Topic	Suggestion	ERCB Response
Clarification of Definitions		
Clay	- Not defined in directive - Definition needs to be specific to methyl blue test	No need to define at this time, as clay mineral water ratio (CMWR) will be removed from the directive.
CT includes consolidated tailings, composite tailings, and nonsegregating tailings	- Need a standard definition across industry - Needs to be aligned with segregated CT definition	CT is no longer used in the directive. CT (consolidated tailings, composite tailings, and nonsegregating tailings) is defined as an engineered mixture of sand and fines to which a coagulant has been added. Upon deposition, the sand and fines do not segregate and water is released. The density of slurry and geotechnical properties of the deposit will vary. The deposit consolidates sufficiently within specified time to create a trafficable area (details to be supplied by operator in DDA plan).
	- Deposition criteria should be part of definition	The deposition criteria have been included in the definition of a dedicated disposal area (DDA).
	- Wording should be changed from ‘CT mixture’ to ‘CT deposit’	"Mixture" is the process and "deposit" is the product.
	- Remove clay mineral water ratio of 0.1 (Last sentence of definition should be removed).	CMWR will be removed from the directive.
	- Focus definition on objectives	The directive will be revised to focus on the result and not the process, based on input received.
	- Why is this definition required in the first place?	A definition is required to enable the ERCB to measure results to determine compliance with the directive.
Trafficable deposit	- Eliminate threshold of 10-100 kPa, focus on achieving reclamation - Need appropriate threshold number to achieve reclamation - Focus on reclamation not trafficability - Change definition of trafficable to reclaimable	A trafficable deposit is typically created through a process involving self-weight consolidation, drying, enhanced drainage, and/or capping of the deposit. A minimum undrained shear strength of 5 kPa achieved by the material deposited in the previous year must be achieved. Further refinement of the definition of a trafficable deposit will be dealt with individually with operators in the development of the DDA plan. Subsequent definitions of a trafficable deposit (consistent with end land use) will be developed with operators in the future.
	- Need to incorporate 5 principles: • Sustainable deposit (not prone to failure & only has natural erosion) • Tied to SFR composition • Time • Disturbance • Definition should be tied to CT mixture & not deposit	The objective is to create a deposit that is trafficable and subsequently will be ready to be reclaimed as land surface according to approved milestones and that does not require ongoing maintenance. The 5 principles have been considered in the directive.
	- Definition is appropriate for directive but ERCB needs Standard Operating Procedures for measurements to support trafficable surface	Agreed. The ERCB has decided on the standard for measurement: ASTM D5778 - 07 Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils.

Topic	Suggestion	ERCB Response
Fluid ~~Fine~~ tailings	- There should be one definition for FFT and MFT	Agreed. Fluid tailings are defined as any material more than 1 wt % solids and less than an undrained shear strength of 5 kPa in a deposit. The following terms will be deleted from the directive: CT, segregated CT, MFT, CT pond, and fluid fine tailings.
Operation and abandonment plan (OAP)	- Need to accommodate alternative technologies, keep objectives in mind, additional definitions for alternative technologies, should be viewed as a management plan. - Choose a different word than abandonment.	OAP deleted and replaced by dedicated disposal area (DDA). The DDA plan is applicable to all DDAs and is a comprehensive submission on the design, construction, operation, and abandonment of a DDA.
Proven technology	- Need to define.	"Proven technology" is not a term used in the directive. It is the responsibility of the operator to comply with the directive.
Saline water table	- Remove reference to 100 000 g/m^3	This term is covered in AENV approvals. The reference to "saline water table" will be removed from the directive.
Sand, thickened fluid, fines, liquid	- Give more detailed definitions that address all layers in a pond.	Coarse sand: Mineral solids with particle size greater than 44 µm based on sieve-hydrometer analysis or a method approved by the ERCB. Fluid tailings: Any material more than 1 wt % solids and less than undrained shear strength of 5 kPa. Fines: Mineral solids with a particle size equal to or less than 44 µm based on sieve-hydrometer analysis or a method approved by the ERCB.
~~CT Pond~~	- Remove entirely OR change the word ‘solely’ in definition.	"CT pond" has been replaced with "dedicated disposal area (DDA)." DDA - An area dedicated solely to the deposition of captured fines using a technology or a suite of technologies. The material deposited each year must achieve a minimum undrained shear strength of 5 kPa within one year of deposition.
Segregated CT	- Remove definition	"Segregated CT" will be removed from the directive.
NST, SFR, start-up-period, transitional period	- These definitions are missing	NST - Nonsegregating tailings has been addressed by the new CT definition. SFR - Sand-to-fines ratio has been removed from the directive. Start-up and transitional periods - Not included in definitions. Will be determined on an approval basis.
	- Industry needs to understand rationale behind SFR of 3.5 and CMWR of 0.1. This is one of many ways of being on spec.	CMWR and SFR will be removed from the directive.
	- Needs technical proof.	Agreed.

Topic	Suggestion	ERCB Response
General recommendations	- ERCB needs to consider alternative technologies - Performance vs. process. Need to focus on performance targets for alternatives and not defining the types of acceptable alternatives	Agreed. As per the directive objectives, the performance criteria are independent of technology.
	- The directive needs to be higher level and needs to look at end goals	The directive is at a level that sets performance criteria and holds operators accountable to their tailings plans.
	- For many sites, meeting the 45% sand requirement may not meet the end goal	True, but performance criteria are the reduction of fluid tailings and the formation of a trafficable deposit.
	- ERCB needs a tracking/measurement method in order to succeed.	A working session to discuss the measurement methods will be held with operators in the future.
	- The end goal will likely include CT plus alternatives and the directive needs to incorporate the characteristics of all the different projects	Agreed.
	- Need to do more work for topic one and topic five after objectives have been firmly established. Subsequent to setting objectives, committees should be struck to provide more details around definitions and measurements	Definitions have been reconsidered and will be revised in the directive. Measurement will be established later for each project. Definition and measurement will require ongoing work for industry working groups, and the ERCB will participate as necessary.
	- Simple non-technical language is needed to communicate the directive and issues to outside groups	Agreed.
	- Industry could report to ERCB in predefined terms	Reporting formats will be established following the ongoing work with industry.
	- Workshop has not addressed new start-up performance concerns; the directive needs flexibility and flexible language for start up.	ERCB will consider operator proposals on an approval basis.
	- In general, there are too many definitions and too specific	The directive will be revised to achieve the intent of the suggestion.
	- Need to move away from dedicated CT ponds, but alternative needs to be measurable	Agreed. See definition of dedicated disposal area (DDA).
	- ERCB could pick terms from CONRAD data	The ERCB is participating in this suggestion through CONRAD exercises.

