

FAQ BHP Tailings Challenge Round 1

General Questions

1. *What kind of professionals or institutions will be the ones to evaluate the solutions presented?*

A diverse evaluation board will be established with BHP specialists from several areas

2. *This challenge includes Companies that can extract the elements of value that can be added to the production and sales chain of BHP? How is the recovery of copper and other metals? Understanding that the remaining material is waste, you must go in search of a new business model.*

All activities described are within the scope of the challenge.

3. *Do you hope that everyone can see everyone's applications in the call?*

All information provided in the application is considered to be confidential and will be managed as such. Teams advancing further in the process will be required to sign a MOU and/or NDA with BHP. This does not apply to the information uploaded to the Challenge's community as this is information will be shared with all community members.

4. *How would you resolve IP protection during sharing information during the challenge community activities?*

The information uploaded to the community is public to all members of the community. The objective of the community is to help applicants identify partners. In this regard, it is up to each applicant to decide the information to be shared and we recommend not to include any confidential information.

The information included in the application documents as applications are confidential and will be managed as such.

5. *How do the applicants protect their intellectual property during the challenge?*

All information provided in the application is considered to be confidential and will be managed as such. Teams advancing further in the process will be required to sign a MOU and/or NDA with BHP. This does not apply to the information uploaded to the Challenge's community as this is information will be shared with all community members.

6. *How will IP be handled if teams are merged?*

If teams merge, it is up to them to define how their IP management strategy.

7. *Do you have any contact where the respective queries can be made by mail?*

All questions must be asked on the platform, Q&A section

<https://fch.brightidea.com/BHPTailingsChallenge>. To access it you need to login first in www.tailingschallenge.com

8. *Is it better if we have a Chilean partner?; Do local companies close to BHP activities, based on communities, have equal opportunities with respect to non-national companies?; Is BHP considering some recognition with startups developing technology in small cities? ;*

All submissions will be considered according to the criteria established in the terms and conditions, regardless on where participants are located.

9. *Does the size of the company that applies to the challenge with the idea have any relevance?; Is it better for the company that owns the idea or the one that is really capable of executing it to apply?; Will SMEs (or PYMES in spanish) or small businesses be acceptable candidates for participation, or should they be part of some kind of partnership or association with bigger companies?*

Companies of all sizes are welcome to participate. Partnerships are encouraged as a way to strengthen proposals.

Remember to access the BHP Tailings Community to identify potential partners. You can access it at <https://fch.brightidea.com/BHPTailingsChallengeCommunityPlatform>

10. *In the concepts stage, will evaluation only be the scientific basis that validates the technology?; Could you please talk about the Close call date, what is required from us and how are teams selected?*

All submissions will be considered according to the criteria established in the terms and conditions. Among other criteria, a high-level market assessment and business model is required.

Key dates and criteria can be found in www.tailingschallenge.com , in the terms and conditions document

11. *Is it possible to obtain samples of the tailings content according to the pertinent indicators for our ideas?*

Samples will be delivered only to those suppliers selected to the Proof of Concept Stage. All technical information is available at www.tailingschallenge.com. We advise you to constantly monitor the site as new information might become available."

12. *What is the term for the first stage?*

Open call stage lasts until August 21. All timeline information is available at www.tailingschallenge.com.

13. *The idea of the challenge is to use tailings at the point of emission (with water, for example) or after disposed (dried, for example)?*

At the point of discharge to the pond. But applicants can set the battery limits in their proposals.

14. *What happens with the equipment used for the 'on-site-test'? Is it returned to the supplied company?*

BHP does not expect to operate any equipment not owned by them. Finalists should install their equipment for the on site test and remove it after.

15. *If there is a commercial value to the proposed concept, how does the partnership with BHP work moving forward?*

BHP aims to make progress in the reduction and recycling of industrial waste. At this stage BHP is willing to look for an agreement to supply fresh tailings as raw materials.

16. *An open question of business model. BHP is looking to externalize the treatment of the tailings? Or the idea is that BHP can operate with the technological proposal.*

BHP aims to make progress in the reduction and recycling of industrial waste. At this stage BHP is willing to look for an agreement to supply fresh tailings as raw materials.

17. *Does BHP have a specific mineral that they are looking to extract from tailings?; Are you also looking at the tailings treatment technologies?*

The challenge seeks to repurpose tailings and treating them could be part of the scope. BHP aims to make progress in the reduction and recycling of industrial waste. At this stage BHP is willing to look for an agreement to supply fresh tailings as raw materials.

18. Are any solutions relating to repurposing the tailings slurry as dry land considered for this proposal? Basically, convert the tailings areas into natural habitats.

If you can make a business out of creating natural habitats using tailings this would be eligible.

