CLAIMS

1. A method for treating a wastewater effluent in a sequencing batch reactor (SBR), said SBR comprising:

- a chamber that is able to contain a mixture of wastewater and sludge comprising different levels, each level being defined by a concentration and/or a density of sludge,
- a sludge bed situated at the bottom of the chamber,
- means for recovering a clarified fraction of the contents of the chamber, comprising:
    - a recovery duct extending below the surface of the mixture in the chamber, between the interior and the exterior of the chamber, comprising:
        - a plurality of channels hydraulically connecting the contents of the chamber and the recovery duct,
        - a plurality of recovery orifices via which the clarified fraction of the contents of the chamber is intended to be drained, the recovery orifices being positioned above the level of the recovery duct,
        - an air duct hydraulically or aeraulically connecting the recovery duct to the atmosphere,
    - an air exhaust valve on the air duct, which is able to take up an open position or a closed position,
    - an air/water blocking device on the recovery duct, which is able to pass from a state referred to as closed to a state referred to as open, and vice versa, so as to block the air in the recovery duct upstream of the air/water blocking device and to block the water downstream of the blocking device,
    - an air injector connected to the recovery duct and intended to supply the recovery duct with boosted and/or compressed air,

said method comprising:

- a step of supplying the SBR, during which a volume of effluent to be treated close to the bottom of the chamber is introduced, in the sludge bed , preferably via a distribution network covering the bottom of the chamber,
- a biological treatment reaction sequence comprising at least:
    - a step of aerating the contents of the chamber, during which the level of the surface of the mixture rises,
- a decanting step, during which sludge is deposited on the bottom of the chamber and the contents of the chamber are clarified close to the surface thereof,
- a step of recovering the clarified fraction of the contents of the chamber, said recovery step and supply step taking place simultaneously, so as to keep the level of the contents of the chamber substantially constant during the recovery step and supply step,

said method being characterized in that it comprises:

- a step of controlling the recovery means, during which:
    - the recovery duct is filled with air until the recovery duct has been completely emptied of the clarified fraction contained in the recovery duct, and
    - the recovery duct is kept filled with air during the reaction sequence and until the end of the decanting step,
- a step of expelling the air contained in the recovery duct with the clarified fraction just before the supply step and the recovery step,
- after the step of supplying the SBR, a step of filling the recovery duct with air by air injection, the exhaust valve being closed and the air/water blocking device being referred to as closed, during the aeration step,
- a step of keeping the recovery duct filled with air without air injection, the exhaust valve being closed and the air/water blocking device being referred to as closed, during the aeration step and decanting step.

2. The treatment method as claimed in claim 1, wherein, during the step of filling the recovery duct with air, the exhaust valve is in the closed position, and the air/water blocking device blocks the air in the recovery duct by creating a hydraulic discontinuity between upstream and downstream of the air/water blocking device.

3. The treatment method as claimed in either one of claims 1 and 2, wherein, during the step of expelling the air from the recovery duct, the exhaust valve is in the open position so as to allow the evacuation of the air simultaneously with the ingress of clarified water into the recovery duct.

4. The treatment method as claimed in claim 3, wherein, during the step of expelling the air from the recovery duct, after the evacuation of the air, the air/water blocking device takes up the position referred to as open so as to allow the clarified fraction to leave through the recovery orifices.

5. An installation for treating a wastewater effluent in a sequencing batch reactor (SBR), said SBR comprising:

- a chamber that is able to contain a mixture of wastewater and sludge comprising different levels, each level being defined by a concentration and/or a density of sludge,
- a sludge bed situated at the bottom of the chamber,
- a device for supplying the SBR with a volume of effluent to be treated close to the bottom of the chamber, in the sludge bed, preferably via a distribution network covering the bottom of the chamber,
- means for recovering a clarified fraction of the contents of the chamber , comprising:
    - a recovery duct extending below the surface of the contents of the chamber, between the interior and the exterior of the chamber, comprising:
        - a plurality of channels hydraulically connecting the contents of the chamber and the recovery duct,
        - a plurality of recovery orifices via which the clarified fraction of the contents of the chamber is intended to be drained, the recovery orifices being positioned above the level of the recovery duct, and
        - an air duct hydraulically or aeraulically connecting the recovery duct to the atmosphere,

- an air exhaust valve on the air duct, which is able to take up an open position or a closed position,
- an air/water blocking device on the recovery duct, the exhaust valve being able to block the air in the recovery duct or to allow it to pass through,
- an air injector connected to the recovery duct and intended to supply the recovery duct with boosted and/or compressed air,

the SBR being able to implement a treatment method comprising a biological treatment reaction sequence comprising at least a step of aerating the contents of the chamber, during which the level of the surface of the mixture rises, a decanting step, during which sludge is deposited on the bottom of the chamber and the contents of the chamber are clarified close to the surface thereof, a step of recovering the clarified fraction of the contents of the chamber, said recovery step and supply step taking place simultaneously, so as to keep the level of the contents of the chamber substantially constant during the recovery step and supply step,

the installation also comprising means for controlling the recovery means so as to fill the recovery duct with air until the recovery duct has been completely emptied of the clarified fraction contained in the recovery duct, to keep the recovery duct filled with air during the aeration step, and to expel the air contained in the recovery duct with the clarified fraction just before the supply step and the recovery step, to fill the recovery duct with air by air injection during the aeration step, to keep the recovery duct filled with air without air injection during the aeration step and decanting step.

6. The treatment installation as claimed in claim 5, wherein the blocking device comprises a U-shaped siphon between the air duct and the recovery orifices.

7. The treatment installation as claimed in either one of claims 5 and 6, the recovery duct comprises an air exhaust duct.