

Consultation response

Part 1: Your details

Original language of response: English

Name: David M Chambers

Country of residence: United States

Are you willing to let us publish your response publicly on the Global Tailings Review website? Yes

Please select which stakeholder group you are representing: Non-governmental organization (NGO) – International

If 'Other', please specify below:

Are you responding on behalf of an organization? No

Please give the name of the organization:

Your level within the organisation:

Part 2: Your views on each of the Principles and Requirements in the Standard

Topic 1: Knowledge Base

Principle 1

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Partially

Which aspects of Principle 1 do your comments relate to?

Requirement 1.2

Your comments on Principle 1

REQUIREMENT 1.2: Prepare and regularly update detailed site characterization of the tailings facility site(s)

Comment: It is critical that we understand not only about the site characterization of existing (operating and closed) tailings facilities, but also that we collect as much information as is possible about those tailings dams that have failed, and those closed tailings facilities that no longer have an identified operator associated with them. UNEP, in particular, is in a relatively strong position to collect this information. No other entity has the influence to approach worldwide governments and corporations to ask for this information. Although collecting this information is arguably beyond the mandate of the Tailings Standard, collecting baseline data on tailings dams and tailings dam failures is a basic need for understanding what is happening, and eventually why it is happening. At the present time no one in the world possesses this information, not in small part because it is not in the best interest

of regulators or the mining industry to know.

Principle 2

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Partially

Which aspects of Principle 2 do your comments relate to?

Requirement 2.2

Your comments on Principle 2

Suggest: "Engage an Independent Tailings Review Board (ITRB) for tailings facilities rated Extreme, Very High, or High, or an independent senior technical reviewer for tailings facilities rated Significant or Low..."

Comment: For tailings facilities rated Extreme, Very High, or High, all of which involve potential loss of life, the risks for failure should be reviewed by more than a single person. Decisions about risk involving loss of life should be supported by the judgment of several individuals.

Topic II: Affected Communities

Principle 3

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Partially

Which aspects of Principle 3 do your comments relate to?

Requirement 3.3

Your comments on Principle 3

This approach -- "considering" good faith measures and "communicating" decisions - for the most part describes present government and industry practices. Instead of "communicating" decisions, reaching "consent" with affected communities on final decisions would be a real breakthrough for the problem of relocation. (How to decide when consent has been reached is, of course, a difficult task.)

Topic III: Design, Construction, Operation and Monitoring of the Tailings Facility

Principle 4

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Partially

Which aspects of Principle 4 do your comments relate to?

Requirement 4.1, Requirement 4.2

Your comments on Principle 4

REQUIREMENT 4.1: The application of what is essentially the Precautionary Principle

in REQUIREMENT 4.1 is strongly supported. The Consequence Classification of a safety-related structure should be a social decision, not a technical or corporate decision. Consequence Classification involves the quantification of risk, and the degree of acceptance of consequence, both of which involve measuring social values, not technical evaluation. In today's world of tailings dam design, safety is just one of several factors that influence the dam design. Another is cost, and if cost is given equal weight with safety, it will always become the most important design factor. Operators and regulators should make an affirmative commitment to make safety the 'primary' consideration in tailings dam design, construction, operation, and closure. Without this commitment, cost will drive the process. This should be stated clearly in Requirement 4.1 as worded above, or alternatively as the Mt Polley Expert Panel suggested, "Safety attributes should be evaluated separately from economic considerations, and cost should not be the determining factor." (Expert Panel 2015) Footnote 20: Safe closure is achievement of a confirmed 'landform' status or similar status that also has a permanent non-credible flow failure state. Achievement of a 'non-credible flow landform' status implies a 'dry' closure of some form. This should be stated more explicitly so that the intent is clear. It is suggested that the following wording be added to Requirement 4.1 c): Tailings facilities should be designed for safe 'non-credible flow landform' closure. If a non-credible flow landform closure is not planned, a risk assessment must be performed to demonstrate that the non-landform closure poses less long-term risk to the public than a non-credible flow landform closure.

