

CIWEM Manual of Practice

NNATURAL

WASTEWATER

TREATMENT

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*N*OTATION

<i>A</i>	Area, m ² or ha
<i>C</i>	Concentration, mg/l
<i>D</i>	Depth, m
<i>e</i>	Base of Napierian logarithms
<i>e</i>	Evaporation or evapotranspiration, mm/d
<i>k</i> ₁	First-order rate constant for BOD removal, d ⁻¹
<i>k</i> _A	First-order area-based rate constant for BOD removal, m/d
<i>k</i> _B	First-order rate constant for FC removal, d ⁻¹
<i>k</i> _N	First-order area-based rate constant for ammonia-N removal, m/d
<i>L</i>	BOD concentration, mg/l
<i>N</i>	Number of FC per 100 ml
<i>n</i>	Number of maturation ponds
<i>P</i>	Population (or population equivalents) served
<i>Q</i>	Flow, m ³ /d
<i>ε</i>	Porosity
<i>θ</i>	Retention time, d
<i>λ</i> _S	Surface BOD loading rate, kg/ha d
<i>φ</i>	Arrhenius constant
<i>Subscripts:</i>	
<i>e</i>	effluent
<i>F</i>	facultative (pond)
<i>i</i>	influent
<i>M</i>	maturation (pond)
<i>M</i> ₁	first maturation (pond)
<i>P</i>	polishing (pond)

A *BBREVIATIONS*

BOD	Biochemical oxygen demand (5-day, 20°C)
CAPEX	Capital expenditure
CVF	Compact vertical-flow (CW)
CW	Constructed wetland(s)
DEM	Deutschmark(s)
DWF	Dry weather flow
FC	Faecal (i.e., thermotolerant) coliforms
FWS	Free-water-surface (CW)
HLR	Hydraulic loading rate(s)
ICE	Institution of Civil Engineers
IWA	International Water Association
NWT	Natural wastewater treatment
OPEX	Operational expenditure
OTR	Oxygen transfer rate(s)
O&M	Operation and maintenance
p.e.	Population equivalent
RBC	Rotating biological contactor(s)
RF	Rock filter(s)
RW	Raw wastewater
SS	Suspended solids (= total suspended solids, TSS)
SSHF	Subsurface horizontal-flow (CW)
SUDS	Sustainable drainage systems
TOC	Total organic carbon
UASB	Upflow anaerobic sludge blanket (reactor)
USD	United States dollar(s)
UWWTD	Urban Waste Water Treatment Directive
VF	Vertical-flow (CW)
WSP	Waste stabilization pond(s)
WHO	World Health Organization

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