Association of State Dam Safety Officials

December 30, 2019

Dr. Bruno Oberle
Global Tailings Review

Dear Dr. Oberle:

The Association of State Dam Safety Officials (ASDSO) was organized in 1984 to foster interstate communication about dams in the United States of America. ASDSO is a national non-profit organization with more than 3,000 members serving state dam safety programs and the broader dam safety community. Membership includes state and federal dam safety professionals, dam owners and operators, engineering consultants, emergency managers, manufacturers, suppliers, academia, contractors, and others interested in improving dam safety. The vision of ASDSO is "A future where all dams are safe" and the mission of ASDSO is to "Improve the condition and safety of dams through education, support for state dam safety programs and fostering a unified dam safety community."

The National Dam Safety Program in the United States was developed in response to significant dam failures in the 1970s including the Buffalo Creek Mine tailings dam in West Virginia in 1972. The National Dam Safety Program is administered by the Federal Emergency Management Agency (FEMA). This program and its support of state dam safety programs have been successful in raising the standard of care and lowering risk from dams in the United States.

In 1987, ASDSO and the Federal Emergency Management Agency (FEMA) published the *Model State Dam Safety Program* (publication FEMA 316). This model provides guidance for states to develop consistent programs and includes recommendations for legislation and regulations, permitting and approving designs, inspecting and evaluating existing dams, enforcement, emergency response, program staffing and training, and other information. The model is broadly applicable to all dams including tailings dams and includes the term "liquid borne materials" in its definition of the contents impounded by a dam. FEMA 316 was updated in 2007 and is currently under revision by an ASDSO task force for another update in 2020.

In January of 2016, the ASDSO Board of Directors established the Tailings Dam Working Group in response to the Mount Polley tailings dam failure in British Columbia in 2014 and the Fundão tailings dam failure in Brazil in 2015. The working group developed the attached resolution on tailings dam safety signed by the President of ASDSO in 2016.

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In 2017, the ASDSO Board of Directors chartered the Tailings Dam Regulatory Committee (TDRC) to lead implementation of tailings dam related aspects of the ASDSO Strategic Plan which includes the development of guidance for state programs on the unique aspects of tailings dam regulation, design, operation and closure that affect safety; support for state programs that regulate tailings dams; and other related work. The current roster of the ASDSO TDRC includes over 30 members from state and federal regulatory programs, tailings dam owners and operators, consulting engineers and environmental specialists, businesses and trade groups.

The ASDSO TDRC is currently developing an appendix for the pending update of the *Model State Dam Safety Program* (FEMA 316) to provide additional detail unique to regulating tailings dams. The ASDSO TDRC is aware of other international efforts to address tailings dam safety including the Global Tailings Review, and endeavors to align the tailings dam appendix to FEMA 316 with other guidance to promote consistency. However, the ASDSO effort is unique because the guidance is tailored specifically for the regulatory community. Other stakeholders will benefit from the updated FEMA 316 because uniform regulatory guidelines representing the minimum standard of care for tailings dams will be transparent. An advanced draft is expected to be completed by September 2020.

As a result of the Global Tailings Review and the release of the public consultation draft of the Global Tailings Standard, the Chair of the ASDSO TDRC asked the committee members and other state representatives to ASDSO to review the proposed standard. Because of the short review time, the responses are candid and presented anonymously in the attached table. Consequently, the solicited comments attached to this letter do not represent a consensus from the ASDSO TDRC nor do they represent the official position of ASDSO or its officers.

Thank you for the opportunity to review and comment on the Global Tailings Standard.

Respectfully submitted,

Charles F. Cobb, P.E.
Chair, ASDSO Tailings Dam Regulatory Committee
State Representative to ASDSO
State Dam Safety Engineer
Alaska Department of Natural Resources

Attachments: ASDSO Resolution Number 1-2016 on Tailings Dam Safety
Comments on Global Tailings Standard from members of ASDSO

Association of State Dam Safety Officials

Board of Directors and State Representatives

Resolution Number 1-2016

WHEREAS, ASDSO advocates for and leads efforts to improve the safety of all dams to reduce risk to lives, property and the environment from dam failure, including mine tailings dams; and

WHEREAS, the mining industry is a critical component of state and national economies, providing numerous benefits that enhance the standard of living for mankind, and mine tailings dams are an essential part of that industry; and

WHEREAS, a well-maintained and properly designed mine tailings dam greatly reduces risk of failure to downstream lives, property, and the environment; and

WHEREAS, the appropriate regulation of dams contributes to the safe design and operation, and reduces the probability of failure, including mine tailings dams; and

WHEREAS, many state dam safety programs in the United States have regulatory authority over mine tailings dams and would benefit from an enhanced dialogue on these important facilities; and

WHEREAS, the objectives of ASDSO are to provide a forum for the exchange of ideas and experiences in state dam safety programs and issues, to provide information and assistance to state dam safety programs, and to improve efficiency and effectiveness of state dam safety programs; and

WHEREAS, ASDSO has a proven track record of accomplishing these objectives for water dams, including the reduction of the risk of failure; and

WHEREAS, ASDSO is uniquely positioned to coordinate with the United States Society of Dams and other stakeholders with a common interest in the safety of mine tailings dams;

NOW THEREFORE BE IT RESOLVED, by the Board of Directors and the State Representatives of ASDSO, meeting on September 11, 2016, that ASDSO acknowledges the importance of safe tailings dams to the economy and safety of individual states and the nation, and will utilize its resources to support state dam safety programs with regulatory authority over tailings dams.

