# ACTIVATED SLUDGE PROCESS DESIGN APP

## BASIS OF COMPUTATION

Conventional single-stage activated sludge (AS) processes comprise a bioreactor and an associated secondary sedimentation tank (SST) in one or more parallel streams.

The AS bioreactor coding in this App is based on the process computational methodology outlined in the German Standard ATV-DVWK-A 131 of May 2000, entitled Dimensioning of Single-Stage Activated Sludge Plants.

The SST coding is based on the Netherlands (STOWa, 1981) design procedure as outlined in IAWQ Scientific and Technical Report No. 6, entitled Secondary Settling Tanks: Theory, Modelling, Design and Operation (1997) – for details refer to the Aquavarra Research Limited SST Design App documentation. This is selected in preference to the ATV SST design procedure as it allows for the use of SSTs with a lower water depth.

It is recommended that users should familiarise themselves with the foregoing sources prior to using this App for design purposes.

## AS PROCESS OPTIONS

The user is offered three AS process options:

 (a)  Non-nitrifying or carbonaceous process
 (b)  Nitrifying process
 (c)  Nitrogen-removal process

The methodology used to determine the required sludge age for each of these processes and hence the required bioreactor volume is based on the design procedure set out in the above German Standard.

 Where the N-removal option is selected, the user is prompted to specify the final effluent total nitrogen (TN) required.

Enhanced biological P-removal is included by clicking the Anaerobic Selector checkbox. The selector volume is calculated to provide 0.75 hour retention based on an inflow of DWF + Sludge recycle at DWF.

The user interface allows for the input of minimum and maximum temperature values. The lower value has an influence on the nitrification process while the upper value influences the required aeration system capacity. The indicated default values of 10 and 20 $^{o}$C may be regarded as reasonable for municipal wastewater treatment in temperature climates.

## OUTPUT

The input data and the calculated parameter values are saved to an Excel blank file that the user has already created and saved to the specified address. The attention of the user is drawn to the fact that the coding does not create this file, it simply transfers data to it.

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