Towards Sustainable Mining

Water Stewardship Protocol

Towards Sustainable Mining
Vers le développement minier durable

TSM ASSESSMENT PROTOCOL

A Tool for Assessing Water Stewardship Performance

Purpose

The purpose of the assessment protocol is to provide guidance to facilities in completing their evaluation of water stewardship performance against TSM indicators. The assessment protocol sets out the general expectations for water stewardship as part of the TSM initiative. This protocol supports implementation of the TSM Water Stewardship Framework.

As with any assessment of a management system, professional judgment is required in assessing the degree of implementation of a system indicator and the quality of management processes and intervention. Application of this protocol will, therefore, require a level of expertise in auditing and systems assessment and knowledge of and experience in the practice of water stewardship performance. This assessment protocol provides an indicator of the level of implementation of water stewardship practices. It is not, of itself, a guarantee of the effectiveness of water stewardship performance.

Where operational water management relates to tailings management, the users of this protocol should be aware that there are potential linkages between this protocol and the Tailings Management Protocol.

TSM's Guiding Principles commit MAC members to comply with all laws and regulations in each country where we operate. This protocol is intended to guide the development of water stewardship practices beyond legal compliance.

Performance Indicators

The Water Stewardship Protocol contains four indicators:

1. Water Governance
2. Operational Water Management
3. Watershed-scale Planning
4. Water Reporting and Performance

1. WATER GOVERNANCE

Purpose

To confirm that commitment and accountabilities are in place and communicated to relevant Communities of Interest to support water stewardship.

Water Governance: *Assessment Criteria*

LEVEL	CRITERIA
C	• The facility does not meet all level B criteria.
B	• Demonstrated commitment to water stewardship is evident. Commitments may not be consistent with the intent of the *TSM Water Stewardship Framework*. • Accountabilities for water stewardship are assigned, but responsibilities may not be defined. • Processes are in place to track and correct non-compliance with water-related regulatory requirements and commitments.
A	• Demonstrated senior management commitment to water stewardship that is consistent with the *TSM Water Stewardship Framework*. • Commitments to water stewardship have been communicated to relevant employees, contractors, and water-related, facility-level COI. • Roles, responsibilities and accountabilities for operational water management and watershed-scale planning are defined.
AA	Assessment of water risks and opportunities is integrated into annual business planning and /or budgeting processes. Internal audit is conducted to determine: • The degree of consistency of facility water stewardship practices with the TSM Water Stewardship Framework. • Whether commitments to water stewardship have been communicated to relevant employees, contractors, and water-related facility-level COI. • Whether roles, responsibilities and accountabilities for operational water management and watershed-scale planning are defined.

AAA	External audit is conducted to determine: • The degree of consistency of facility water stewardship practices with the *TSM Water Stewardship Framework.* • Whether commitments to water stewardship have been communicated to relevant employees, contractors, and water-related facility-level COI. • Whether roles, responsibilities and accountabilities for operational water management and watershed-scale planning are defined.

Water Governance: *Frequently Asked Questions*

2. OPERATIONAL WATER MANAGEMENT

Purpose

To confirm that water-related plans and management systems are implemented at the facility level. This indicator includes both water quality and water quantity.

Operational Water Management: *Assessment Criteria*

LEVEL	CRITERIA
C	• The facility does not meet all level B criteria.
B	• Identification and assessment of facility-level risks related to surface water and groundwater have been conducted. • Processes to monitor the facility's water performance are established. • Records of facility-level water quality and water quantity data are maintained.
A	A systematic approach to operational water management has been established and implemented, including: • A site-wide water balance has been prepared of the facility. Water balances are updated on a pre-defined frequency and incorporate monitoring data. • A water monitoring program addressing surface water and groundwater, including both water quality and water quantity parameters and informed by identified risks is being implemented. • Controls based on identified risks have been established and are being implemented as planned. • Response and contingency plans for water-related risks and incidents are established. • Relevant employees and contractors are provided with training that is in accordance with their roles and responsibilities.

