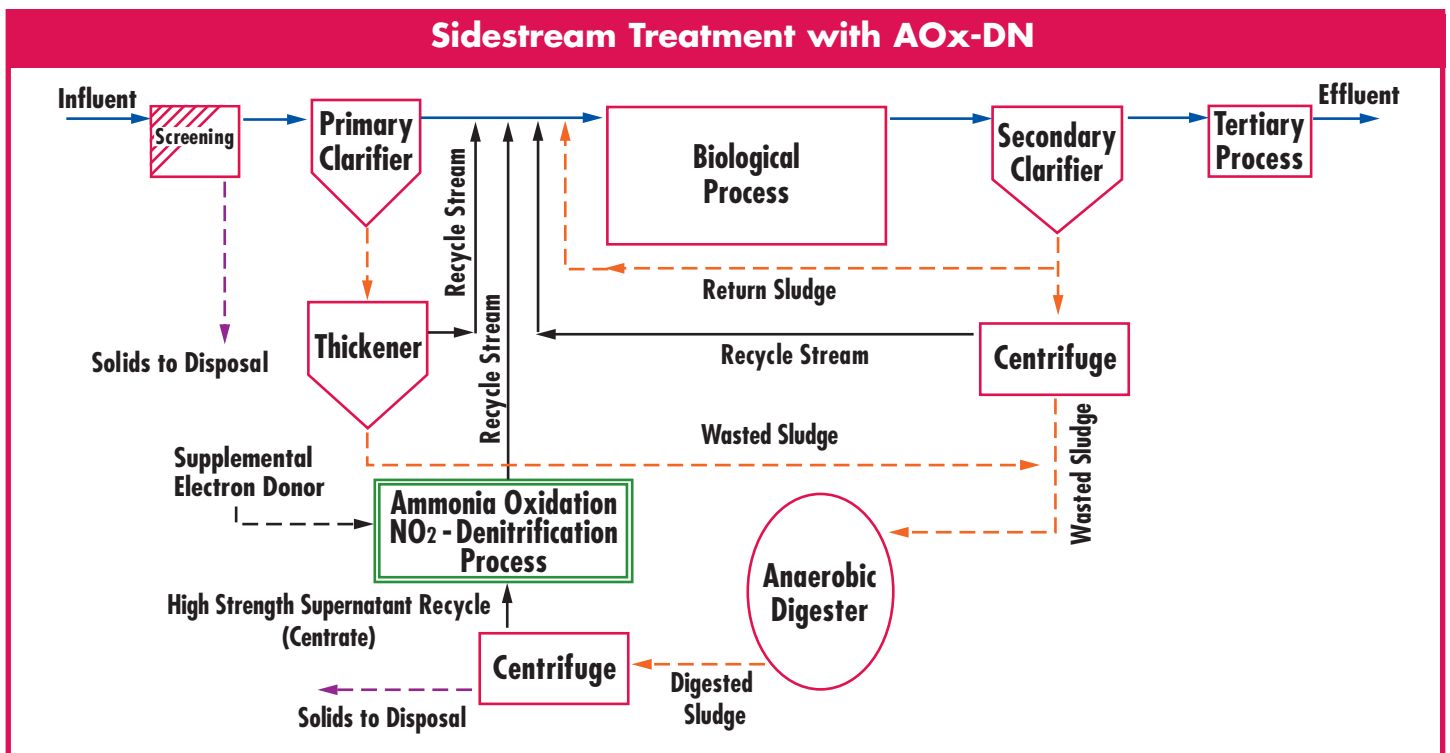


# AOx-DN

## Ammonia Oxidation-Denitrification Over Nitrite

**AOx-DN** is a process for nitrogen removal from a high ammonium concentration waste stream that minimizes the quantity of both the air and the supplemental electron donor (organic carbon). This is achieved by intermittently aerating the bioreactor to accomplish ammonium oxidation to nitrite and then denitrification over nitrite.

The bioreactor is operated so that the aerobic contact time only allows for the oxidation of ammonium 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 ( $K_s$ ) 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.



Because the amount of organic carbonaceous matter within the centrate is limited, a supplemental carbon source is supplied to the bioreactor during the anoxic periods. The recovery of alkalinity during denitrification typically sustains the alkalinity requirement of the ammonium oxidizing reaction. This eliminates the need for chemical addition to maintain the alkalinity and pH level.



273 Weymouth St.,  
Rockland, MA 02370  
www.frmahony.com  
tel. 781.982.9300  
fax 781.982.1056

### AOx-DN Process advantages:

- **Extremely stable reaction to nitrite only, with no dependence on temperature**
- Nitrogen removal via the nitrite route requires 25% less oxygen
- Denitrification from nitrite requires approximately 40% less supplemental carbon
- High biomass concentration results in relatively small area requirement for reactor
- Ease of operation