Topic	Suggestion	ERCB Response
Additional Comments	- Dedicated CT ponds are difficult to achieve	The term "dedicated CT pond" will be removed from the directive. See definition of dedicated disposal area (DDA).
	- CT definition does not necessarily mean success	Agreed. Performance criteria are now defined in terms of the reduction of fluid tailings and the formation of trafficable deposits.
	- Industry can meet the objectives of the directive without a dedicated CT pond.	See the definition of dedicated disposal area (DDA). The ERCB must be satisfied with the method to manage the deposit to achieve directive compliance.
	- Management of risk is a portfolio of technology	Agreed. The directive does not preclude alternatives.
	- Key Measurement = MFT inventory vs. time where MFT is defined as tailings with Su <10 kPa (Su = shear strength)	The directive will include monitoring the fluid tailings volumes. See the definitions above for fluid tailings.
	- Pond CT deposition is not consistent, some segregation will always occur whether in pipes or ponds	The ERCB agrees that some segregation occurs if method of processing and deposition is ineffective. The ERCB must be satisfied with the method to manage the deposit to achieve directive compliance.
	- Changing objectives will drive a need for new definitions and measurements	The directive performance criteria are "The reduction of fluid tailings and the formation of a trafficable deposit."
	- The directive is written both at a high level and very prescriptive in places- these two directions are in opposition to each other.	Measurement and reporting need to be sufficiently detailed for effective regulation. The ERCB believes they are at the highest level possible.

Topic	Suggestion	ERCB Response
Use of CT (NST) to Meet Directive Requirements / Limitations / Recommendations		
The objectives of the directive are clear, purposeful, and defensible. CT moves towards accomplishing these objectives but CT is not the 100% solution.		Agreed.
The directive is too prescriptive (i.e., too focused on CT) when it should be performance driven (focused on MFT reduction). Thus the directive detracts from the creativity and commitment needed to pursue alternative technologies. CT alone will not flatten the MFT growth curve.		The directive will be adjusted as required to focus on performance criteria rather than the technology to achieve performance. The ERCB will monitor fluid tailings accumulation and consider revisions to the directive as necessary to ensure diminishing volumes.
Sand volumes for dike construction and capping of CT deposits	- Reduce the target SFR (Sand to Fines Ratio) from 4:1 to 3:1 or even 2:1. The fines consumption increases dramatically. Deposits will segregate less, but will take longer to dewater and consolidate. - Over-stripping sand or stripping sand outside of the lease boundary will lead to a larger footprint. - Re-use and/or re-handling of sand from OPTAs and in-pit dykes to make CT or to cap CT deposits. As these volumes are at a 6:1 or 7:1 SFR, fines consumption (to the directive target of 4:1) will be limited. - Continue to use overburden for dyke construction. - Dedicated CT facilities, as proposed by the draft directive, should not be built. Stick with current methods.	SFR is no longer part of the directive. Tailings performance criteria must be achieved (i.e., fluid tailings reduction and formation of trafficable deposits). Technology to achieve performance is not prescribed. Footprint area may be considered in the future.
Overburden – sufficient volume and quality suitable for dike construction	- Over-stripping overburden outside of the lease boundary will lead to a larger footprint. - Re-handling of overburden is constrained by the composition and construction methods for overburden dumps (competent materials on the outside, poorer materials used as fill).	These concerns will be considered in the implementation (reporting, etc.) of the directive.
Sand-based tailings methods (e.g., CT/NST) do not consume 100% of the fines.	- Integrated facility design (upfront) would result in more efficient use of sand and overburden. - Moving to non-sand based methods will require equivalency measures. Certain methods may require less dyke construction (smaller ponds).	The ERCB agrees that integrated facility design is preferred. The performance criterion for fluid tailings reduction is based on fines captured in DDAs. The criterion establishes the percentage of dry fines in feed to extraction that must report to the DDAs.

Topic	Suggestion	ERCB Response
Percentage of fines is increasing in certain ore bodies/leases.	- The consequences may include increasing legacy volumes and/or decreased recovery of ore. - Alternative technologies may avoid the liabilities associated with CT.	The ERCB agrees with the possible consequences. However, tailings performance criteria must be achieved.
CT plants are currently coupled with extraction plants.	- Decoupling is possible with time and expense. - CT processes can be changed (e.g., double cyclone time) - Document changes in CT efficiency and effects and mitigate these effects over time (adaptive management). - Organizations should make CT a priority comparable to bitumen extraction (with respect to resources, corporate commitment and organizational structures).	Agreed. Tailings performance criteria must be achieved.
The 5-year timing in the directive is optimistic.	- Consolidation and dewatering of CT deposits are occurring faster than the timelines predicted by models. An optimistic timeline could be 5-7 years.	The DDA deposit must be ready for reclamation within 5 years after active deposition has ceased. The deposit will have the strength, stability, and structure necessary to establish a trafficable surface. The trafficable surface must have a minimum of 10 kPa of undrained shear strength.
Individual leases are limited in size, thus limiting options for tailings technologies.	- Off-site solutions need to be pursued. - Regional solutions are constrained by concerns with shared liabilities.	The ERCB understands that project-specific application of the directive will need to be considered. The ERCB expects and encourages collaboration with regard to oil sands tailings management and in the future will facilitate industry-wide workshops to share knowledge. Consideration may be made on making reports available via the ERCB Web site. Mechanisms to assess and manage regional liability should be developed by government and industry.
Standards and measurements cited in the draft directive need more work (e.g., rationale, elaboration).	- Industry has an opportunity to speak to all details in the directive, including definitions, any proposals for equivalency and better performance management techniques. - (These matters are also the subject of other tables.)	Inputs have been considered and the directive has been amended - further changes may be considered in future. The ERCB has committed to providing the assessment of the input and the revised version of the directive prior to final release.
The directive is too prescriptive by identifying CT as the solution.	- Industry proposed that lease-specific plans be adopted along with compliance consequences.	The directive will be revised to reflect the suggestion.
The directive may have unintended consequences.	- The ERCB (and industry) should monitor for unintended consequences, such as resource sterilization.	The ERCB will assess for unintended consequences.

Topic	Suggestion	ERCB Response
Alternative Technologies		
How could alternative technologies meet the directive requirements? (It was agreed that directive "requirements" refers to directive objectives.)	- A suite of technologies is required to ensure sustainable landforms and fluid fine tailings reduction. - Alternative technologies could be developed via a shared, central, third party development centre and/or tailings management facility - Alternative technologies can only satisfy ERCB objectives if success factors are presented. It was recommended that success factors align with fluid fine tails reduction/elimination and sustainable landform development and not sand allocated to CT. - Alternative technologies could only be developed to meet the directive objectives/requirements if a longer time frame is allowed. Resource limitations such as experienced engineers, capital, area, project barriers, and the time required to achieve proof at scale make developing alternatives lengthy endeavors. Also, to meet the directive as written, insufficient resources are available to fully develop alternatives. - Alternative technologies were described by all industry participants as a must as experience has proven that CT provides limited success.	These are valid comments and have been considered in the directive. Success factors (performance criteria) are the reduction of fluid tailings and trafficable landform development. The ERCB agrees that a suite of technologies will be required. Regarding insufficient resources: satisfying the directive is required, but timing could be a consideration (i.e., phase-in period). The directive holds operators accountable for committments made in applications. The ERCB believes, and industry leadership agrees, that improvements in tailings management are required now and therefore the necessary resources must be applied to meet the directive requirements. The directive requires operators to show how requirements will be met for each project. The ERCB's assessment of operator submissions will take into account the issues that arise in adding or modifying facilities.
Success factors of alternatives, such as surface distribution disturbance and greenhouse gases.	No suggestion listed.	Each operator is expected to meet this directive performance criterion.
Fines consumption relative to CT @ 45% neglects technologies that do not incorporate sand.	CT should be presented in the directive as an example, and not the prescriptive solution.	The performance criterion for fluid tailings reduction is based on fines captured in DDAs. The criterion establishes mass of dry fines in the feed that must report to the DDAs.
Lengthy regulatory process will limit assessment and implementation of an alternative.	ERCB must use an efficient regulatory process for alternative testing at sufficient scale.	Agreed.
Each deposit has unique characteristics and thus should have its own success criteria.	- Each application must include a detailed path to sustainable landforms - Path will be stewarded by operator and assessed for compliance by ERCB - Allow operators to manage sand to CT over a multi-year average instead of annually	Operators will submit their tailings plan and the ERCB will assess it for compliance with the directive and condition approvals accordingly.
	Other points: - Further condition approvals - Link compliance and enforcement to bitumen production - Use MLMP as a tool to assign appropriate financial liability to accumulated fine tailings	Operators will submit their tailings plans and the ERCB will assess them for compliance with the directive and condition approvals accordingly. Directive 019 is the basis for compliance assurance. Details are outside the scope of this directive at this time. MLMP is currently in the developmental stage; it is not a usable tool at this time.