AA	• Water balances are updated on a pre-defined frequency, incorporating monitoring data and a range of climate conditions including potential variability from climate change, if relevant to the operational phase. • There is a process in place to identify opportunities to improve water performance and it is being implemented, as planned, and monitored for effectiveness. • Control measures are in place for water-related risks and being monitored for effectiveness. • Monitoring data are stored and trends are analyzed on a pre-defined frequency to inform continual improvement and/or decision-making processes. • Groundwater is modelled with an appropriate level of detail and physical scale as informed by identified risks. • Internal audit is conducted to determine whether the operational water management practices meet the requirements of Level A.
AAA	• Long-term water management considerations are incorporated into current water management decision-making processes and closure plans. • Where opportunities to minimize long term water management activities beyond the life of mine have been identified, they are being incorporated into long-term investment decisions and/or closure plans. • External audit is conducted to determine whether the operational water management practices meet the requirements of Level A and AA. • An evaluation of effectiveness is conducted and a tracking process is in place for opportunities for improvement identified.

Operational Water Management: *Frequently Asked Questions*

3. WATERSHED-SCALE PLANNING

Purpose

To confirm that the facility supports engagement with other water users and COI in the watershed and participates in watershed-scale planning and governance fora, where they exist. This indicator focuses on watershed planning beyond the operational footprint of the facility.

Watershed-scale Planning: *Assessment Criteria*

LEVEL	CRITERIA
C	• The facility does not meet all level B criteria.
B	• A relevant watershed boundary has been identified by the facility. • Relevant water-related Communities of Interest (COI) have been identified. • Responsibility for involvement in watershed-scale planning has been designated.
A	• Engagement has taken place to better understand how relevant COI in the watershed use water resources by seeking information on factors including water-related local practices, beliefs, customs and traditional knowledge. • The facility participates, either directly or indirectly, in watershed governance fora or groups where they exist. • Assessment of how operational water management practices contribute to cumulative effects in its watershed.
AA	• Through engagement with relevant COI, water-related risks and opportunities in the watershed have been identified and prioritized. • The facility communicates with relevant COI to help them understand how operational water management practices address the priority watershed-related risks. • For priority risks beyond the control of the facility, the facility participates in watershed governance fora, where they exist, to evaluate and develop collaborative response options.

AAA	• Following Level A and AA engagement activities, at least one of the following initiatives is occurring in the facility's watershed: o Setting watershed-scale goals, including those contained in land use plans where they exist. o Developing a watershed plan. o Tracking of watershed goals and engagement with water-related COI on progress. o Collaborative monitoring at the watershed scale

Watershed-scale Planning: *Frequently Asked Questions*

4. WATER PERFORMANCE AND REPORTING

Purpose

To confirm that water related objectives or targets have been established to measure performance and that reporting is in place to inform decision-making and to communicate performance publicly.

Water Performance and Reporting: *Assessment Criteria*

LEVEL	CRITERIA
C	• The facility does not meet all level B criteria.
B	• Water performance objective(s) or target(s) are established for relevant water risks and/or opportunities.
A	• Progress of actions to achieve objective(s) or target(s) is regularly tracked and reported to facility-level senior management. • Public reporting on water includes performance relative to established objectives and targets.
AA	• Water-related objectives or targets have been met in the reporting year, or corrective actions have been identified and are being implemented. • A system or process is in place for the independent verification of the accuracy of public reporting on water.
AAA	• COI feedback on water reporting is actively sought. • Results of independent verification of the public reporting on water performance is publicly available. • Public reporting includes facility-level water data.

Water Reporting and Disclosure: *Frequently Asked Questions*

APPENDIX 1: FREQUENTLY ASKED QUESTIONS

Protocol-Specific Guidance

1. **How is water stewardship defined?**

   As there is no universal definition for the term water stewardship, individual companies should consider how they define the term to ensure their definition fits within the context of their facility and watershed. Below are two examples of definitions:

   Water stewardship is "the use of water that is socially equitable, environmentally sustainable and economically beneficial achieved through a stakeholder-inclusive process that involves site and catchment-based actions" - Alliance for Water Stewardship (also adopted by the ICMM) http://a4ws.org/about/impacts-of-aws/

   "Water stewardship is about business understanding the risks they face from water scarcity and pollution and taking action to help ensure water is managed sustainably as a shared, public resource. – World Wildlife Fund
   http://wwf.panda.org/our_work/water/water_management/

2. **What are relevant employees, contractors and facility-level Communities of Interest?**

   Relevant employees and contractors are those that have direct or indirect responsibilities related to water management. Examples of those with direct responsibility would include the manager responsible for water treatment, water treatment operators or those with responsibility for environmental monitoring activities. An example of a position with indirect responsibilities are supply chain personnel as they may order critical control parts, pipes, etc. for water management and treatment infrastructure, but do not work directly on water management activities.

