Creation of an inflow file for REBEKA 2 and DIM

In REBEKA 2 and REBEKA DIM only one overflow structure can be taken into account per project. For a network with several overflow structures, a REBEKA project must be created for each structure, which are linked via outflow files from upstream projects that are read in from downstream projects. For a complete simulation, all projects must be calculated from top to bottom. It may also be necessary to combine two discharges (i.e. two discharge files have to be combined to a new discharge file). For this purpose REBEKA 2 offers the menu item "File / Merge Two Flow Files".

If a structure has to be modelled with REBEKA 2 or REBEKA DIM in a network, in which some structures are located above, which do not need STORM processing or dimensioning it is easier to create the inflow file with WaterElements. This requires that the network upstream of the structure in question must be modelled in WaterElements and pollutants NH4-N and TSS must be modelled.

Creation of the inflow file in WaterElements

As an example, consider the following network with four combined sewer overflows (CSO's) upstream of the overflow tank RB 5 (see Fig. 1).
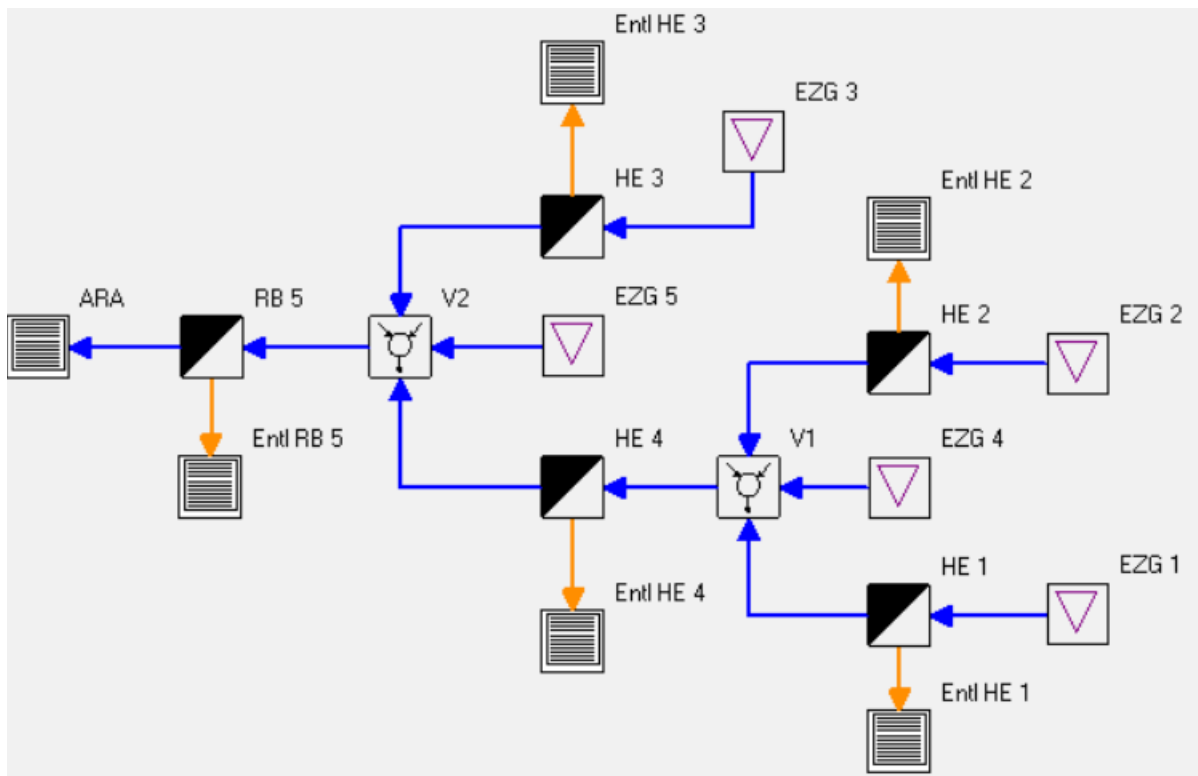

Fig. 1: Network as entered in WaterElements

RB 5 is to be examined with REBEKA 2 or dimensioned with REBEKA DIM. Therefore, an inflow file for RB 5 is now created in WaterElements. For this purpose, time series of flow rate Q and concentrations of NH4-N and TSS must be created and saved in a file.

After "Execute Commands" has been carried out successfully, the time series can be selected under "Settings / Define Time Series": Union: Expand V2 and then activate V2: Q, Expand NH4-N and activate V2: C (NH4-N), Expand GUS and activate V2: C (GUS).
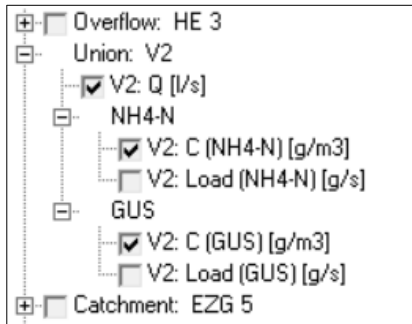
This should then look like the screen shot on the left.

Now activate "Save Data to File" and "Short Headers" (Attention! Do **not** activate "Date/Time as Text").

If necessary, adjust the file name (by default "TS [project name].txt" is set).

Now a simulation must be carried out with "Run" to create the time series file.

The created file should be copied into the directory of the REBEKA project so that it can be found by REBEKA.

The used rainfall data files in WaterElements and REBEKA should be identical or cover the same time period. In WaterElements the range can be set with the command:

SetStartAndEndOfSimulation(start date HH:MM, end date HH:MM), e.g.

SetStartAndEndOfSimulation(01.01.2000 00:00, 31.12.2009 23:50). It is recommended to set the end a little later than the end of the rain file at REBEKA (approx. 10 h). In WaterElements, missing values are completed with the last existing values, assuming that these are the dry weather values.

Reading in the inflow file in REBEKA 2 / DIM

In REBEKA, the inflow file is activated by double-clicking on "Inflow" in the main window on the system view. Then a small window "Inflow data from file" appears in which the inflow file can be selected. It must be in the same directory as the REBEKA project. After "OK" it is checked whether the inflow file is suitable for the current simulation by reading the start and end time of the data points and comparing them with those of the current rainfall time series. It is also checked whether the data are continuous. Inflow files generated in REBEKA are not continuous, as REBEKA does not perform a continuous simulation. WaterElements models continuously and therefore also generates continuous inflow files, whose processing in REBEKA takes a little more time, but are less error-prone than non-continuous inflow files.

If the inflow file has been accepted, a simulation can now be carried out in REBEKA 2 / DIM.

The displayed end of the rainfall series is actually the end of the simulation and is by default some hours later than the end of the rain series, so that the runoff of the last rain event is safely finished. It is therefore advisable in WaterElements to select the end of the simulation about 10 h later than the end of the rainfall file so that the inflow file is safely long enough.

If the element for creating the inflow file was selected directly before the structure, i.e. contains all catchment areas, contributing area and dry weather flow must be set to 0. In REBEKA DIM a small value > 0 (e.g. 0.0001) is necessary for the area in order to prevent an error.