



**EXPANDE –
Open Innovation
Program in Mining
by Fundación Chile**

**Challenge BHP-26-2019
«Avoid Jarosite formation in
Copper Sulfide Leaching Heaps»**

August, 2019

Challenge «Avoid Jarosite formation in Copper Sulfide Leaching Heaps»

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.

Challenge Description

▪ Context

In the cathode plant of Escondida Mine, sulfur minerals are processed in leaching heaps. In this process, mineral heaps are irrigated with acid solutions through drippers arranged on the top lift of the heap.

Due to some factors, such as the decrease in acidity in lower lifts of the heap, the formation of Jarosite is promoted. The formation begins in the third lift of the heap, generating physical-chemical problems that prevent the leaching of minerals in that area and producing waterproofing (solution irrigation blockages).

Among the problems generated by the appearance of Jarosite, we can mention:

- Loss of physical stability of the leaching heap
- Reduction of the recovery of the leaching process
- Decrease in the solutions collection

▪ Aim and scope

Solutions are sought to avoid or eliminate the formation of Jarosite, ensuring the physical stability of the leaching heap and increasing the recovery of mineral.

In addition, the proposed solution should not affect the natural bacteria that are present and neither interfere with the structure of the leaching heap.

Challenge Description

- **Current situation**

Currently, leaching heaps are irrigated by drippers and air is added at room temperature. They also have covers to prevent evaporation and regulate the temperature.

The natural bacteria found in leaching heaps are ferroxidants, thermophilic, mesophilic and chemotropic.

- **Attempted technologies**

It has been evaluated to increase the amount of acid, but it has not been implemented.

- **Available information**

pH data, irrigation time, flow chart and leaching heap design structure.

Prequalification documents

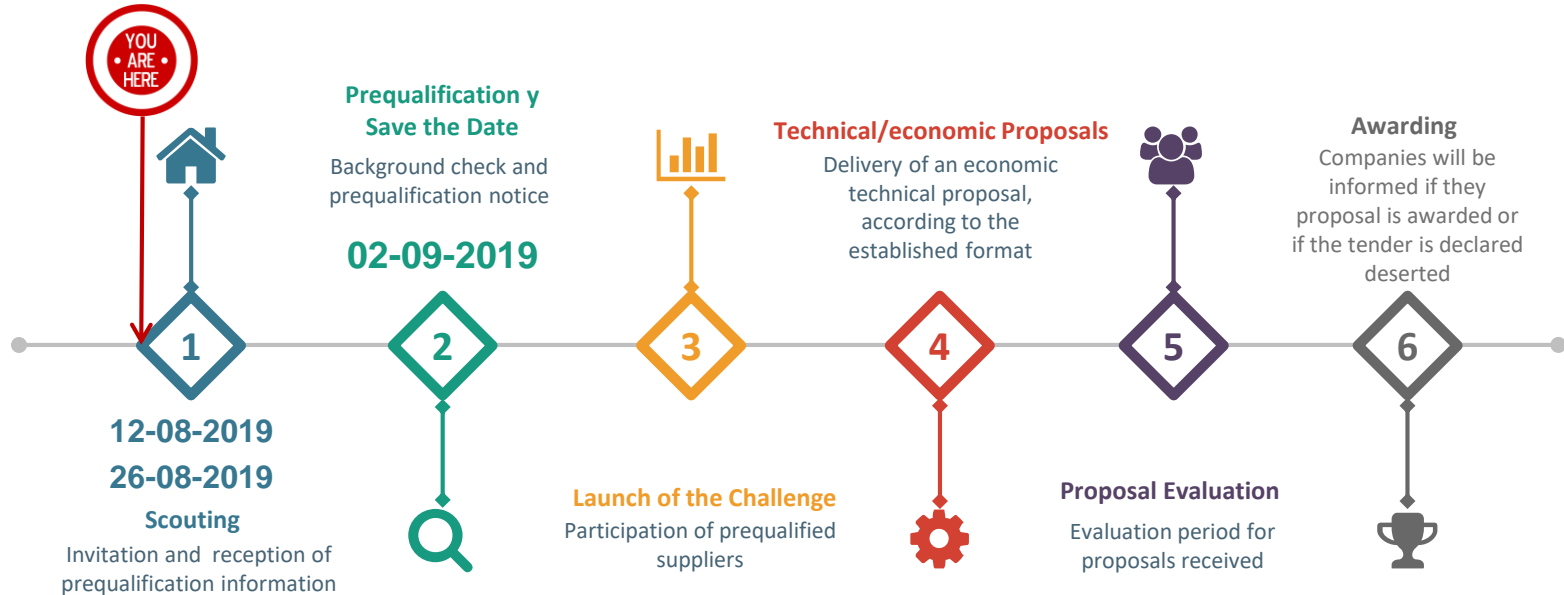
The following information is requested for this prequalification stage:

- National and international Companies/Suppliers
 - Relevant competences and experience of the supplier's team member for the Challenge.
 - Previous experience in similar solutions.
 - Description of the technological solution and degree of technological maturity (Solution under development, tested, implemented and/or in operation).
 - Success stories.
 - Ability to provide operational and maintenance services in the field.
- International Companies/Suppliers
 - Availability to operate in Chile or through technical/commercial representatives.

The format of the information delivered is free (pptx, pdf, image) and can be a brochure or presentation of the company's capabilities and technological solutions that apply to the proposed challenge.

The requested information must be uploaded to the Challenge website:
<https://fch.brightidea.com/BHP262019EvitarformacionJarositapilasulfuro>

Stages of development of the process



1. Scouting
 - In case of interest, go to the link sent in the prequalification invitation email and upload the information required
2. Prequalification
 - Expande will send an email notifying if your company pre-qualifies or not to participate in the challenge.
 - In case of prequalification, you must enter to the Challenge page where you can download the technical documents and the BHP Pack Tender.
 - In case of acceptance or refusal to continue participating, upload the respective letter to the Challenge page.
 - In case of acceptance, confirm participation for the launch day in the form link indicated in the invitation letter.