

*A Guide to*  
**Audit and Assessment of  
Tailings Facility Management**  
*2011*



**The Mining Association of Canada**  
ADVOCACY STEWARDSHIP COLLABORATION





# **A Guide to Audit and Assessment of Tailings Facility Management**

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# Foreword

It is with pleasure that I present, on behalf of the members of The Mining Association of Canada (MAC), *A Guide to Audit and Assessment of Tailings Facility Management*.

The Guide complements our companion publications on tailings management:

- *A Guide to the Management of Tailings Facilities*, updated in 2011; and
- *Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities*, 2003.

The tailings management series is integral to MAC's Towards Sustainable Mining (TSM) initiative, and forms the basis for the tailings management performance indicators under TSM.

This *Guide* is, as with the others in the series, the result of collaboration by members of a team of Canadian mining industry practitioners and experts on the MAC Tailings Working Group (TWG). We owe a debt of gratitude to the team members for the skill, expertise, dedication and enthusiasm that they brought to the task of building consensus in dealing with such complex subject matter. We also acknowledge the efforts of the many individuals and companies that have implemented comprehensive tailings management systems—across Canada and around the world—since the original management guide was published in 1998. This *Guide* builds upon many years of experience gained in implementing the tailings management framework, as well as the knowledge and expertise of audit and assessment practitioners in the field.

The *Guide* has been designed to meet the needs of the mining industry. It encourages and provides a means of measuring safe and environmentally responsible management of tailings facilities. I trust that the industry and others will find it a useful contribution to continual improvement in this area.

**Pierre Gratton**  
President & CEO

The Mining Association of Canada



# Preface

In 1998, The Mining Association of Canada (MAC) published *A Guide to the Management of Tailings Facilities*. This was followed, first, in 2003 by the publication of *Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities* and, now, by this publication, *A Guide to Audit and Assessment of Tailings Facility Management*. Together the three guides provide a strong message to tailings facility owners, operators and contractors: that the key to safe and environmentally responsible management of tailings is consistent application of sound engineering capability within an effective management framework, from initial site selection and design, through construction and operations, to eventual decommissioning and closure.

The purpose of this *Guide* is to provide protocols for the audit and assessment of conformance with the tailings management framework presented in *A Guide to the Management of Tailings Facilities* (updated 2011 edition). It describes protocols both for an audit of tailings facility management and for an additional, qualitative assessment of that management.

Since MAC's first tailings management guide was published, the tailings management framework has been applied at mining operations across Canada and around the world. Experience gained through the implementation and verification of tailings management systems, and through operating, maintenance and surveillance manuals, has been incorporated into both this *Guide* and a concurrent update to the original *A Guide to the Management of Tailings Facilities*.

Since 1998, MAC has also embarked upon the Towards Sustainable Mining (TSM) initiative. The tailings management framework is integral to TSM and forms the basis of the tailings management performance indicators under TSM. The audit and assessment protocols recommended herein complement the TSM tailings management assessment protocol.

This *Guide*, like its companion guides, was prepared through a collaborative effort by representatives of the Canadian mining industry who participate on the MAC Tailings Working Group. MAC acknowledges and thanks all members of the Tailings Working Group, past and present.





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# Chapter 1—Introduction

# 1

Tailings facilities are site-specific complex systems that have unique environmental and physical characteristics. They pose significant environmental and business risks that must be effectively managed for the long term. The mining industry has the technology and resources to safely site, design, construct, operate, decommission and close tailings facilities, but there remains a need to continually improve their management in a consistent, safe and environmentally responsible manner through the full life cycle.

The Mining Association of Canada (MAC) has published the tailings management series of guides to help companies develop and implement comprehensive tailings management systems.

The first in the series, *A Guide to the Management of Tailings Facilities*, originally published in 1998, has been updated in 2011 to reflect the commitment to continual improvement embodied in the tailings management framework. It recommends implementing a comprehensive tailings management framework to manage risk while integrating environmental and safety considerations into each stage of the life cycle of a tailings facility, from initial site selection, through construction and operation, to eventual decommissioning and closure.

The second guide, *Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities*, was published in 2003. Building on the management guide, it outlines the information that a site-specific operation, maintenance and surveillance (OMS) manual should contain to ensure that operating methods and decisions are properly documented for ongoing reference.

The purpose of this third handbook is to provide protocols for verifying conformance with the tailings management framework presented in *A Guide to the Management of Tailings Facilities*. It describes protocols for both an audit of tailings facility management and an additional qualitative assessment of that management. It is intended to be used by internal and/or independent auditors, facility management and corporate management.

Applying these audit and assessment protocols can:

- a) assist facility and corporate management to evaluate the implementation and effectiveness of a tailings management system, to reduce risk, and to drive continuous improvement; and
- b) provide assurance to a company's CEO, Board of Directors and Communities of Interest that tailings facilities are being effectively managed in conformance with the MAC tailings management framework.



► **A tailings facility** includes the collective structures, components and equipment pertaining to tailings impoundment and management, including dams and reservoirs, other related facilities and appurtenances.

► **Tailings Management System:** a documented set of processes and practices that enable an organization to manage its tailings safely and environmentally responsibly while increasing its operating efficiency.

# 1

## *Introduction*

The application of the protocols also provides a process to ensure that tailings facility management is being implemented comprehensively and effectively. This can benefit an organization by:

- increasing the awareness and understanding of tailings management issues by managers and employees;
- improving the facility management's ability to achieve tailings management objectives;
- providing a basis for and demonstrating due diligence in risk management;
- affirming compliance with regulatory requirements;
- reducing potential liability; and
- demonstrating a commitment to continual improvement.

Any areas of potential risk or weakness in management system design or implementation, as identified during a management system audit or assessment, will warrant follow-up.

Both protocols recommended in this *Guide* are practical tools. They can be applied to audits and assessments of tailings management throughout the life cycle of a tailings facility, from initial site selection and design, through construction and operation, to decommissioning and closure. Note, however, that audits and assessments are not intended to directly assess the safety of dams or any other technical aspect of a facility. These factors should be the subject of separate, specific technical or safety reviews within an overall tailings management system.

Audits and assessments of tailings management are specialized activities, and the processes and requirements for each are more fully elaborated upon in the following chapters.

# Chapter 2—Verification through Audit or Assessment

# 2

In this *Guide*, the terms “audit” and “assessment” describe two distinct protocols that, when employed, can provide assurance that tailings facilities are being managed effectively and are in accordance with the tailings management framework presented in *A Guide to the Management of Tailings Facilities*. The recommended protocols provide guidance on the approach and methodology of verification to be implemented either as an audit or as a more extended assessment. This guidance provides the information necessary to design a detailed plan for an audit or assessment, customized to site-specific needs.

- An *audit* is the formal, systematic and documented examination of an organization’s or facility’s conformance with explicit, agreed, prescribed criteria, which are often requirements stipulated in law or regulation or, in the case of this *Guide*, the MAC tailings management framework.

An audit is not based on opinion, nor is it designed to determine the root cause of deficiencies or to evaluate management system effectiveness.

- An *assessment* goes beyond measuring against stipulated criteria (as in an audit) to incorporate professional judgment in evaluating the effectiveness, implementation, application and maintenance of a management system.

An assessment is driven by a concern for the quality of system design and management process implementation. It can identify system deficiencies and determine their root cause to provide a basis for improving the process.

This *Guide* has been designed to assist in the audit or assessment of application of the MAC tailings management framework, which was originally introduced and has been recently updated in *A Guide to the Management of Tailings Facilities*. The two protocols address each aspect of the tailings management framework:

- Policy and Commitment
- Planning
  - Roles and responsibilities
  - Objectives
  - Managing for compliance
  - Managing risk
  - Managing change
  - Resources and scheduling
  - Emergency preparedness and response

# 2

## Verification through Audit or Assessment

- Implementation
  - Operational control, including OMS and monitoring
  - Financial control
  - Documentation
  - Training, awareness and competency
  - Communications
- Checking and Corrective Action
- Management Review

The *Guide* presents the two complementary protocols in separate, parallel chapters that address the above-listed aspects of the tailings management framework.

### **Audit (Chapter 3):**

- outlines the purpose and objective of audit; and
- provides specific questions to test conformance with the MAC Tailings Management Framework.

### **Assessment (Chapter 4):**

- outlines the purpose and objective of assessment;
- provides specific investigative checks to guide additional qualitative assessment of the management system; and
- provides guidance to the rating of management process effectiveness through examples of management process markers that meet the minimum accepted threshold expectations or that may be regarded as demonstrating leadership as a “best” practice.

The protocols are presented as a series of questions for audit and guiding statements for assessment:

- What elements of a tailings management system are in place?
- How are they organized and implemented?
- Who has responsibility and accountability?

Annexes to the *Guide* provide additional background and information:

- an approach to audit and assessment; and
- typical sources of information and evidence.

# Chapter 3—Tailings Management System Audit

# 3

## Policy and Commitment

**Purpose:**

*to verify that a tailings management policy has been established that expresses intentions, commitments and principles in relation to tailings management.*

Is there a policy statement that describes the commitment to tailings management?

