3745-42-05 **Design flow and waste strength requirements for treatment works sized for one hundred thousand gallons per day or less.**

(A) Except as provided in paragraphs (A)(1) to (A)(5) of this rule, the minimum design flows and waste strengths in table A-1 of this rule shall be used to design a treatment works sized for one hundred thousand gallons per day or less. The design flow and the waste strength shall be based on the existing and proposed services at the facility, and the justification for the proposed design flow and the proposed waste strength shall be submitted with the permit to install application. In addition to table A-1 of this rule, the director may also consider additional relevant engineering design data, including flow monitoring data, computer flow modeling data, flow equalization facilities, potential impacts to upstream sewers and sampling data for waste strength characterization.

[Comment: If the place to be served by a wastewater treatment works is not listed in table A-1 of this rule, the applicant or consultant should discuss the design flow with an Ohio EPA district office representative so that a proper flow value and waste strength can be chosen.]

(1) Flow monitoring. The director may consider flow monitoring data in addition to the minimum design flow requirements in table A-1 of this rule when evaluating the design of a treatment works sized for one hundred thousand gallons per day or less, provided that the flow monitoring data is obtainable and documented on a daily basis.

(a) The flow monitoring data shall be submitted with the permit to install application and shall:

(i) Be from the facility for which the treatment works is being designed, and be representative of the range of operating conditions that are expected to occur, which includes considering the months, days and hours of operation; or

(ii) Be from a place of like kind, like usage, and located in a similar climate, and be representative of the range of operating conditions that are expected to occur, which includes considering the months, days and hours of operation.

(b) For facilities that operate year-round, at least twelve months of flow monitoring data shall be provided. For seasonal facilities, flow monitoring data shall be provided for the entire operational period within a calendar year.

(2) Computer flow modeling. The director may consider computer flow modeling data in addition to the design flow requirements in table A-1 of this rule when evaluating the design of a treatment works sized for one hundred thousand gallons per day or less. The computer flow modeling data shall be submitted with the permit to install application.

(3) Flow storage and equalization facilities. The director may consider flow equalization facilities at the treatment works or upstream of the treatment works in addition to the design flow requirements in table A-1 of this rule, when evaluating the design of a treatment works sized for one hundred thousand gallons per day or less. For facilities that have significant variations in daily flow for each day of the week, the director may allow the storage facilities to equalize the flow over several days. The values in table A-1 shall be used to determine the storage volume needed and the design flow of the treatment units following the storage facility. If a facility has a significant variation in daily flow through the week, month or season and lagoon treatment is proposed, the director may allow the proposed lagoon design to be based on an average daily flow and average daily organic loading that is lower than the peak flow values and organic strength values in table A-1, provided sufficient flow monitoring data is provided for the director's consideration. The flow equalization data shall be submitted with the permit to install application.

(4) Potential impacts to upstream sewers. The director may consider potential impacts to upstream sewers in addition to the design flow requirements in table A-1 of this rule when evaluating the design of a treatment works sized for one hundred thousand gallons per day or less. Any information regarding the potential impacts to upstream sewers shall be submitted with the permit to install application.

(5) Sampling data for waste strength characterization. The director may consider sampling data in addition to the organic loading concentration ranges in table A-1 of this rule when evaluating the design of a treatment works. Sampling data shall be provided that is indicative of normal operations. For seasonal operations, the data shall be reflective of the time when the facility is most used. This data shall include the following: daily raw data, seven-day averages and thirty-day averages. This shall be submitted along with the permit to install application and:

(a) Be from the facility for which the treatment works is being designed, and be representative of the range of operating conditions that are expected to occur; or

(b) Be from a place of like kind, like usage, and located in a similar climate, and be representative of the range of operating conditions that are expected to occur.

[Comment: The NPDES regulations at paragraph (d) of 40 CFR 122.45 (effective July 1, 2011) require that all permit limits be expressed, unless impracticable, as both average-monthly limits (AMLs) and maximum-daily limits (MDLs) for all discharges other than publicly owned treatment works (POTWs), and as average weekly limits (AWLs) and AMLs for POTWs. The MDL is the highest allowable discharge measured during a calendar day or twenty-four-hour period representing a calendar day. The AML is the highest allowable value for the average of daily discharges obtained over a calendar month. The AWL is the highest allowable value for the average of daily discharges obtained over a calendar week.]