19. The proposal must be directed to what type of? Is the aim to provide a solution for freshly generated tailings, legacy tailings or both?

BHP Tailings Challenge is focused on repurposing fresh copper tailings. Legacy tailings are outside of the scope of this challenge.

20. Is the tailings challenge aimed at reaching zero tailings emission?

BHP Tailings Challenge is focused repurposing tailings to avoid disposal in the pond. The focus is not to avoid generating tailings in the concentration process.

21. How BHP will support us, during the tailing challenge process, to encourage cooperation instead of competition among participants?

BHP Tailings Community is a space provided to foster cooperation and identified potential partners. You can access it at <https://fch.brightidea.com/BHPTailingsChallengeCommunityPlatform>

22. Will environmental permits and land be managed by BHP?

BHP will facilitate the implementation of the on site test. Permits management is still to be defined as it will be analyzed in a case to case basis as teams move forward on the process.

23. As far as repurposing tailings, what is the scope?; Is it possible if they can summarize the most important concerns that BHP wants to be addressed with ideas and solutions?

The challenge seeks to repurpose tailings. In this regard, for the Open Call it is relevant to show you have a comprehensive approach to the whole process, from collection to the end client. Check criteria in the Terms and Conditions document in www.tailingschallenge.com.

24. *Who will be the counterparts from BHP during this process?*

Expande is the counterpart of the challenge, as they facilitate it. All communications will be handled through www.tailingschallenge.com, the BHP Tailings Challenge Community and the Q&A section <https://fch.brightidea.com/BHPTailingsChallenge>. To access the Q&A section, you need to login first in www.tailingschallenge.com.

25. *Is it possible to carry out the tailings treatment in intermediate stages before it is sent to the tailings dam? ; Slags can be considered part of the proposal or another waste can be considered?; Can it be scaled to sterile material?; What is the battery limits? Are you providing the dredger and we shall take from the slurry feed forward?*

It is up to the applicant to define the battery limits of its proposal.

26. *Can the energy and the water required for implementing the process be part of the open innovation process?*

Yes, as long as they are considered as part of an application.

27. *Is the 50 Mton / year at 24 hours, 7 days per week during the entire year?*

It is an annual figure.

28. *Does participating in this solution limits a startup to work in other projects with BHP itself or other mining companies?*

No.

29. *Can I apply to the challenge being a startup that does not have a company created?*

No, natural persons cannot apply, applicants must be formal companies.

30. *Is it better if we prepare the project in Spanish?*

No, the official language of the call is English and all documents must be submitted in this language.

31. *Is Fundación putting up funds into this and how are they benefitting?*

No, there is no commitment from Fundación Chile to allocate funds to companies participating in BHP Tailings Challenge. Expande's role is to organize the Challenge.

32. Is there a legal figure that is requested to apply as a Technology Consortium?

No, you must only upload commitment letters indicating the role of the associates that are part of consortia.

33. Does the solution need to consider any permit requirements?

Not at initial submission. For later stages this is to be defined.

34. What happens to the variability found in the chemical and physical composition of the tailings?; The recovery of items of value or economic interest (beyond Cu-Mo) vary from case to case. In this framework, each extraction project will present subtle but important differences. How do you hope to frame a proposal that allows you to recognize this variety?

Proposals are expected to be able to manage the heterogeneity of tailings and not to be site specific.

35. Are you considering water recycled from tailings under repurposing?

Recycling water can be part of the process.

36. Can reprocessing and eventual relocation of the deposit considered?

Reprocessing is considered but we do not expect relocation of the deposit as the goal of the challenge is to transform tailings to avoid enlarging the deposit.

37. Are we talking about reprocessing just fresh tailings from the flotation plant or also tailing already deposited in a tailing dam facility?

Tailings from the flotation plant. The challenge is restricted to fresh copper tailings. Consolidated tailings are outside the scope of BHP Tailings Challenge.

38. What percentage of the tailings do you want to allocate for this business? Are there any minimum requirements?

The applicant must explain the volume that their technology can repurpose. There's no minimum but we expect a relevant amount considering that this challenge involves a large mining operation.

39. The challenge is restricted just to artificial deposits as tailings; is BHP considering to launch a similar challenge with old waste ROM dumps with marginal Cu grades in sulphides?

The focus of BHP Tailings Challenge is on repurposing tailings. The question is outside the scope of the Challenge.

40. Could you specify whether the focus is on water recovery, or mineral reprocessing for rare earth or other mineral recovery?

The focus is on repurposing tailings. All the issues raised might be relevant.

41. What are BHP's goals for repurposing tailings in terms of volume reduction of tailings vs valorization?; Is BHP interested in proposals to reduce copper in tailings?