   Examples of relevant facility-level Communities of Interest are other water users or water rights holders in the watershed and those that express an interest in water-related issues in the watershed.

3. **How should regional water stewardship approaches be reflected where there are multiple facilities in a single watershed?**

   Where a company operates multiple facilities within a single watershed, the company may choose to adopt a regional approach to water stewardship. This could also include collaboration between different companies. In these cases, the division of roles and responsibilities between facility-level personnel and regional personnel should be clear and supporting systems should be developed and implemented at the appropriate level. Water stewardship targets may be set for the region, rather than each individual facility and public reporting of performance can be aggregated for the region.

4. **What is meant by "water performance"?**

   Water performance is decided at a facility level based on water related risks and includes both water quality and quantity.

5. **What is the intended scope of the independent verification of public reporting on water performance and can this be included in the external audit required in Levels AAA of indicator 2?**

The verification scope would include the accuracy, replicability, and completeness of water performance data and information, including performance relative to established objectives and/or targets. The verification can consider not only how the indicators are determined, but also the management and reporting systems used to ensure the indicators are consistently determined and reported over time. This requirement could be addressed through the external audit required in Level AAA of Indicator 2 if the scope of the audit explicitly includes accuracy, replicability and completeness of water performance data and information.

6. **What is meant by "site-wide water balance"?**

A site-wide water balance forecasts site water inflows, outflows and changes in water inventory and water management infrastructure over the life of the facility and including closure. A water balance allows for a range of scenarios to be modelled including "normal" hydrological conditions, less-frequent wet and dry hydrological conditions, feasible upset conditions, and conditions brought about by climate change (such as higher water inflows, restricted discharge, reduced storage capacity, droughts, etc.). The magnitude of the wet and dry hydrological conditions modelled will be defined on a risk basis. A water balance can also be used as the basis to develop a water quality model to forecast water quality over-time.

A site-wide water balance is used to support planning and the associated evolution of water management infrastructure and to demonstrate how the operations can manage water in the short and long term to minimize the potential impact to the environment or other water users in the watershed.

7. **What is meant by "Monitoring data are stored, and trends are analyzed on a pre-defined frequency to enable integrated decision-making"?**

Data relating to water quality and volumes are stored in a database that can be used to analyze the variables (which may include both environmental and operational data). A database could be either a dedicated environmental management database, a generic database, or a spreadsheet tool. It is at the discretion of the facility personnel responsible for water management to determine what type of database best serves their needs. Likewise, facility personnel responsible for water management should determine which types of analysis are most relevant to inform their water management decision making processes. Integrating the data and analysis into decision-making requires the facility to be able to show that the results of the analysis are being considered by personnel with decision making for water-related responsibilities.

8. **What is meant by "groundwater is modelled with an appropriate level of detail and physical scale as informed by identified risks?"**

This means that the facility has considered potential risks to groundwater such as water withdrawal, seepage into mine workings, or infiltration of mine-affected water into groundwater systems and has developed a conceptual and/or numerical model at a scale and to a level of detail that allows for assessment of the potential risk and mitigation options.

9. **Are improvement projects identified to mitigate risk assessed the same as projects that were identified as proactive opportunities?**

At some companies, the definition of risk includes opportunity. So, if a company can demonstrate implementation of mitigation measures as well as implementation of (improvement) opportunities, they would be assessed at Level AA. However, if only risks (i.e. threats) have been addressed then the company would be assessed as Level A.

10. What does long-term mean with respect to water management considerations?

Long-term water management considerations are those that extend beyond the operational phase of the facility and need to be considered with respect to closure planning. During the operational phase of the facility consideration should be given to such long-term water management considerations to look for opportunities to reduce closure liabilities and long-term treatment costs and to increase the long-term climate resiliency of the final closure configuration.