Topic	Suggestion	ERCB Response
Technical Criteria for Equivalent Alternative Technologies		
Targets of acceptable project endpoint criteria, such as fluid fine tailings inventory, are required for operators to steward to for all technology.	...such as fluid fine tailings inventory	The ERCB agrees; the tailings plans submitted will be used to monitor and manage fluid tailings inventory.
A formula is required to incorporate all objectives together, such as footprint disturbance, trafficability, reclaimability, and resource sterilization to compare alternative technologies.	...such as footprint disturbance, trafficability, reclaimability, and resource sterilization	One formula would be very difficult to develop within the timeframe for the release of the directive. ERCB decisions consider all factors. Full cost accounting (life-cycle assessment) is a tool that operators should be applying now. Resource sterilization should not be covered directly in this directive, as it is covered in ID 2001-7.
	Prior to use of new technologies, the operator must demonstrate that they work, will meet end land use requirements and will have no liability to the people of Alberta at the end of the project life.	The tailings plan must meet the performance criteria (reduce fluid tailings and form trafficable deposits). End land use and management of liability are outside the scope of this directive. DDAs must be reclaimable to AENV standards.
	Alternative technologies must meet the following requirements: a) Achieves end of project MFT inventory on a dry tonnage basis. b) Needs a measure to determine that it captures fines. c) Meets reclamation requirements, or can be shown that it meets reclamation requirements by producing the required trafficability strength per end landscape objective.	The tailings plan must meet the performance criteria (reduce fluid tailings and form trafficable deposits). One key objective is to minimize and eventually eliminate long-term storage of fluid tailings in the reclamation landscape. Measurement of fines capture will be determined on a deposit basis. The ERCB agrees that deposits must be trafficable, as defined in the directive.
Need to establish relative weighting and importance of directive objectives to be able to compare alternative technologies.		Reduction of fluid tailings and the formation of a trafficable deposit is required by this directive.
	An alternative technology score card is required to compare key criteria, such as variety of end land uses, time to reclamation, consumption rate of fluid fine tailings and chemical viability to CT, or other proven technologies.	Technology selection, which is up to operators, involves scoring alternatives. The score card concept may be developed in the future to compare alternatives; it is currently outside the scope of this directive.
Trafficability requires more definition - what is trafficable varies by landform.	(e.g., lakes, marsh lands, flat lands and hills).	Trafficable deposit is defined above under Clarification of Definitions.
More definition required for acceptability of various technologies that recognize objectives of the directive.		The ERCB's intent is to set the criteria at a high level, enabling each operator the flexibility to achieve compliance.
More equivalency criteria are required for new technologies in the directive.		The criteria have been changed and are not technology specific.

Topic	Suggestion	ERCB Response
	Reword the directive "objectives" to: a) Reducing/avoiding FFT (on dry tonnage basis). b) Produce/demonstrate reclaimable landform. Dam Safety Branch will sign off on the dam/impoundment and time scales are acknowledged. These objectives apply to any technology.	a) Fluid tailings volume reduction is a performance criterion and will be monitored. b) Trafficability is a performance criterion of the directive.
	The objective of the new technologies is the same - consumption of fines. Therefore, the measurement will be the same. Based on the fines that would be consumed using CT as prescribed in the directive, the expectation would be that the new technology would consume the same amount of fines as the CT case.	The minimum requirement is to consume at least the same amount of or MORE fines as the CT case.
	Incorporate a measure of cumulative benefit for new technologies if the minimum tailings criteria are not achieved (e.g. less footprint disturbance, less air emissions less water use and less energy use).	Tailings performance criteria must be achieved.
	Stewarding to the requirements of the directive may not produce the best outcome for the specific project. Therefore, the requirements of the directive should be compared to the operator's tailings management plan to ensure that stewarding to the directive is in alignment, and not detrimental to the objectives of the operator's tailings management plan.	Operators will submit their tailings plan and the ERCB will assess it for compliance with the directive and condition approvals accordingly.
	Use MFT inventory and reclamation trajectory versus life of project plan as intermediate checks to determine if the operator is on plan.	Fluid tailings volumes will be monitored through submitted tailings plans.
	Use Ternary (geotechnical) Diagram as a framework of comparison for end landscape objectives.	Ternary (geotechnical) diagrams could be a good optional tool for operators. End landscape objectives are outside the scope of this directive; the objective is the development of trafficable deposits.
	A sliding scale is required for new technology if new technology does not achieve design performance. This would allow operators to adjust and tweak new technology, or implement a contingency plan to make up for the shortfall of the new technology.	Tailings performance criteria must be achieved. Excess capability should be incorporated into the operator's plan to compensate for underperformance of new technology.
	Instead of monitoring CT performance or other technology performance, link operator’s security deposit in the Mine Liability Management Program (MLMP) to MFT inventory versus approved life of project plan. If MFT inventory exceeds what was approved during the operation of the project, the operator would have to increase its security deposit in the MLMP.	MLMP is currently in the developmental stage, it is not a usable tool at this time Liability is an issue that will be addressed in the future.

