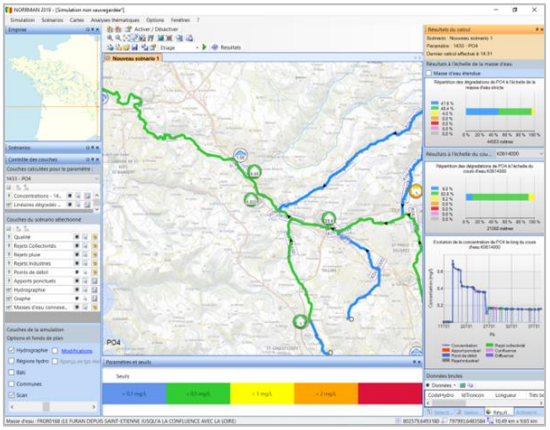
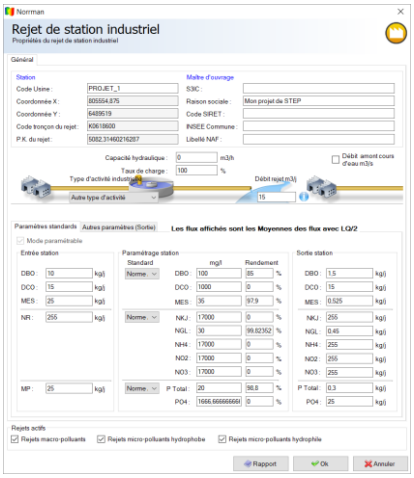
5.2. NORRMAN-MAR

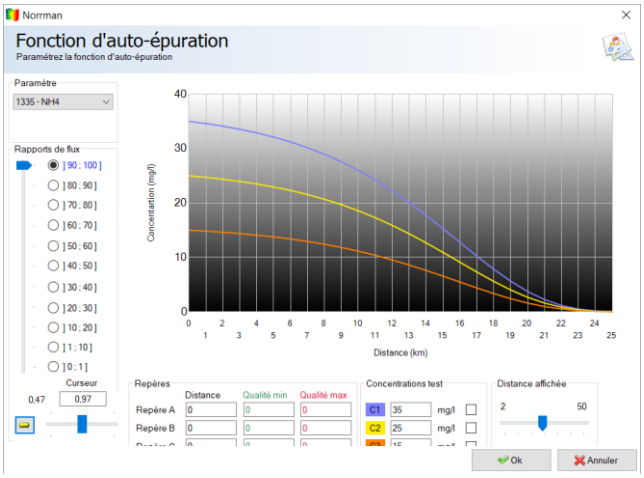
5.2.1. The NORRMAN software



The NORRMAN software (**N**ormes et **O**bjectifs de **R**éduction des **R**ejets pour les **MA**sses d'eau **N**aturelles: Standards and Discharge Reduction Targets for Natural Water Resources) simulates the impacts of polluting emissions in rivers at the scale of the water body. It helps to evaluate emission limit values and thus to determine discharge permits in compliance with good status objectives. NORRMAN has been published since 2008 by Antea Group after an initial collaboration with the Loire-Bretagne Water Agency.

The operating principle of NORRMAN is to create and edit simulations of the impact of discharges at the scale of a body of water. The user selects a geographical footprint (water body), initial conditions (low water or modulus, rainy or dry weather, discharges: maximum, average...). NORRMAN then uploads the data from a web service published by Antea Group and initiates the simulation. Before performing the calculations of his simulation, the user can create, modify, parameterize, or move different objects on his map: Wastewater treatment plants (public or industrial), weirs, lateral inputs of watercourses, runoff, water flows and speed, kinetics by river section.





For these calculations, NORRMAN relies on self-purification kinetics parameterized according to hydrophilic micropollutants (DT50), hydrophobic micropollutants, macropollutants, flow rates and velocities. The results are rendered in the form of distribution graphs, graphs of profiles in length, GIS layers of degraded shelves, list of downgrading discharges...

5.2.2. Project Objectives

The NORRMAN software deals with the impact of wastewater treatment plants on the environment at the scale of the water body. It is a relevant decision-making tool for the wastewater treatment plant manager who wishes to assess the impact on surface water of an existing site or a construction project. The business field and the scale of work constitute a very relevant basis for integrating the Managed Aquifer Recharge (MAR) / Soil Aquifer Treatment (SAT) issue that is studied within the EviBAN project.

APPENDIX 4 : SAT & MAR monitoring, and model for performance evaluation from EviBAN D2.1, June 2023

The aim was therefore to provide NORRMAN users with additional functionality to assess the feasibility of soil treatment of wastewater. Presented in the form of a geographical layer projected on the study territory, the module should make it possible to determine whether the area where the treatment plant is located is favourable to the implementation of an MAR/SAT system.