11. What is meant by "watershed"?

The area of land from which all surface runoff and subsurface waters flow through a sequence of streams, rivers, aquifers and lakes into the sea or another outlet at a single river mouth, estuary or delta; and the area downstream affected by the facility's discharge. Watersheds, as defined here, include associated groundwater areas and may include portions of water bodies (such as lakes or rivers). Watersheds are also referred to as catchments, basins (or sub-basins).The term 'catchment' is used by ICMM whereas TSM uses 'watershed'. For the purposes of TSM, the terms are interchangeable.

Additional detailed guidance is provided in the ICMM's *A Practical Guide to Catchment-Based Water Management for the Mining and Metals Industry* (2015) and the Alliance for Water Stewardship.

12. What is intended by watershed-scale planning?

The ICMM provides detailed guidance on watershed-scale planning in *A Practical Guide to Catchment-Based Water Management for the Mining and Metals Industry*. This document includes the following description:

A catchment-based approach to managing water resources looks at activities and issues in the catchment as a whole, rather than considering different aspects separately. It requires a diverse range of processes to be considered, including the hydrology and land use, as well as broader political, economic, social and ecological dynamics that influence water availability and quality. A catchment-based approach encourages organizations to consider holistically how competing demands on water resources from a range of stakeholders (domestic water users, industry, regulators, politicians) can create pressures and lead to conflict if not appropriately managed. It also requires that people from different sectors be brought together to identify issues and agree priorities for action, and ultimately build local partnerships to put these actions in place.

13. **How can a remote facility with no other water users in the watershed support the types of collaborative initiatives identified in Indicator 3 Level AAA?**

    Where a facility is considered remote and there are no other identified water users in the watershed, that facility can achieve Level AAA in Indicator 3 by demonstrating that operational water management practices and goals are informed by an understanding of the watershed.

14. **What does monitoring at the watershed-scale include?**

    Monitoring at the watershed scale is defined based on the attributes of each watershed defined through engagement with water-related COI and other users. It could include cumulative effects monitoring where there are multiple users, monitoring and assessment of minimum instream flow requirements, and collaborative monitoring programs.

15. **What is the difference between objectives and targets?**

    For the purpose of this protocol, objectives are intended to reflect qualitative goals whereas targets are intended to be quantitative goals.

16. **Useful References**

1. International Council on Mining & Metals (ICMM): *A Practical Guide to Catchment-Based Water Management*
   https://www.icmm.com/guide-to-catchment-based-water-management

2. ICMM: A Practical Guide to Consistent Water Reporting
   https://www.icmm.com/en-gb/environment/water/water-reporting

APPENDIX 2: TSM SELF ASSESSMENT CHECKLIST

Water Stewardship Protocol

Facility Name:		Company Name:	
Assessed By:		Date Submitted:	

Supporting Documentation / Evidence:	
NAME OF DOCUMENT	**LOCATION**

Interviewees:			
NAME	**POSITION**	**NAME**	**POSITION**

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
INDICATOR 1: WATER GOVERNANCE					
Indicator 1 Level B	Is there a demonstrated senior management commitment to water stewardship in place (consistent or not with the intent of the TSM Water Stewardship Framework)?				
	Have accountabilities for water stewardship been assigned?				
	Are there processes in place to track and correct non-compliances with water-related regulatory requirements and commitments?				
	If you have answered "Yes" to all of the Level B questions, continue to the Level A questions. If you have not answered "Yes" to all of the Level B questions, assess the facility as a Level C.				
Indicator 1 Level A	Is there a demonstrated senior management commitment to water stewardship that is consistent with the intent of the TSM Water Stewardship Framework?				
	Has the commitment to water stewardship been communicated to relevant employees, contractors and water related, facility-level COI?				
	Are roles, responsibilities and accountabilities defined?				
	If you have answered "Yes" to all of the Level A questions, continue to the Level AA questions. If you have not answered "Yes" to all of the Level A questions, assess the facility as a Level B.				
Indicator 1 Level AA	Has an assessment of water risks and opportunities been integrated into annual business planning and/or budgeting processes?				
	Has an internal audit been conducted in the last three (3) years to determine:				
	• The degree of consistency of facility water stewardship practices with the TSM Water Stewardship Framework?				
	• Whether commitments to water stewardship have been communicated to relevant employees, contractors, and water-related facility-level COI?				
	• Whether roles, responsibilities and accountabilities for water stewardship are defined?				
	If you have answered "Yes" to all of the Level AA questions, continue to the Level AAA questions. If you have not answered "Yes" to all of the Level AA questions, assess the facility as a Level A.				

