Mixing Zone Rule Crosswalk

Existing Rule	Proposed Rule	Comment or Rationale
None	**010.xx Bioaccumulative Pollutants**. A compound with a bioaccumulation factor of greater than one thousand (1,000) or a bioconcentration factor of greater than three hundred (300).	New definition. Need to define term used in proposed rule so people know what we mean.
None	**010.xx Thermal Shock**. A rapid temperature change that causes aquatic life to become disoriented or more susceptible to predation or disease.	New definition. Need to define term used in proposed rule so people know what we mean.
Zone of Initial Dilution (ZID). An area within a Department authorized mixing zone where acute criteria may be exceeded. This area should be as small as practicable and assure that drifting organisms are not exposed to acute concentrations for more than one (1) hour more than once in three (3) years. The actual size of the ZID will be determined by the Department for a discharge on a case-by-case basis, taking into consideration mixing zone modeling and associated size recommendations and any other pertinent chemical, physical, and biological data available.	**010. 117 Zone of Initial Dilution (ZID)**. An area within a Department authorized mixing zone where acute criteria may be exceeded. This area shall be no larger than necessary and shall be sized to prevent lethality to swimming or drifting organisms by ensuring that organisms are not exposed to concentrations exceeding acute criteria for more than one (1) hour more than once in three (3) years. The actual size of the ZID will be determined by the Department for a discharge on a case-by-case basis, taking into consideration mixing zone modeling and associated size recommendations and any other pertinent chemical, physical, and biological data available.	Existing definition. Definition edited in response to comments to add clarity and consistency with body of rule.
060.01. Mixing Zones for Point Source Wastewater Discharges. After a biological, chemical, and physical appraisal of the receiving water and the proposed discharge and after consultation with the person(s) responsible for the wastewater discharge, the Department will determine the applicability of a mixing zone and, if applicable, its size, configuration, and location. In defining a mixing zone, the Department will consider the following principles:	**060.01 Mixing Zones for Point Source Discharges**. A mixing zone, including its size, configuration and location, must be authorized by the Department each time a permit is issued or renewed and is valid until permit renewal or modification. Such an authorization is required before a mixing zone can be used to determine the need for, or level of, effluent limits for a particular pollutant. Narrative criteria in Subsection 200.05 apply within the mixing zone.	Rewrote introductory paragraph. Revision emphasizes need for authorization of mixing zones and removes the confusion of "will consider" and then "shall" construct for principles that follow in existing rule. Edits made during rule negotiations in response to comments.
060.01.a. The mixing zone may receive wastewater	**060.01.j.** The following elements shall be	No direct crosswalk.

through a submerged pipe, conduit or diffuser.	considered when designing an outfall: i. Encourage rapid mixing to the extent possible. This may be done through careful location and design of the outfall; and ii. Avoid shore-hugging plumes in those water bodies where the littoral zone is a major supply of food and cover for migrating fish and other aquatic life or where recreational activities are impacted by the plume.	Old rule language is replaced by concept of discharge design and location considerations, encouragement of rapid mixing which will serve to keep size of plume/mixing zone small while maximizing dilution available.
060.01.b. The mixing zone is to be located so it does not cause unreasonable interference with or danger to existing beneficial uses.	**060.01.d.** Mixing zones, individually or in combination with other mixing zones, shall not cause unreasonable interference with, or danger to, beneficial uses. Unreasonable interference with, or danger to, beneficial uses includes, but is not limited to, the following: i. Blocking or impeding passage to any life stage of fish or other aquatic life, preventing successful spawning, egg incubation or rearing, or causing injury to attached aquatic life. ii. Heat in the discharge that causes thermal shock, lethality, or loss of cold water refugia. iii. Bioaccumulation of pollutants (as defined in Section 010) resulting in tissue levels in aquatic organisms higher than the applicable water column criteria would predict. iv. Lethality to aquatic life passing through the mixing zone. v. Concentrations of pollutants that exceed Maximum Contaminant Levels at drinking	Unreasonable interference. Carried forward but expanded to provide detail on what constitutes unreasonable interference. Went through several revisions during rule negotiations. Edited extensively in response to comments during rule negotiations.