Topic	Suggestion	ERCB Response
Measurement		
Determination of fluid tailings volumes	Method to validate actual performance vs. expected tailings/CT performance is required. Time frame suggested: no shorter than annual	Annual monitoring and reporting of fluid tailings volume are required. Measurement is addressed in Appendices B, D, E, and F of the directive.
	Measurement suggestions include: - Annual mass balance on fines with the performance measurement being the difference between the fines in oil sands and the fines in MFT. Inputs: density, composition, flow. Outputs: fluid inventory - Track performance by measuring MFT volumes vs. time or tonnes of ore to measure the success of fines reduction/capture	Measurement to determine compliance performance criteria is required. A working session to discuss the measurement methods for the annual mass balance will be held with operators in the future.
	Measurement focus should be on MFT inventory/mass. Measurement inputs include annual pond surveys, cross sectional sampling of pond for density. Fines to be reconciled on a dry tonnage basis	Annual pond surveys and sampling are required by the directive. The directive requires the measurements to lead to an accurate inventory of fluid tailings on an annual basis. Measurement is addressed in Appendices B, D, E, and F of the directive.
	One operator has in place the ability to measure, mass balance, and report fines consumption on a quarterly basis. Lab analysis of sample streams is performed. A comparison between the material balance model and the annual pond survey are typically within 5%. This is based on two independent methods	Expertise exists for sampling and measurements. The ERCB must be satisfied with the level of accuracy. Audits will be conducted as required. Quarterly reports may be achievable using data including tonnes of oil sand delivered and fines in the ore.
	There is limited expertise with respect to persons to complete ponds surveys.	The ERCB expects that the required expertise will be expanded to meet the requirements of the directive.
	Quarterly reports may be achievable using data including tonnes of oil sand delivered and fines in the ore. If the MFT approach is used on an annual basis, there may be a large variance	Quarterly reports will be reconciled with the annual detailed survey.
Trafficable Deposit	For soft tails deposits, Cone Penetration Testing (CPT) can be used to check for strength. One operator indicated that CPT will not provide fines content in soft tailings.	As will be indicated in the directive (in Section 4.4 and Appendices A and D), the required measurement is per ASTM D5778 - 07 Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils.
	The concern with CPT is accessibility to non-water capped soft deposits in CT only ponds and safety concerns with access for boats to the soft deposits.	CPT is a common technique used for both land and water and has been successfully used on soft deposits in the industry.
	Trafficability should be redefined to be consistent with the end land use.	Trafficable deposits are as defined in the Clarification of Definitions section above.
	Measurement should match the final objective for end land use. One concern raised with this approach is that the measurement is too far in the future to be a reference point.	The performance criteria of the directive are the reduction of fluid tailings and the formation of a trafficable deposit. Measurements should achieve this objective.

Topic	Suggestion	ERCB Response
Fines distribution site wide	One operator uses a nuclear source meter to measure the fines in slurry.	The ERCB must be satisfied with the measurement techniques used.
	Fines management needs to be considered on a site-wide basis. A predictive tool or model needs to include future ore deposit data as well as data for existing ore deposits. A concern is extrapolation of data to predict future fines.	The ERCB agrees with the methods and concerns as stated.
	A correlation between fines types and destination (beach, CT, etc.) is needed.	The directive requires a material balance (including fines) by destination, as specified in Appendix E.
	Measurement focus should be on MFT inventory/mass. Measurement inputs include annual pond surveys, cross-sectional sampling of pond for density. Fines to be reconciled on a dry tonnage basis.	Reduction of fluid tailings inventory will be addressed in the ERCB assessment of each operator's tailings plan and in future criteria development. A working session to discuss the measurement methods for the annual mass balance will be held with operators in the future. Annual pond and DDA surveys and sampling are required by the directive. The directive requires the measurements to lead to an accurate inventory of fluid tailings on annual basis.
	One operator has in place the ability to measure, mass balance and report fines consumption on a quarterly basis. Lab analysis of sample streams is performed. A comparison between the material balance model and the annual pond survey are typically within ~5%. This is based on two independent methods.	A working session to discuss the measurement methods for the annual mass balance will be held with operators in the future.
Sand	Can be measured in extraction by laser technology.	A working session to discuss the measurement methods for the annual mass balance will be held with operators in the future.
Additional comments	Sampling of the product produced and drill hole density would be decided based on consistency of product produced. The requirement would need to be manageable and practical. If the deposit is homogenous, the sample frequency may not need to be as rigorous. Drilling to evaluate composition for CT is not effective as most of the present deposits are heterogeneous.	A working session to discuss the measurement methods for the annual mass balance will be held with operators in the future.
	Concern was raised that even with a SFR 4 and 45% sand consumption there may be segregation.	True, but the performance criteria are the reduction of fluid tailings and the formation of a trafficable deposit.
	Some operators are unsure of the purpose of the quarterly report	The quarterly reports will provide ongoing monitoring of progress according to the tailings plan (Appendix B of the directive). A working session to discuss the report requirements will be held with operators in the future.
	The objective of the tailings directive may impact the objective of bitumen recovery as there may be competing objectives which will impact the operational parameters (e.g., Underflow). In some operations, equipment modifications may be required to meet both objectives	The tailings performance criteria in the directive and the bitumen recovery criteria must be achieved.

Topic	Suggestion	ERCB Response
Collaboration		
	Perhaps CONRAD should have a broader scale and a more collaborative role.	The ERCB expects and encourages collaboration in regard to oil sands tailings management. The ERCB is open to venues for leverage tailings information (sharing and development) and will consider a means for sharing tailings information in future.
Need to differentiate between sharing information on tailings and information about extraction.		The ERCB agrees about this issue.
Currently, 1:1 collaborations exist.	Centrifuge, thickeners, testing, dykes. - Integrate plans - Integrate new players by introducing a buy in program	The ERCB agrees that collaboration exists. However, much more is required.
Legal issues surrounding collusion and collaboration	Contracting out water recycling and tailings management to a third party (third party processing of fines). Conduct business agreements.	The ERCB expects and encourages collaboration in regard to oil sands tailings management.
Labour shortage that may affect collaborative efforts	- Establishing a commercial pipeline for water treatment and tailings - Joint funding - Develop regional facilities	The ERCB expects and encourages collaboration in regard to oil sands tailings management and regional facilities development.
Collaborative working groups currently exist, such as CONRAD. Dragline user group (past example of a collaborative group that worked)	Information sharing (putting technological advancement as a higher priority than IP) - Share science; collaborate on R&D - Develop a framework to share science and budget - Share tailings for research, then share findings	It is in the interest of the public that researchers and technology developers have access to tailings samples, information for research purposes, and published research.
Limitations to collaboration: - Raiding of staff has created hard feelings among industry. - Assessment of liabilities may be a limiting factor in industry's willingness to collaborate. - Funds are not present to pursue scale-up technology testing.		Mechanisms to assess and manage regional liability should be considered.
Tailings is a shared problem and needs to have a higher priority than applied science (intellectual property). Government should have a more active role in tailings management.	- ERCB should introduce regulatory incentives to encourage resource sharing - Introduction of fines to keep operators accountable - More regular feedback between industry and ERCB - Directive should hold industry accountable for sharing research developments - Gov't should accept one group's tailings going into another group's pond - Gov't should make tailings available for research if one group needs tailings for research - Gov't should talk with industry about making tailings a group effort	Tailings reports filed with the ERCB are currently available to the public upon request, and the ERCB will consider making them more readily accessible in the future. Operators can apply for protection of proprietary information up to the limits of legislation.

Topic	Suggestion	ERCB Response
	- A venue to talk about technical concerns in the public eye - Tailings course to ensure everyone has the same understanding - Collaborate with CAPP to keep public more informed	The ERCB will consider a means for sharing tailings information in the future. Valuable tailings courses have been held at the U of A.
	- Regular communication in the form of face-to face meetings, publications, phone calls - Industry and ERCB should have working groups to keep the ERCB more technically informed when writing directive	Regular communication is encouraged. The ERCB has increased staff and will work more closely with industry.
Limitations to collaboration: - Financial commitment (government should supply the funding for R&D) - Understanding who would hold liability if resources were to be shared - Protecting the rights of those who have already invested in research		Several sources of government funding for R&D are available. Mechanisms to assess shared liability should be developed. Operators can apply for protection of proprietary information up to the limits of legislation.