Is it signed and dated by current senior management?

Does the policy include commitments to:

- implementing the principles outlined in the MAC tailings management framework;
- locating, designing, constructing, operating, decommissioning and closing tailings facilities in a manner such that:
  - all structures are stable;
  - all solids and water are managed within designated areas; and
  - all aspects of tailings management comply with regulatory requirements and conform with sound engineering practice, company standards, the MAC TSM Guiding Principles, the MAC tailings management framework, and commitments to Communities of Interest;
- taking responsibility for implementing this framework through the commitments and actions of its employees;
- consulting with Communities of Interest, taking into account their considerations relating to the tailings facility management; and
- establishing an ongoing program of review and continual improvement to manage health, safety and environmental risks associated with tailings facilities?

## Roles and Responsibilities

**Purpose:**

*to verify that responsibilities and accountabilities for tailings management are specified, that all employees are aware of their respective roles, and that a tailings management reporting structure has been established.*

Has overall accountability for tailings management been assigned to an executive officer (CEO or COO) of the company, with responsibility for ensuring that an appropriate management structure is in place?

Have both the corporation and its Communities of Interest been provided assurance that tailings facilities are managed responsibly?

► *Executive accountability for tailings management is necessary to signal the importance of tailings facilities to our business and the adverse impacts that improper tailings management practices may have on the environment and our reputation.*

*It is expected that the executive officer will delegate responsibility for tailings management, budgetary issues and other tailings-related functions to operations and other senior corporate personnel, while retaining overall accountability for the management of tailings and its outcomes.*

# 3

## Tailings Management System Audit

► *Tailings facility plans typically address:*

- *objectives, targets and performance measures;*
- *permits and approvals;*
- *communication procedures among the team with senior management and with Communities of Interest;*
- *site selection and characterization criteria;*
- *safety, environmental and engineering design criteria;*
- *construction, operating, decommissioning and closure procedures;*
- *requirements for documentation, including as-built records;*
- *maintenance, surveillance, inspection, reporting and review requirements; and*
- *knowledge and skills requirements.*

Have roles, responsibilities, budgetary authority and reporting relationships been:

- defined;
- assigned; and
- communicated

to implement the tailings management framework through all stages in the facility life cycle?

### Objectives

**Purpose:**

*to verify that objectives and targets for effective tailings management through all stages of the life cycle have been established and provide a basis for planning to manage tailings in conformance with the tailings management policy.*

Are objectives and targets established for the tailings facility?

- Do they deal with all phases of the facility life cycle, including eventual closure?
- Are they consistent with regulatory requirements, company standards, the MAC tailings management framework, commitments to Communities of Interest, and sound engineering and environmental practices?

Are the tailings facility plans also in accordance with regulatory requirements, company standards, the MAC tailings management framework, commitments to Communities of Interest, and sound engineering and environmental practices?

Have Communities of Interest been consulted to identify appropriate community expectations for tailings facilities?

Does the closure plan address:

- protection of public health and safety;
- mitigation of negative environmental impacts; and
- acceptable post-closure use within a feasible technical and economic framework?

### Managing for Compliance

**Purpose:**

*to verify that the requirements of applicable regulations, permits and other commitments are understood by and communicated to all facility employees, and that there are management processes in place to ensure compliance.*



## Tailings Management System Audit

Are the legal requirements for, and actions needed to ensure compliance of, the tailings facility known, documented and communicated to facility employees?

Are processes and procedures in place to ensure measurement and compliance?

Is there evidence that the facility is in compliance with legal requirements?

Have objectives and management plans been established to address compliance issues, including for the reporting on non-compliance?

### Managing Risk

**Purpose:**

*to verify that there is a risk management plan that addresses risks associated with a tailings facility throughout its life cycle.*

Is there a formal risk management plan in place?

Does the risk management plan include:

- a definition of acceptable risk in the context of the facility;
- a formal risk assessment that identifies, evaluates and ranks possible triggers and failure modes associated with the tailings facility throughout its life cycle;
- processes and procedures to minimize the likelihood of adverse safety or environmental impacts and to detect and respond to potential failures at the facility? (See also the section on emergency preparedness and response.)

### Managing Change

**Purpose:**

*to verify that processes and procedures are in place to ensure that the integrity is maintained of both the tailings management system and the approved facility designs and plans, and that:*

– *temporary or permanent modifications or alterations to physical plant, design,*

*construction, operation, controls, personnel, procedures; or*

– *changed regulations, operating conditions or other requirements*

*do not introduce new, unacceptable, and/or unmanaged environmental, health or safety risks into the operation of the tailings facility or affect the integrity of the facility.*

Have processes and procedures been established and documented:

- to ensure that the integrity of both the management system and the approved facility designs and plans is maintained during implementation; and

# 3

## Tailings Management System Audit

- to manage changes made to approved personnel, roles and responsibilities, designs and plans?

Has a process been established to identify, evaluate the impact of, approve and document changes made to approved plans or designs?

Has a process been established to identify, evaluate the impact of, and document changes to legal requirements?

Are procedures updated to incorporate changes?

### **Resources and Scheduling**

**Purpose:**

*to verify that human, physical and financial resources essential to implementing the tailings facility management are defined and allocated.*

Have the resources and schedule required to manage tailings effectively and safely been defined and allocated, including:

- staffing;
- design and review support;
- specialized skills development;
- technology and equipment; and
- financial resources?

Have adequate human and financial resources been allocated for decommissioning and closure?

### **Emergency Preparedness and Response**

**Purpose:**

*to verify that procedures and resources to effectively respond to reasonably foreseeable emergency situations associated with a tailings facility are defined and in place.*

Have the tailings facility and its related operations been systematically examined to identify possible accident or emergency situations, such as through the risk management plan?

Have procedures been developed and documented for response to emergency situations as they arise, and to prevent and mitigate potential impacts?

Are the emergency preparedness and response plans consistent with identified possible emergency situations?

Are employees trained in emergency response?

## Tailings Management System Audit

Have the emergency preparedness and response plans been communicated to internal and external interested and affected parties?

Are the emergency preparedness and response plans tested on a regular basis, and are the results of such tests documented and reported?

### Operational Control

**Purpose:**

*to verify that effective operational controls are in place to implement the tailings management plans, to achieve compliance and objectives, and to manage risks throughout the facility life cycle.*

Are operational controls in place to ensure:

- implementation is in accordance with legal requirements, approved designs, plans, sound engineering and environmental practices, and the MAC tailings management framework, including:
  - assembling a qualified team with assigned responsibilities;
  - routinely and regularly inspecting, monitoring, testing, recording, evaluating and reporting key characteristics and performance parameters of the tailings facility;
  - calibrating equipment;
  - identifying existing or emergent problems; and
  - tracking performance and compliance with legal requirements, targets and objectives;
- all required permits and approvals are acquired and maintained; and
- contingency plans and emergency preparedness and response plans are implemented and tested periodically?

Are procedures in place to detect, document and correct non-conformance with plans and deviations from operational procedures, objectives and targets?

### Financial Control

**Purpose:**

*to verify that financial resources allocated to tailings management are effectively applied to ongoing operation, maintenance and surveillance of the tailings facility.*

Have financial resources, commensurate with the defined objectives and needs, been allocated for tailings management?

# 3

## Tailings Management System Audit

Has a financial control system been implemented to track capital and operating costs of tailings management?

Are financial controls and cost provisions reviewed regularly?

### **Documentation**

**Purpose:**

*to verify that current information on tailings management is made available to employees for carrying out their responsibilities, that records relating to the tailings management are maintained, that appropriate information is available for training employees, and that records are maintained to demonstrate due diligence in tailings management.*

Is there a document management system, for both electronic and hard copy, to ensure that key aspects of tailings management are documented?

Are required documents periodically reviewed, revised or updated?

Does the system include a document control program to ensure that:

- current versions of documents, including as-built drawings, are located at readily accessible, identified locations; and
- obsolete versions of documents are promptly removed from use and retained in a secure place to provide a historical record?

### **Training, Awareness and Competency**

**Purpose:**

*to verify that procedures are in place to ensure that personnel employed in tailings management are competent, have a full understanding of the requirements of the facility operation and management, and are aware of impacts that may result from the facility.*

Are the personnel who are employed for tailings facility design, construction, operation, decommissioning and closure qualified by virtue of education, experience, training, and/or testing?

Is appropriate training provided to all personnel, including contractors and suppliers, whose work may significantly affect the tailings facility, specifically addressing:

- facility management plans, permits and approval requirements;
- the importance of conformance with design, operational controls and change management procedures;
- potential risks;

## Tailings Management System Audit

- significant actual and potential environmental impacts;
- emergency preparedness and response requirements; and
- individual roles and responsibilities in achieving conformance with the requirements?

### Communication

**Purpose:**

*to verify that procedures are in place for appropriate two-way communication of significant information and decisions with all relevant personnel, including senior management, and for open and effective communication of performance and significant issues respecting tailings management with Communities of Interest.*

Are documented procedures implemented for communications among all personnel who have roles and responsibilities in implementing the tailings management plan?