James T. Pawloski

Jim Pawloski
President, ASDSO

Date 9-14-16

Comments on Global Tailings Standard (GTS) from members of ASDSO

The following comments from members of the Association of State Dam Safety Officials (ASDSO) are presented anonymously except for the commenter's occupational perspective and do not represent the consensus of the ASDSO Tailings Dam Regulatory Committee and do not represent the official opinions or position of ASDSO or its officers or members at large. See the cover letter to these comments dated December 30, 2019 for more information about ASDSO.

Global Tailings Standard—Draft for public consultation—November 2019		
Table Legend		
Commenter X		**Occupational Perspective**
#	**Reference**	**Comment**
**	****	****** (*End of Commenter's Contribution*)

Commenter A		**Regulator**
#	**Reference**	**Comment**
1	Whole document	The investors and the mining community are commended for attempting to raise the standard of care for tailings dams at the international level, but the effective work is easier said than done. The GTS should provide high-level policy guidance and reference existing technical standards where available to limit scope of work.
2	Overview of the Standard	Regarding Topic 3 in 4th paragraph, the third sentence states "Where upgrading an existing facility is not feasible, the Operator must reduce the consequences of a potential failure to the greatest extent possible." This seems counterintuitive. Why is only part of the risk equation addressed? Reducing the probability or likelihood of a failure is a primary component of risk mitigation and reducing the consequences of a failure can be even more challenging, for example, moving a downstream community. The idea that feasibility limits upgrades implies that costs trumps safety. The paragraph would benefit from a more direct discussion of performance based, risk-informed, safe design if that is the basis underpinning Topic 3.
3	Overview of the Standard	Under Topic 4 in 5th paragraph, use Responsible Tailings Facility Manager instead of Responsible Tailings Facility Engineer in order to limit confusion, establish hierarchy to avoid conflict with EOR, and broaden labor pool.
4	Overview of the Standard	Under Topic 4 in 5th paragraph, the Tailings Management System should be called the Tailings and Water Management System because the two are integrated and water is the more difficult element to manage.
5	Overview of the Standard	Under Topic 5 in 6th paragraph, the discussion should include contingency planning to preclude catastrophic failure by reacting to developing adverse conditions.
6	Overview of the Standard	Regarding Topic 6 in 7th paragraph, does this transparency include information developed under Topic Area 3 including reports from Independent Tailings Review Boards?
7	A Systems Approach, 2nd paragraph	This should be the Tailings and Water Management System given the integrated nature of tailings and water and extend to water management ponds where water and tailings are separated. To ignore the water is to ignore the risk. The current omission is a deficiency in the standard.

8	Role of the State	The GTS should provide useful information specific to state regulatory programs. Many different state regulatory programs may be involved in the scope of work described by the GTS. The GTS should emphasize the critical role of state dam safety programs in mitigating risk from tailings dams, especially catastrophic failure. The work to provide detailed guidance to regulators is beyond the scope of the GTS. The GTS should consider referencing the Model State Dam Safety Program published by the US Federal Emergency Management Agency (FEMA 316) as an example of appropriate guidance for state regulatory programs.
9	The Role of the State	The first sentence of the first paragraph says the GTS "informs states about best practices" which seems to conflict with Note 2 on preceding page 1.
10	The Role of the State	Fourth sentence of first paragraph implies an undue burden on the State. The State's role is to hold the Operator accountable for identifying and correcting problems. The role of the State is primarily to set a minimum standard of care, not to conduct risk identification and mitigation.
11	The Role of the State	Regulators should not be responsible for mandating appropriate corrective actions. Rather, the regulator should be responsible for reviewing actions proposed by operators and Engineers of Record for appropriateness of response. The liability for corrective actions must remain with the Operator.
12	The Role of the State	States should not be "mandating appropriate actions." Determining appropriate actions can take considerable engineering and operational evaluations and implementing such actions carries significant risk and liability. Instead, regulators must have the capacity to understand and comprehend technical work and recognize the appropriate standard of care and engineering detail.
13	The Role of the State	In second paragraph, the role of the state should also include training staff in technical subjects pertinent to tailings and water management systems.
14	The Role of the State	In third paragraph, the GTS should clarify the benefit of diffusing authority to the regions of the state where mining occurs in order to provide local knowledge of site conditions and regional practices. In order to provide effective oversight, the regulator should be as familiar with the project as the Engineer of Record.
15	Implementation	In 7th and 8th bullets, clarify what “assurance” refers to. Is this financial assurance?
16	GTS-Topic I Prin. 2, Req. 2.5	Financial assurance is mentioned for the first time without any context. Requirement is ambiguous. Financial assurance for what? Reclamation, closure, long -term care and maintenance?
17	GTS-Topic I Prin. 2, Req. 2.6	This requirement is ambiguous also.
18	GTS-Topic III Prin. 5, Req. 5.5	Designing for closure should be first consideration, then back up to develop the start-up and interim operating configurations.
19	GTS-Topic III Prin. 4, Req. 4.2	A decision to “rebut” design requirements based on “consequence classification” must be consistent with regulatory requirements.
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Commenter B		**Regulator**
#	**Reference**	**Comment**
20	GTS-Annex 1 Glossary and Notes	Incremental loss definition in the Glossary. Incremental loss should be compared to the condition where the facility did not fail, rather than comparing it to the condition where the facility did not exist.

