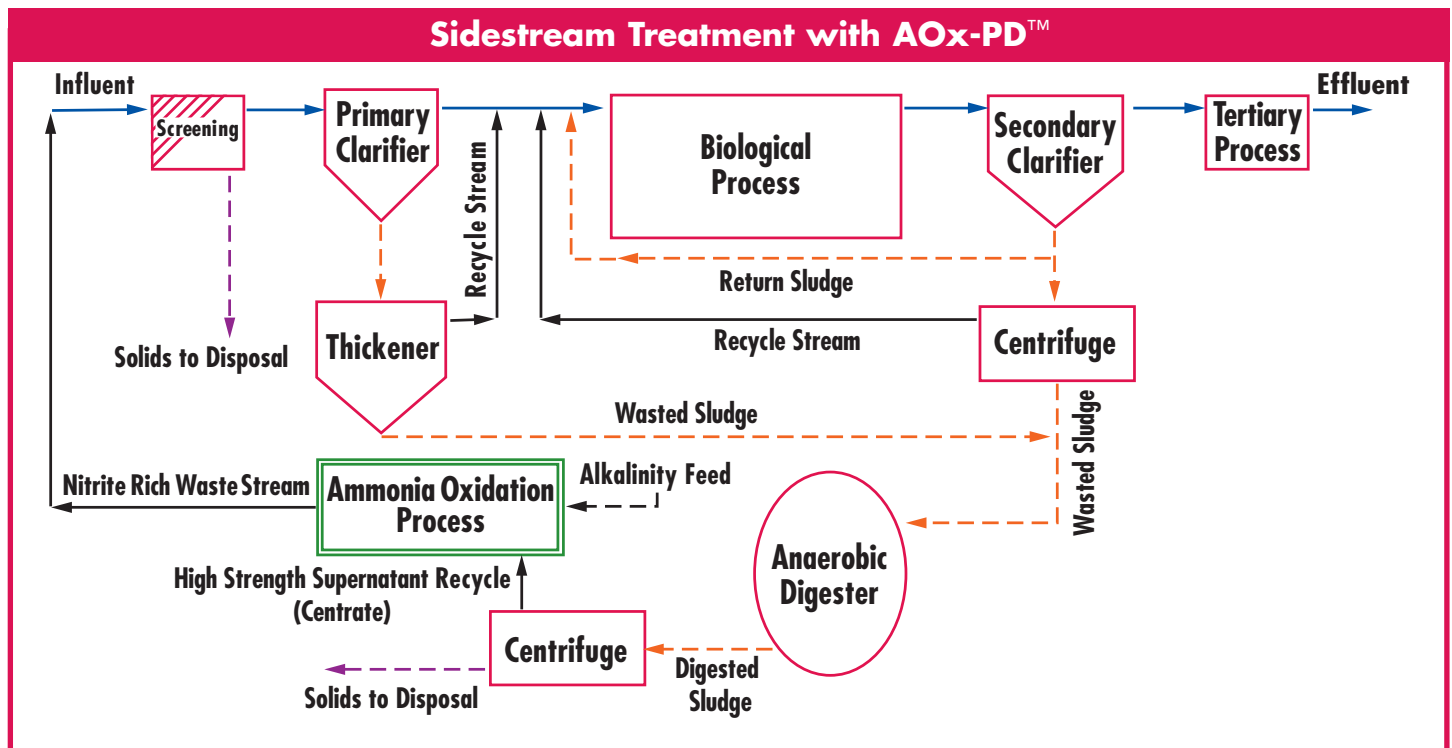


# AOx-PD™

## Ammonia Oxidation-Pipe Denitrification

AOx-PD™ is a process for nitrogen removal from a high ammonium concentration waste stream that minimizes the quantity of air and eliminates the need for a supplemental electron donor (carbon). This is achieved by intermittently aerating the bioreactor for ammonium oxidation to nitrite. The intermittent aeration creates environmental conditions (i.e. low DO), which inhibit the nitrite oxidizing bacteria (NOB). This is likely due to the NOB oxygen half-saturation coefficient (Ks) of 1.1 mg/l as compared to 0.3 mg/l for ammonia oxidizing bacteria. The result is a very stable reaction to nitrite only. Chemical addition is necessary to maintain the alkalinity requirement of the ammonium oxidizing reaction.



Although some denitrification occurs within the bioreactor, AOx-PD™ takes advantage of the environmental conditions within the influent piping system and headworks of a typical municipal wastewater treatment plant by introducing the partially treated (high nitrite concentration) recycle stream into the collection system. Therefore, the collection system and headworks are utilized as a denitrification reactor.

### AOx-PD™ Process advantages:

- **Extremely stable reaction to nitrite only, with no dependence on temperature**
- Nitrogen removal via the nitrite route requires 25% less oxygen
- No supplemental carbon is required with sufficient residence time within influent piping
- Denitrification that occurs within the pipe reduces the carbonaceous load to the treatment plant
- Odor suppression within the influent pipe due to the addition of nitrite
- High biomass concentration results in relatively small area requirement for reactor
- Ease of operation



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