Do the communications procedures address reporting significant information and decisions regarding the management and performance of tailings facilities to senior management and to Communities of Interest?

### Checking and Corrective Action

**Purpose:**

*to verify that procedures are in place for periodic checking of the tailings management system to ensure policies and commitments are being met, objectives and targets are being attained, and plans and procedures are being followed, and, where there is a non-conformance, that there is appropriate response.*

Are procedures in place for periodic formal inspection and review of the entire tailings facility, to:

- measure progress towards attainment of objectives and targets;
- confirm facility operation in compliance with regulatory requirements and in conformance with plans and commitments;
- review existing or emergent problems;
- re-visit the facility design, construction, operation, decommissioning and closure plans and programs;
- update the evaluation of downstream risks, the overall risk assessment and the risk management plan;
- evaluate performance in the management of tailings;

# 3

## *Tailings Management System Audit*

- evaluate the need for changes or updates to risk management plans, contingency plans and emergency preparedness and response plans;
- identify items requiring corrective action; and
- communicate promptly the results of such inspection and review to senior management?

Is the schedule for formal inspection and review documented, and is it appropriate for the level of identified risk?


Are procedures in place to ensure timely corrective action to non-conformances, including:

- development of action plans; and
- assignment of accountability, responsibility and timelines for completion?

### ***Management Review for Continual Improvement***

***Purpose:***

*to verify that the tailings management system is reviewed annually, that it remains effective and that it drives continual improvement in performance.*



Is there an annual corporate review of tailings management to:

- evaluate the performance of the tailings management system, considering inspection, audit and assessment reports, changing circumstances, monitoring results, spills and other incidents, recommendations, and the commitment to continual improvement;
- evaluate the continuing adequacy of, and need for changes to, policies and objectives and performance of the tailings management system; and
- address the need for changes to commitments to Communities of Interest.

Are the results of the annual review of tailings management reported to the accountable executive officer?

# Chapter 4—Tailings Management System Assessment

# 4

## **Preamble**

An assessment of a tailings management system builds on and extends the audit process, from an essential evaluation of conformance with the MAC tailings management framework to a qualitative assessment of the effectiveness, implementation, application and maintenance of actual tailings management processes. The assessment protocol thus begins with and includes the audit protocol questions presented in Chapter 3. The responses to those questions provide a starting point for the recommended additional checks presented in this chapter, which are designed to elicit qualitative information on the underlying management processes.

## **Policy and Commitment**

### **Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of policies and commitments for tailings management.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the process for developing, implementing, maintaining and reviewing the tailings management policy. Evaluate how the policy:

- was developed;
- aligns with the organization's overall business strategy and vision;
- expresses the level of commitment expected;
- is reviewed and how often it is updated by senior management; and
- is communicated to and how well it is understood by employees.

Also evaluate how Communities of Interest have been involved in the development and review of the policy, including their level of involvement and how the policy is made available to them.

# 4

## Tailings Management System Assessment

Policy and Commitment	
Meets Threshold Expectations	Leadership Position
<p>The facility has formal policy and commitments consistent with the MAC tailings management framework as presented in <i>A Guide to the Management of Tailings Facilities</i>, perhaps embedded within overall site management policies, endorsed by senior management and effectively implemented. Budgets are allocated specifically for tailings management.</p> <p>The policy statement is current and signed by senior management.</p> <p>The process for regularly reviewing the policy is informal.</p>	<p>It is formally demonstrated that the implementation of corporate policy and commitments on tailings is consistent with the MAC tailings management framework.</p> <p>The tailings management policy and commitments are consistent and aligned with the company's overall business strategy and vision.</p> <p>The policy statement is a living document, reflects business risks and is formally and periodically reviewed and revised, particularly in the event of significant incidents.</p> <p>Independent validation of corporate policy and commitments on tailings has been implemented.</p>

### Roles and Responsibilities

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of the assignment of roles, responsibilities and accountabilities with respect to tailings management to ensure that all employees are aware of their respective roles and that a tailings management reporting structure has been established.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Identify the executive officer assigned overall accountability for tailings management.

Review how that accountability has been assigned.

Evaluate how the tailings management structure implemented by the executive officer provides assurance to the corporation and its Communities of Interest that tailings facilities are managed responsibly.

Evaluate how roles, responsibilities, budgetary authority and reporting relationships have been assigned for:

- establishing tailings facility objectives and targets;



# Tailings Management System Assessment

# 4

- maintaining awareness of current legislation and other requirements, future regulatory trends, and compliance with regulatory and other requirements;
- managing risk;
- managing change;
- ensuring adequate human, technological, and financial resources are assigned to locate, design, operate, decommission and close tailings facilities in accordance with the policy and objectives;
- establishing operational controls, including adherence to them;
- conducting training and evaluating the competencies of tailings management personnel;
- maintaining documented procedures, including the OMS manual, and important records;
- establishing and maintaining document control systems;
- receiving, evaluating and responding to information requests from employees and Communities of Interest;
- communicating important information to employees and Communities of Interest;
- identifying and evaluating non-conformance and implementing corrective and preventive action;
- conducting management reviews for continual improvement; and
- developing, implementing and maintaining emergency preparedness and response.

Evaluate how roles, responsibilities, accountabilities, and authority levels are communicated to affected personnel.

Evaluate how the organization manages potential for overlaps or conflicts between individuals and assigned roles, responsibilities, accountabilities and authority levels.

Evaluate how departures from established standards or requirements are made:

- who has assigned authority to grant such departures; and
- what processes ensure that departures from established standards or requirements are reported and documented?

# 4

## Tailings Management System Assessment

Roles and Responsibilities	
Meets Threshold Expectations	Leadership Position
<p>Formal assignment of specific responsibilities and accountabilities for tailings management to an executive officer (CEO or COO) of the company, with responsibility to ensure that an appropriate tailings management system is in place to provide assurance that tailings facilities are managed responsibly.</p> <p>Tailings management team has clearly defined and documented roles, responsibilities and accountabilities to implement the framework through all stages in the tailings facility life cycle..</p>	<p>The executive officer assigned overall accountability for tailings management actively promotes responsible management of tailings through the tailings management system to provide assurance to the corporation and its Communities of Interest that tailings facilities are managed responsibly.</p> <p>The company can demonstrate that the roles, responsibilities and accountabilities of staff have been assigned and are well understood.</p> <p>The executive officer participates directly in consultations with Communities of Interest to underscore the commitment for responsible tailings management.</p>

### Objectives

#### **Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of established objectives and targets for tailings management in conformance with the tailings management policy and commitments through all stages of the life cycle.*

In addition to the questions posed for this aspect of the tailings management system included in the Tailings Management System Audit protocol (Chapter 3), undertake the following reviews and evaluations.

Review the process used for establishing objectives and targets for the tailings facility, in line with stated policy.

Identify who is responsible and accountable for setting objectives and targets for tailings management.

Evaluate the processes used to ensure that tailings facility objectives, targets and plans, including closure plans, are:

- prioritized in relation to the results of risk assessments;

# Tailings Management System Assessment

# 4

- applied to maintain compliance with relevant regulatory requirements, company standards, the MAC tailings management framework, commitments to Communities of Interest, and sound engineering and environmental practices;
- meaningful and measurable;
  - tracked using meaningful and measurable indicators;
  - developed in association with the employees who are responsible for achieving them;
  - communicated to those individuals who are expected to achieve them;
  - aligned with the views of external Communities of Interest;
  - regularly reviewed and correlated to performance, and then revised, as necessary, to reflect desired improvements in tailings facility performance; and
  - reviewed and revised to reflect significant lessons learned from incidents.

Objectives	
Meets Threshold Expectations	Leadership Position
<p>Objectives, targets and action plans are set for tailings management through an annual, informal planning process.</p> <p>Objectives are developed based on identified significant risks, regulatory requirements and commitments, and decommissioning and closure requirements.</p> <p>Measurable tailings management objectives are incorporated and tracked in the business strategic plan, and accountability for delivery is assigned</p>	<p>Objectives for tailings management are established using similar processes to those for a business plan. They are strategic in scope, measurable, tracked, and take into account stakeholder needs, risks posed to the business, business opportunities that could be realized through effective tailings management, and the business strategic plan.</p> <p>Objectives are kept current through periodic review, and targets and action plans are correspondingly updated.</p> <p>The objectives include consideration of sustainable development, climate change, life-cycle analysis, and future scenario planning.</p>

## Managing for Compliance

### **Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of management processes to ensure compliance with applicable regulations, permits and other commitments, and to ensure that these are communicated to all employees who are responsible for compliance.*

# 4

## *Tailings Management System Assessment*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

# Tailings Management System Assessment

# 4

Review the processes and procedures that are used to:

- identify and track changes to legal and other requirements with which the facility must comply; and
- ensure compliance with permit conditions (e.g., monitoring frequency, reporting schedule, documentation).