21	GTS-Annex 2 Consequence Classification	Concern that the consequence classification is not in alignment with US Federal Guidelines for Dam Safety definitions or most state hazard classification definitions.
22	GTS-Annex 2 Consequence Classification	Table 1: Suggest changing the heading from "Potential Loss of Life" to "Probable Loss of Life". Potential is too vague and is captured in the first and last column. Suggest adding definition of whatever term will be used to the Glossary.
23	GTS-Annex 2 Consequence Classification	Design Flood Annual Exceedance Probability is not in alignment FEMA P-94, Selecting and Accommodating Inflow Design Floods for Dams, August 2013.
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Commenter C		**Regulator**
#	**Reference**	**Comment**
24	Whole document	In my observation of recent waste dam failures, it seems to me that consultants in this industry are much more torn between public safety and serving their clients (leaning more towards getting the next job), as compared to the traditional dam safety industry, at least in the US. I can only conclude that this is because the traditional dam safety industry in the US has a more mature regulatory scheme, so in our world, consultants need to be equally interested in having credibility with the regulator as with serving their clients' interests. This is purely my personal opinion and conjecture.
25	Role of the State	My thoughts regarding the "the Role of State" are generally, that the "state" provides independent oversight. This includes not just direction to implement remedial measures, but also includes independent reviews of new and rehabilitation construction, independent inspection, and independent oversight of the owner's overall safety program, including independent review of inspection and maintenance activities and engineering evaluation.
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Commenter D		**Regulator**
#	**Reference**	**Comment**
26	Whole Document	1. This appears to be heading in the right direction but I think a lot of the standards are too general. There is tons of room for interpretation and wiggle room to say that you are meeting these standards. 2. No minimum requirements for an EOR listed. 3. What type of training does the onsite Responsible Tailings Facility Engineer need to have?
27	Whole Document	Overall there are some great ideas in this document but it needs a little bit more detail if they would like mining companies to follow or adopt this standard
28	Role of the State	We have an independent inspection program; however, we only inspect tailings facilities once every 5 years and if they are an older facility, there is limited instrumentation for us to review to "identify problems early". We should be working hand and hand with EOR. They have the time to devote to a tailings facility.
29	Role of the State	Their statement that States currently don't have the capacity to carry out the tasks of early detection, a comprehensive understanding of each facility. We have the

		authority to issue violation orders but those take time. We don't have any monies to dip into in the event of an emergency it is all up to the owner.
30	Role of the State	I don't agree with the statement that "Only States have a mandate to carry out enforcement and oversight". The owner should have an internal process or policy on oversight and enforcement/compliance. The owner is the first line of defense.
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Commenter E		**Regulator**
#	**Reference**	**Comment**
31	The Role of the State	Our state Minerals program has concerns about the mandate language. We believe the State should not mandate a specific corrective action but should have review and approval authority over proposed corrective actions (note the State should have the mandate to require corrective actions).
32	GTS-Topic V	There is discussion on making inundation maps publicly available. Unfortunately, in this day and age, terrorism is a big concern and making this sort of information available to the public may actually put the public in these inundation areas at a greater risk. I can see making limited information available to emergency responders though.
33	GTS-Annex 2 Table 2	Table 2 at the end proposes design flood exceedance probability for various hazard classifications. In my experience, there is typically less than 50 years of precipitation and/or stream gage data for mine sites. Table 2 proposes a 1 in 2500 or a 1 in 5000 exceedance probability for structures with less than an Extreme hazard classification. Forecasting a 1/2500 or a 1/5000 event with 50 or even a 100 years of data is stretching the bounds of statistics. A more defensible/practical standard might be a half PMF (instead of the 1/5000) and a quarter PMF (instead of the 1/2500).
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Commenter F		**Regulator**
#	**Reference**	**Comment**
34	Foreword p. ii, 4th paragraph	*"…streamlining certain requirements…"* Is this an enforceable document, or should *requirements* be *recommendations* or *standards?*
35	Overview of the Standard p. 2	Topic Area 3 – I think more emphasis should be given to closure and what happens post-closure and who is responsible for monitoring and maintenance. Note: There is an emphasis throughout this Standard on preventing catastrophic failures (and human fatalities) during operations, and rightly so. However, there are other concerns which also merit consideration. The responsibility for ensuring ongoing performance of a closed tailings impoundment may last forever even as the risk from a catastrophic failure slowly declines. It's akin to a chronic level of risk which may last forever vs. an acute level of risk which may be time limited. A long-term risk can represent a significant manpower and financial commitment.
36	The Role of the State p. 3, 1st paragraph	Closure of a facility is listed as one of many items in a long list of potential State oversight responsibilities. The functional life of a TSF after it is closed is far greater than the time it will have been in operation, so this should be highlighted. I think more needs to be said about the long-term liability posed by these highly engineered