REQUIREMENT 4.2: It is strongly recommend that the decision to rebut an "Extreme" classification be made by the Board of Directors of the operating company, with the recommendation of the Accountable Executive. Ultimate corporate authority, whether it be for profitability or safety, rests with the Board of Directors. If accountability is separated from authority, a fundamentally misaligned management situation will be created. In this case the Board of Directors, if they are not directly responsible for the safety of the tailings dams, will be enticed to send an indirect message to management that cost and profitability are the primary management concerns, with safety an important, but secondary, consideration. This is the situation as it now exists, and the Global Tailings Review proposal in REQUIREMENT 4.2 only perpetuates this imbalance. Legally the Board of Directors will ultimately be responsible for the safety of tailings dams. The financial liability for the impacts of tailings dam failures, and the direct impacts on the financial performance of the company due to these failures, will be their responsibility. As a result, the Board of Directors should be acutely aware of, and directly involved with, the fundamental decisions that determine tailings dam safety classifications.

Principle 5

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 5 do your comments relate to?

Your comments on Principle 5

Principle 6

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 6 do your comments relate to?

Your comments on Principle 6:

Principle 7

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 7 do your comments relate to?

Your comments on Principle 7

Principle 8

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Partially

Which aspects of Principle 8 do your comments relate to?

Comments on the Principle itself

Your comments on Principle 8

Post-closure monitoring, and funding, should also be addressed. Post-closure monitoring will be at a reduced scope and frequency from operational monitoring. Funding for post-closure monitoring and maintenance also needs to be addressed. Reliance on post-closure monitoring to insure post-closure safety should be minimized because there will inevitably be periods where monitoring is not done, or where the results of monitoring are not applied for preventive maintenance. Things do not always work as planned.

Topic IV: Management and Governance

Principle 9

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 9 do your comments relate to?

Your comments on Principle 9

Principle 10

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 10 do your comments relate to?

Your comments on Principle 10:

Principle 11

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

No

Which aspects of Principle 11 do your comments relate to?

Comments on the Principle itself, Requirement 11.5

Your comments on Principle 11:

It is recommended that "High" classification facilities be included in REQUIREMENT 11.5 because High Consequence Classification events also involve loss of human life.

Principle 12

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 12 do your comments relate to?

Your comments on Principle 12:

Principle 13

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 13 do your comments relate to?

No

Your comments on Principle 13:

Principle 14

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 14 do your comments relate to?

Your comments on Principle 14:

Topic V: Emergency Response and Long-Term Recovery

Principle 15

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 15 do your comments relate to?

Your comments on Principle 15:

Principle 16

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Partially

Which aspects of Principle 16 do your comments relate to?

Comments on the Principle itself

Your comments on Principle 16:

Consider a REQUIREMENT 16.6: The mine operator shall carry private coverage and/or pool insurance to cover at least US\$1 billion (2020) to cover mitigation and impacts from a catastrophic mine waste accident. The financial assurance provision referenced in REQUIREMENT 2.6 addresses coverage for "... the construction, operation, maintenance, and/or closure of a tailings facility." This is a provision that most developed countries, and many developing countries, have already adopted. However, even though we continue to experience catastrophic tailings failures at the rate of approximately one per year, there is no requirement anywhere in the world for a financial assurance to cover the cost of mitigation and reparations related to a catastrophic tailings dam failure. If the operating company cannot pay for these expenses with their own resources, then the public becomes responsible for these costs, or for bearing the resultant impacts. Some large mining companies have reported they have such coverage, but obtaining the availability of universal coverage would probably involve development of a financial instrument by the mining industry itself (Poulin and Jacques 2004). However, it should also be noted that if such a requirement were implemented, it would give mine operators an economic incentive to prevent dam failures, which they do not in essence have at the present time. The figure of \$1 billion US (2020) is an approximate amount resulting from previous catastrophic tailings dam failures (Bowker and Chambers 2015). Oil tankers in Canada have approximately \$1.5 billion available per accident, and the financial assurance required for large pipeline failures in British Columbia is \$1 billion (Allan 2016). The nuclear industry in the US is required by the Price-Anderson Act to carry pool insurance for \$10 billion, and there is a similar requirement for Canada (Heal and Kunreuther 2010).

Topic VI: Public Disclosure and Access to Information

Principle 17

In your view, will compliance with this Principle and its Requirements contribute to the prevention of catastrophic failure of tailings facilities?

Yes

Which aspects of Principle 17 do your comments relate to?