Evaluate how the compliance processes and procedures:

- assign responsibility for maintaining current awareness of legal and other requirements;
- ensure that the tailings or water management facility incorporates legal and other requirements into its objectives;
- communicate legal and other requirements to those expected to comply with them; and
- ensure the completion of periodic environmental, health and safety compliance audits.

Managing for Compliance	
Meets Threshold Expectations	Leadership Position
<p>Compliance and associated monitoring requirements are documented and well integrated into operating procedures.</p> <p>Action plans are in place to ensure that calibration of equipment, monitoring effectiveness, and compliance; accountability for delivery is assigned.</p> <p>Compliance exceptions are minor and are addressed in a timely manner.</p> <p>Regulatory developments are tracked on an ongoing basis and communicated through the organization to those responsible for compliance.</p>	<p>Compliance is consistently achieved and strong systems are in place.</p> <p>Compliance status is routinely and transparently reported to the public.</p> <p>Permit needs are identified early. Permit development and negotiation process is streamlined.</p> <p>There is active participation in development of regulatory agenda.</p> <p>In all jurisdictions, including those without a strong regulatory framework, the facility applies technically proven measures to protect the health and safety of their employees, contractors and communities and seeks to minimize the impact of their operations on the environment and biodiversity, through all stages of development, from exploration to closure.</p>

## Managing Risk

### **Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of the risk management plans to ensure management of risks associated with a tailings facility throughout its life cycle.*

# 4

## Tailings Management System Assessment

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the risk management system. Evaluate how it addresses:

- hazard identification, risk assessment and risk management, including the definition of unacceptable risk;
- appropriateness of the hazard identification methodology for the facility and its unique issues (e.g., what-if, what-if-checklist, potential problem analyses, failure mode effects analysis, hazard and operability studies);
- training for personnel involved in risk management (e.g., issue identification, risk assessment, ranking);
- ranking and prioritizing risks, setting action thresholds (risk tolerance) and communicating the results of risk assessments;
- maintenance of a “risk register” to ensure that issues raised are not eliminated until actions are taken or the risk reassessed and found to be below an acceptable threshold;
- recommendations for mitigation of unacceptable risks; and
- ensuring that risk assessments are current and adequately reflect current conditions, operations and processes.

► *Effective risk assessment is the cornerstone of a management system for the design, construction, operation, decommissioning and closure of tailings facilities.*

# Tailings Management System Assessment

# 4

Managing Risk	
Meets Threshold Expectations	Leadership Position
<p>A formal hazard identification, risk assessment and risk management program is in place for the facility, including mitigating, contingency and emergency plans to deal with significant risks throughout the full life cycle.</p> <p>Methodologies used are appropriate to the risks being considered and are documented.</p> <p>The process covers the major health, safety and environment risks, and ensures that new or changing risks are identified and appropriately evaluated.</p> <p>Hazards or issues are assessed, ranked and prioritized for normal operating conditions, shut down and startup and reasonably foreseeable emergency situations.</p> <p>Communities of Interest are consulted to inform them of the risk profile and risk management plans.</p> <p>Tailings management risk information is generally timely for business decision making.</p>	<p>The process addresses the full range of relevant health, safety and environmental risks, including emerging issues. Business management has a detailed understanding of the health, safety and environmental risks it faces.</p> <p>The process is incorporated into routine decision making, requiring business managers to consider tailings management risks for operations, business and strategic planning.</p> <p>Rigorous, well-documented assessments of tailings management risks yield highly reliable, replicable results well accepted by business managers.</p>

# 4

## Tailings Management System Assessment

### Managing Change

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of processes and procedures to manage change in the tailings facility management, to ensure that temporary or permanent modifications do not introduce new, unacceptable, and/or unmanaged environmental, health or safety risks into the operation of the tailings facility or affect the integrity of the facility.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Determine who has been assigned the responsibility for:

- filing change requests;
- training employees; and
- updating process safety information and operating procedures, and ensuring the conduct of necessary reviews.

Review the management of change process. Evaluate how it:

- defines change;
- sets the scope of the management of change process (i.e., what is included, at what level, and what is not);
- involves all necessary employees (including environmental and permitting functions);
- links the management of change process to the facility risk identification and management process;
- requires risk assessments to ensure that changes are not introducing new risks, including recommendations for action to mitigate risk;
- confirms that risk assessments and mitigation actions are documented;
- identifies authority levels required to:
  - approve changes in design, construction, operation, or decommissioning of tailings facilities;
  - review work orders and purchase orders,
  - grant extensions to temporary changes; and
  - make emergency changes;
- ensures that permits, site plans, process and instrumentation diagrams and documentation of operating procedures, etc., are kept current and reflect changes made;



# Tailings Management System Assessment

# 4

- requires that action plans to mitigate risks are followed up to ensure that planned actions were actually carried out;
- includes a process to ensure that temporary changes are time limited;
- grants extensions to time-limited temporary changes, and makes provision for emergency changes;
- requires that employees affected by the changes are informed of them; and
- ensures that major changes result in updating the training materials, and if needed, retraining of affected employees.

Managing Change	
Meets Threshold Expectations	Leadership Position
<p>There is a formal process in place that defines changes subject to change management procedures and that provides direction on managing the risks that may be associated with changes to processes, plans, procedures, equipment and controls.</p> <p>There is a defined time limit for temporary changes and clear definition of idle and redundant plans.</p> <p>Changes are subject to a formal approval by a qualified individual with designated accountability.</p> <p>Change approvals take into account possible impacts on the integrity of the facility and current "approved" designs and permits.</p> <p>Operating instructions, training manuals and other documents are modified, as necessary, to reflect the result of changes, and these changes are communicated to all who have a need to know.</p> <p>There is a systematic process for maintaining site plans and process and instrumentation diagrams for all process modifications and additions, and these are readily accessible in hard or electronic copy.</p>	<p>There is evidence that management of change procedures are consistently followed.</p> <p>Communities of Interest are consulted to inform them of change management procedures.</p>

# 4

## Tailings Management System Assessment

Formal hand-over and commissioning procedures are in place.

The change management procedures are kept current.

### Resources and Scheduling

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of the definition and allocation of human, physical and financial resources essential to the implementation of tailings facility management.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review how human, physical and financial resource requirements to manage the tailings facility in conformance with the policy, objectives and targets are identified and allocated.

Evaluate how progress is tracked against the schedule.

Resources and Scheduling	
Meets Threshold Expectations	Leadership Position
<p>There is formal designation of the essential resources and schedule required to effectively and efficiently implement tailings management.</p> <p>Resources and scheduling requirements are reviewed regularly.</p> <p>The resources and scheduling designated in the resource plan are actually assigned to the facility and tracked.</p>	<p>The tailings facility is managed as a discrete business unit, with specific assignment of resources, accountabilities and reporting.</p> <p>Where possible, Communities of Interest are aware of this formal designation, review and assignment.</p> <p>Any company cost cutting or downsizing considers risk management for tailings.</p>

## **Emergency Preparedness and Response**

### **Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of procedures and resources to respond to reasonably foreseeable emergency situations associated with tailings facilities.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the emergency preparedness and response procedures, and allocated resources. Evaluate how they:

- ensure emergency situations that could be reasonably anticipated to occur are identified, including potential on-site and off-site related impacts;
- ensure that the emergency preparedness and response plans are consistent with identified emergency situations;
- ensure that contractors, visitors, emergency response personnel, mutual aid teams, etc. have been trained on their responsibilities and designated actions under the emergency plan; and
- ensure that all emergency contact services numbers are kept up-to-date, readily available and listed in a prominent part of the plan.

Evaluate how the emergency preparedness plan for the tailings facility has been:

- integrated into the overall emergency preparedness and response plans for the broader mine site: and
- is periodically tested and updated.

Evaluate how the facility enters into and manages agreements with other organizations (e.g., fire, rescue, police) as appropriate to provide equipment and assistance during an emergency. For example, has the facility adopted the recommendations of the UNEP Guidance for the Mining Industry in raising *Awareness and Preparedness for Emergencies at the Local Level* (APELL)?

Determine if an emergency mutual assistance agreement has been effected with other operators in the region.

# 4

## Tailings Management System Assessment

Emergency Preparedness and Response	
Meets Threshold Expectations	Leadership Position
<p>The facility operations are systematically examined to identify potential accidents or emergency situations.</p> <p>There are formal procedures for preventing and mitigating the potential impacts and for responding to emergency situations as they arise.</p> <p>Employees are trained in emergency response.</p> <p>The emergency preparedness and response plan has been communicated to internal and external interested and affected parties.</p> <p>The facility emergency response plan is coordinated with overall corporate emergency preparedness and crisis management plans.</p> <p>Effective coordination exists with local authorities and off-site response and service providers.</p> <p>Communities of Interest are informed of the plan, how it is implemented and how it may involve local communities.</p> <p>The emergency preparedness and response plan is regularly tested, the plan is updated to reflect site changes and lessons learned, and the results documented.</p>	<p>The facility emergency response plan is tested by means of simulated incidents involving external emergency services and the community, particularly downstream water users or inhabitants.</p> <p>Communities of Interest provide input into the development of the facility emergency response plan, and the plan is regularly reviewed with Communities of Interest.</p>

# Tailings Management System Assessment

# 4

## **Operational Control**

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of operational controls to achieve compliance and objectives, and to manage risks throughout the facility life cycle.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the operational controls in place at the tailings facility, especially as they relate to priority risks and environmental impacts, including:

- engineering controls;
- administrative measures;
- personal protective equipment; and
- other measures, such as standard or specified operating procedures.