		structures and who will be financially responsible for ensuring their ongoing performance in closure. Likely the State.
37	GTS-Topic I, p. 6	Include a requirement acknowledging the long-term liability of closed TSFs and the need to plan and finance their monitoring and maintenance, perhaps in perpetuity.
38	GTS-Topic I p.8	Requirements 2.5 & 2.6 – Here's an opportunity to clearly enunciate and expand on the role of the State vis-à-vis who will be ultimately responsible for long term monitoring and maintenance, and why financial assurance should be required. In case of default by the Operator, it is likely the State will become the responsible party and therefore the need for robust financial assurance. It's not clear from these requirements why financial assurance would be required and what its purpose is.
39	GTS-Topic III p. 10-13	I recommend a new standalone principle or another requirement under one of the existing principles (maybe Principle 8?) that addresses post-closure. The principle should identify a responsible party, why they should be held accountable for post-closure requirements, and the scope of their responsibilities and obligations, including financial, for ensuring long term facility performance and stability.
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Commenter G		**Regulator**
#	**Reference**	**Comment**
40	Whole Document	Here are my thoughts on the Draft Global Tailings Standard. It is not a very detailed document but is a start in the right direction. A comprehensive review every 3-10 years is good, which should include hazard classification, design storm, geotechnical evaluation (foundation, stability, seepage, etc. The Engineer of Record (EOR) concept is good, but over the life of a tailings dam, which can be decades, there will need to be allowances for new personnel/companies. I would suggest that the design for each modification of the tailings dam (i.e. raising) include an assessment of the entire structure, not just the part the engineer has designed. (I have seen projects where the engineer seals the drawings but includes a disclaimer that it applies only to the new portion.) The document references ICOLD hazard classes of Extreme, Very High, High, Significant, and Low (Table 1) and that new facilities should be considered Extremely High until proven otherwise. I think that the PMF design storm should apply to Extreme, Very High, and High in Table 2, not just Extreme. In the Role of the State section, includes statements "...States are uniquely situated to provide independent oversight of the permitting, construction, operation, maintenance, monitoring, and closure of tailings facilities. They are likewise the most appropriate entity to set up an independent inspection and enforcement program capable of identifying problems early and making sure those problems are corrected promptly before they increase the risk of catastrophic failures." I realize that in this context, "State" means any regulatory agency, but I would think that most such agencies are under-funded and not

		going to be able to provide independent oversight without a huge increase in resources. Maybe tailings dams operators should pay a fee to the regulatory agencies for review. The fee would be based on size (imp;ounded volume), and hazard class, ... Sharing monitoring information with the public, 8.4 and 17.1, is a good idea but I think will prove difficult. See footnote on page 20: "Public disclosure should exclude confidential financial and business information or where disclosure would present a risk to operational or physical security." Some companies may feel that the data on its tailings facilities are confidential and then not make it available. Finally, I think that tailings dams are not inherently different from dams which impound water and should be regulated, designed, evaluated, operated and inspected the same as other dams. A minor comment: In requirements 7.3 and 8.4 the term EOR is referenced before it is defined as Engineer of Record in requirement 10.2. Similar for RTFE term.
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Commenter H		**Regulator**
#	**Reference**	**Comment**
41	Whole Document	Serious concerns with the GTS. It should be re-written, or better yet the UNEP, ICMM and PRI should adopt the MAC and CDA MDC guidelines and bulletins.
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Commenter I		**Regulator**
#	**Reference**	**Comment**
42	Whole Document	It is unfortunate that there was not more time to comment on this important issue. The standards seen very general. It would have been helpful if there was background information that describes why this general approach was taken as to opposed to developing more specific and detailed standards. I recommend including background information or supporting documentation that describes: (1) how the GTS requirements compares to recommendations from the Mt Polley Independent Report and recommendations from any other independent reports from recent tailings failures; and (2) how the GTS requirements compare to recently developed standards and requirements from advanced jurisdictions (e.g., Canada, Montana, etc.). These comparisons are important in order to show how the GTS comports with recommendations and lessons learned from independent reviews of recent failures in order to demonstrate that the GTS would indeed be successful at preventing failures. Where the GTS is not consistent with independent report recommendations or recent standards/requirements from advanced jurisdictions, the background document should describe why the GTS departs from such recommendations or requirements. This supporting documentation and analysis could be included as a separate document or an appendix to the GTS. This documentation and analysis could improve the credibility of the GTS and the public