Indicator 1 Level AAA	Has an external audit been conducted in the last three (3) years to determine:				
	• The degree of consistency of facility water stewardship practices with the TSM Water Stewardship Framework?				
	• Whether commitments to water stewardship have been communicated to relevant employees, contractors, and water-related facility-level COI?				
	• Whether roles, responsibilities and accountabilities for operational water management and watershed-scale planning have been defined?				
	If you have answered "Yes" to all of the Level AAA questions, assess the facility as a Level AAA. If you have not answered "Yes" to all of the Level AAA questions, assess the facility as a Level AA.				
	ASSESSED LEVEL OF PERFORMANCE FOR INDICATOR 1				**Level: _____**

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
INDICATOR 2: OPERATIONAL WATER MANAGEMENT					
Indicator 2 Level B	Have facility-level risks related to surface water and groundwater been identified and assessed?				
	Are processes established to monitor the facility's water performance?				
	Are records of facility-level water quality and water quantity data maintained?				
	If you have answered "Yes" to all of the Level B questions, continue to the Level A questions. If you have not answered "Yes" to all of the Level B questions, assess the facility as a Level C.				
Indicator 2 Level A	Has a systematic approach to operational water management been established and implemented?				
	Has a site-wide water balance been prepared for the facility?				
	Has a pre-defined frequency been established for updating the water balance?				
	Do updates to the water balance incorporate monitoring data?				
	Is there a water monitoring program that addresses both surface water and groundwater?				
	Has the selection of water quality and quantity parameters for the monitoring program been informed by identified risks?				
	Have controls been established based on identified risks and are those controls being implemented?				
	Have response and contingency plans been established for water-related risks and incidents?				
	Have relevant employees and contractors been provided with training that is in accordance with their roles and responsibilities?				
	If you have answered "Yes" to all of the Level A questions, continue to the Level AA questions. If you have not answered "Yes" to all of the Level A questions, assess the facility as a Level B.				
Indicator 2 Level AA	Are water balances updated on a pre-defined frequency, incorporating monitoring data and a range of climate conditions including potential variability from climate change, if relevant to the operational phase?				
	Is there a process in place to identify opportunities to improve water performance and is it being implemented, as planned, and monitored for effectiveness?				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
	Are Control measures in place for water-related risks and being monitored for effectiveness?				
	Are monitoring data stored and are trends analyzed on a pre-defined frequency to inform continual improvement and/or decision-making processes?				
	is groundwater modelled with an appropriate level of detail and physical scale as informed by identified risks?				
	Has an internal audit been conducted in the last three years to determine whether the operational water management practices meet the requirements of Level A?				
	If you have answered "Yes" to all of the Level AA questions, continue to the Level AAA questions. If you have not answered "Yes" to all of the Level AA questions, assess the facility as a Level A.				
Indicator 2 Level AAA	Have long-term water management considerations been incorporated into current water management decision-making processes and closure plans?				
	If the opportunities to minimize long term water management activities beyond the life of mine have been identified, are they being incorporated into long-term investment decisions and/or closure plans?				
	Has an external audit been conducted in the last three years to determine whether the operational water management practices meet the requirements of Level A and AA and did that audit include an evaluation of the effectiveness of implementation.				
	Is there a process in place to track whether opportunities for improvement identified in the evaluation of effectiveness have been acted upon?				
	If you have answered "Yes" to all of the Level AAA questions, assess the facility as a Level AAA. If you have not answered "Yes" to all of the Level AAA questions, assess the facility as a Level AA.				
	ASSESSED LEVEL OF PERFORMANCE FOR INDICATOR 2				**Level: _____**

