

Biological Treatment	Sludge Treatment
<p><i>Intermittent Sand</i></p> <p>Filter rate: 50,000 to 100,000 (gpad)² with plain settling and 400,000 gpad with trickling filter or activated sludge. Sand: 24 in all passing $\frac{1}{4}$-in. sieve. E.S. 0.35-0.6 mm. Unif. coef. < 3.5</p>	<p><i>Digester</i></p> <p>Capacity: with plain sedimentation 2 to 3 ft³ per cap. heated, or 4 to 6 unheated. With standard trickling filter 3 to 4 ft³ heated and 6 to 8 unheated; 4 to 5 ft³ heated and 8 to 10 ft³ unheated with a high rate filter. With activated sludge 4 to 6 ft³ per cap. heated and 8 to 12 ft³ unheated. Bottom slope: 1 on 4.</p>
<p><i>Contact Bed</i></p> <p>Filter rate: 75,000 to 100,000 gpad per ft.</p>	<p><i>Sludge Drying Bed</i></p> <p>Open: 1 ft² per capita with plain sedimentation, 1$\frac{1}{2}$ ft² with trickling filter, 1$\frac{1}{4}$ ft² with activated sludge, and 2 ft² with chemical coagulation. Glass covered: reduce area by 25 percent</p>
<p><i>Trickling Filter</i></p> <p>Standard rate: 400 to 600 lb BOD/acre-ft/day, or 2 to 4 mgad², 6 ft depth. High rate: 3000 + lb BOD/acre-ft/day, or 30 mgad for 6-ft depth. Min. filter depth 5 ft, max. 10 ft.</p>	<p><i>Vacuum Filtration</i></p> <p>Lb/ft²/hr dry solids. Prim. 6 to 10, trickling filter 1.5 to 2.0, activated sludge 1 to 2</p>
<p><i>Activated Sludge</i></p> <p>See Table 4-21. Normally 2-hour retention in primary and final sed. and 6 to 8-hour aeration</p>	<p><i>Centrifuging</i></p> <p>Flow rate based on gpm per HP</p>
<p><i>Rapid Filtration—Tertiary Treatment</i></p> <p>2 to 5 gpm/ft², 1 to 4 mm sand, 48 in. backwash 15 to 25 gpm/ft²</p>	<p><i>Wet Combustion</i></p> <p>Sludge thickener loading of 10 lb/day/ft²</p>
<p><i>Land Treatment</i></p> <p>See text</p>	<p><i>Land Disposal</i></p> <p>Stabilized sludge only. See text</p>
<p><i>Stabilization Pond—Facultative</i></p> <p>15 to 35 lb BOD/acre-ft/day, 3- to 5-ft liquid depth, center inlet, variable withdrawal depth, 3-ft freeboard, detention 90 to 180 days, multiple units, winter flow retention. Use up to 50 lb BOD loading in mild climate and 15 to 20 in cold areas. See Table 4-15</p>	<p><i>Incineration</i></p> <p>Tons/hr depending on moisture and solids content. Temperature 1250 to 1400°F. Pyrolysis temperature higher</p>
<p><i>Rotating Biological Contactors</i></p> <p>See text</p>	<p><i>Gas Production</i></p> <p>A properly operated heated digester should produce about 1 ft³ of gas per capita per day from a secondary treatment plant and about 0.8 ft³ from a primary plant. The fuel value of the gas (methane) is about 640 Btu/ft³</p>
<p><i>Disinfection</i></p> <p>Chlorine, ozone. see text</p>	

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