Assessment and Response to Public Workshop (September 24, 2008)

Concerns Expressed at Workshop	ERCB Response
Liability and Compliance	
- Reclamation bonding in oil sands - What is included in the liability calculation?	The objective of the directive is to reduce fluid tailings volumes to form trafficable deposits and thereby limit or remove liability. The ERCB does not receive the details of the liability calculation. <u>Comments made at the workshop:</u> – Liabilities are generated over the full life-cycle of the mineable oil sands industry. – AENV identified its role in collection of reclamation of security deposits. – AENV noted that a review of the security program is required.
How will the ERCB measure the success of the tailings directive? What are the consequences to industry if they don't comply?	The directive requires annual reporting on fluid tailings volumes and types to form trafficable deposits. In the event of noncompliance, the ERCB applies Directive 019. If the operator still doesn't comply, the ERCB has the authority to implement reviews of sites, limit production, delay current applications, and shut in sites. These options are not entertained unless there is significant noncompliance.
Accumulation and Storage	
Tailings accumulation in the past has exceeded projected volumes.	The intent of the ERCB is to restrict storage requirements of existing operators to original approved application volumes.
An expansion is currently before the Board with an additional impoundment. Will this be the norm?	No. The ERCB intends to restrict operators to the tailings volumes estimated in their original applications.
Will large external containments continue?	New tailings containment associated with new projects may be required. The intent is to reduce the volume of fluid tailings requiring containment. The directive does not specify locations for containment.
How do existing developers deal with multiple ponds? How does the directive apply to legacy volumes of tailings in existing ponds?	Existing developers apply for ponds and operate them according to their operational requirements and ERCB approvals. The directive does not explicitly address existing legacy volumes. (The consumption of fluid tailings will be from either legacy volumes or current produced volumes. This directive does not specify the method, but rather specifies the required outcome.) Legacy volumes will be considered in the future.
Tailings Technical Information	
Volumes, types, and composition of tailings produced – What are the recylced tailings water composition trends over time? – How will the ERCB measure the magnitude of the change as a result of the tailings directive? – Will 45% sand allocation result in zero net inventory?	As fluid tailings volumes are difficult to measure, one goal of the directive is to ensure consistent measurement methods across the industry. ERCB will require adequate reporting and measurement of fluid tailings. The ERCB will track performance through requirements of rigorous measurement and reporting of fluid tailings volumes. The intent of the directive is to slow the rate of increase of fluid tailings. Other technologies will be required to accomplish the goal of zero net inventory.
CT definition	See revised definition of CT in Appendix A of the directive. CT is not used in the directive. A definition of CT is included, however, since CT is one means to achieve the purposes of the directive.

Concerns Expressed at Workshop	ERCB Response
Environmental Concerns	
Will reports on irregularities, exceeded levels, leaks, and spills be publicly accessible?	This information is currently accessible by the public. The ERCB may approve, on application, special studies and experimental schemes progress reports to be held in confidence for limited periods.
Is there an issue with reusing water? If water is going to be released when tailings are consolidated, why can't this be recycled?	Operators already recycle a large portion of their process-affected water. There are environmental issues with respect to releasing this water. The water chemistry differs from receiving bodies.
– Process-affected water: What kinds of naphthenic acids are toxic, and what are the limits for the release of these?	The discharge of tailings release water is not approved. <u>As stated by AENV at the workshop:</u> Groundwater monitoring programs are in place to monitor for leakage from tailings ponds. With respect to the release of naphthenic acids, guidelines exist and additional work is under way. Naphthenic acids exhibit chronic and acute toxicity, depending on concentrations and type, and may be consumed by bacteria. Some exist naturally in this environment, and some are naturally released through the ore body.
When will criteria be developed for the safety of workers and wildlife?	Wildlife management is not within the ERCB's mandate. Wildlife issues may be addressed within AENV approvals. The ERCB works with AENV and with other departments as necessary to address relevant wildlife issues. Until the production of fluid tailings ceases, wildlife safety will be an issue. Mitigation measures, including wildlife deterrent systems, need to be reviewed. Worker safety is the responsibility of Workplace Health and Safety in Alberta Employment and Immigration.
What can be done to reuse waste? Are there any studies to recycle liquid waste from the tailings pond? When will the research be applied? A request was made to summarize tailings R&D findings in a public format.	These issues were not directly considered in the development of the directive. <u>Industry comment:</u> Yes, lots of research has been done, e.g., by CONRAD and individual operators. The information needs to be communicated to the public in a less technical format.
Reclamation Concerns	
What will the landscape look like? Will reclamation occur faster? Will there be progressive reclamation?	The intent of the directive is to reduce the volume of fluid tailings and to create trafficable deposits. The directive promotes progressive reclamation. <u>Industry comment:</u> Industry participants indicated that reclamation would vary on a site-by-site basis, e.g., due to variations in the ore body.

Concerns Expressed at Workshop	ERCB Response
Participation	
Who else is here from the public? Why was this meeting held on the same day as the CEMA General Meeting? Concern was raised about a lack of representation by the general public at this meeting.	The draft directive was released for public review on the ERCB website. Input was received from First Nations and the public including the Pembina Institute, Northern Lights Health Region, and World Wildlife Federation. One-on-one meetings are still possible upon request.
Does the ERCB consult First Nations? Is there adequate and effective consultation with First Nations and government? First Nations and industry? The scope and meaning of the term “consultation” were discussed. The following concerns were expressed: 1. There is not enough consultation or dialogue with the First Nations or the public. 2. Traditional knowledge has to be incorporated into the directive through a meeting with the First Nations. 3. First Nations input is also needed with respect to subsequent revisions to the directive.	A meeting was held for representatives from the ERCB and First Nations from Fort Chipewyan on Oct. 30, 2008.
Why are there so many industry members in attendance?	Industry representatives were invited to attend and to listen to stakeholder concerns.
Timeline of Directive	
What is the timeline for the draft? When can we expect a final version? When will the notes from the workshops be released?	The information from this workshop will be collected, summarized, and released as soon as possible. The directive is expected to be issued in the fall of this year. Before the directive is issued, the ERCB will assess all input received and consider modifications to the directive.
Is the timing of the directive too aggressive? Is the ERCB able to capture all concerns before finalizing the tailings directive? Some industry and First Nations participants shared the view that the directive was proceeding too quickly.	The intent of the ERCB is to finalize and release the tailings directive by fall 2008. The ERCB will continue to work with stakeholders to ensure that concerns and suggestions are incorporated where appropriate. Subsequent revisions to the directive are contemplated to address further aspects of tailings management.
What would happen if the directive were not issued in 2008?	The ERCB intent is to issue the directive in 2008. <u>Industry comment:</u> A participant responded that the reputation of the regulator and industry would be irreparably damaged. Another participant indicated that industry was obliged to deal with the issue as a business decision.