The focus of BHP Tailings Challenge is on repurposing a large volume of tailings. All the ideas are welcome. Volume reduction, valorization, and reduction of copper in tailings could be interesting as long as they are part of a comprehensive solution.

42. Why does the waste not return to the open pit or underground mine or how do we provide tailings return to the pit after mine closure?

The focus of BHP Tailings Challenge is on repurposing tailings. The question is outside the scope of the Challenge.

43. At this stage, will a letter or support from potential national and international stakeholders be required?

The letters of commitment to participate in a team are to be provided with the submission. Having international stakeholders is not required.

44. Is this challenge for BHP's Antamina asset?

The site of the on site test is to be defined.

45. The tailings for this challenge are only those at Escondida?; Can the solution be proposed for Spence's future tailings?

The site of the on site test is to be defined. BHP expects the solution to be transferable across assets so an ideal solution should not be site specific.

46. What is the approximate closing cost of the tailings to work?

This information is not available as the site of the on site test is yet to be defined.

47. Does Escondida get all its make-up water from desalination, as stated in the presentation?

The site of the on site test is to be defined. Escondida does get its make-up water from desalination. They also recover water from the tailings dam.

48. Reprocess company can operate within MEL?

The site of the on site test is to be defined. This will be defined later in the process in accordance to BHP's and teams needs.

49. I am curious about the samples to be given for the tests. How can we be sure we get enough amount of sample to be representative of the whole tailing dam? The amount of sample to be given is fixed or we can ask for a specific amount based on our needs?; Will tailings samples be shipped overseas?

Participants can expect to receive a sample of 10lt (including water) to perform the tests and activities regarding the proof of concept. The option for overseas shipment is available.

50. Can there be participants in more than 1 consortium?

There are not restrictions in this regard, it is up to the consortia to establish its own rules. Just be clear on how the time of that person will be distributed if two or more applications where he/she participates are selected.

51. According to the final USD 8,600,000 grant, what is the expected throughput capacity of the scalable solution?

There is no predefined throughput, but you need to consider a volume large enough to have a meaningful impact for a large scale mining operation.

52. There any format to prepare the project proposal?; Is the proposal to be submitted based on BHP's own technical or economic forms, or is it an open proposal in the form of presentation?

There's an application form inside the platform, you can access here <https://fch.brightidea.com/BHPTailingsChallenge>. To access it you need to login first in www.tailingschallenge.com

53. What solutions for this challenge have you used before and why have they not fully worked?

This challenge has not been addressed before as it's posted in the BHP Tailings Challenge web page.

54. Are there defined lines of work or are they free? Does BHP have a roadmap of the challenge - in terms of steps/hurdles/PoC etc?

This is a disruptive challenge, there's no defined lines of work, all ideas are welcome. There is no predefined Road Map. We expect applicants to propose such.

55. Regarding the on site pilot stage, will the machine be installed and operated by the customer (bhp) or the supplier?

This is to be defined but it is expected to be operated by the supplier.

56. Can you explain the concept of TRL2?

This refers to the Technology Readiness Levels Index. A detailed description can be find in the Terms & conditions document in www.tailingschallenge.com TRL 2: Technological concept and / or formulated application

57. BHP will deliver the KPIs of the processes that the innovation will do?

This will we defined among participants and BHP during the process

58. Can I as a BHP employee participate? should I quit From BHP?

BHP employees can't apply to this challenge

59. *Water recovery is expected?*

The challenge seeks to repurpose tailings. BHP aims to make progress in the reduction and recycling of industrial waste. Water recovery could play a role in the repurposing of tailings.

60. *Can one team submit more than 1 submission?*

Yes.

61. *Is the 50,000USD free to use?*

Yes, as far as it is used in activities directly related to the challenge. All information can be found in the Terms and Conditions document in www.tailingschallenge.com.

62. *Can several institutions apply together?*

Yes, teams and consortia are welcome to participate. Remember to access the BHP Tailings Community to identify potential partners. You can access it at <https://fch.brightidea.com/BHPTailingsChallengeCommunityPlatform>

63. *Valuable metal elements are a small % of the total. Should the treatment of items that have no value be part of the solution?*

Yes, the objective is to transform tailings into marketable products

64. *Can we participate as a company in Chile together with foreign companies and universities*

Yes, there are no restrictions regarding the location of companies participating. Remember to access the BHP Tailings Community to identify potential partners. You can access it at <https://fch.brightidea.com/BHPTailingsChallengeCommunityPlatform>

65. *How do we access community?*

You can access here: <https://fch.brightidea.com/BHPTailingsChallengeCommunityPlatform>

66. *Regarding the environmental issue, are you currently having problems of this nature due to copper tailings?*

You can find all the available information at www.tailingschallenge.com

67. Will teams or shortlisted teams receive support and 'mentoring' to ensure solutions are relevant to the BHP operating environment? Also to ensure they're economically viable?