		will certainly be interested in how, specifically, the GTS was informed by recent failures. The GTS indicates that some States do not currently have capacity to carry out the tasks described in the GTS (under "Role of the State"). If there are known capacity issues, then it seems that the GTS should address this by developing a standard and requirements pertinent to improving State capacity. More emphasis should be placed on water management, closure, and consideration of closure during design. Provide more information regarding financial assurance. The Role of the State section should include a discussion of the State's role in approving, holding, and implementing (if needed) financial assurance. More emphasis should be placed on need for financial assurance to include all aspects of closure costs, including water management, monitoring, closure and post-closure independent reviews, etc. (this comment could apply to requirements 2.5 & 2.6). Requirement 17.1 should include making financial assurance information publicly available so that stakeholders are assured that adequate financial assurance is available.
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Commenter J		**Engineering Consultant**
#	**Reference**	**Comment**
43	Whole Document	My general thoughts are that they use absolute terms too often, for example: *…analyze all feasible sites and technologies… …minimize risk… …minimize the amount of tailings and water… …address all credible failure modes… …minimize the consequences…* I understand it is a goal, but there will be almost no way to comply with these absolutes. I think the goal is to reduce risks. I don't think you can minimize them unless you adopt the "do-nothing" option, and don't mine. And I don't think we are so advanced that we can all technologies or all failure modes.
44	Whole Document	I thought that it was going to be similar to the Cyanide Code, where member companies had to become signatories to the Code. Use of the Code is entirely voluntary, but stakeholders are supposed to sway the mining companies to comply with the Code. In part, the foreword to the Standard indicates: "Investors can insist that the Standard be embedded in corporate practice, and insurers can encourage adoption by linking implementation to the availability and cost of insurance. Consumers can choose to buy or use mining and metal products that are responsibly sourced, and local communities can demand that a company complies with the Standard". This part seems a little far-fetched to me, and more of a pipedream.
45	Whole Document	• GTS provides lots of principles and requirements without a necessary framework. • *"Zero harm goal".* Goal is unachievable. Wording used in MAC (2019) seems more appropriate, such as*:* · *Zero catastrophic failures of tailings facilities* · *No significant adverse effects on the environment or human health*

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“Minimize risk” is included in the GTS several times. Minimize risk should link to a limit such as “As Lowest Acceptable Reasonable (ALARP)” or tolerable risk.
The “Accountable Executive” is not explicitly linked to the highest executive in the organization, as MAC (2019) does. This does not seem good practice.
When referring to “all failure modes”, the word “credible” should be added (all credible failure modes).

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<tr><td>46</td><td>GTS-Annex 2
Table 2</td><td>
The new standard is similar to the CDA in terms of consequence rating, but further defines in terms of dollar amounts for economic loss and disruption to livelihoods.

The design events are, however, quite different:

<table>
<tr><th rowspan="2">Dam Classification</th><th colspan="2">CDA</th><th colspan="2">Draft GTS</th><th rowspan="2">Difference, relative to CDA</th></tr>
<tr><th>IDF</th><th>Earthquake</th><th>IDF</th><th>Earthquake</th></tr>
<tr><td>Low</td><td>1/100</td><td>1/100</td><td>1/2500</td><td>1/2500</td><td>Much Higher</td></tr>
<tr><td>Significant</td><td>Between 1/100 and 1/1000</td><td>Between 1/100 and 1/1000</td><td>1/2500</td><td>1/2500</td><td>Much Higher</td></tr>
<tr><td>High</td><td>1/3 between 1/1000 and PMF</td><td>1/2,475</td><td>1/5000</td><td>1/5000</td><td>Typically Higher</td></tr>
<tr><td>Very High</td><td>2/3 between 1/1000 and PMF</td><td>1/2 Between 1/2,475 and 1/10,000 or MCE</td><td>1/5000</td><td>1/5000</td><td>Maybe less/ Neutral</td></tr>
<tr><td>Extreme</td><td>PMF</td><td>1/10000 or MCE</td><td>1/10000 or PMF</td><td>1/10000 or MCE</td><td>Similar</td></tr>
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The following comments therefore relate to this:

Low Consequence and Significant Consequence have MUCH higher design events. Is this necessary, and what are we trying to achieve? For Low Consequence, although the GTS consequence lists up to 10 households may have damage in the short term and losses within this category can be up to $1M US, I would question the need to design to such large events for LOW consequence. This will have significant impact for lots of dams in earthquake areas. I am not clear that any recent large failures link to earthquake risk and therefore we are not really tailoring to where the risk actually lie? If they persist with this for low consequence dams I would suggest they need to split low into two categories, low and very low as many low would not really have that much financial impact or disrupt any households. For Very Low structures, there would be really no need to design to such large events. These much larger events for low consequence will, be quite costly for small owners/operators and closed sites.
On the other hand, the design events for Very High could be less than CDA
The design storm for Extreme seems actually less?
There shouldn’t really be a choice at high consequences.

