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EXPANDE
Open Innovation in Mining Program by Fundación Chile

Challenge: BHP-08-2019
«Flotation cell cleaning»

July, 2019

FCH
FUNDACIÓN CHILE

Challenge BHP-08-2019: «Flotation cell cleaning»

This project is managed by the Supply Innovation area of BHP Billiton, associated with the Alta Ley Program, and supported by the Mining Open Innovation Program (EXPANDE) by Fundacion Chile (FCh).

The common purpose is to promote innovation and make possible a better future for global mining, strengthening the mining ecosystem in Chile, together with constituting a collaborative model that enables the best solutions for the high complexity challenges of today and tomorrow's mining.

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Challenge Description

- **Context**

Minera Escondida has three copper concentration plants. Los Colorados, Laguna Seca 1 and Laguna Seca 2. Flotation cells are part of the productive process, which aim to create a copper concentrate.

This challenge aims to scout technological solutions that optimize the cleaning process of the flotation cells, specifically the activities that currently take place in conventional and column cells.

Flotation cells (both conventional and column) need to be cleaned periodically in order to ensure operating conditions in the equipment: maintain treatment capacity and copper recovery efficiency, plus ensuring operational continuity and fulfillment of the production schedule.

The current cleaning process is deficient in terms of:

- Low quality
- Time demanding: 3-4 days per column, 5 days per row on conventional cells
- Labor intensive
- Most importantly, the workforce is exposed to hazardous conditions

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Challenge Description

- **Objective:**

Optimize the cleaning process of the flotationc cells (conventional and columna), with the aim to:

✓ Decrease cleaning times
✓ Reduce hazard exposure to the worforce assigned to the cleaning tasks
✓ Increase cleaning efficiency in terms of quality, time and resources

Scope:

From a safety standpoint, the solution must favor the reduction to risk exposure, as well as the number of workers.

The challenge is aimed to have impact in the flotation process and its pilot is set to take place in the columna cells.

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Challenge Description

- **Current situation and process affected**

Flotation cell cleaning must take place periodically due to material build-up as a consequence of material adherence to the walls of the cell.

Cleaning activities are performed manually. The worker applies a water flow using a hose connected to the water and pressure supply of the plant. Also, a high pressure microjet system installed in trucks is used. All of this partially removes the adhered material on the walls and components, specially in the base and upper border of the column. The process takes up 3 to 4 days per column and is carried out by a crew of 4 workers.

For the conventional cells, the process takes 5 days per row (both night and day shifts), uses plant water and is carried out by 4 workers.

This process presents a high risk exposure to the workers, specially when using the high pressure microjet system (10000 psi)

- **Attempted technologies**

Mannual cleaning with plant water and high pressure microjet.

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Prequalification Documentation

The following information is requested for this prequalification stage:

- National and international companies/suppliers
  - Relevant experience of the team members that will face the challenge
  - Previous experience in similar solutions in the technological area of the challenge
  - Description of the technological solution and maturity level (TRL; in development, tested, implemented or in operation)
  - Success stories
  - Capacity to provide operational and maintenance services on-site

- International companies/suppliers
  - Availability to operate in Chile through technical and commercial representatives

The information at this stage can be provided in an open format (pptx, pdf, image) and can be a brochure or presentation with the qualifications of the company and the technological solutions related to the challenge.

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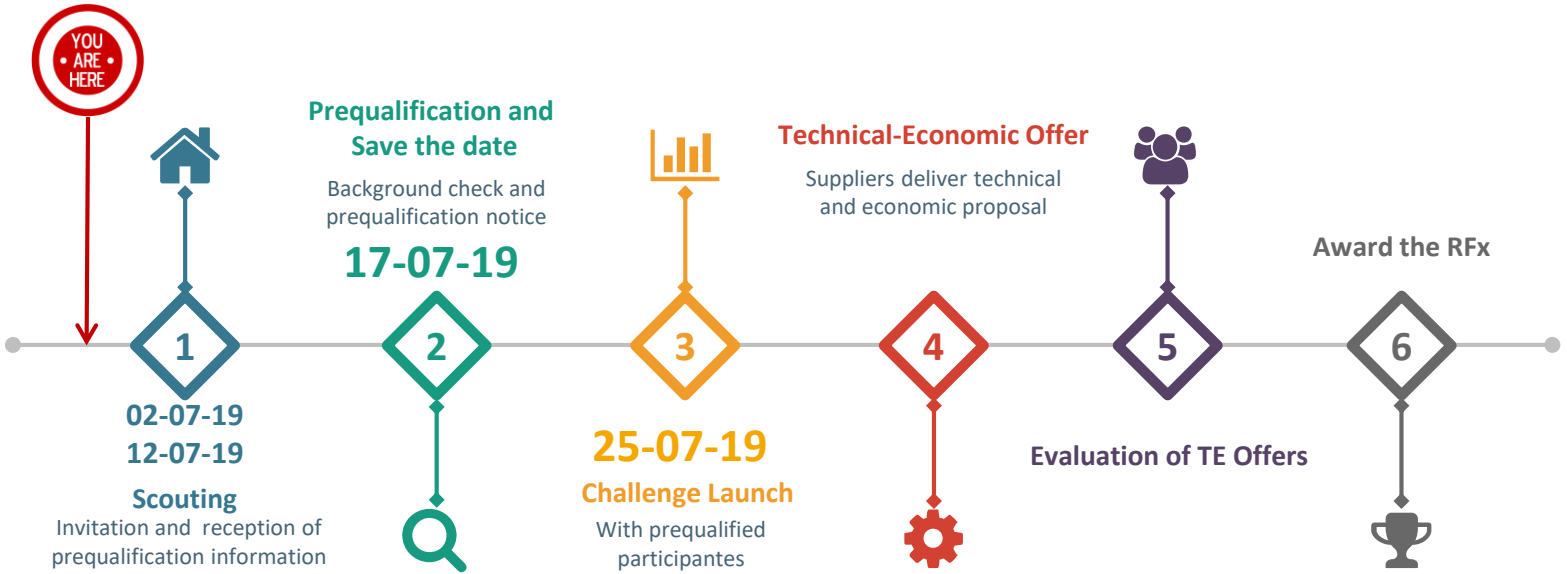
Challenge Stages



1. Scouting
   - If you are interested, attach supporting documentation.(Experience and Administrative Information) to: **innovacion.abierta@fch.cl**

2. Prequalitication and Save the Date
   - Expande will send an email to comunicate the prequalification state .
   - If you are prequalificated, Expande will send documentation. (RFP, Bidding guideline, General guideline)
   - Also, to participate in the challenge launch, you should send the acceptance letter.

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