Assessment and Response - Letters from Industry

Topic	Suggestion	ERCB Response
Letter A		
Implementation of the reporting and stewardship protocol contemplated in the draft directive, with stewardship targets defined by the approvals held by individual operators.	The (company) recommends that these approval targets include ERCB, AENV, and (if/where applicable) SRD interests, and that review of operator performance include representatives from all three regulatory agencies. The intent of this initiative is to foster enhanced communication and understanding between Industry and provincial regulatory staff on the various aspects of tailings management, and to define the 'gap' between the fluid fine tails inventory profiles currently forecast by approval holders and those in their applications, with intent to determine whether operators are in a position to attain the landform design assumed in their C&R plans	This is an ERCB initiative and the intent is to share information with AENV and SRD (Section 2 of the directive). The ERCB supports enhanced communication between industry and provincial regulatory staff. Landform design is outside the scope of the directive. The performance criteria of the directive are the reduction of fluid tailings and the formation of a trafficable deposit. This directive is a new requirement beyond existing approvals.
	where such 'gaps' exist, provide each approval holder a reasonable time frame (suggest 18-24 months) to prepare and submit a plan that would resolve this 'gap'	Reduction of fluid tailings volumes will be monitored by the ERCB as operators submit tailings plans. Further reduction of fluid tailings inventory will be addressed in the ERCB assessment of each operator's tailings plan and in future versions of the directive.
	a series of technical exchanges between Industry and ERCB staff to enhance understanding of alternate tails management technologies and processes, which will facilitate the crafting of a tailings criteria directive that will ensure both effective address of the issue of fluid fine tails management and flexibility of approach	The ERCB agrees about having ongoing technical exchanges between industry and the ERCB that will contribute to the enhancement of the current and the development of future versions of the directive.
	subsequent to these activities, regulators could advise approval holders of the need to submit applications for amendment to their approvals to facilitate review and regulatory decision on any significant changes to project scheme, tails management plan, and C&R plan	The development of tailings plans as specified in the directive will define performance measures and milestones that will constitute enforceable measures in ERCB approvals.
	subsequent monitoring of and enforcement on tailings management activities as required	The ERCB agrees about the need for the ongoing monitoring of and enforcement (as required) on tailings management.
Letter B		
	Implementation of the reporting protocol contemplated in the draft directive, with stewardship targets defined by the approvals held by individual operators. Intent of this initiative is to foster enhanced communication and understanding between Industry and ERCB staff on the various aspects of tailings management both addressed and overlooked in the draft directive	This directive is a new requirement beyond existing approvals. The directive sets performance criteria and reporting requirements that will be enforceable. The ERCB supports enhanced communication between industry and provincial regulatory staff.
	Engage in a series of technical exchanges between Industry and ERCB staff to enhance understanding of alternate tailings management technologies and processes, and how a tailings criteria directive might be crafted to ensure both effective address of the issue of fluid fine tailings management and flexibility of approach	The ERCB agrees about having ongoing technical exchanges between industry and the ERCB that will contribute to the enhancement of the current and future versions of the directive.

Topic	Suggestion	ERCB Response
	Develop a suite of criteria for tailings management, landform design, and process water management, with review and involvement of other provincial regulators and harmonization with the legislation, regulation, and other guiding documents of these regulators	This version of the directive deals with tailings management. Future versions of the directive will look at incorporating other regulatory criteria.
	To avoid the potential of a lengthy deferral (the company) recommends a two-phased implementation of the directive: Phase 1 being a reporting, discussion, exchange slate of activities as described in the first three bullet points above, and Phase 2 being the implementation of enforceable standards that are reflective of the learning's derived from the Phase 1 activities	The ERCB has decided that there will be performance criteria with enforcement consequences; reporting will not be sufficient.
Appendix - The following issues were raised and discussed at the workshop, and (the company) believes that they are important to be addressed in the directive, with the goal to meet the common objective:	See Appendix of (the company)'s letter for more details on these topics: Regulatory Alignment Retro-activity Coarse Sand Utilization Risk Management Impact on Existing and Approved Projects Consolidated Tailings and Other Technologies	These topics have been considered in the assessment of the workshop input and will continue to be discussed in the future.
Letter C		
	(The company) recommends: 1. Implementation of the reporting protocol contemplated in the draft directive, with stewardship targets defined by the approvals held by individual operators. Intent of this initiative is to foster enhanced communication and understanding between industry and ERCB staff on the various aspects of tailings management	This directive is a new requirement beyond existing approvals. The directive sets performance criteria and reporting requirements that will be enforceable. The ERCB supports enhanced communication between industry and provincial regulatory staff.
	2. Engage in a series of technical exchanges between industry and ERCB staff to enhance understanding of alternative tails management technologies and processes, and how a tailings criteria directive might be crafted to ensure both effective address of the issue of fluid fine tails management and flexibility of approach	The ERCB agrees about having ongoing technical exchanges between industry and the ERCB that will contribute to the enhancement of the current and future versions of the directive.
	3. Develop a suite of criteria of tails management, landform design, and process water management, with review and involvement of other provincial regulators and harmonization with the legislation, regulation and other guiding documents of these regulators	This version of the directive deals with tailings management. Future versions of the directive will look at incorporating other regulatory criteria.
	4. Subsequent to completion of the above steps, issuance of a set of compliance criteria and processes that are reflective of the understandings gained	The directive will be issued in 2008.

Topic	Suggestion	ERCB Response
Letter D		
Specifically, Section 4.1.2 requires an annual average of 45% sand dedicated to CT production.	(The company) believes that at times, sand capping commitments (to deliver progressive reclamation) will necessitate a much lower dedication of sand to CT production, such that a rolling average over a longer time period (such as 5 years) would still provide the desirable result, while aligning better with operational requirements. In addition, the criteria should strive to focus on the pace of CT production that demonstrates the desired result, which may be a rate lower than 45%.	The ERCB expects operators to demonstrate how they will comply with the directive. Project-specific tailings plans will be assessed by the ERCB as submitted; considerations will be made as required. The ERCB understands that a suite of technologies will be required to reduce fluid tailings volumes. The directive will be revised to reflect the reduction of fluid tailings regardless of technology.
Similarly, Section 4.1.4 requires rehandling of segregated tailings by the end of the following calendar year.	This is inconsistent with (the company)'s plan which recognizes the operational necessities. Again, a longer time period (such as 5 years) would still provide the desired result, while aligning better with operational requirements.	The ERCB expects operators to demonstrate how they will comply with the directive. Project-specific tailings plans will be assessed by the ERCB as submitted; considerations will be made as required.
	Finally, the above requirements as pertaining to CT, should be applied to the (company's) project only when inpit tailings disposal begins. The rationale for this is further explained in this letter.	The ERCB expects operators to demonstrate how they will comply with the directive. Project-specific tailings plans will be assessed by the ERCB as submitted; considerations will be made as required.
Letter E		
	(The company)'s suggestions for amendments to the draft directive are: 1. Honour current approvals terms	This directive is a new requirement beyond existing approvals. The ERCB will consider proposals to optimize tailings management.
	2. Commence FFT reduction requirements when in pit space is available	The ERCB expects operators to demonstrate how they will comply with the directive. Project-specific tailings plans will be assessed by the ERCB as submitted; considerations will be made as required. The ERCB believes that proposals should be made to optimize tailings management among (the company) / (the company) / other operators (and potentially, regionally) approvals.
	3. Regulate FFT inventory	Reduction of fluid tailings volumes will be monitored by the ERCB as operators submit tailings plans. Reduction of fluid tailings inventory will be addressed in the ERCB assessment of an operator's tailings plan and in future versions of the directive.
	4. Regulate tailings deposit reclaimability	The objectives of the directive are the reduction of fluid tailings and the formation of a trafficable deposit. The requirement is to form a trafficable deposit that is ready for reclamation as soon as possible.

