



Ministry of Environment and Climate Change Strategy

TECHNICAL GUIDANCE MIN-20

ENVIRONMENTAL MANAGEMENT ACT

DEVELOPMENT AND USE OF ADAPTIVE MANAGEMENT PLANS

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Environmental Protection Division

Purpose of this Guide

Adaptive Management Plans (AMPs) allows for decisions to be made in the face of uncertainty and provides a means to systematically reduce uncertainties and improve management practices over time by learning from the outcomes of operational activities. AMPs are tools that support the implementation of adaptive management efforts in accordance with authorization requirements. Typically, AMPs are prepared by authorization holders and their qualified professionals (QPs), for implementation as required through their authorizations. Because AMPs are legal requirements, they should be drafted clearly and understandable, and where implementation efforts can be easily tracked and monitored.

This guide serves as a reference for proponents and their QPs who are responsible for the preparation of AMPs. This guide focuses on recommended best practices for the preparation of AMPs.

AMPs are reviewed by Ministry of Environment and Climate Change Strategy (ENV) staff to ensure conformance with this guidance document and any other regulatory requirements, and to confirm that they are clear, the actions will be effective, and the language is enforceable. Adherence to the advice laid out in this guidance document in the preparation of the plan will not only result in more effective plans but will also reduce the likelihood that the plan will need to be significantly amended following ENV review. This will result in savings in time and expenses for the proponent.

Definitions

Discharge Standard – a requirement that limits the quality, quantity, frequency, and/or duration of the waste discharge including the maximum and/or mean limits for the concentration of contaminants of potential concern, including the period over which the limits are measured. Permit limits are an example of how discharge standards are set under EMA.

Numeric Performance Metric (NPM)- a measurable value that quantifies either the outcome or result of effluent treatment (i.e. the final effluent quality), or the performance of the treatment in removing a specified chemical constituent (i.e. load reduction). It forms the basis for a quantitative comparison of the quality of treatment plant inflows and outflows.

Residual Uncertainty – elements of project related risk to the environment that were incompletely characterized during the permit application process.

Site Performance Objective (SPO) - a target set for a location in the receiving environment to help ensure the performance of works and management practices. SPOs may be established as standards that must be met in the receiving environment (like a permit limit), conditions that must be true for a discharge to occur, or triggers for implementation of contingency measures or further investigations.

Trigger Response Plans (TRPs)- identify appropriate specific actions to be used in response to observed or measured changes in conditions that are approaching management objectives (i.e., to respond to increasing trends which may be approaching approved EMA permit limits). TRPs are a proactive measure to avoid non-compliance and to ensure impacts to the receiving environment are avoided.

Principles for Preparing an Adaptive Management Plan

An AMP addresses uncertainties through a process of designing assessments or experiments to provide a better understanding of the factors influencing potential effects of a discharge on the environment, or other uncertainties that may be at play in a particular circumstance. The results of these assessments are then used to determine refinements to modelling or impact assessment assumptions and to adapt management strategies, mitigations, actions, and methods so that attainment of environmental objectives or outcomes is achieved. As complexities and uncertainties increase on a given project, the importance of requiring an AMP increases. AMPs are “living” documents and need to be continually revised throughout the life of the project. AMPs need to respond to changes in the project and environment.

Adaptations developed from AMP findings may potentially include revisions to discharge standards, management plans, operational activities, and/or environmental benchmarks, which may require permit amendments or statutory approval prior to implementation. A permit requirement to establish an AMP should include a definition of scope or a requirement to develop a terms of reference for approval. Requirements to ensure implementation of the plan, evaluation of results, and a means to revise management practices, may also be included in the AMP.

