

3745-2-11      **Dissolved oxygen modeling.**

(A) The loading capacity of a flowing receiving water for dissolved oxygen (D.O.) shall be determined by the use of mathematical water quality models. The models may range from simple solutions based on the Streeter-Phelps equation to complex, time variable models. The model complexity required shall be based on site-specific considerations. Whenever possible, these models should be calibrated and verified using site-specific data.

- (1) Alternative modeling methods including, but not limited to, continuous simulation or probabilistic analyses may be used if the director determines that they are appropriate and protective of water quality criteria.
- (2) If the director does not have sufficient site-specific stream data for D.O., the director may conduct a wasteload allocation (WLA) to maintain the criteria for ammonia toxicity. The required effluent ammonia may then be used to make a decision regarding necessary treatment related to overall D.O. impact in the receiving water, based on available information on wastewater treatment processes.

(B) The following stream design flows shall be used for dissolved oxygen modeling.

- (1) May to November: 7Q10 for summer.
- (2) December to February: 7Q10 for winter.
- (3) The director may determine design flows for streams that are impacted by reservoirs or other physical alterations by taking into account relevant site-specific factors. Stream design flows for such impacted stream segments shall be established to assure protection of designated uses.
- (4) Alternative flows or seasons may be used if the director determines that the flow or season is as protective as those listed in paragraph (B) of this rule.

(C) The background concentration of D.O. shall be based on the percentages of D.O. saturation in this paragraph at the temperature that represents the stream after mixing with the effluent. Site-specific D.O. values may be used if sufficient supporting data are available.

- (1) Ninety per cent of saturation shall be used for streams classified as exceptional warmwater or coldwater habitat.
- (2) Eighty per cent of saturation shall be used for all other stream uses.

- (D) Exception for direct discharges to lake Erie. If it is necessary to determine a WLA for a direct discharge to lake Erie, the mixing assumptions contained in rule 3745-2-05 of the Administrative Code shall be used.
- (E) Exception for direct discharges to the Ohio river. If it is necessary to determine a WLA for a direct discharge to the Ohio river, the mixing assumptions contained in rule 3745-2-05 of the Administrative Code shall be used.
- (F) Multiple discharges. When the director determines that it is necessary to consider multiple discharges in a WLA, the loading capacity may be distributed among discharges using a method deemed appropriate by the director, based on site-specific considerations. This WLA shall be developed pursuant to rule 3745-2-05 of the Administrative Code.

Effective: 10/31/1997

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Promulgated Under: R.C. 119.03

Statutory Authority: R.C. 6111.03, 6111.12

Rule Amplifies: R.C. 6111.12

Prior Effective Dates: None