



Minnesota
Pollution
Control
Agency

AERATED POND— REVIEW CHECKLIST

Water Quality

Wastewater
Technical
Review and
Guidance

Water/Wastewater/#5.04, May 2001

FACILITY NAME

DATE

CONSULTING ENGINEER

SITE INSPECTION (DATE & INSPECTOR)

PLANNING OR DESIGN PHASE

Hydraulic Loading		Gals/day
Organic Loading, CBOD ₅		Lbs/day
Number of Cells		Primary(s)
		Secondary(s)
Total Acres at mean Operating Depth		Acres
#1 Primary		Acres
#2 Primary		Acres
#1 Secondary		Acres
#2 Secondary		Acres
Total Storage capacity available for		
Operations above two-foot level		Gals
#1 Primary		Gals
#2 Primary		Gals
#1 Secondary		Gals
#2 Secondary		Gals
Total detention time available		
above two-foot level		Days
Area available for expansion		Acres

wq-wwtp5-04





Type of Seal

Soils and Groundwater Checklist
Complete?

Pond structures and electrical panel protected from
physical damage to the 100-year flood?
(If located in flood plain).

Ponds and lift stations fully operational and
accessible during 25-year flood? (If located in
flood plain).

Land use zoning adjacent to proposed pond(s).
Acceptable?

Description and contour map of site.
Acceptable?

Soil borings data by independent soil testing
laboratory submitted (at least one boring minimum
of 25 feet deep or into bedrock).
Acceptable?

Calcium carbonate hardness of the basic water
supply.

Pond site at least ¼ mile from nearest dwelling
unless alternate power for aeration equipment (then
no requirement).

Pond site at least ½ mile from city or cluster of
residences (or future development).

Fifty feet buffer zone around outside toe.

Prevailing winds in direction of uninhabited areas.



Types and effects of industrial wastes (check Section 3 of MPCA Technical Criteria “Pond Design Review Considerations” for prohibited wastes).

Organic loading of primaries.

Detention time calculation $t = \left(\frac{\text{E}}{2.3 K_T \times (100-E)} \right)$

Oxygen supplied by aeration at least 2 lbs O₂/lb BOD.

One complete fluid turnover in 20 minutes for entire unit volume required. Check mfg. data.

Number of primary cells (minimum of 2).

Number of secondary cells.

Primary cells can be operated in series and parallel?

Area of units (maximum 40 acres per unit)

All cells can be independently isolated.
Consideration given to frostheave of seal and equipment preservation during isolation.

Secondary cell(s) has hydraulic capacity of one-third of total system (minimum).

_____ %

Elevation difference between primaries and secondaries.

_____ ft

Portable pumps for ponds with same elevation or for recirculation.

Proposed pond(s) designed for possible future expansion (including chemical addition and mixing if necessary)?

Cells should be rectangular and length to width ratio (4 to 1 max.)

Common dike construction if possible.



Dikes constructed of relatively impervious material and compacted to 90% Standard Proctor Density (SPD).

% (SPD)

Inlets and outlets minimum of ten feet from toe of dike.

Minimum dike top width 10 feet.

ft

Inner slopes no flatter than 4 horizontal to 1 vertical (4:1).

Freeboard, 3 foot minimum.

ft

Minimum operating depth to protect from freezing and erosion damage to seal and aeration equipment.

ft

Operating depth, between 10 ft. and 15 ft.

ft

Vegetation to be established prior to prefilling from outside toe to minimum pond operating depth.

Riprap required at a minimum around all piping entrances and exits.

Riprap or acceptable equal from one foot above high water mark (measured on the vertical) to two feet below the low water mark in areas where turbulence will occur.

ft

Bentonite additives should have preliminary testing and meet requirements of this section.

Synthetic liners appropriate to meet requirements of MPCA Technical criteria.

Influent lines above seal.

Multiple inlets to equalize loading

Influent line: gravity has adequate clearing velocity into pond, forcemain has adequate shut-off valves.



Manhole or vented cleanout on influent line at dike with invert 6" above maximum waterline.

All primaries have individual influent lines that distribute the load within the mixing zone of the aeration equipment.

Influent lines 1/3 point, farthest from outlet. (Avoid short-circuiting.)

Velocity maximum at end of apron 1 ft/sec.

Discharge apron size.

Control structures, accessible, do not hinder dike maintenance, locked, contain flow controls, non-corrosive materials, located to discourage short-circuiting and freezing. Should be multi-purpose.

Drawdown pipe entrance minimum 2 ft from bottom and vertical entrance.

Slide gates adjustable in 6" increments and of non-corrosive material.

Piping of acceptable material and maximum diameter of 18" (use multiple structures for greater hydraulic capacity).

Multiple intakes for units designed deep enough for stratification.

Emergency drawdown for complete draining available.

Control discharge systems permit a minimum rate of 6" pond water depth/day.

Blowers capacity based on air temperature of 115°F or as low as -20°F.

Air filters provided on air supply.

Blower location chosen to reduce noise in work area.



Multiple blowers provided that can supply average air demand with single largest unit out of service.

Piping can deliver 200% of average air requirement.

Valving provided at each junction in matrix.

BUBBLER DIFFUSERS

Bubbler tubes rodent resistant.

Bubbler lines extended across pond connected to headers on each side.

Gas ports at each connection to air headers.

Gassing equipment provided.

Extra (10%) bubble lines supplied as spare equipment.

Air-cooled or electric motor boat provided.

DIFFUSERS WITH SPORAGERS OR HELIXERS, TURINES

Piping extends across ponds and up each dike.

Air lines anchored with non-corrosive anchors of 2 ½ times buoyant force.

Flexible coupling to prevent joint separation.

Air lines easily removable or cleaned w/o draining pond.

Gasports provided at all connections to air headers.

Water depth to top of sparger not less than 4 ft.

SURFACE AERATORS, PLATFORM MOUNTED, TURBINES

Sewage influent line discharge below aerators.



Consideration to prevent freezing, ice damage baffling
at mfg. recommendations.

Minimum 2 aerators per pond. Average air supply
available with largest unit out of service.

FLOATING SURFACE AERATORS

Flotation device capable of 2 x weight at the one-half
depth mark.

90% of unit weight below water line.

Depth of impeller minimum of 12" unless auto
emergency switch over provided.

Alternate power source required.

Access by boat, raft, etc. w/winch provided.

BRUSH ROTOR TYPE AERATORS

Conform to fixed or floating aerator criteria.

Variable brush immersion depths.

Covers w/heat provided.

Fence provided with vehicle access gate with lock
fence should not be in the way of maintenance of dike.

GENERAL ISSUES

All weather road to ponds and on dikes.

Warning sign every 500 feet.

For mechanically aerated systems, pretreatment to
remove rags, sticks or debris is required.

Grit removal should be considered.

Influent flow measurement.



Effluent flow measurement.

Ground water monitoring wells, if required.

Lab equipment (D.O. meter minimum).

Pond level gauges in outfall structures.

Is there a control building?