Topic	Suggestion	ERCB Response
Letter F		
	(The company) suggests that rather than general prescriptive criteria in the directive, that the ERCB focus on requirements to meet the objectives and that tailings management should be approved on a project specific basis. This and future criteria should be developed as operating performance standards taking into account company specific processes and ore characteristics so that each project can best achieve the objectives of the directive.	The ERCB expects operators to demonstrate how they will comply with the directive. Project-specific tailings plans will be assessed by the ERCB as submitted. The ERCB believes a uniform set of performance criteria are set at a high level (not prescriptive) and applicable to all operators.
	The directive should include all parameters that are being considered for the performance criteria so that operating data can be collected to ensure an informative basis for the development of future criteria. These parameters should be listed in the operating plans and should have a reporting requirement so that future directive enhancements can be tailored for the (company's) Site to fully support the directive objectives.	The ERCB agrees about having ongoing technical exchanges between industry and the ERCB that will contribute to the enhancement of the current and the development of future versions of the directive.
	The requirement for a segregated pond to contain fluid fine tailings and for these tailings to be rehandled annually will be difficult to achieve at the (company's) Project, particularly in the first five years of operation. A segregated pond and the equipment necessary for collection and reprocessing is not part of our approved project and therefore would not be available during initial years of operation. Significant planning, engineering, procurement, and construction will be required for a segregated pond and to implement reprocessing. Additionally this requirement may conflict with meeting several other objectives outlined in the directive. (The company)'s suggestion is that the Tailings Management Plan specific to (the company) address meeting the related objectives of the directive.	The reference to "dedicated CT ponds" has been replaced with "dedicated disposal area (DDA)" in the directive. The ERCB will not prescribe the method, but operators must demonstrate that the tailings deposits are formed such that they are trafficable and acceptable to the ERCB. The ERCB will assess tailings plans against the performance criteria of the directive as submitted by each operator.
Letter G		
(The company) is supportive of the ERCB's stated role and intent.	Consequently, (the company) expects the ERCB to revise the draft directive to remove statements or conditions in the directive that prescribe the means by which Industry meet the objectives stated in the draft directive.	Revisions to the directive are being made to ensure that performance is achieved independent of method.

Topic	Suggestion	ERCB Response
Specifically, (the company) notes the following inconsistencies between the stated ERCB role and intent and the current wording in the draft directive: - The references to a "dedicated CT pond". As worded in the draft directive, the "dedicated CT pond" precludes the co-deposition of coarse-tailings streams (densified tailings, regular tailings, cyclone overflow tailings etc.) into CT ponds. Discussion with ERCB members [ERCB correction - this should be stated as "ERCB staff" not "ERCB members"] did not reveal any technical basis for separating coarse tailings streams from CT deposition.	(The company)'s experience is that coarse sand co-deposition with CT create coarse sand lenses in CT deposits which enhance CT consolidation. (The company) expects the "dedicated CT pond" references to be removed from the draft directive.	The reference to "dedicated CT ponds" has been replaced with "dedicated disposal area (DDA)" in the directive. The ERCB will not prescribe the method but operators must demonstrate that the tailings deposits are formed such that they are trafficable and acceptable to the ERCB. The ERCB will assess tailings plans against the performance criteria of the directive as submitted by each operator.
- The references to statements prescribing which ponds may contain fine fluid tailings, and the quantities they may contain during the course of plant operations. These statements, based on the discussions during our meeting, appear to be founded on an assessment by ERCB staff of pond conditions necessary for non-segregating CT deposition.	These statements do not contribute to the objective of defining minimum expectations for fine fluid tailings consumption. This ERCB assessment is not supported in (the company's) ponds. (The company) expects these statements prescribing which ponds may contain fine fluid tailings, and the quantities they may contain during the course of plant operations, to be removed from the draft directive.	
In addition, (the company) provides an attached matrix documenting (the company)'s responses and concerns on a statement-by-statement basis to the statements made in the draft directive. These are grouped both in the order presented in the directive, and by statement 'category'.	As requested by the ERCB staff, the matrix also includes suggested rewording of several directive statements that (the company) finds contradictory, technically prescriptive, and/or in conflict with achieving the stated objectives of the draft directive.	The ERCB has assessed all input received and will revise the directive accordingly.
	Furthermore, (the company) expresses concern with the additional volume of workload and ERCB approvals, required to implement this new draft directive for both Industry and the ERCB, and encourages the ERCB to plan realistic timelines for implementation.	Agreed. The ERCB is on schedule to issue the directive in 2008. Tailings plans will be assessed by the ERCB as submitted by individual operators.

Topic	Suggestion	ERCB Response
Letter H		
While the (letter's author) supports the directive's ability to monitor and enforce CT technology and application, we are concerned with the continued reliance on end pit lakes at mine closure as a tool to reclaim mature fine tails.		End pit lakes are outside of the scope of this version of the directive.
The (letter's author) understands that this directive forms one component of a larger initiative to deliver performance criteria for conservation and reclamation in the mineable oil sands region and therefore urges the ERCB to provide direction that reduces the reliance on less established tools such as EPLs as soon as possible.	The (letter's author) would like information as to when other tools will be employed as part of the larger initiative. ...urges the ERCB to provide direction that reduces the reliance on less established tools such as EPLs as soon as possible.	The ERCB will review tailings plans and performance reports as submitted by operators and will contemplate additional criteria as they develop. This directive is the first step towards forming trafficable deposits from fluid tailings volumes.
The directive requires operators to allocate a minimum of 45% coarse sand to CT production. The (letter's author) would like to better understand how this percentage was derived and selected, as well as the outcomes of its implementation.	More information explaining how this requirement will influence current tailings management plans and on-the-ground tailings volumes is requested.	The performance criterion for fluid tailings reduction is based on fines captured in DDAs. The criterion establishes mass of dry fines in the feed to extraction that must report to the DDAs. The performance criteria of the directive are the reduction of fluid tailings and the formation of a trafficable deposit. It will be the responsibility of the operator to demonstrate compliance.
The absence of easily accessible and of publicly available oil sands environmental performance information remains a major concern, and impacts the credibility of both government and industry.	The (letter's author) requests that the annual tailings management plans and tailings performance reports be made publicly available and online. We are concerned with issues pertaining to seepage and its impacts on ground water. Any historic data summarizing tailings water chemistry, seepage water chemistry, and seepage water rates into the groundwater from reports of groundwater and tailings monitoring programs provided to AENV should be made public.	Tailings reports filed with the ERCB are currently available to the public upon request, and the ERCB will consider making them more readily accessible in the future.
The ERCB bulletin states: "The directive was developed following an assessment of tailings management at existing and approved schemes and consideration of potential tailings performance."	The (letter's author) requests a copy of the documents it has regarding this assessment, including any informal reports, memos, or presentations in effort to better understand how this assessment was done.	The directive has been created over a period of years using numerous applications, decisions, data, and reports. The ERCB is open to meetings upon request to assist stakeholders in their understanding of this directive.
Once again, the (letter's author) acknowledges the ERCB's progress in presenting draft tailings management criteria, however we view the draft directive as a small step towards resolving a forty-year legacy of industry-governed tailings management.	We strongly urge the ERCB to provide comprehensive tailings management guidelines that employ a variety of technologies thereby eliminating the reliance on end pit lakes as deposit sites for tailings waste as soon as possible.	The ERCB agrees that a variety of technologies is required to reduce fluid tailings volumes.

