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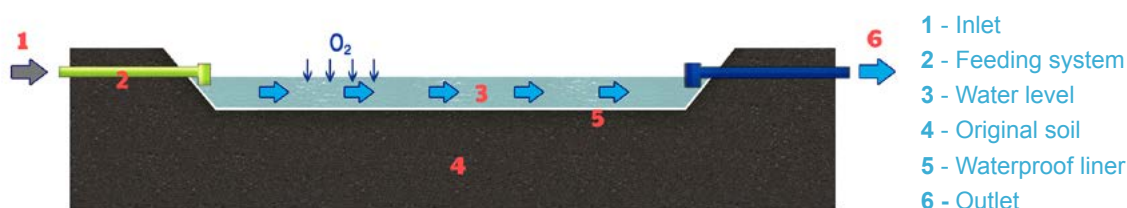
# MATURATION PONDS

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## AUTHOR

Matthew E. Verbyla, *Department of Civil, Construction and Environmental Engineering, San Diego State University, California*

Contact: [mverbyla@sdsu.edu](mailto:mverbyla@sdsu.edu)



## Description

Maturation ponds (MPs) are shallow (typically 1 m) open basins, enclosed by earthen embankments, often rectangular in shape and typically lined with concrete or synthetic materials. MPs use natural processes to polish and disinfect secondary treated wastewater. Aerobic conditions typically persist throughout the water column. Baffles are sometimes used to approximate plug flow conditions and to adjust length:width ratios, depending on land availability.








## Advantages

- Low energy usage possible (feeding by gravity)
- Robust against load fluctuations
- No harvesting of biomass required
- Lower construction price than subsurface flow treatment wetlands

## Disadvantages

- Potential mosquito habitat

## Co-benefits

High	 Water reuse					
Medium	 Biodiversity (fauna)					
Low	 Biodiversity (flora)	 Temperature regulation	 Carbon sequestration	 Aesthetic value	 Biosolids	

### Notes:

Other co-benefits include aquaculture and biomass harvesting.

## Compatibilities with Other NBSs

Mainly used to treat the effluent of facultative ponds, but also commonly used to polish the effluent of other secondary wastewater treatment processes (anaerobic reactors, trickling filters, treatment wetlands) to improve nutrient and pathogen reduction. Recent research shows the potential for photo-biodegradation of micropollutants.

## Case Studies

### *In publication*

- Wastewater pond technology in Mysore, India: a combination of facultative and maturation ponds
- Wastewater pond technology with anaerobic, facultative and maturation ponds in Trichy, India

## Operation and Maintenance

### Regular

- Controlling submerged, floating, and overall site vegetation (weekly)
  - Control efficiency of pre-treatment; prevent growth of macrophytes
  - Removal of algal layers formed on the top surfaces
- Preventing/controlling erosion (seasonally)
- Controlling pests (as needed)
- Maintaining control structures (periodically)
- Monitoring seepage (weekly)
- Maintenance of entry roads, fence, gates, signage (annually)
- Desludging (every 2–10 years)

### Extraordinary

- Replacement of lining if damaged

### Troubleshooting

- Odor: due to overloading

## Literature

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## NBS Technical Details

### Type of influent

- Secondary treated wastewater

### Treatment efficiency

- COD ~16%
- BOD<sub>5</sub> ~33%
- TN 15–50%
- NH<sub>4</sub>-N 20–80%
- TP 20–50%
- TSS ~16%
- Indicator bacteria Faecal coliforms  $\leq 1-3 \log_{10}$

### Requirements

- Net area requirements: 3–10 m<sup>2</sup> per capita
- Electricity needs: can be operated by gravity flow, otherwise energy for pumps is required

### Design criteria

- HRT: ideally >20 days for pathogen reduction
- L:W ratio: 1:2–1:3

### Commonly implemented configurations

- FP – MP
- AP – FP – MP
- HF/VF – MP
- Biological reactor – MP

### Climatic conditions

- Suitable in both warm and cold climates
- Very suitable for tropical climates