The six stages of the adaptive management cycle are outlined in Figure 1 below:

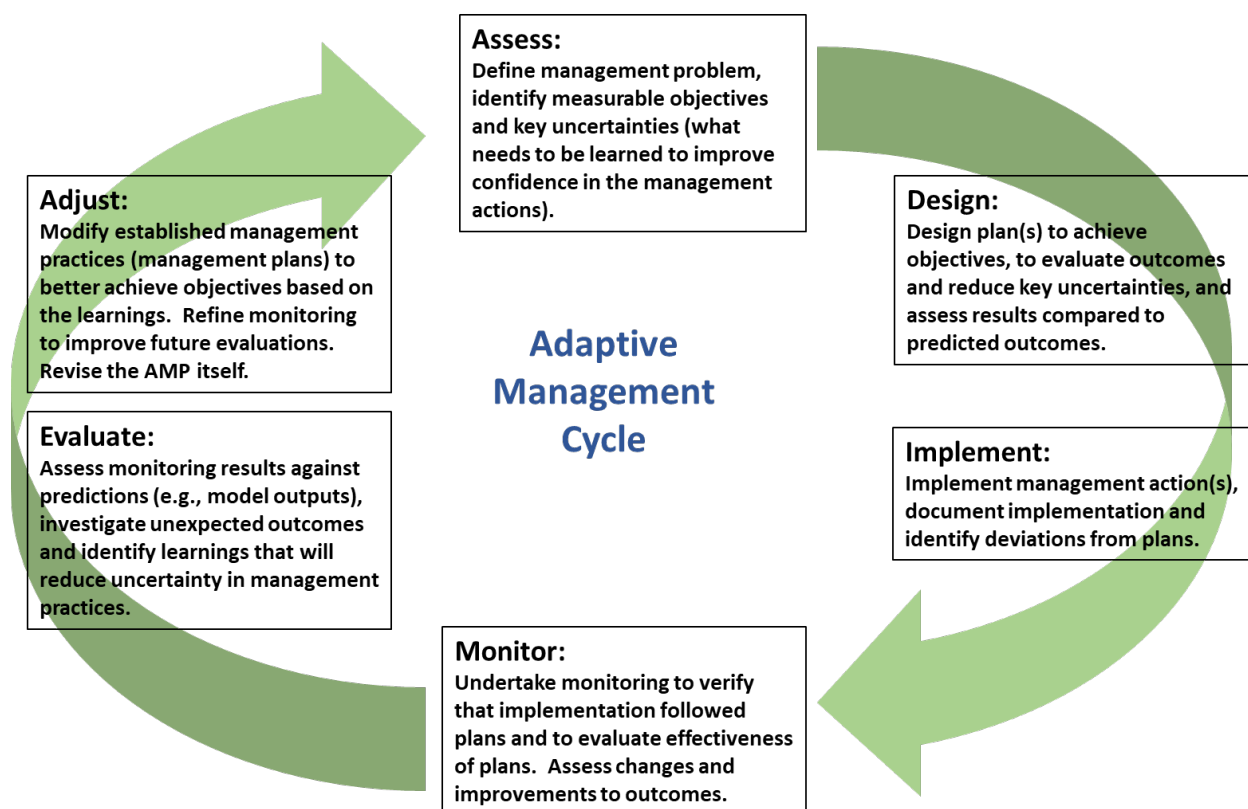


Figure 1. Adaptive Management Cycle

AMPs are not the same as TRPs in that they are intended to address and reduce uncertainty, and lead to refined discharge management practices. AMPs are not intended to set contingency measures at predetermined conditions in the manner that TRPs do.

Key elements of AMPs are:

1. Clear and precise statement of the question(s)/uncertainty(s) that the AMP is to address;
2. Process and timeline to design the adaptive management assessments or experiments;
3. Clear statement of the monitoring requirements (e.g., locations, frequency, timing, duration, specifically what will be sampled, etc.) and how this will answer the questions or uncertainties;
4. Clear and precise statement of when the monitoring will start;
5. Process and timeline to use the knowledge gained to improve on past practices and current management practises;
6. Timeframe for the plan and its components to be executed;
7. Reporting process (e.g., timing, to whom, what, etc.); and
8. Annual review process (e.g., timing, Indigenous nation involvement, etc.).
9. Process and timeline to update and re-define key elements of the plan as listed above.

AMPs are to be enforceable and checked for compliance and actual implementation. They must be written in clear wording with specific tasks, associated timelines to implement and review, and communications plan. This applies to all parts of the AMP (e.g., monitoring, sampling, analysis, reporting out, annual review, etc.).

For examples of Adaptive Management Plans please contact Regional Operations Staff, Ministry of Environment and Climate Change Strategy, Mining Operations.