Evaluate how the operational controls:

- are developed, authorized, approved and implemented;
- specify roles, responsibilities, accountabilities and authorities;
- are integrated into employee training;
- address startup, shutdown, emergency shutdown, and startup after an emergency shutdown;
- are documented; and
- are periodically reviewed, audited and/or inspected.

Evaluate how non-conformance with operational controls is managed.

Review the document control procedures related to operational controls and verify that document management requirements are being met.

# 4

## Tailings Management System Assessment

Operational Control	
Meets Threshold Expectations	Leadership Position
<p>Effective controls are in place to manage risks, including health, safety and environmental requirements, to achieve compliance and objectives, and to provide effective tailings management throughout the facility life cycle.</p> <p>The facility has a tailings OMS manual in conformance with <i>Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities</i> that is fully implemented; roles and responsibilities for operating personnel are documented; formal training plans for personnel are implemented; clear lines of reporting are defined between operators, maintenance, surveillance and management personnel; and emergency preparedness and response plans are documented.</p> <p>Tailings management standards and procedures are consistent with other operating procedures. While they may be “stand-alone” documents, for example, contained in a tailings OMS manual, there has been an attempt to ensure that they are relevant to the line organization and to operational realities.</p> <p>Procedures are subject to a formal approvals process that involves line management.</p> <p>Operational controls and responses are routinely tested.</p> <p>Communities of Interest are informed of pertinent operational controls as well as pertinent changes to operational controls and procedures.</p>	<p>There is validated implementation of:</p> <ul style="list-style-type: none"> <li>■ effective controls to manage risks, achieve compliance and objectives, and provide effective tailings management throughout the facility life cycle</li> <li>■ an OMS manual in conformance with <i>Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities</i>;</li> <li>■ a formal annual review of the OMS manual to ensure that it truly reflects current conditions, particularly in the event of significant incidents;</li> <li>■ an annual management review of the overall tailings management policy; and</li> <li>■ emergency preparedness and response plans testing.</li> </ul> <p>Employees are engaged in developing, reviewing and updating the operational controls.</p> <p>Tailings management standards and procedures are integrated into, and are seamless with, standard operating procedures and work instructions for managing operations.</p>

# Tailings Management System Assessment

# 4

## Financial Control

### **Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of financial controls for ongoing operation, maintenance and surveillance of the tailings facility, including for eventual decommissioning and closure.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the allocation and tracking of financial resources for tailings management.

Evaluate how:

- the financial resources to meet tailings facility policy, objectives and targets are identified and allocated;
- the costs for tailings management are tracked against budget; and
- financial resources for the decommissioning and closure of the tailings facility are allocated.

Verify that asset retirement obligation estimates are completed and submitted.

Financial Control	
Meets Threshold Expectations	Leadership Position
Sufficient financial resources have been allocated for ongoing facility design, construction, operation, maintenance and surveillance, as well as for eventual decommissioning and closure.	The organization's capital and operating budget decision-making process includes input from individuals who are responsible for operating and maintaining the tailings management system.
A financial control system to track capital and operating costs of tailings management has been implemented.	The tailings facility is managed as a discrete business unit, with specific cost codes and budgeting of tailings-related resources.
Financial controls and cost provisions are reviewed regularly.	

# 4

## Tailings Management System Assessment

### Documentation

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of documentation and information management to ensure that employees have current information available to carry out their responsibilities, that records relating to the tailings management are maintained, that appropriate information is available for training employees, and that records are maintained to demonstrate due diligence in tailings management.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the tailings management system documentation and the OMS manual.

Evaluate how the documentation and information management procedures:

- identify the important records and documents to control;
- establish roles and responsibilities for records and document control;
- ensure that only the most current version of procedures is available; and
- ensure that obsolete documents are archived for future reference and preservation of knowledge.

Documentation	
Meets Threshold Expectations	Leadership Position
<p>Facility plans, as-built drawings, procedures and processes required for the management of tailings facilities, as described in <i>A Guide to the Management of Tailings Facilities</i>, are prepared and kept up-to-date and immediately available to all who have need to access them.</p> <p>Records are kept to track achievement of targets, objectives and regulatory compliance at the tailings facility.</p> <p>Documents are periodically reviewed to ensure that they remain current.</p> <p>There are procedures for controlling documents relating to tailings management to ensure that:</p>	<p>There is validation that documentation of facility plans, as-built drawings, procedures and processes are prepared and kept up-to-date.</p> <p>Information technology is used to efficiently manage tailings management records.</p> <p>Document control systems are consistent across the facility.</p>



# Tailings Management System Assessment

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- the current version of a document is available and in use;
- obsolete documents are removed from use;
- superseded documents are archived; and
- an appropriate repository is designated for documents necessary to be kept post-closure.

Communities of Interest are informed of pertinent documentation that supports demonstration of the facility due diligence.

## ***Training, Awareness and Competency***

### ***Purpose:***

*to evaluate the effectiveness, implementation, application and maintenance of personnel training and experience to ensure a full understanding of the requirements of the facility operation and management and to be aware of the impacts that may result from the facility.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review how:

- competency requirements are developed for each job at the tailings facility (knowledge, training, physical capability etc.); and
- deficiencies in required competencies are identified.

Evaluate how the competency and training program addresses:

- overall site requirements for tailings management;
- job specific requirements;
- site-specific orientation;
- the need to understand tailings facility management plans, permits and approval requirements;
- the importance of conforming to design;

# 4

## Tailings Management System Assessment

- the identification and management of risk;
- the identification of significant environmental impacts; and
- emergency preparedness and response requirements.

Evaluate the way in which required training is provided, including:

- how the training is provided (i.e., external or internal courses);
- how the competencies of the trainers are assessed;
- what training materials are used;
- how training materials are developed and kept current;
- how the effectiveness of delivered training is assessed (written exams, observation on the job etc.); and
- how the requirement for refresher training is assessed.

Evaluate how contractors, new or transferred-in employees, become aware of requirements.

Evaluate how training is documented and communicated.

Competency	
Meets Threshold Expectations	Leadership Position
<p>Formal job descriptions for all work in tailings management are in place.</p> <p>A formal training plan exists that addresses training needs assessment for all personnel including, as appropriate, contractors and consultants working on tailings management. This includes specific environment, health and safety aspects for each job.</p> <p>Qualified personnel are employed for tailings facility design, construction, operation and closure.</p> <p>Processes are in place to test competency and to determine training needs.</p> <p>Training is delivered according to the plan, including refresher training.</p> <p>The job descriptions, training, course materials and the training plan are kept</p>	<p>There is demonstration that tailings personnel have the appropriate competencies on the basis of education, training or experience, including an understanding of the potential consequences of departure from procedures. Records demonstrating these competencies are retained.</p> <p>Awareness activities are fostered in a learning environment, beyond basic competency training needs.</p> <p>Employees are actively involved in the ongoing development and upgrading both of determining competency needs and of training programs.</p>

# Tailings Management System Assessment

# 4

current.

## Communication

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of communication procedures to ensure appropriate two-way communication of significant information and decisions with all relevant personnel, including senior management, and for open and effective communication of performance and significant issues respecting tailings management with Communities of Interest.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the procedures for the timely communication of relevant information about the tailings facility (e.g., policy, objectives and targets, operational controls, and overall tailings performance including safety, health, and environmental information) to employees and Communities of Interest.

Evaluate how:

- the communications system provides for two-way exchanges of views and information;
- the responsibility for ensuring effective communication has been assigned;
- records of relevant communications to employees and Communities of Interest are kept;
- the views of employees and Communities of Interest are considered in decisions about tailings management; and
- decisions regarding tailings management are reported back to employees and the Communities of Interest.

Communication	
Meets Threshold Expectations	Leadership Position
<p>Formal procedures are established and maintained for two-way communication of significant information and decisions to all relevant personnel, including senior management.</p> <p>The communication procedures include operating procedures and changes to</p>	<p>There is validation that procedures for communication of significant information and decisions, operating procedures and changes to procedures and reporting systems are in place, including procedures for communications with Communities of Interest.</p>

# 4

## Tailings Management System Assessment

procedures, company standards and expectations, and external requirements, including regulatory requirements. Reporting systems are in place to ensure that deficiencies or problems are promptly addressed and key performance indicators are tracked and reported.

Procedures for communicating with Communities of Interest are defined.

Formal, effective, two-way communication processes are established with Communities of Interest to ensure that their concerns are understood and acted upon, and to provide them with information on operational issues and performance related to tailings management.