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		• It seems the very large disasters they are trying to stop have no change or are slightly lower design events? • The design events puts the equivalent design events for water dams as much lower for certain consequences. This seems odd and means at any one site, despite the consequences being the same, dams will be designed to very different standards based on whether they are water or tailings? • Therefore there may be push to get closed dams reclassified as water facilities or there may be some debate as to at what point something becomes a tailings facility if they are Low consequence. So there may be some wheeling and dealing at the Low end, because the penalty for calling it Low is so severe. This is a bit of a grey area in some jurisdictions anyway, i.e. below ground structures but on sloping natural ground, what is the magic distance between the natural hillside and the sloping ground at what point we end up with a facility? 25 m, 300m, 3km? In other words, by being so punitive at the Low end, they may find that tailings facilities disappear and they have the opposite effect to what they want.
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Commenter K		**Environmental Consultant**
#	**Reference**	**Comment**
47	Whole Document	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.
48	GTS-Topic I Principle 1 Req. 1.2	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.
49	GTS-Topic I Principle 2 Req. 2.2	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.
50	GTS-Topic III Principle 3 Req. 3.3	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.)
51	GTS-Topic III Principle 4 Req. 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 is 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)
52	GTS-Topic III Principle 4 Req. 4.1 Footnote 20	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.
53	GTS-Topic III Principle 4, Req. 4.2	It is strongly recommended that the decision to rebut an "Extreme" classification be made by the Board of Directors, 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.
54	GTS-Topic III 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 ensure 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.
55	GTS-Topic IV Principle 11 Req. 11.5	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.
56	GTS-Topic IV Principle 11 Req. 11.5	It is recommended that "High" classification facilities be included in REQUIREMENT 11.5 because High Consequence Classification events also involve loss of human life.
57	GTS-Topic V Principle 16	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. The Global Tailings Standard should consider adding a requirement for a financial assurance for $1 billion US (2020) dollars to cover economic damages suffered by non-mine entities affected by a catastrophic tailings facility failure. Some large mining companies have reported they have such coverage, but obtaining the availability of universal coverage would probably involve development of such 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 essentially 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).
58	GTS-Annex 1 Glossary and Notes	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.
59	GTS-Annex 1 Glossary and Notes	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.
60	GTS-Annex 2 Table 2	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%.)
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Commenter L		**Tailings Dam Owner/Operator**
#	**Reference**	**Comment**
61	Whole Document	The Global Tailings Standard aims to achieve the safe and secure management of mine tailings facilities globally by preventing the catastrophic failure of tailings facilities. The following comments are intended to advance this objective from the perspective of a mining company that has operated tailings facilities in the United States for decades without catastrophic failure. **General:** The standard should incorporate a more detailed definition of "best practice." The Annex definition references Merriam-Webster. In the United States, regulatory agencies with jurisdiction over tailings facilities have an obligation to protect the public interest. They are in a unique position to collect information across multiple facilities from which best practices can be distilled. These agencies also have rule-making processes designed to collect stakeholder perspectives through public comment and generate reasoned decisions regarding the best practices that are necessary and appropriate to protect the public. For the Global Tailings Standard, "best practices" should be defined as the best of the practices adopted by regulatory agencies with the resources and knowledge to identify, and periodically review, industry practices for operating tailings facilities to protect the public interest. Secondly, there has to be a structure or avenue for periodically reassessing and/or amending the document when realities change or it's wording is being misinterpreted or misused by any group. Lastly, the term "Accountable Executive" must be better defined since Executives while ultimately responsible have other duties than tailings specific knowledge (i.e. they have competent and knowledgeable managers and directors). There are some categorical misuses of the term without proper qualification (vague language) throughout.
62	GTS-Topic I Prin. 1 Req. 1.1	Principle 1, Requirement 1.1 refers to knowledge aligned with international ***best practice***. As indicated above, the notion of international "best practice" is vague and would benefit from a more precise definition for this Principle and throughout the Standard.
63	GTS-Topic I Prin. 1 Footnote 1	Principle 1, Footnote 3 recommends an update "whenever there is a material change to the tailings facility, the social or environmental context or condition." While agreeing that information should be updated when there is a material change to the tailings facility; we do not have a basis for determining when a change might be material for "the social or environmental context or conditions." Therefore, it is recommended that this phrase be deleted from Footnote 3 and from Requirement 2.4 (line 3).
64	GTS-Topic II Prin. 3 Req. 3.4	Requirement 3.4 is "Establish an effective operational-level, non-judicial *grievance mechanism* that addresses the concerns, complaints and grievances of *project-*