Your comments on Principle 17:

Part 3: Your views on the Standard

Your view as to whether the content of the Standard meets your expectations

Your view as to whether the content of the Standard meets your expectations (closed question):

2: Falls somewhat below my expectations

Please summarize why you chose this option:

The Global Tailings Standard is positioning itself to be the fundamental guidance document for tailings dam safety. As such, the Global Tailings Standard is different from tailings dam guidance from ICMM, ICOLD, CDA, MAC, and other industry and professional organizations in that it should reflect the nexus between the demands of society for the products of mining and level of risk that society finds acceptable in obtaining metal products. Industry and professional organizations are only in a position to guess at the level of risk society is willing to accept. As a result, guidance from industry and professional organizations generally reflects what has historically been used as an acceptable level of risk, and which was probably developed i

Your view on whether the Standard will create a step change for the industry in the safety and security of tailings facilities

Your view on whether the Standard will create a step change for the industry in the safety and security of tailings facilities (closed question):

3: Will strengthen some but not all aspects of the safety and security of tailings facilities

Please summarize why you chose this option:

An example of this can be seen in Annex 2 – Table 2, where Dam Failure Classifications of High and Very High, both of which could lead to loss of life. These dams, which must stand in perpetuity, are assigned design seismic and hydrologic events that are less than the maximum credible earthquake and the probable maximum flood events. I believe this is a reflection of the Canadian Dam Association (CDA 2013) dam risk classifications. These are dam classifications developed by engineers, not communities and/or politicians. They are good starting points for a discussion about what should be appropriate dam failure classification levels, but they are not classifications based on technical research, they are based merely on the judgement of the

Does the content of the Standard address all aspects of tailings facility management adequately?

Does the content of the Standard address all aspects of tailings facility management adequately (closed question)?

No

Please explain why and/or what is missing:

I believe the Panel has the opportunity not only to make the dam classification more protective of people, and less reflective of cost, but also to make safety the clear driver of dam design, construction, operation, and closure, also over cost.

Part 4: Suggestions for topics to be included in the accompanying Recommendations Report

On which topics would you expect to have further clarification or guidance in this document?

Annex 1: Glossary and Notes (Suggested Additions) Add: Financial Assurance
Financial assurance means the money or other form of financial instrument (e.g., surety bonds, trust funds, escrow accounts, proof of stable revenue sources for public agencies) required of the operator. This is to ensure that the functions of the closure plan, and/or reimbursements for economic damages suffered by non-mine entities due to catastrophic accidents, are achieved and maintained over the long term. Add: Independent Reviewer The "independence" of reviewers is important for safety. A reviewer, as an individual or an organization, should not have a financial conflict with the mine it is reviewing. We can define a financial conflict as having worked for the mine operator, either at this mine or another company operated facility, in the past 5 years. If the reviewer has been contracted to review this mine, or as many as 5 mines for any one operating company, this would not be considered as a conflict. (It would not be prudent for one company to engage only one organization to review all of its mines, if that number exceeds five mines.) An "independent" reviewer or "organization" is a reviewer or organization that has not had a contract with the operator of the mine being reviewed during the past 5 years, except as an independent reviewer, for as many as 5 different mines for the same operator. Annex 2: Consequence Classification The choice of the design event, in this case the 1/10,000 or 1/5,000 event for both earthquakes and floods, is a social decision. That is, how much risk is acceptable? By choosing a less-than-maximum design event, UNEP/ICMM/PRI are saying that loss of some life is justified by the cost savings associated with using a less-than-maximum design event for seismic and flood events. Can you explain the rationale for using a less-than maximum event for a tailings dam, the failure of which could cause loss of life? (It should be noted that the probability of the 5,000-year design event being exceeded in the nominal 10,000-year/perpetuity period is approximately 86%.) Additional Comment – Management and Governance of Global Tailings Standard In the discussion during the Global Tailings Review - Public Consultation - Technical Aspects Confirmation on Monday, December 17, 2019, there was mention that the panel is considering recommending a management and governance model for the Global Tailings Standard one like that for the International Cyanide Management Institute (ICMI). From a management perspective the ICMI is a good model. However, from

a governance standpoint the board of the ICMI is too narrowly selected. The ICMI Board is small, and is drawn mainly from industry. The issues surrounding tailings dam safety and classification are more complex and less technically oriented than cyanide safety. The board for governing a Global Tailings Standard should be representative not only of technical and industry considerations, but should also include representatives of civil society, international labor, downstream metal users, investors, and potentially affected communities from around the world. Lacking this broad representation, the Global Tailings Standard can be captured by one interest segment, and not represent the combined concerns of a global society potentially impacted by tailings dam failures.

