

Risk Based Approach (RBA)

Output of a Dose related Risk and Effect Assessment Model (DREAM) indicating high risk impact affecting species in the top part of the water column



Introduction

RBA is a standard regulatory method devised to ensure that produced water discharge is unlikely to result in significant harm to the marine environment.

The approach used mirrors that utilized for the discharge of offshore chemicals in the OSPAR Harmonised Mandatory Control System. In 2012, OSPAR (Oslo and Paris Conventions) adopted the recommendation 2012/5 for a 'Risk Based Approach to the management of Produced Water (PW) discharges from offshore installations'.

Procedure involves calculation of the predicted environmental concentration (PEC) and the predicted no effect concentration (PNEC) of the discharge or its constituent components.

All installations on the UK Continental Shelf (UKCS) that have a permit to discharge produced water must undergo RBA. Those not included in Phase 1 are scheduled in the 2021 programme.

The 1st phase of the UK RBA Implementation Programme was carried out from 2014 to 2018. The 2nd phase of the next RBA assessment period will commence in 2023.

Now is the time to carry out Step 6 of the process, **to evaluate the effectiveness of any risk management measures undertaken to reduce the environmental risk associated with a PW discharge.**

Produced water management is the most critical step as the tiered process stages all feed into this.

Benefits of RBA:

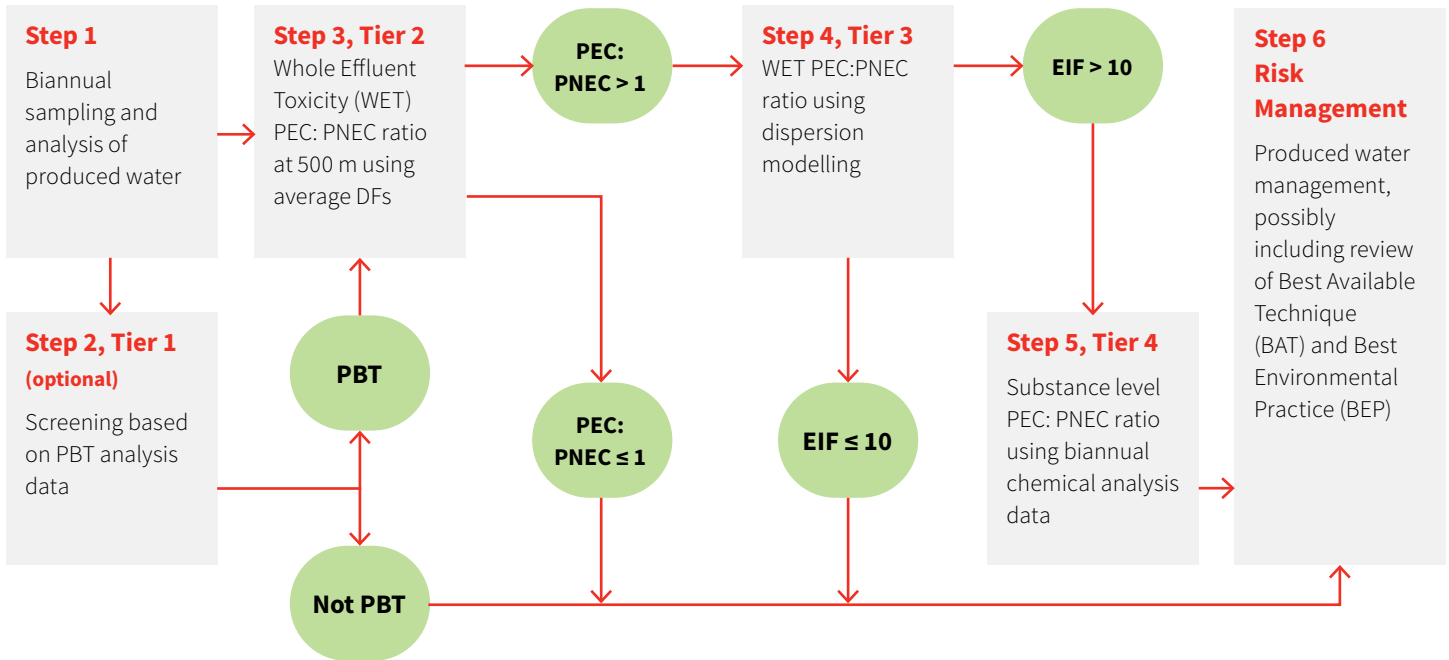
- Provides comprehensive insight into what is released from the discharge into the marine environment.
- The approach uses both chemical analysis and whole effluent toxicity (WET) testing using different trophic level species.
- Evaluation gives outcome accounting for both naturally occurring substances (NOSs) and production chemicals.
- RBA is barometer of the effectiveness and efficiency of the production process.

Benefits of BAT/BEP:

- Targeted and optimized CapEx
- Lower OpEx
- Reduced downtime
- Enhanced production
- Improved / optimum environmental performance
- Improved morale and safety

BAT & BEP for a particular process will change with time in the light of production changes, technological advances, as well as changes in scientific knowledge and understanding.

Phased Approach



Environmental Optimization

When RBA is coupled with BAT/BEP assessments, operation cost and environmental risk can be evaluated and reduced.

The risk associated with a produced water discharge is measured in terms of Environmental Impact Factor (EIF).

Tier 3 EIF >10 = consider risk reduction measures:

- Chemical substitution
- Amending PW treatment process
- Technical measures
- Application of closed systems
- End-of-pipe PW treatment
- Organizational measures