Information technology is used to efficiently manage communications, making it immediately available to all who have need to access it.

### Checking and Corrective Action

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of procedures for periodic checking of the tailings management system to ensure policies and commitments are being met, objectives and targets are being attained, and plans and procedures are being followed and, where there is a non-conformance, that there is appropriate response.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review defined procedures for conducting periodic reviews and audits (internal or external) of the tailings management system and reporting of the results to senior management.

Evaluate whether and how the periodic reviews and audits:

- address all the elements of the tailings management system and operations, maintenance, and surveillance manual;
- are conducted by personnel appropriately trained in review and audit procedures;
- address compliance with regulatory requirements, conformance with operational controls, degree of attainment of objectives and targets, and adequacy of monitoring and measuring equipment calibration; and
- document results.

# Tailings Management System Assessment

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Review the program to ensure continuing adequacy of calibration and maintenance of monitoring equipment.

Evaluate the assignment of roles, responsibilities, and authorities to investigate and address non-conformance within the tailings management system (e.g., audit findings, inspection results, non-compliance with regulatory and other requirements, missed objectives and targets, etc.).

Review the procedures for action plans dealing with non-conformance and how it is managed.

Evaluate how these procedures address:

- identifying and investigating non-conformance;
- identifying the immediate and root cause of non-conformance;
- taking action to correct non-conformance and follow-up to ensure actions were effective; and
- ensuring that the actions carried out to mitigate non-conformance results in updating the tailings procedures and materials, and informing or retraining employees as appropriate.

Checking and Corrective Action	
Meets Threshold Expectations	Leadership Position
<p>Procedures are in place to regularly and routinely inspect, monitor, test, record, evaluate and report key characteristics of the tailings facility.</p> <p>Inspections are systematic and formalized, using checklists or other means to guide the inspection team.</p> <p>Procedures are in place to detect non-conformance with regulatory requirements, plans, design, construction, operation, decommissioning and closure of tailings facilities, deviations from operational controls and objectives and targets.</p> <p>Processes are in place to report non-conformance promptly and to take appropriate corrective action including developing action plans.</p>	<p>The checking and correction action processes are regularly, frequently and formally validated. This includes performing systematic audits commensurate with the identified risk of the facility.</p> <p>Communities of Interest are provided with opportunities to be involved in the checking processes, where appropriate.</p>

# 4

## Tailings Management System Assessment

### Management Review for Continual Improvement

**Purpose:**

*to evaluate the effectiveness, implementation, application and maintenance of the annual review of tailings management so that it remains effective and is driving continual improvement in performance.*

In addition to the questions posed for this aspect of the tailings management system included in the Audit Protocol (Chapter 3), undertake the following reviews and evaluations.

Review the process for planning and conducting annual reviews of tailings management.

Examine records of these reviews and evaluate:

- the scope and frequency of review;
- how the results of the reviews are documented, communicated and acted upon;
- how the results of the reviews are communicated to the accountable executive officer and corporate management;
- how the reviews evaluate:
  - performance of the tailings management system;
  - compliance with regulatory requirements and conformance with corporate standards, design criteria, closure and reclamation plans;
  - future performance objectives;
  - risk management requirements, including change management; and
  - audit and inspection results;
- processes in place to ensure that reviews address continual improvement to:
  - applicable policies;
  - operational controls;
  - training; and

# Tailings Management System Assessment

# 4

Management Review for Continual Improvement	
Meets Threshold Expectations	Leadership Position
<p>To drive continual improvement in performance, senior management conducts a formal, annual review of:</p> <ul style="list-style-type: none"><li>■ the adequacy of tailings management policies and objectives; and</li><li>■ the performance of the tailings management system..</li></ul>	<p>There is validation that the tailings management policies, objectives and management system performance are subject to formal annual senior management review for continual improvement.</p> <p>The company has shared the management review and entered into meaningful dialogue with Communities of Interest with respect to annual senior management review of the tailings management system.</p> <p>Action plans to address identified deficiencies are developed soon after completion of the management review. Responsibilities for completion are assigned and there is a follow-up process.</p>





# Annex 1—Approach to Audit and Assessment

# A1

***This section presents general guidance on audit and assessment processes; it is not specifically part of the audit protocol.***

## ***Introduction***

In an effective management system audit or assessment, consensus is obtained between the audit or assessment team and the operation being verified, and the final report represents a true reflection of the implementation of the management system and its effectiveness in meeting the needs of the operation.

To achieve these results, the team must be well qualified and experienced, the audit or assessment program must be well planned and professionally executed, and the audit or assessment and reporting must be open and transparent.

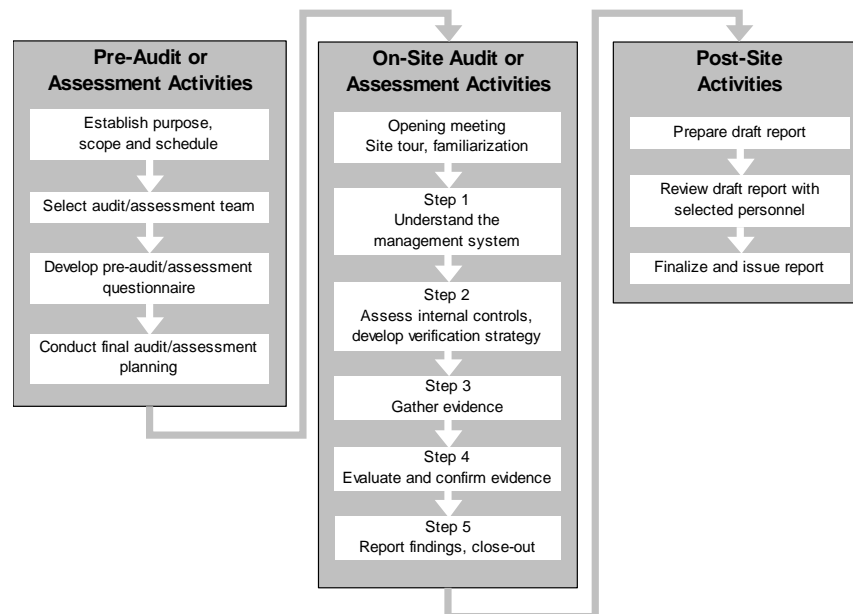
Verification, either by way of audit or assessment, involves:

- pre-audit or pre-assessment activities
- on-site audit and assessment activities (which follow a five-step process as illustrated in the following figure); and
- report preparation and distribution.

**Figure: Typical Audit or Assessment Schematic**

# A1

## Approach to Audit and Assessment



### ***Pre-Audit or Pre-Assessment Activities***

#### **Audit or Assessment Program Planning and Considerations**

Before committing resources to an audit or assessment initiative, it is important to carefully evaluate the context in which the audit or assessment program will be conducted. To use resources efficiently, to ensure that effort is not wasted or misdirected and to avoid liability, there are some fundamental issues that must be resolved.

#### **Objectives**

The starting point in designing a tailings management audit or assessment program is to understand fully the objectives. What is the audit or assessment expected to achieve? What questions is it intended to answer?

The audit or assessment leader needs to know who the principal clients of the audit or assessment are and must ensure that their needs and expectations are considered. There may be multiple clients being served by an audit or assessment, and their requirements may be very different.

Audit and assessment programs represent a significant investment for an organization, both in terms of finances and human resources. Not only is there a cost associated with fielding an audit or assessment team, but the audit or assessment process takes personnel away from their primary responsibilities, which can have an impact on production. The responsible audit or assessment manager will therefore seek to maximize the return on the investment that is being made in the verification. The audit or assessment can be designed to meet its primary objectives and also to

# Approach to Audit and Assessment

address special concerns of local facility management, thus providing “added value.” It may provide a useful learning experience for team members or it may be a means to transfer knowledge of how issues have been successfully resolved across the organization.

## Scope

Before embarking on an audit or assessment program, it is important that the scope and focus are clearly thought through. How scope and focus are defined will depend, of course, on the reasons for carrying out the audit or assessment. In particular, it is important to establish upfront whether the verification is an *audit* against stipulated criteria (the MAC tailings management framework) or a more broadly directed qualitative *assessment* of the tailings management.

## Audit or Assessment Team

Audits and assessments must be carried out by an individual or team who are independent, impartial and objective with regard to the evaluated site. They must have the following competencies:

- credibility with management;
- credibility with intended audience;
- knowledge of and experience in audit and assessment processes;
- knowledge of and experience in relevant mining processes; and
- understanding of:
  - the MAC tailings management framework;
  - benchmarks;
  - regulatory/permitting concepts;
  - tailings/water facility engineering concepts;
  - management systems;
  - risk management; and
  - socio-economic factors.

Where the audit or assessment is performed by a team, a team leader must be designated who will have additional specific responsibilities, including establishing the audit or assessment plan. The plan should contain the following information:

- objectives;
- duties and responsibilities of each of the members of the audit or assessment team;
- audit or assessment criteria;
- resources required;
- the proposed audit or assessment schedule; and
- protocols.