Other information

Non-fitting response text (text submitted which did was not in response to one of the questions above)

Attachment 1 reference (if applicable)

ref:0000000511:Q83

Attachment 2 reference (if applicable)

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"Technical Support for Grassroots Public Interest Groups"



December 30, 2019

Dr. Bruno Oberle
Global Tailings Review
consultation@globaltailingsreview.org

Re: Comments on the Draft Global Tailings Standard

Background

David Chambers has 40 years of experience in mineral exploration and development – 15 years of technical and management experience in the mineral exploration industry, and for the past 25+ years he has served as an advisor on the environmental effects of mining projects both nationally and internationally. He has Professional Engineering Degree in physics from the Colorado School of Mines, a Master of Science Degree in geophysics from the University of California at Berkeley, and is a registered professional geophysicist in California (# GP 972). Dr. Chambers received his Ph.D. in environmental planning from Berkeley. His recent research focuses on tailings dam failures, and the intersection of science and technology with public policy and natural resource management (Chambers 2019).

General Comments

The Global Tailings Standard is positioning itself to be the fundamental guidance document for tailings dam safety. As such, the Global Tailings Standard is different from tailings dam guidance from ICMM, ICOLD, CDA, MAC, and other industry and professional organizations in that it should reflect the nexus between the demands of society for the products of mining and level of risk that society finds acceptable in obtaining metal products. Industry and professional organizations are only in a position to guess at the level of risk society is willing to accept. As a result, guidance from industry and professional organizations generally reflects what has historically been used as an acceptable level of risk, and which was probably developed in the narrow window of technical expertise and the direct costs of construction and maintenance to industry. I know of no examples where public input on the appropriate level of risk was obtained in the development of failure classifications. Efforts to change that level of risk, which are being discussed in the Draft Global Tailings Standard, chance being constrained by the amount new proposals deviate from existing risk standards, not by what society really demands of the risk levels.

An example of this can be seen in Annex 2 – Table 2, where Dam Failure Classifications of High and Very High, both of which could lead to loss of life. These dams, which must stand in perpetuity, are assigned design seismic and hydrologic events that are less than the maximum credible earthquake and the probable maximum flood events. I believe this is a reflection of the Canadian Dam Association (CDA 2013) dam risk classifications. These are dam classifications developed by engineers, not communities and/or politicians. They are good starting points for a discussion about what should be appropriate dam failure classification levels, but they are not classifications based on technical research, they are based merely on the judgement of the engineers who developed the classifications.

I believe the Panel has the opportunity not only to make the dam classification more protective of people, and less reflective of cost, but also to make safety the clear driver of dam design, construction, operation, and closure, also over cost.

Section-Specific Comments

REQUIREMENT 1.2: Prepare and regularly update detailed *site characterization* of the tailings facility site(s)

Comment: It is critical that we understand not only about the site characterization of existing (operating and closed) tailings facilities, but also that we collect as much information as is possible about those tailings dams that have failed, and those closed tailings facilities that no longer have an identified operator associated with them. UNEP, in particular, is in a relatively strong position to collect this information. No other entity has the influence to approach worldwide governments and corporations to ask for this information. Although collecting this information is arguably beyond the mandate of the Tailings Standard, collecting baseline data on tailings dams and tailings dam failures is a basic need for understanding what is happening, and eventually why it is happening. At the present time no one in the world possesses this information, not in small part because it is not in the best interest of regulators or the mining industry to know.

REQUIREMENT 2.2: Engage an *Independent Tailings Review Board (ITRB)* or an independent *senior technical reviewer* with no conflicts of interest to assess and review the *alternatives analysis* for site and technology selection.

Suggest: "Engage an Independent Tailings Review Board (ITRB) for tailings facilities rated *Extreme, Very High, or High*, or an independent senior technical reviewer for tailings facilities rated *Significant or Low...*"

Comment: For tailings facilities rated Extreme, Very High, or High, all of which involve potential loss of life, the risks for failure should be reviewed by more than a single person. Decisions about risk involving loss of life should be supported by the judgment of several individuals.

REQUIREMENT 3.3: Where the risks of a potential *tailings facility* failure could result in loss of life or sudden *physical and/or economic displacement* of people, the Operator shall con-sider in good faith additional measures to minimize those risks or implement resettlement following international standards¹⁸. The Operator shall communicate these decisions to those affected.