Monitoring – links to Adaptive Management Plans

AMPs may require additional monitoring that may not be part of the routine monitoring requirements of a permit.

Relationship to Trigger Response Plans

Trigger Response Plans (TRPs) are a detailed operational response tool for changes detected through monitoring. TRPs contains explicit actions, responsibilities, and timeframes in response to defined changes in waste and receiving environment conditions detected by monitoring. AMPs can indicate where a TRP may need to be amended to be a better response to detected changes. While both TRPs and AMPs support better management and operations of mines, they are two different tools with different outcomes.

Implementation and Compliance

Permit clauses for AMPs should lay out a clear process, timetable, who is responsible to take the action, and deliverables for approval. However, the detailed content of the AMP can be flexible to meet the needs of specific situations. An iterative and deliberative process is needed for adaptive management. The involvement of Indigenous nations and other agencies with overlapping interests is essential to create the most effective AMP.

Summary

AMPs can be required in effluent permits to help address residual risk and uncertainty. AMPs are accompanied by monitoring to ensure continuous improvement in managing effluent discharges is occurring. Where there is further investigation of uncertainties through adaptive management processes, permit amendments may be needed to address findings. Figure 2 below illustrates this operational model:

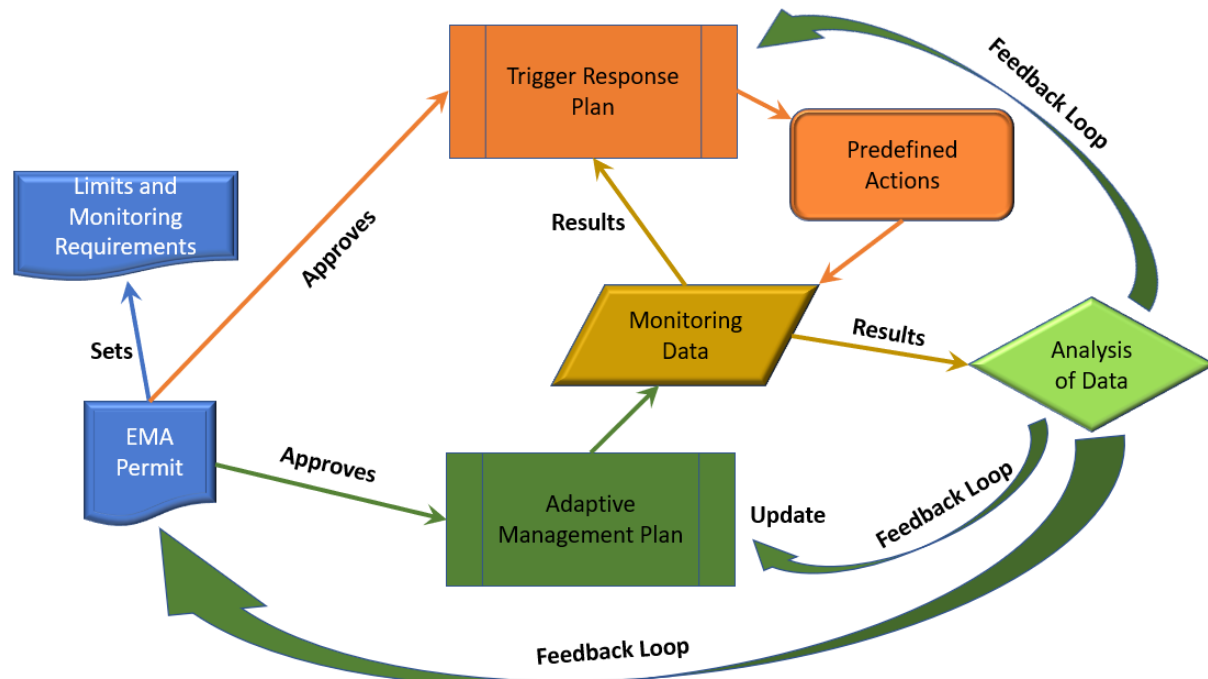


Figure 2. Operational Model - Permit limits, Trigger Response Plan and Adaptive Management Plan