## *Approach to Audit and Assessment*

The protocol presented in this document provides a plan for the audit and assessment of an organization's tailings/water management practices. It also provides a format for assigning specific tasks to individual members of an audit or assessment team, for comparing what was accomplished during the audit or assessment and for summarizing and recording the work in progress and work to be completed. All members of the audit or assessment team should be very familiar with the sections of the protocol for which they will be responsible before they go on site.

A major advantage of using a comprehensive audit or assessment protocol is to ensure consistency in the process and to compare results between mining operations. This is particularly important where audit or assessment team membership is rotated.

Not every audit or assessment will follow every step outlined in the protocol, and modifying the procedure will be necessary to suit each case. No matter how comprehensive or detailed a protocol may be, it must be regarded as a guide, not a rigid tool. Every audit or assessment poses its own challenges, and the team should be prepared to be flexible and use good judgment in determining which elements of the protocol apply in each case. No audit or assessment guide can be fully comprehensive and predict all local requirements, and therefore the team must be alert to important issues that are not addressed by the guide.

### **Pre-Audit or Pre-Assessment Questionnaire**

Audits and assessments can be very disruptive to operations and can take away from other duties of the highly qualified people who will execute them. It therefore makes good business sense to try to minimize the time spent on site, which requires the team to be well prepared before commencing the fieldwork.

A pre-audit or pre-assessment questionnaire can help in the preparation. The questionnaire should be sent to the site at least two weeks before (and preferably earlier) the audit or assessment begins, and it should request information on the organizational structure of the facility (personnel who are responsible for various aspects of tailings management), the layout and nature of the operations, and special hazards, such as asbestos or ionizing radiation, that may be on site.

### **Other Pre-Audit or Pre-Assessment Activities**

The prudent audit or assessment team leader will ensure that several other tasks have been carried out before arriving on site:

- the most up-to-date regulations are available and have been considered in the audit or assessment protocol;
- the latest versions of corporate policies and procedures are available, if they are within the scope of the audit or assessment;
- the audit or assessment team has been picked with the right blend of skills to carry out the job efficiently and effectively, with the audit or assessment team members confirmed available on the dates scheduled for the verification;
- an audit or assessment plan that assigns responsibilities to team members has been prepared so that everyone knows exactly what is expected of them;

## *Approach to Audit and Assessment*

- time and costs have been budgeted for each task so that, as the audit or assessment progresses, it is clear whether things are on track or falling behind;
- special health or safety concerns have been addressed (e.g., special immunisation requirements, high-altitude adjustments); and

## ***Approach to Audit and Assessment***

- the logistics of getting the team on site, accommodated while carrying out the work and home again have been checked and double-checked. This task is especially important if international travel is involved and if team members are congregating from different home base locations.

Planning and forethought can go a long way to making an audit or assessment a success and an experience that benefits all those involved.

### ***On-Site Audit or Assessment Activities***

#### **Opening Meeting**

The opening meeting sets the tone for the whole audit or assessment. This meeting affords the opportunity to introduce the audit or assessment team and to explain the objectives of the audit or assessment. The scope and purpose should be very clearly defined so that there are no surprises for the facility being verified. The meeting also allows the audit or assessment team to become aware of local concerns or sensitivities (e.g., labour relations issues) and ensures that the team is fully advised of safety rules or special hazards on site.

The other main purposes of the opening meeting are to schedule initial interviews, define documents that the audit or assessment team may wish to review and generally sort out the logistics and arrangements for the verification. During the meeting, the facility personnel and the audit or assessment team should establish how the reporting of results will be handled, including end-of-day reviews.

#### **Site Tour**

Following the opening meeting, it is usual, and most effective, to carry out a brief tour of the facility. The purpose of this tour is to orient the team to the layout of the facility and to gain an appreciation of the nature and organization of the work being carried out.

#### **Audit or Assessment**

***Step 1—Understanding of management systems.*** It is not the intent, in conducting the initial phase of an audit or assessment, to attempt to assess fully the effectiveness of tailings management systems.

Rather, the verifier should aim to understand:

- how the facility has evaluated the applicability of existing regulatory standards, the MAC tailings management framework and other requirements to the facility;
- how the facility assesses and manages risks due to on-going operations, changes and controls risk, including regulated activities;
- whether management roles and responsibilities are clearly understood;
- what types of programs or activities are in place in to familiarize employees with tailings management information; and
- how the facility maintains and documents the effectiveness of its tailings management activities.

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**Step 2–Assessing internal controls.** An assessment of the relative strengths and weaknesses of the tailings management systems allows the audit or assessment team to prioritize its activities to focus first on inherently high-risk situations where the systems in place are least robust.

**Step 3–Gathering audit or assessment evidence.** The results of Step 2 (i.e., setting the audit or assessment priorities by assessing the strengths and weaknesses of management systems) provide the basic framework for the verifier to develop a sound and defensible audit or assessment strategy. Once the team has determined the priorities, a strategy can be developed on the basis of what resources are available, what needs to be done, how the information is to be gathered, where audit or assessment testing is to be applied and what sampling strategies are available. When gathering audit or assessment evidence, each verifier should ensure that the information evaluated is representative of the situation being assessed and is sufficient to verify compliance or to substantiate non-compliance.

The verifier can use a range of techniques to confirm information. Visually examining the facility and its operations and observing aspects of tailings management are often the starting points. The time spent observing operations in the facility will readily indicate whether the site is well organized and whether there is regard for safety and the environment.

Much evidence comes from personal interviews with facility personnel. The audit or assessment team can expect to interview a broad range of site people, including management, safety and health professionals, and personnel on the shop floor. Questions asked during these interviews allow the assessor to get a sense of the operating philosophy of the organization:

- what processes are meant to be in place, and what activities are supposed to be carried out;
- are these expectations communicated to and understood by line staff responsible for carrying them by out; and
- what is actually being implemented?

Certainly, having effective communication skills (and particularly listening skills) is one of the most important attributes of a successful verifier.

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In an audit, most of the questions used are “close-ended” or “leading” (prompting only yes or no responses). In an assessment, “open-ended” or “how-do-you-know” questions (prompting more detailed answers) are more typically used because the goal is to gain a better sense of the activities and processes in place, along with a measure of effectiveness of those processes in meeting the organization’s objectives. (The chart below illustrates examples of different types of questions.)

Type of Question	Example
Close-ended	Do you carry out monthly inspections of the dam? How often do you inspect the dam?
Leading	You conduct a monthly inspection of the dam don't you?
Open-ended	What inspection processes do you have for the dam?
How-do-you-know	How do you ensure the integrity of the dam?

After posing the questions, it is good practice to relate briefly to the interviewee what you have learned from the interview. The interviewee should be given the opportunity to volunteer relevant information that has not been covered in the questioning.

**Step 4–Evaluating the audit or assessment evidence.** Throughout the audit or assessment process, it is very important to maintain contact with other members of the team to verify all the findings based on observations made. As fieldwork is completed, the information gathered should be checked to ensure that it is relevant, free from bias, objective and persuasive. It should also be sufficient to support the objectives of the audit or assessment and the conclusions reached.

Audit or assessment evidence should be confirmed by supporting documents and/or observation. Activity or management responsibility required by MAC’s tailings management framework and its *OMS Guide* must be documented in sufficient detail to verify that it has been undertaken properly. Confirmation of findings can be achieved by:

- conducting further interviews;
- examining documents, reports and records;
- observing activities and conditions; and/or
- reviewing assay or test results.

A sufficient number of documented results, such as monitoring data, incident reports, and inspection records, should be reviewed to ensure that a representative sample has been considered.

**Step 5–Reporting audit or assessment findings.** To ensure the smooth and effective conduct of the audit or assessment, an ongoing dialogue with facility personnel should be maintained. End-of-day wrap-up meetings provide a very effective means of keeping management informed of progress and can prevent unpleasant and unnecessary surprises at the close-out meeting. The end-



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of-day meetings also help to keep the verifiers on track (e.g., if the information received has been misinterpreted or the verifiers have been talking to people who do not have the correct information).

### **The Close-Out Meeting**

It is very important that the audit or assessment team leader and team members are well prepared for their presentation, either oral or written, of the findings and observations. In particular, all team members must agree on the findings to be presented before the close-out meeting takes place. This is especially important where audit or assessment teams have not worked together before, or where they are made up of a mixture of corporate, facility and outside verifiers.

The close-out meeting should be viewed as a final opportunity for open dialogue between facility personnel and the audit or assessment team before the final report is written. It provides an opportunity to test, one last time, the findings that have been made, and gives the facility the opportunity to ensure that the contexts of the findings have been properly understood by the verifiers. Disagreements in the “facts” being reported should be noted and attempts should be made to resolve them.

### ***Reporting Activities***

#### **Audit or Assessment Report**

A completed tailings management audit or assessment must be finalized with a written report. The structure and content of the report will vary depending on the nature of the audit or assessment, its scope and purpose, and the client. For example, the report may be intended to give advice and guidance to local facility personnel, or it may be part of a corporate overview process, or it may be intended to provide assurance to boards of directors and officers of a company that due diligence has been exercised in the management of tailings facilities. It is strongly recommended that the audit or assessment team leader have a clear conception of the purpose of the final report as well as an appreciation of how it will be structured before embarking upon the audit or assessment. The report should be clear and concise, should provide the information needed by management to initiate corrective action and should describe a record of the conduct of the audit or assessment and its findings.