This approach -- "considering" good faith measures and "communicating" decisions -- for the most part describes present government and industry practices.

Instead of "communicating" decisions, reaching "consent" with affected communities on final decisions would be a real breakthrough for the problem of relocation. (How to decide when consent has been reached is, of course, a difficult task.)

REQUIREMENT 4.1: Presume the consequence of failure classification of all new tailings facilities as being 'Extreme' (see Annex 2, Table 1: Consequence Classification Matrix) and design, construct, operate and manage the facility accordingly. This presumption can be rebutted if the following three conditions are met: ...

The application of what is essentially the Precautionary Principle in REQUIREMENT 4.1 is strongly supported. The Consequence Classification of a safety-related structure should be a social decision, not a technical or corporate decision. Consequence Classification involves the quantification of risk, and the degree of acceptance of consequence, both of which involve measuring social values, not technical evaluation.

In today's world of tailings dam design, safety is just one of several factors that influence the dam design. Another is cost, and if cost is given equal weight with safety, it will always become the most important design factor.

Operators and regulators should make an affirmative commitment to make safety the 'primary' consideration in tailings dam design, construction, operation, and closure. Without this commitment, cost will drive the process. This should be stated clearly in Requirement 4.1 as worded above, or alternatively as the Mt Polley Expert Panel suggested, "Safety attributes should be evaluated separately from economic considerations, and cost should not be the determining factor." (Expert Panel 2015)

Footnote 20: Safe closure is achievement of a confirmed 'landform' status or similar status that also has a permanent non-credible flow failure state.

Achievement of a 'non-credible flow landform' status implies a 'dry' closure of some form. This should be stated more explicitly so that the intent is clear. It is suggested that the following wording be added to Requirement 4.1 c):

Tailings facilities should be designed for safe 'non-credible flow landform' closure. If a non-credible flow landform closure is not planned, a risk assessment must be performed to demonstrate that the non-landform closure poses less long-term risk to the public than a non-credible flow landform closure.

REQUIREMENT 4.2: The decision to rebut the requirement to design for 'Extreme' Consequence Classification, shall be taken by the *Accountable Executive* or the *Board of Directors* (the '*Board*'), with input from an independent *senior technical reviewer* or the *ITRB*. The *Accountable Executive* or *Board* shall give written reasons for their decision.

It is strongly recommended that the decision to rebut an "Extreme" classification be made by the Board of Directors of the operating company, with the recommendation of the Accountable Executive. Ultimate corporate authority, whether it be for profitability or safety, rests with the Board of Directors. If accountability is separated from authority, a fundamentally misaligned management situation will be created.

In this case the Board of Directors, if they are not directly responsible for the safety of the tailings dams, will be enticed to send an indirect message to management that cost and profitability are the primary management concerns, with safety an important, but secondary, consideration. This is the situation as it now exists, and the Global Tailings Review proposal in REQUIREMENT 4.2 only perpetuates this imbalance. Legally the Board of Directors will ultimately be responsible for the safety of tailings dams. The financial liability for the impacts of tailings dam failures, and the direct impacts on the financial performance of the company due to these failures, will be their responsibility. As a result, the Board of Directors should be acutely aware of, and directly involved with, the fundamental decisions that determine tailings dam safety classifications.

PRINCIPLE 8: Design, implement and operate monitoring systems.

Post-closure monitoring, and funding, should also be addressed. Post-closure monitoring will be at a reduced scope and frequency from operational monitoring. Funding for post-closure monitoring and maintenance also needs to be addressed. Reliance on post-closure monitoring to insure post-closure safety should be minimized because there will inevitably be periods where monitoring is not done, or where the results of monitoring are not applied for preventive maintenance. Things do not always work as planned.

REQUIREMENT 11.5: For tailings facilities with ‘Very High’ or ‘Extreme’ Consequence Classification, ...

It is recommended that "High" classification facilities be included in REQUIREMENT 11.5 because High Consequence Classification events also involve loss of human life.

Consider a REQUIREMENT 16.6:

The mine operator shall carry private coverage and/or pool insurance to cover at least US\$1 billion (2020) to cover mitigation and impacts from a catastrophic mine waste accident.