	water intake structures. vi. Conditions which impede or prohibit recreation in or on the water body. Mixing zones shall not be authorized for E. coli.	
060.01.c. When two (2) or more individual mixing zones are needed for a single activity, the sum of the areas and volumes of the several mixing zones is not to exceed the area and volume which would be allowed for a single zone;	**060.01.f.** Multiple mixing zones can be established for a single activity with multiple points of discharge. When these individual mixing zones overlap or merge, their combined area and volume shall not exceed that which would be allowed if there was a single point of discharge. When these individual mixing zones do not overlap or merge, they may be authorized as individual mixing zones.	Single activity, multiple discharges. Concept in existing rule retained, but language modified during rule negotiations. More permissive in situations where multiple mixing zones for a single activity do not overlap.
060.01.d. Multiple mixing zones can be established for a single discharge, each being specific for one (1) or more pollutants contained within the discharged wastewater;	**060.01.e.** Multiple nested mixing zones may be established for a single point of discharge, each being specific for one (1) or more pollutants contained within the discharge.	Single discharge, multiple mixing zones. Concept retained, language essentially the same.
060.01.e. Mixing zones in flowing receiving waters are to be limited to the following: i. The cumulative width of adjacent mixing zones when measured across the receiving water is not to exceed fifty percent (50%) of the total width of the receiving water at that point; ii. The width of a mixing zone is not to exceed twenty-five percent (25%) of the stream width or three hundred (300) meters plus the horizontal length of the diffuser as measured perpendicularly to the stream flow, whichever is less; iii. The mixing zone is to be no closer to the ten (10) year, seven (7) day low-flow shoreline than fifteen percent (15%) of the stream width; iv. The mixing zone is not to include more than twenty-five percent (25%) of the volume of	**060.01.h.** Mixing zones shall meet the following restrictions; provided, however, that the Department may authorize mixing zones that vary from the restrictions under the circumstances set forth in Subsection 060.01.i. below: i. For flowing waters: (1) The width of a mixing zone is not to exceed twenty-five percent (25%) of the stream width; and (2) The mixing zone shall not include more than twenty-five percent (25%) of the low flow design discharge conditions as set forth in Subsection 210.03.b of these rules.	Mixing zone size in flowing waters. Size restriction simplified, e.g. width limit now just 25% of width, removed relation to length of diffuser. Made more clear these size restriction can be varied from (as described in new section 060.01.i) Fraction of stream flow now clearly related back to low design flows in section 210.03.b on toxics criteria, which has been the practice. Some of previous concepts under size moved to other sections in proposed rule, e.g.: Cumulative width now covered under unreasonable interference, but with no fixed limit on width. (see above) Proximity to shoreline now addressed under outfall design in 060.01.i.ii (see above)

the stream flow;		
060.01.f. Mixing zones in reservoirs and lakes are to be limited to the following: i. The total horizontal area allocated to mixing zones is not to exceed ten percent (10%) of the surface area of the lake; ii. Adjacent mixing zones are to be no closer than the greatest horizontal dimension of any of the individual zones;	ii. For all new discharges to nonflowing waters authorized after July 1, 2015: (1) The size of the mixing zone is not to exceed five percent (5%) of the total open surface area of the water body or one hundred (100) meters from the point of discharge, whichever is smaller; (2) Shore-hugging plumes are not allowed; and (3) Diffusers shall be used. iii. Lakes and reservoirs with a mean detention time of fifteen (15) days or greater shall be considered nonflowing waters for this purpose. Detention time will be calculated as the mean annual storage volume divided by the mean annual flow rate out of the reservoir for the same time period.	Mixing zone size in non-flowing waters (now a sub heading under 060.01.h.) Switched from reservoirs and lakes to non-flowing waters to parallel use of the word flowing in previous section and thus not exclude any type of waters. Going forward from adoption of new rule; reduced size limits, disallow shore-hugging plumes and require diffusers to recognize poor mixing conditions in non-flowing waters and value of shoreline for recreation and wildlife. Added definition of non-flowing waters for lakes and reservoirs specific to mixing zones. This serves primarily to distinguish run-of-the-river reservoirs that behave more like rivers, from storage reservoirs that behave more like lakes.
060.01.g. The water quality within a mixing zone may exceed chronic water quality criteria so long as chronic water quality criteria are met at the boundary of any approved mixing zone. Acute water quality criteria may be exceeded within a zone of initial dilution inside the mixing zone if approved by the Department.	**060.01.b.** Water quality within an authorized mixing zone is allowed to exceed chronic water quality criteria for those parameters approved by the Department. If approved by the Department, acute water quality criteria for one or more parameters may be exceeded within the zone of initial dilution inside the mixing zone. All water quality criteria must be met at the boundary of any mixing zone under its design conditions.	Water quality within mixing zone. The same requirements as exists now, edited during negotiations to add clarity.
060.01.h. Concentrations of hazardous materials within the mixing zone must not exceed the ninety-six (96) hour LC50 for biota significant to the receiving water's aquatic community.		No comparable section in new rule. This is redundant of section above regarding acute criteria, thus not needed.
060.02. Mixing Zones for Outstanding Resource Waters. An ORW mixing zone will be downstream	**060.02. Points of Compliance as Alternatives to Mixing Zones.** Specification of mixing zones for	Rewritten section.