[Comment: "C.F.R" refers to the federal "Code of Federal Regulations," which can generally be found in public libraries and electronically online at www.gpo.gov/fdsys, and can be obtained by writing to: "Superintendent of Documents, PO Box 371954, Pittsburg, PA 15250-7954."]

Comment: To convert milligrams per liter to pounds per day the following formula can be used:

Pounds per day = [(concentration) x (flow) x (conversion factor)]

Pounds per day = [(mg/L) x (MGD) x (8.34)]

Note: MGD means the flow expressed in million gallons per day.

Table A-1 for design flow and waste strength requirements [g]

Place	Notes	Design flow (gallons per day)	Waste strength range BOD_5 (milligrams per liter)
Airport	b, i, j, p, r, t	15 per employee plus 4 per parking space	200 to 280 [r, s, t]
Apartment	b, l	120 per bedroom	200 to 280 [r, s, t]
Assembly hall	a, i, j	15 per employee plus 3 per seat without kitchen facilities or 7 per seat with kitchen facilities	200 to 280 [r, s, t]
Banquet hall	b i, j	15 per employee plus 3 per seat without kitchen facilities or 7 per seat with kitchen facilities	400
Barber shop	i, j	80 per basin	200 to 280 [s]
Beauty shop, styling salon	i, j	200 per basin	200 to 280 [s]
Bowling alley	a, i, j, p	75 per lane	200 to 280 [r, s, t]
Car wash	i, q	Sewer connection required; contact district office	
Campground or recreational park	a, i, j, m, n, p	30 per tent camp site without showers; 60 per tent camp site with showers; 60 per RV camp site without water hook-up; 90 per RV camp site with water hook-up	200 to 280 [r, s, t]
Church (less than 200 sanctuary seats)	a, h, j, k, o, p	3 per sanctuary seat without kitchen; 5 per sanctuary seat with kitchen	200 to 280 [r, s, t]
Church (greater than 200 sanctuary seats)	b h, j, k, o, p	5 per sanctuary seat without kitchen; 7 per sanctuary seat with kitchen	200 to 280 [r, s, t]
Coffee shop	a i, j	15 per employee plus 5 per seat	200 to 280 [r, s, t]
Convenience store, service station or gas station (add all flows that apply)	a, d, i, j, p, q	500 per pump island; 500 per service bay; 250 per shower; 15 per employee	200 to 280 [r, s, t, u]

Country club, sportsman club or gun club	b i, j, m, n, o, p	50 per member	200 to 280 [r, s, t]
Dance hall	a, i, j, p	15 per employee plus 3 per patron without kitchen facilities or 7 per patron with kitchen facilities	200 to 280 [r, s, t]
Daycare facility	a, i, j, p	35 per employee plus 10 per student	200 to 280 [r, s, t]
Dentist office	i	35 per employee plus 10 per patient plus 75 per dentist	200 to 280 [s]
Doctor office	i	35 per employee plus 10 per patient plus 75 per doctor	200 to 280 [s]
Dry cleaner	i	Contact district office [1]	200 to 280 [s]
Factory	i, q	25 per employee without showers; 35 per employee with showers	200 to 280 [r, s, t]
Food service operation/restaurant categories (as noted below)			
-Ordinary restaurant (not 24 hours)	c, i, j, p	35 per seat	400 to 600
-24 hour restaurant	c, i, j, p	60 per seat	400 to 600
-Restaurant along freeway	c, i, j, p	100 per seat	400 to 600
-Tavern (very little food service) or bar (full food service)	c, i, j, p	35 per seat	400 to 600
-Curb service (drive-in)	c, i, j, p	40 per car space	400 to 600
-Vending machine	c, i, j, p	100 per machine	400 to 600
*** End of food service operation/restaurant categories **********	*** End of food service operation/restaurant categories **********	*** End of food service operation/restaurant categories **********	*** End of food service operation/restaurant categories **********
Homes in subdivision	b, l	120 per bedroom	200 to 280 [r, s]
Hospital	b, i, j, p	300 per bed plus 35 per employee	200 to 280 [r, s, t]
Hotel or motel	a, i, j, p	100 per room	200 to 280 [r, s, t]
Institution (such as psychiatric hospitals or prisons)	b, i, j, p	100 per bed plus 35 per employee	300