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A typical audit or assessment report will have a five-part structure:

- **Executive summary.** The executive summary should describe the most important findings in report, particularly those that may present significant liability or that indicate a serious failing in the management systems.
- **Introduction.** The introduction should provide:
  - site identification and relevant description;
  - the duration and dates of the audit or assessment;
  - the objectives, scope and criteria of the verification;
  - identification of the people involved (those people on site and the audit or assessment team members);
  - the methodology employed (i.e., the protocols used, types of document reviewed, number of interviews conducted, etc.); and
  - any aspects included in the original scope of the audit or assessment that were not addressed and the reasons why (e.g., lack of time, key information not available).
- **Findings.** The findings section should provide a conclusion that summarizes conformance, strengths and weaknesses in the implementation of the system. Generally, it is helpful to clearly separate regulatory findings, progress against items previously identified, findings of non-conformance with company policies, standards and procedures and situations in which there is a lack of adherence to generally accepted industrial standards or “good practices.” Documents and evidence reviewed should be listed.
- **Recommendations.** Reporting recommendations is optional in compliance *auditing*. However, in an *assessment* of management systems, any recommendations to correct deficiencies or areas of weakness to drive continual improvement should be included.
- **Noteworthy strengths.** Often, the audit or assessment report will highlight particular strengths in management systems or processes. This section is particularly important if a purpose of the assessment is to identify leading practices that can be shared across a company or industry.

### Report-Preparation Considerations

Findings presented in audit or assessment reports should be thorough, factual, clear, concise and accurate. All statements should be supported by evidence presented in the report, or should be readily defensible through reference to field notes. Wherever possible, specific information should be provided to put the finding in a proper context.

# Approach to Audit and Assessment

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## Distribution of Reports

A concern for the verifier is how to handle the distribution of the report, particularly when it may contain information that is critical of performance or sensitive. Many managers worry that by disclosing deficiencies in a facility's programs or reporting items of non-compliance with regulatory requirements individuals or the company may be put at risk or incur liability. These concerns, while real, are not sufficient for a prudent employer to avoid determining the status of tailings management performance by means of a well-managed audit or assessment program. Liability can be minimized by the corporation making a strong commitment to address issues of non-compliance in a forthright way and to put in place corrective actions when deficiencies are observed and reported. Such a commitment can be included in a corporate policy that requires an audit or assessment report to automatically trigger the process for reviewing deficiencies and initiating corrective action. The careful preparation of findings and prompt action to address deficiencies are by far the best protection against liability and the most responsive approach.

The distribution of reports must be considered in the planning stages of the audit or assessment. It is important to ensure that reports are not distributed too widely; the audit or assessment program manager and audit or assessment leaders must be very clear on who the client is, and must take direction from the client in the distribution of reports. In many circumstances, it will not be the individual being verified who is the client that commissioned the audit or assessment, and the individual being verified may not, therefore, be the owner of the report.

## Audit or Assessment Papers

The notebooks used during the audit or assessment constitute an important record of the verifier's activities and findings while on site. Notes should be clearly written and the pages should be dated and signed by the verifier. Any notes taken in working papers should be accurate accounts of what was done and what observations were made. All fact must be verified. The language used in notes should be prudent with no editorial comments. All exhibits should be numbered and referenced to notes in the working papers. As these records may be required at a later date, they should be carefully retained in secure storage.

## Follow-up

The follow-up of audit or assessment findings is the responsibility of the operator or the client who commissioned the audit or assessment. Follow-up should *not* be the responsibility of the audit or assessment team, or team leader, and, therefore, is not within the scope of the audit or assessment.



## **Annex 2—Sources of Evidence**

***This section presents general guidance on audit or assessment processes; it is not specifically part of the audit protocol.***

The information below suggests typical sources of evidence that can guide a verifier in undertaking an audit or assessment. It is arranged by the audit or assessment categories.

### ***Policy and Commitment***

Written procedure or flowchart for reviewing the applicability of the tailings management policy based on management reviews

The policy itself

Meeting minutes reviews, presentations, group meetings, ISO 14001 certification to verify discussion on tailings policy, distribution of policy information

Interviews with tailings employees to verify their understanding of the policy and to determine their views on management's commitment to fulfilling the terms of the policy, demonstration of commitment, etc.

### ***Roles and Responsibilities***

Organization charts

Personnel job descriptions

Core competency reviews

Personnel performance reviews including objectives setting (if not confidential)

Job procedures and work instructions where roles and responsibilities may be discussed

Interviews with key personnel

Statements of accountabilities and authority levels (for action, approvals, budgets, spending limits)

### ***Objectives***

Written documentation of objectives-setting exercises (typically a list or meeting minutes)

Employee interviews

Consultants' reports

Tailings facility policy

Training records

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## *Sources of Evidence*

### ***Managing for Compliance***

Services of a legal firm retained for the purpose

Subscriptions to a legal and regulatory updating service

Written procedure describing how the tailings or water management facility maintains current awareness of legal and other requirements

Industry association involvement

Interviews with tailings personnel

Regulatory non-compliance reports

Documented tasks associated with regulatory requirements, including timelines, and responsibility assignment

Documentation of responsibilities for dissemination of legal and other requirements

### ***Managing Risk***

Corporate risk management policy

Risk management system documentation (e.g., how are risk assessments carried out, the results ranked and actions plans formulated?)

Current and previous risk assessments

Interviews with personnel

Emergency preparedness plan

Operation, Maintenance and Surveillance manual

Relevant design documents—current and historical

Safety and incident records

Documented compliance with operational and regulatory requirements

Dam safety inspections and dam safety reviews

### ***Managing Change***

Documented procedures for the management of the risks potentially introduced through changes or in personnel, equipment, process chemicals, process technology, or modifications thereof

If documented procedures do not exist, interviews with key personnel to determine whether informal practices exist that serve a similar purpose

Training procedures and records

Existing project documents such as operating procedures, permits, site plans, workplace inspection procedures, etc. to determine whether they have been updated to reflect changes

Former risk assessment to determine whether it has been updated to reflect changes  
(See the section Managing Risk to evaluate risk introduced through change.)

## ***Resources and Scheduling***

Operating and capital budgets

Manpower and production schedules

Comparison of budget and actual cost reports

Asset retirement obligation estimates

Budgets that reflect objectives set for the tailings facility

Closure and decommissioning cost estimates

Interviews with key facility personnel

## ***Emergency Preparedness and Response***

Copies of emergency preparedness and response plans

Records of drills and practices and of reviews of drills

Telephone list contacts including off-site authorities

EPP training records

Communications with external emergency response agencies and affected parties

Inundation studies

## ***Operational Control***

Conformance with engineering standards

Interviews with key facility personnel

Comparison of significant risks, environmental impacts, and legal and other requirements with corresponding operational controls

Examination of operational controls themselves

## ***Financial Control***

Operating and capital budgets

Financial performance tracking documents

## ***Documentation***

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## *Sources of Evidence*

Written document control procedures

Interviews with key tailings facility personnel

Physical and electronic archives

Documents and records, including but not limited to:

- submissions to regulatory agencies
- permits and licences
- training records
- quality assurance/quality control reports, construction reports, photos, videos, etc.
- monitoring results
- unusual or special conditions
- as-built drawings
- dam surveillance and inspection records
- records of deviations
- design reports
- site operating manuals

### ***Training, Awareness and Competency***

Personnel interviews

Training needs assessments

Personnel performance reviews

Training modules

Operating and maintenance procedures

Training records including relevant test results

### ***Communication***

Documented communication procedures

Documentation of decisions, meetings, etc. Guide update to specifically note requirement for documenting communication records

New employee, contractor and consultant briefing programs

Public communication of important issues on bulletin boards, e-mail, website and other publicly accessible mediums

Departmental, interdepartmental committees and team meeting minutes

Company publications



Public liaison committees, open houses and town meetings

### ***Checking and Corrective Action***

Documented audit/assessment procedures detailing audit/assessment scope, frequency, methodology, requirements and reporting

Audit and assessment reports

Interviews with senior management to determine awareness of the contents of audit/assessment reports

Audit/assessment training records/certificates to ensure competency of auditors (for internal auditors)

Existence of performance metrics and tracking against same

Documented calibration procedures and records

Preventive maintenance procedures, schedules and records

Non-conformance reports

Investigation reports

Action plans to address non-conformances

Follow-up investigations to effectiveness of actions

Interim measures where permanent solutions must await resources

Reports to regulatory agencies

### ***Management Review for Continual Improvement***

Meeting minutes, schedules and agendas

Interviews with senior management and key personnel

Documentation from management reviews including presentations

Follow-up reviews on action items

System change documentation

Inspection and audit/assessment results



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