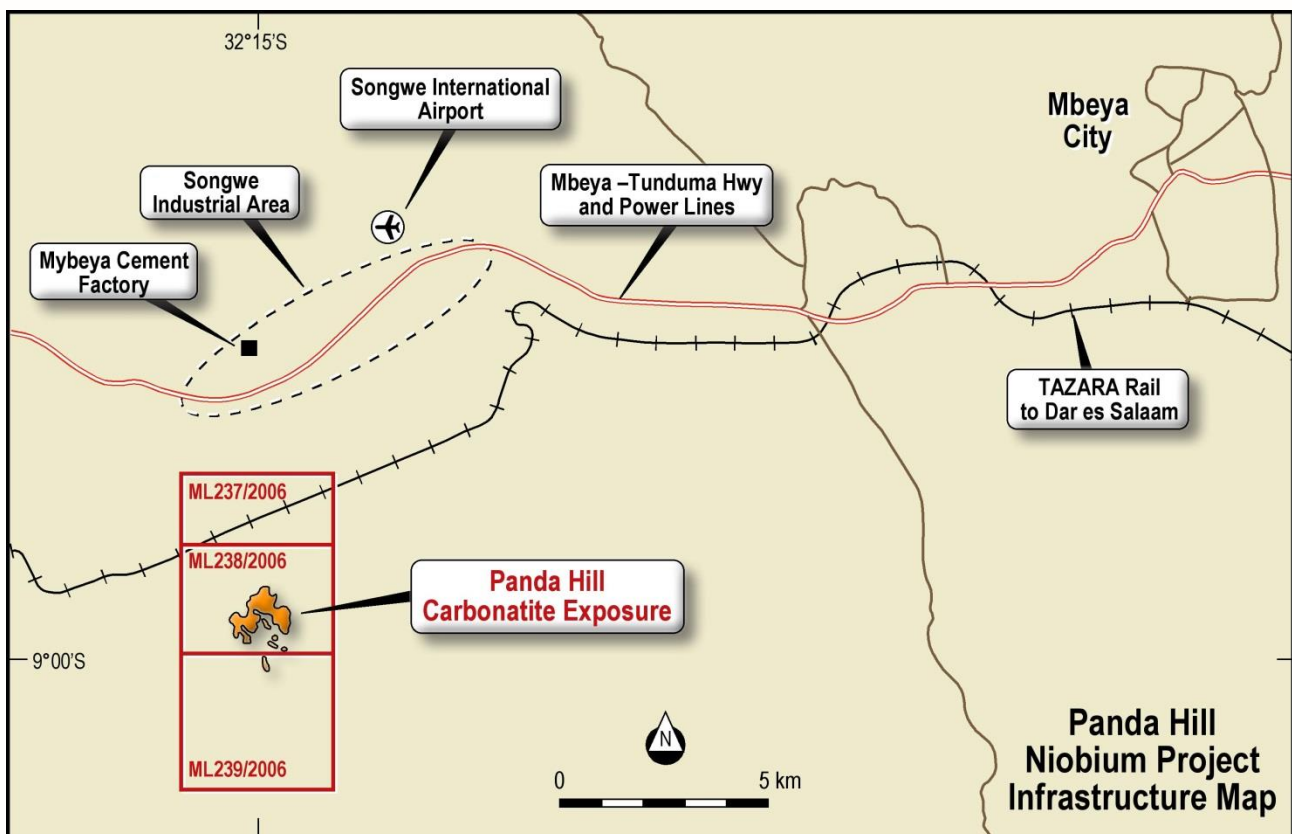


Figure 1: Location of the Project Tenure and Surrounding Infrastructure

*By order of the Board*