Laundromat	i, q	15 per employee plus 400 per machine	200 to 280 [s]
Marina (restrooms and showers only)	a, i	20 per boat mooring or slip	200 to 280 [r, s, t]
Migrant labor camp	e, i, j, p	50 per employee	200 to 280 [r, s, t]
Mobile home park	b, i, j, p	300 per mobile home space	200 to 280 [r, s, t]
Nursing and rest homes	b, i, j, p	200 per bed plus 100 per resident employee plus 50 per non-resident employee	300
Office building	a, i, j, k	20 per employee	200 to 280 [r, s, t]
Playground or day park	a, i, k, p	15 per employee plus 12 per parking space	200 to 280 [s]
Retail store	a, i, j, p	15 per employee plus 12 per parking space	200 to 280 [r, s, t]
School	b, i, j, k, p, t	15 per employee plus 15 per pupil for elementary schools; 20 per pupil for junior and high schools; 85 per pupil for boarding schools	200 to 280 [r, s, t]
Service station or convenience store or gas station (add all flows that apply)	a, d,i, j, p, q, u, v	500 per pump island; 500 per service bay; 250 per shower; 15 per employee	200 to 280 [r, s, t, u]
Shopping center	a, f, l, p, q	15 per employee plus 2 per parking space without food service or 5 per parking space with food service	200 to 280 [r, s, t]
Swimming pool	a, i, m, n	5 per swimmer without hot showers or 10 per swimmer with hot showers	200 to 280 [r, s, t]
Theater	a, i, j, p	5 per seat for indoor auditorium or 10 per car for drive-in	200 to 280 [r, s, t]
Vacation cottage	b, i, j, p	50 per person without kitchen or 75 per person with kitchen	200 to 280 [r, s, t]
Veterinarian office and animal hospital	f, i, j	15 per employee plus 100 per doctor plus 20 per run and cage	200 to 280 [r, s, t]

Youth and recreation camps	b, i, j, p	15 per employee for day camp plus 15 per camper for day camp with food service or 10 per camper for day camp without food service; 50 per employee for overnight camp plus 50 per camper for overnight camp	200 to 280 [r, s, t]

Note a: Food service waste not included.

Note b: Food service waste included, but without garbage grinders.

Note c: Aeration tanks for these systems require forty-eight hour detention periods. Garbage grinders not permitted.

Note d: Truck parking areas will require consideration for treatment of runoff at large truck stops.

Note e: Twenty gallons per day of a vault latrine is used for toilet wastes.

Note f: Assume manual hosing of dog runs and solids (food droppings, etc.) removal prior to hosing.

Note g: Year round disinfection of all wastewater may be required before discharge to waters of the state or to any other surface or subsurface disposal systems.

Note h: Lower per seat estimate assumes a maximum of one church service per day, higher per seat estimate assumes a maximum of three church services per day. Weddings and funerals shall be counted as services.

Note i: Non-domestic or industrial wastes are prohibited from being discharged to soil based treatment systems.

Note j: Total capacity for number of persons should be confirmed by occupancy license or total occupancy capacity.

Note k: Higher flows shall be estimated when showers are available.

Note l: Deviating from this estimated design flow will require the director's approval, prior to applicant submitting the permit to install.

Note m: Pools cannot discharge pool filter backwash into soil based treatment systems.

Note n: Pool de-watering is prohibited from discharging to soil based treatment systems.

Note o: Flow estimates do not consider daycare facilities. If a daycare is present, the flow requirements for a daycare facility must be included.

Note p: An external grease trap is required for facilities with food service for soil based treatment systems.

Note q: Assume one working shift of not more than eight hours. Assume higher flows for two or three shift operations.

Note r: Assume no garbage grinder and normal domestic waste. If garbage grinders are present, the waste strength should be increased from twenty to sixty-five per cent.

Note s: Data for regular strength waste range of 200 to 280 milligrams per liter was obtained from U.S. EPA's manual "Onsite Wastewater Treatment Systems Manual, February 2002 (EPA/625/R-00/008)." This manual is available on the internet at www.epa.gov/ncepihom/ and can be ordered by telephone by calling (800) 490-9198.

Note t: Waste strength should be twenty to sixty-five per cent higher for facilities that include food service operations, such as cafeterias, service stations and for facilities that may handle pet wastes.

Note u: Sewer connection is required for a car wash. Please contact your district office.

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