

## Exercises VIII: Air emission control I

### Applied wastewater engineering

#### Exercise 1: Biofiltre for waste air treatment

A wastewater facility mandates you to compute the size of a biofiltre for their waste air treatment. They plan to build a new building (6m (width) x 25 m (length) x 5 m (height)) where the following instruments will be installed: screen, screenings washer and compactor, thickener for mixed primary and secondary sludge. The waste air generated in this building should be treated. Based on the design criteria given in the course answer the following questions:

- a) How much air has the biofiltre to treat per day?
- b) How much surface is required to build such a biofiltre? Could it be placed on the roof of the same new building?
- c) Assume a filter media depth of 1 m and a porosity of 40 %. What will be the effective gas residence time in the biofiltre (in seconds)?

#### Exercise 2: Treatment processes of odorous compounds

The treatment processes to remove odorous compounds are either based on biological, chemical, and physical processes.

- a) Explain how the biological treatment process permits to remove those substances and indicate a possible process.
- b) Explain how the chemical treatment process permits to remove those substances and indicate a possible process.
- c) Explain how the physical treatment process permits to remove those substances and indicate a possible process.