		affected people that relate to the *tailings facility."* It is highly recommended to develop mechanisms ***designed to address the concerns***, but those affected will have to determine whether the mechanism actually ***addresses*** these concerns. We suggest a minor language change to recognize this, "Establish an effective … mechanism ***designed to address*** the concerns …."
65	GTS-Topic III Prin. 4	Principle 4 introduces a rebuttable presumption that the tailings facility failure classification is "Extreme" for purposes of design, construction, operation and monitoring. This may have unintended consequences. A tailings facility that warrants an Extreme failure classification will require more resources to properly design, construct and operate. Thus, there is an economic incentive to locate and design tailings facilities in ways that do not warrant an Extreme failure classification. If all tailings facilities are presumptively classified as Extreme, the Standard unintentionally takes away one of the economic benefits to build less Extreme tailings facilities.
66	GTS-Topic III Prin. 4 Req. 4.1	Requirement 4.1: Instead of the presumption of Extreme, it is recommended that the Standard place the burden on the operator and its design team to demonstrate the proper classification of a new tailings facility on the failure matrix (Table 1 of Annex 2). Absent evidence of a lower classification, the tailings facility would be classified at the higher failure level. We believe this achieves the intent of Principle 4.
67	GTS-Topic III Prin. 4 Req.4.2	Requirement 4.2: Change "The decision to rebut …" to "The classification decision, shall be taken …."
68	GTS-Topic III Prin. 4 Req. 4.3	Requirement 4.3: Existing facilities should be classified under the Classification Matrix within a reasonable time after the Standard is adopted and should have operation and maintenance burdens commensurate with the level of failure classification.
69	GTS-Topic III Prin. 7 Req. 7.3	Requirement 7.3 currently requires a detailed Construction Records Report "whenever there is any change to the tailings facility, its infrastructure or its monitoring system." This is unreasonably broad and should be limited to ***material construction projects*** that change the facility, its infrastructure or its monitoring system.
70	GTS-Topic III Prin. 8 Req. 8.1	Requirement 8.1 requires comprehensive performance monitoring system that "covers all potential failure modes." This is unreasonably broad and should be limited to "***credible*** failure modes". This is consistent with the language used in Requirement 5.4, Requirement 15.1 and elsewhere.
71	GTS-Topic IV Prin. 10 Req. 10.5	Requirement 10.5 Most executives rely on their experienced staff and shouldn't require tailings-based qualifications and experience. (must be clear since currently vague)
72	GTS-Topic IV Prin. 11 Req. 11.4	Requirement 11.4 there are clear technical and operational requirements in dam reviews; it is not clear on governance aspects; better references are needed so they don't get misrepresented after publishing.
73	GTS-Topic V Prin. 15 Req. 15.2	Requirement 15.2 provides for meaningful engagement with the public and at-risk communities for emergency planning and implementation. Consistent with our other comments regarding public disclosure, etc., it may be worth qualifying this section with the same footnote not requiring disclosure of CBI information. We could alternatively use the same qualifying language regarding seeking information from a regulatory agency where it is not feasible to meet with at-risk community members.
74	GTS-Topic VI	Public disclosure of certain information may be contrary to the overall goal of eliminating catastrophic dam failures. As expressed in a report to Congress entitled "Dam Safety Overview and the Federal Role" (Oct. 24, 2019):