The financial assurance provision referenced in REQUIREMENT 2.6 addresses coverage for "... *the construction, operation, maintenance, and/or closure of a tailings facility.*" This is a provision that most developed countries, and many developing countries, have already adopted. However, even though we continue to experience catastrophic tailings failures at the rate of approximately one per year, there is no requirement anywhere in the world for a financial assurance to cover the cost of mitigation and reparations related to a catastrophic tailings dam failure. If the operating company cannot pay for these expenses with their own resources, then the public becomes responsible for these costs, or for bearing the resultant impacts.

Some large mining companies have reported they have such coverage, but obtaining the availability of universal coverage would probably involve development of a financial instrument by the mining industry itself (Poulin and Jacques 2004). However, it should also be noted that if such a requirement were implemented, it would give mine operators an economic incentive to prevent dam failures, which they do not in essence have at the present time.

The figure of \$1 billion US (2020) is an approximate amount resulting from previous catastrophic tailings dam failures (Bowker and Chambers 2015). Oil tankers in Canada have approximately \$1.5 billion available per accident, and the financial assurance required for large pipeline failures in British Columbia is \$1 billion (Allan 2016). The nuclear industry in the US is required by the Price-Anderson Act to carry pool insurance for \$10 billion, and there is a similar requirement for Canada (Heal and Kunreuther 2010).

Annex 1: Glossary and Notes (Suggested Additions)

Add: Financial Assurance

Financial assurance means the money or other form of financial instrument (e.g., surety bonds, trust funds, escrow accounts, proof of stable revenue sources for public agencies) required of the operator. This is to ensure that the functions of the closure plan, and/or reimbursements for economic damages suffered by non-mine entities due to catastrophic accidents, are achieved and maintained over the long term.

Add: Independent Reviewer

The "independence" of reviewers is important for safety. A reviewer, as an individual or an organization, should not have a financial conflict with the mine it is reviewing. We can define a financial conflict as having worked for the mine operator, either at this mine or another company operated facility, in the past 5 years. If the reviewer has been contracted to review this mine, or as many as 5 mines for any one operating company, this would not be considered as a conflict. (It would not be prudent for one company to engage only one organization to review all of its mines, if that number exceeds five mines.)

An "independent" reviewer or "organization" is a reviewer or organization that has not had a contract with the operator of the mine being reviewed during the past 5 years, except as an independent reviewer, for as many as 5 different mines for the same operator.

Annex 2: Consequence Classification

Table 2: External loading criteria required by the Standard

Dam Failure Consequence Classification	Design Flood Annual Exceedance Probability	Design Ground Motion Annual Exceedance Probability
Low	1/2500	1/2500
Significant		
High	1/5000	1/5000
Very High		
Extreme	1/10000 or PMF*	1/10000 or MCE**

* PMF Probable Maximum Flood
 ** MCE Maximum Credible Earthquake

The choice of the design event, in this case the 1/10,000 or 1/5,000 event for both earthquakes and floods, is a social decision. That is, how much risk is acceptable? By choosing a less-than-maximum design event, UNEP/ICMM/PRI are saying that loss of some life is justified by the cost savings associated with using a less-than-maximum design event for seismic and flood events.

Can you explain the rationale for using a less-than maximum event for a tailings dam, the failure of which could cause loss of life? (It should be noted that the probability of the 5,000-year design event being exceeded in the nominal 10,000-year/perpetuity period is approximately 86%.)

Additional Comment – Management and Governance of Global Tailings Standard

In the discussion during the Global Tailings Review - Public Consultation - Technical Aspects Confirmation on Monday, December 17, 2019, there was mention that the panel is considering recommending a management and governance model for the Global Tailings Standard one like that for the International Cyanide Management Institute (ICMI).

From a management perspective the ICMI is a good model. However, from a governance standpoint the board of the ICMI is too narrowly selected. The ICMI Board is small, and is drawn mainly from industry. The issues surrounding tailings dam safety and classification are more complex and less technically oriented than cyanide safety. The board for governing a Global Tailings Standard should be representative not only of technical and industry considerations, but should also include representatives of civil society, international labor, downstream metal users, investors, and potentially affected communities from around the world. Lacking this broad representation, the Global Tailings Standard can be captured by one interest segment, and not represent the combined concerns of a global society potentially impacted by tailings dam failures.

Thank you for the opportunity to comment on this Draft.

Sincerely;



David M. Chambers, Ph.D., P. Geop.

References

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