Teams participating in the Proof of Concept stage will have support from Expande's team of technical and business managers. Additional engagement of specialist from BHP could be available. This is to be analyzed on a case to case basis.

68. Will the program provide support and/or mentoring about sharing IP, joint ventures, etc.?

Expande will provide support and share best practices for topics in its areas of competence.

69. If teams are allowed to merge on the second stage. How would that happen?

If the organization of the Challenge identifies potential synergies among participants, it will facilitate an introduction to the involved teams. It is up to the participants to decide what to do and to establish the conditions of a potential merge.

70. Will the program support the team with visas, soft landing, etc into Chile?

All administrative matters such as visas are expected to be managed by the participants. We are open to provide support in the form of letter if needed. There is no soft landing program in the scope but we recommend identifying local partners within BHP Tailings Community which can be accessed here:

<https://fch.brightidea.com/BHPTailingsChallengeCommunityPlatform>

71. Are there any restrictions associated with dealing with local community in relation to benefits of any possible solutions? Also, will BHP be supplying detail of local environments (physical and social) and challenges that they may face that could also be incorporated into any proposed solution?

Creating a positive impact in the local community is desirable and will be considered in the evaluation. Given that the site is yet to be defined, there is no information currently available regarding the local environments.

72. Is the target to refill aquifers?; Do you need to recycle waters to salar and bofedales?

No, the target is to repurpose fresh copper tailings. The site is yet to be defined so there is no information on salar or bofedales at this stage.

73. *Is this challenge only for copper tailings in Chile?*

BHP Tailings Challenge is being championed by Minerals America. The site is to be defined across locations under the responsibility of Minerals Americas.

74. *What does success look like to BHP?*

Success looks like the ability to establish a sustainable business using fresh copper tailings as raw material that can be scaled to other operations.

Technical Information (answer to all questions at the end of the section)

1. *Is there information of the history of the material?*
2. *Where do we find a detailed Chemical Analysis?*
3. *When would teams receive more detailed compositional data including trace elements?*
In addition to the information provided in the presentation.
4. *What are the sulphide species in the tailings and their relative proportions?*
5. *What is the pyrite and arsenopyrite content of the tailings?*
6. *Will further details about what thickeners are being used?*
7. *What is the surface of the tailings reservoir?*
8. *Where will we find a full Chemical Analysis?*
9. *What is the water to solids split of the tailings?*
10. *What is the specific gravity of this mixture of different ores that you have found?*
11. *What is the water content of the tailing at point of collection?*
12. *Will you share the documents about the previous works and studies?*
13. *Regarding the technical data of the tailings samples. Approximately how many analyzes do you have, are they distributed over time? Are they from the outlet of the plant exclusively? What analyzes were performed on them?*

14. *Would you share the documents about the previous efforts and studies?*
15. *40% w/w for the tailings what is the volume of water? or what is the density of the tailings solids on a whole.*
16. *Is the tailings stream really 40% solids? Thickener feed is usually 25%-30% and underflow is ~50%.*
17. *Is there a summary of the chemical and metallurgical properties of the copper tailings?*
18. *Where one can find the exact chemical composition of the muds in the dams?*
19. *Are any extrinsic reagents, non-typical to environment, present in the muds?*
20. *Which percentage of the tailing is commonly reinjected to the open pit mine or underground?*
21. *What is the flow that enters the tailings?*
22. *What kind of metals are associated with silicates, carbonates and sulfates.*
23. *It sounds like you want us to determine and design for the entire range of tailings compositions that might arise. Is this correct or will you provide a range of values for us to look at?*
24. *What is the residual copper content in the tailings?*
25. *What are the dry stacking / pressure filtration experience with this particular tailings?*
26. *Do you have any details on the types of contamination that would be expected to be encountered*

All technical information is available is shown below and can be downloaded at www.tailingschallenge.com. We advise you to constantly monitor the site as new information might become available.

- **Production parameters:**

- Average production: 50 Mton/year
- Solids content: 40% w/w
- Approximate Particle size distribution (PSD):
 - D90 → 160 μm
 - D80 → 110 μm
 - D60 → 75 μm
 - D50 → 40 μm
 - D20 → 10 μm
- Clay content:
 - 0-25% (Kaolinite and montmorillonite)

- **Geochemical parameters:**

- pH: 7 (neutral)
- Potential acid generator
- Tailings Mineralogy:
 - Silicate → 29-92%
 - Carbonate → 2-83%
 - Sulphide → <1-40%
 - Sulfate → <1-10%
 - FeOxide → 0-8%
 - Others → ~2%