		"Following terrorist attacks on September 11, 2001, the federal government focused on dam security and the potential for acts of terrorism at major dam sites. . . As a consequence of the September 11, 2001, terrorist attacks, current federal policy and practices restrict public access to most information related to the condition assessment of dams and consequences of dam or component failure. For example, according to USACE, dams in the NID meet the definition of critical infrastructure as defined by the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT) Act of 2001 (P.L. 107-56). Vulnerability assessments of critical infrastructure are restricted from public access." See p. 36. It will be important for this Standard to recognize that catastrophic failures of tailings dams may also be caused by intentional actions, and public access to certain information could do more harm than good. Footnote 38 in the Standard recognizes: "Public disclosure should exclude confidential financial and business information or where ***disclosure would present a risk to operational or physical security***." In the U.S., government agencies play an important role as a gatekeeper for potentially sensitive information regarding dam vulnerabilities and impacts. There are established processes for obtaining information available to the public and processes for protecting information when disclosure is not in the public interest. Footnote 36 expresses a fundamental principle for transparency. We suggest adding the following sentence to that footnote, "Sensitive information for which public disclosure may present a risk to operational or physical security may be submitted to a government agency with a process for establishing whether disclosure of the information is in the public interest."
75	GTS-Topic VI Prin. 17 Req. 17.1 Footnote 37	We also have concerns regarding the breadth of Footnote 37 that requires disclosure of a minimum of information by citing to multiple other requirements throughout the draft Standard. The minimum information should exclude any sections that may generate information excluded under Footnote 38. We suggest that this Footnote exclude sections 1.3; 4.3; 11.1; 11.4 and perhaps others that may contain information the disclosure of which is contrary to the public interest.
76	GTS-Topic VI Prin. 17 Req. 17.2	Requirement 17.2: should be revised to read, "Respond in a systematic and timely manner to all reasonable stakeholder requests for information about the *tailings facility*, **including, where appropriate, directing such stakeholders to regulatory agencies where such information is kept and disseminated in accordance with the public interest."**
77	GTS-Topic VI Prin. 17 Req. 17.3	Requirement 17.3 requires a commitment to global initiatives to make tailings information publicly accessible. We are concerned that this bypasses the important role that government agencies serve in protecting the public interest in the U.S., including restricting access where disclosure would present a risk to operational or physical security. Therefore, we suggest that the Standard delete Requirement 17.3.
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Commenter M		**Tailings Dam Owner/Operator**
#	**Reference**	**Comment**
78	Whole Document	The GTS should focus on outlining principles rather than prescriptive requirements. For example, the GTS should focus on reducing risks in line with ALARP rather than solely focusing on "minimizing" "consequences."
79	Implementation	No agreement has been made by ICMM, UNEP, and PRI about a possible implementation phase for the GTS. GTS should acknowledge equivalency of existing programs such as ICMM Performance Expectations, MAC Towards Sustainable Mining, etc. ICMI was mentioned during one of the public consolation meetings, but the GTR may not be aware of existing certification programs such as ICMM Performance Expectations, MAC Towards Sustainable Mining, among others.
80	GTS-Topic I Prin. 2, Req. 2.5	Financial Assurance can only be given if there is an entity authorized by law to hold Financial Assurance. This is a function of State law and cannot be created by an international standard. Insurance mechanisms are likely not feasible alternatives. In addition to consideration of worker and public safety, companies have substantial market and liability pressures to avoid catastrophic failures in order to retain social license to operate and economic viability.
81	GTS-Topic III	The GTS should refer to publicly available (already published) design standards or guidelines and not try to set new ones in the short timeframe the GTR has to develop the GTS. This is applicable throughout the GTS, but especially as related to Annex 2 text, Table 1 and Table 2. Consequence classification is not an acceptance of failure; rather it is a guide to designing and stewarding dams according to hypothetical scenarios of credible failure modes. Design loadings should be treated as suggestions for consideration by EoR but EoR should decide to State regulations and publicly available, already published design guidelines.
82	GTS-Topics III & IV	The Board of Directors (BoD) members do not typically have technical expertise to make determinations of consequence classification. They can be informed of the consequence classification but are not qualified to establish it. Rather, the consequence classification is more appropriately established with an EoR and input from an independent reviewer or ITRB. An Accountable Executive can be informed and can accept or reject the classification, but the AE should be provided with a recommended classification from the technical experts who evaluate the details. The AE can inform the BoD of tailings matters; depending on company organizational structure, the AE may sit in a variety of positions within a company and will not necessarily be a member of the BoD.
83	GTS-Topic III	Feasibility of study options always consider costs but that doesn't mean this consideration should / would impact decisions about safety. Any option considered in a feasibility study must be safe; otherwise it should be ruled out as a fatal flaw. Design robustness can also be considered in technical factors of a multiple accounts analysis. These types of details are best left to guidance documents, such as the ones being developed by ICOLD and ICMM tailings experts.
84	GTS-Topic IV Prin. 9	Operators, with support from their EoRs, are the entity that can ascertain whether the risks of a potential tailings facility failure could result in a loss of life or displacement of people and whether the risks can be reasonably mitigated. Operators can work with relevant State authorities and potentially impacted communities to

		assess implementation of additional measures where reasonably practicable. Consequence classification is a technical decision considering factors outlined in published standards and guidelines.
85	GTS-Topic IV Prin. 12	There is limited capacity of technical experts and EoRs available to fill all of the roles required for the thousands of tailings facilities worldwide, especially considering the proposed limitations on using the same experts multiple times at a given site or at multiple sites within a company's portfolio. Owners need to be able to hire the most competent engineers and expert reviewers who follow professional codes of ethics. The definition of independence should be left to guidance documents such as the ICMM tailings guide being developed which will recognize professional engineering society ethics requirements, etc. Similarly, the requirements for EoRs, independent expert reviewers and/or ITRBs for all facilities and the exclusionary principle tied to consequence classification (rather than to risk) and all associated requirements means that substantial consultants will be required for lower risk facilities, which may serve to weaken the available pool of consultants for higher risk facilities.
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END OF COMMENTS