

Defining Parameters of Concern for Effluent Discharge Authorization Applications

The Ministry of Environment and Climate Change Strategy authorizes discharges to the environment under the *Environmental Management Act*. To evaluate potential effects on freshwater or marine aquatic environments and guide management actions it is necessary to define parameters of concern (POCs). To determine if a parameter is a POC, a stepwise evaluation is completed (Figure 1) which refines the list of all detectable parameters to parameters of potential concern (POPCs) and then further to POCs.

Important Terms

- A POPC is any parameter predicted to be detectable in untreated effluent that is (a) a special case parameter, or (b) is predicted to exceed 80% of a relevant threshold.
- A POC is a POPC that does not have suitable rationale to exclude it from further assessment and poses a risk to the environment. All POCs require management action and/or use of regulatory tools.

How to Define Parameters of Concern

Apply the five steps in Figure 1 to define POCs. Each step for each parameter must be documented and supported with rationale.

Step 1 – Is the parameter detectable in untreated effluent predictions?

- Effluent quality predictions should be developed for the expected case and for scenarios that represent variability in process, seasonal, climate and/or geochemical conditions.

Step 2 – Is the parameter a special case parameter?

- A special case parameter is one where toxicity and water concentration have an unpredictable relationship and/or can bioaccumulate, bioconcentrate or biomagnify.
- Examples of special case parameters found in mining effluent include selenium and mercury.

Step 3 – Is there a BC WQO, SBEB, WQG or other appropriate threshold?

- A water quality threshold is a value below which negative environmental effects are not anticipated.
- For defining POCs, the thresholds are to be used in the following order:
 - (1) BC water quality objective,
 - (2) Science-based environmental benchmark,
 - (3) Approved BC water quality guideline, and
 - (4) Working BC water quality guideline.
- If a BC-specific threshold does not exist, other thresholds may be considered (e.g. Canadian environmental quality standards). Use of other thresholds must be justified.
- For any calculations using toxicity-modifying factors, ambient background concentrations must be used.

Step 4 – Does the parameter exceed (0.8 x) the threshold?

- To align with a conservative approach to effluent permitting, a parameter is considered a POPC if it exceeds 80% of the applicable threshold.

Step 5 – Can the POPC be excluded from consideration as a POC?

- Parameters identified as POPCs require additional consideration to determine if there are reasons to exclude them from further assessment. Scientifically-justified and fully-documented rationale is required.
- Elevated background concentration is not sufficient justification for excluding a POPC from the final list of POCs.

Next Steps

Once POCs are defined, an effects assessment is conducted and management actions and/or regulatory tools must ensure that, should an effluent discharge authorization be issued, the environment is protected.

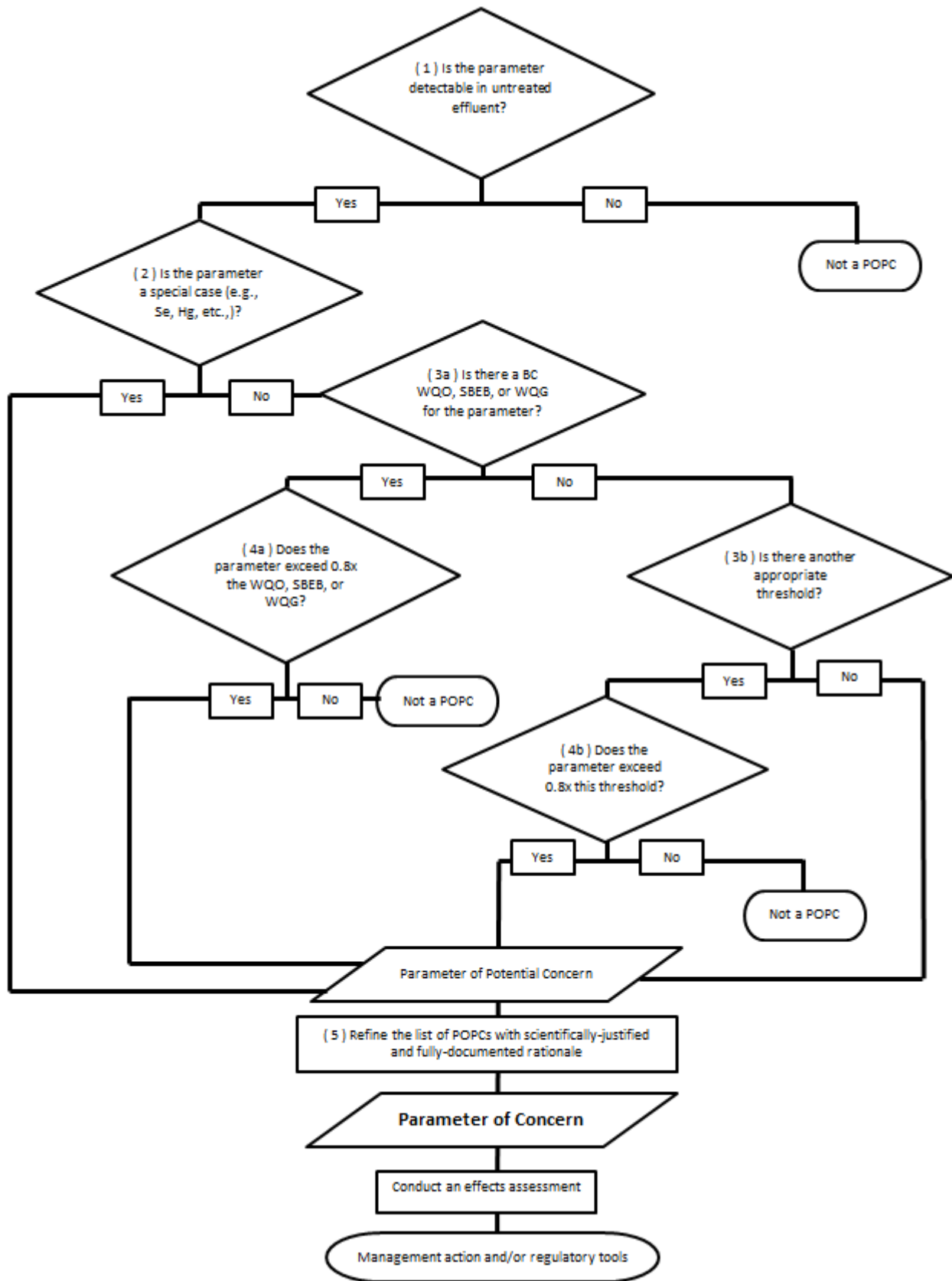


Figure 1 - Flowchart to define Parameters of Concern for effluent discharge authorization applications

Acronyms

SBEB – science-based environmental benchmark

WQG – water quality guideline

WQO – water quality objective