from the discharge of a tributary or segment immediately upstream which contains man caused pollutants as a result of nonpoint source activities occurring on that tributary or segment. As a result of the discharge, the mixing zone may not meet all water quality standards applicable to the ORW, but shall still be protected for existing beneficial uses. The Department, after consideration of input from interested parties, will determine the size, configuration and location of mixing zones which are necessary to meet the requirements of these rules.	some 404 dredge and fill activities, stormwater, and nonpoint source discharges may not be practicable due to the generally intermittent and diffuse nature. Rather, the Department may establish points for monitoring compliance with ambient water quality criteria. These alternatives to a mixing zone are still subject to requirements outlined in Subsection 060.01.d.	Generalized section to address mixing for all manner of discharge where such discharge may be intermittent or not emanate from a pipe, not just ORW's. Prompted by experience in dealing with questions of mixing for sources for which mixing zones have not traditionally been applied.
None	**060.01.a.** Mixing zones shall not be authorized for a given pollutant when the receiving water does not meet water quality criteria for that pollutant; provided, however, the Department may authorize a mixing zone when the permitted discharge is consistent with an approved TMDL allocation or other applicable plans or analyses (such as 4b implementation plans, watershed loading analyses, or facility-specific water quality analyses) that demonstrate that authorizing a mixing zone is consistent with achieving compliance with water quality standards in the receiving water.	New section. Added to make it clear that generally there is no assimilative capacity that would allow for mixing when pollutant concentrations exceed criteria in a receiving water body while providing for some clear exceptions.
None	**060.01.c.** The size of mixing zone(s) and the concentration of pollutant(s) present shall be evaluated based on the permitted design flow. The Department shall not authorize a mixing zone that is determined to be larger than is necessary.	New section. Sets principles for sizing mixing zones. Some elements, e.g. design flow, evaluation, borrowed from existing rule.
None	**060.01.g.** Adjacent mixing zones of independent activities shall not overlap.	New section. Added to avoid overlapping mixing zones that would compound stress to aquatic life
None	**060.01.i**. The Department may authorize a mixing zone that varies from the limits in Subsection 060.01.h. if it is established that: i. A smaller mixing zone is needed to avoid an	New section Added to make it clear that based on particulars of each facility, its discharge, and the receiving stream, the Department may authorize mixing

	unreasonable interference with, or danger to, beneficial uses as described in Subsection 060.01.d., and the mixing zone meets the other requirements set forth in Section 060; or ii. A larger mixing zone is needed by the discharger and does not cause an unreasonable interference with, or danger to, beneficial uses as described in Subsection 060.01.d., and the mixing zone meets the other requirements set forth in Section 060. The discharger shall provide to the Department an analysis that demonstrates a larger mixing zone is needed given siting, technological, and managerial options.	zones larger or smaller than nominal size restrictions in section 060.01.h. Smaller mixing zones may be needed to avoid unreasonable interference to beneficial uses. Larger mixing zones may be possible if the discharger can show need and a larger mixing zone does cause unreasonable interference.