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
INDICATOR 3: WATERSHED-SCALE PLANNING					
Indicator 3 Level B	Has a relevant watershed boundary been identified by the facility?				
	Have relevant water-related communities of interest (COI) been identified?				
	Has responsibility for involvement in watershed-scale planning been designated?				
	If you have answered "Yes" to all of the Level B questions, continue to the Level A questions. If you have not answered "Yes" to all of the Level B questions, assess the facility as a Level C.				
Indicator 3 Level A	Has engagement taken place in the watershed to better understand how relevant water-related COI use water resources by seeking information on factors including water-related local practices, beliefs, customs and traditional knowledge?				
	Did the engagement seek information on factors including water-related local practices, beliefs, customs and traditional knowledge?				
	Does the facility participate, either directly or indirectly, in watershed governance fora or groups where they exist?				
	Has an assessment of how operational water management practices contribute to cumulative effects in its watershed been undertaken?				
	If you have answered "Yes" to all of the Level A questions, continue to the Level AA questions. If you have not answered "Yes" to all of the Level A questions, assess the facility as a Level B.				
Indicator 3 Level AA	Has the facility engaged with relevant water-related COI to identify and prioritize water-related risks and opportunities in the watershed?				
	Does the facility communicate with relevant water-related COI to help them understand how operational water management practices address the priority watershed-related risks?				
	Where they exist, does the facility participate in watershed governance fora to evaluate and develop collaborative response options for priority risks beyond the control of the facility?				
	If you have answered "Yes" to all of the Level AA questions, continue to the Level AAA questions. If you have not answered "Yes" to all of the Level AA questions, assess the facility as a Level A.				
Indicator 3 Level AAA	Are one or more of the following occurring in the facility's watershed? • Setting watershed-scale goals, including those contained in land use plans where they exist. • Developing a watershed plan. • Tracking of watershed goals and engagement with water-related COI on progress. • Collaborative Monitoring at the watershed scale				

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
	If you have answered "Yes" to all of the Level AAA questions, assess the facility as a Level AAA. If you have not answered "Yes" to all of the Level AAA questions, assess the facility as a Level AA.				
	ASSESSED LEVEL OF PERFORMANCE FOR INDICATOR 3				**Level: _____**

	QUESTION	Y	N	NA	DESCRIPTION & EVIDENCE
INDICATOR 4: WATER REPORTING AND PERFORMANCE					
Indicator 4 Level B	Have water performance objective(s) or target(s) been established for relevant water risks and/or opportunities?				
	If you have answered "Yes" to all of the Level B questions, continue to the Level A questions. If you have not answered "Yes" to all of the Level B questions, assess the facility as a Level C.				
Indicator 4 Level A	Is progress on actions to achieve objective(s) or target(s) regularly tracked and reported to facility-level senior management?				
	Does public reporting on water include performance relative to established objectives and targets?				
	If you have answered "Yes" to all of the Level A questions, continue to the Level AA questions. If you have not answered "Yes" to all of the Level A questions, assess the facility as a Level B.				
Indicator 4 Level AA	Where water-related objectives or targets been met in the reporting year? If no, were corrective actions been identified and are they being implemented?				
	Is a system or process in place for the independent verification of the accuracy of public reporting on water?				
	If you have answered "Yes" to all of the Level AA questions, continue to the Level AAA questions. If you have not answered "Yes" to all of the Level AA questions, assess the facility as a Level A.				
Indicator 4 Level AAA	Is COI feedback on water reporting actively sought?				
	Are the results of the independent verification of the public reporting on water performance publicly available?				
	Does public reporting include site level water data?				
	If you have answered "Yes" to all of the Level AAA questions, assess the facility as a Level AAA. If you have not answered "Yes" to all of the Level AAA questions, assess the facility as a Level AA.				
	ASSESSED LEVEL OF PERFORMANCE FOR INDICATOR 4				**Level: _____**

For more information about the TSM initiative, visit:

The Mining Association of Canada
www.mining.ca/tsm

Quebec Mining Association
www.amq-inc.com

Finnish Mining Association (FinnMin)
www.kaivosvastuu.fi/in-english

The Argentinean Chamber of Mining Entrepreneurs (CAEM)
www.caem.com.ar/hms/

Botswana Chamber of Mines
www.bcm.org.bw

Confederación nacional de empresarios de la minería y de la metalurgia (CONFEDEM)
www.confedem.com