Topic	Suggestion	ERCB Response
Letter I		
In particular, we believe that it is important to set performance based standards for tailings pond reclamation and to encourage the adoption of alternate tailings technology.	…options for performance based standards including a discussion on the following: - Prohibition of any tailings deposition on land that will be turned into an end pit lake - Size restrictions for external tailings impoundments - Setting limits for the maximum amount of land which can be disturbed at any time on each minesite - Setting limits for the proportion of land that must be reclaimed throughout a mine's life - Setting limits for the quantity of makeup water that can be used to encourage water re-cycle	The objective of the directive is the reduction of fluid tailings and the formation of a trafficable deposit. These options may be considered in the future.
Letter J		
Maximize intermediate process water recycle to increase energy efficiency and reduce fresh water import.	The proposed CT directive, by increasing the rate of CT production should increase process water recycle and reduce fresh water import. However, the use of thickened or dry tailings technology at the outset would be a much better way of achieving this objective so long as the system used to thicken tailings results in process water that is suitable for recycle, which may not always be the case.	The ERCB considers this directive as a tailings directive, not a CT directive. Changes have been made such that the performance criterion for fluid tailings reduction is based on fines captured in DDAs. The criterion establishes mass of dry fines in the feed to extraction that must report to the DDAs. The ERCB continues to consider several performance criteria to reduce the impacts of fluid tailings, and this was chosen as a place to start.
Reduce stored process-affected waste water volumes on site.	The proposed CT directive, by increasing the rate of CT production should reduce stored process-affected waste water volumes. However, the use of thickened or dry tailings technology at the outset has the potential to completely eliminate stored water and would be a much better way of achieving this objective.	
Eliminate or reduce containment of fluid fine tailings in an external tailings disposal area during operations.	The proposed CT directive does nothing towards achieving this. External tailings ponds should be only permitted at the commencement of mining and the size of these impoundments should be limited. Mines which plan expansions should not be allowed to create additional external disposal areas.	
Minimize and eventually eliminate long-term storage of fluid tailings in the reclamation landscape.	The proposed CT directive addresses this in part. It does not, for example, deal with the deposition of fine tailings or MFT in end pit lakes, which should not be allowed.	
Create a trafficable landscape at the earliest opportunity to facilitate progressive reclamation.	The proposed CT directive addresses this directly and sets out criteria to increase the rate of trafficable tailings. However, CT technology requires a number of years to create mature fine tailings and further time to create CT. Other tailings technology (such as dry tailings) could be used to greatly increase the rate of tailings reclamation.	

Topic	Suggestion	ERCB Response
Minimize resource sterilization associated with tailings ponds.	The proposed CT directive only addresses this in a peripheral fashion. Certainly, if dry tailings were mandated then tailings could be placed in a variety of locations thereby eliminating the possibility of resource sterilization.	See above response.
Ensure that the liability for tailings is managed through reclamation of tailings ponds.	The proposed CT directive, by increasing the pace of tailings pond reclamation, does address this but only partially. The financial liability associated with transforming fine tailings to an eventual trafficable landscape suitable for reclamation is undoubtedly very large. If the true cost of converting fine tailings to a trafficable landscape were reflected in the reclamation security deposit, then the cost associated with alternative technologies such as dry tailings may be much more favorable.	
Letter K		
1) Once specific criteria are set forth through regulatory limitations such as maximum amounts of volumes of tailings wastewater per tonne for example, is there any consequences to industry if they exceed the maximum set capacity limits?	...maximum amounts of volumes of tailings wastewater per tonne	In the event of noncompliance, the ERCB applies Directive 019. -If the operator still doesn't comply, the ERCB has the authority to implement reviews of sites, limit production, delay current applications, and shut in sites. These options are not entertained unless there is significant noncompliance. - Operators will submit their tailings plans and the ERCB will assess them for compliance with the directive and condition approvals accordingly.
2) If consequences are set for exceedances, are they of a substantial fine or other penalties where it would make a difference for the company to ensure future compliance, accountability and responsibility?		
3) Will operators be required to report any irregularities, exceedances, leaks, spills, breaks in berms, etc.? Will these reports be publicly accessible?		Currently, this information is accessible to the public. The only items held in confidence are experimental scheme progress reports.
4) Will there be anything in place to deter wildlife from entering these ponds?		Wildlife management is not within the ERCB's mandate. The ERCB may work with AENV and with other departments to address relevant wildlife issues.
5) Is groundwater going to be monitored to check for potential leakages?		Groundwater monitoring programs are in place to monitor for leakage from tailings ponds. AENV has juristiction over water release.
6) Will air quality be affected or reduced from these operations?		Impact on air quality was not considered as part of the directive. However, the ERCB is aware of existing tailings-related air quality issues.
7) What are the long term expectations and consequences for these ponds?		The performance criteria of the directive are the reduction of fluid tailings and the formation of a trafficable deposit.
8) Is remediation of groundwater going to be the responsibility of industry in case of potential contamination?		The fundamental responsibility for groundwater remediation during the operation of a mine rests with the operator.

Topic	Suggestion	ERCB Response
9) Waste management - cumulative effects?		The performance criteria of the directive are the reduction of fluid tailings and the formation of a trafficable deposit.
10) What is the full life cycle (approximate number in years) of the CT ponds?		Operators must submit tailings plans for approval as required by the directive. The ERCB believes that the full life-cycle of each pond varies according to size, depth, etc. The directive requires the formation of a trafficable deposit.
11) Since tailings accumulations in the past have exceeded projected volumes, is that issue going to be a planned recurrence?		The ERCB's intent is that existing operators restrict storage requirements to original approved application volumes.
12) Will future projects impose on Treaty 8 traditional territory? Will TEK be observed?		Yes, to the extent that future projects are approved. The ERCB will continue to work with stakeholders to ensure that concerns and suggestions are incorporated where appropriate. TEK is dealt with in the application and approval process.
Letter L		
	There needs to be more discussion with the ERCB and oil sand companies about moving away from the production of mature fine tailings in favour of dry tailings technology.	The long-term goal is to minimize or eliminate fluid tailings. The first tool to limit the inventory of fluid tailings is to increase the consumption of fluid tailings. This is intended to create a zero net inventory. A suite of technologies will be required to reduce the accumulation fluid tailings.
	The focus on fine tailings consolidation is a good first step but should be augmented with criteria based on reduced water withdrawals.	Other criteria (including water recycling) were considered during the development of the draft directive. The two key criteria in the directive were selected as a place to start.
	Also, the Board should collect and report on the volumes and types of tailings in the region (both for individual operators as well as aggregate numbers for the region).	Agreed. The draft directive requires annual reporting on fluid tailings volumes and types. Individual tailings reports filed with the ERCB are currently available to the public upon request, and the ERCB will consider making them more readily accessible in the future.
	The Board should also provide annual summaries on the performance of the operators on these criteria to First Nations.	Tailings reports filed with the ERCB are currently available to the public upon request, and the ERCB will consider making them more readily accessible in the future.