Appendix 3F

Water Quality Objectives for North Western Water Control Zone and Western Buffer Water Control Zone

Water Quality Objectives for North Western Water Control Zone

Parameter	Water Quality Objective	Part(s) of Zone
Aesthetic Appearance	(a) discharge shall not cause objectionable odour or discoloration	Whole Zone
	(b) no tarry residue, floating wood, articles made of grass, plastic, rubber or any other substance	Whole Zone
	(c) Mineral oil not visible on the surface. Surfactants shall not give rise to a lasting foam.	Whole Zone
	(d) no recognizable sewage-derived debris	Whole Zone
	(e) no floating, submerged or semi-submerged subjects likely to interfere with the free movement or damage of material	Whole Zone
	(f) not to contain substances which settle to form objectionable deposits	Whole Zone
Bacteria	(a) The level of Escherichia coli should not exceed 610 per 100 mL, calculated as the geometric mean of all samples collected in a calendar year.	Secondary contact recreation subzones
	(b) The level of Escherichia coli should be less than 1 per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Tuen Mun (A) and Tuen Mun (B) Subzones and Water Gathering Ground Subzones
	(c) The level of Escherichia coli should not exceed 1000 per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Tuen Mun (C) Subzones and other Inland Waters
	(d) The level of Escherichia coli should not exceed 180 per 100 mL, calculated as the geometric mean of all samples collected from March to October inclusive. Samples should be taken at least 3 times in one calendar month at intervals of between 3 and 14 days.	Bathing beach subzones
Colour	(a) Waste discharges shall not cause the colour of water to exceed 30 Hazen units.	Tuen Mun (A) and Tuen Mun (B) Subzones and Water Gathering Ground Subzones
	(b) Waste discharges shall not cause the colour of water to exceed 50 Hazen units.	Tuen Mun (C) and other Inland Waters
Dissolved Oxygen	(a) Waste discharges shall not cause the level of dissolved oxygen to fall below 4 mg per litre for 90% of the sampling occasions during the whole year; values should be calculated as water column average (arithmetic mean of at least 3 measurements at 1 m below surface, mid-depth and 1 m above seabed). In addition, the concentration of dissolved oxygen should not be less than 2 mg per litre within 2 m of the seabed for 90% of the sampling occasions during the whole year.	Marine waters
	(b) Waste discharges shall not cause the level of dissolved oxygen to be less than 4 mg per litre.	Tuen Mun (A), Tuen Mun (B) and Tuen Mun (C) Subzones, Water Gathering Ground Subzones and other inland waters

Parameter	Water Quality Objective	Part(s) of Zone
pH	(a) The pH of the water should be within the range of 6.5-8.5 units. In addition, waste discharges shall not cause the natural pH range to be extended by more than 0.2 unit.	Marine waters excepting Bathing Beach Subzones
	(b) Waste discharges shall not cause the pH of the water to exceed the range of 6.5-8.5 units.	Tuen Mun (A), Tuen Mun (B) and Tuen Mun (C) Subzones and Water Gathering Ground Subzones
	(c) The pH of the water should be within the range of 6.0-9.0 units.	Other inland waters
	(d) The pH of the water should be within the range of 6.0-9.0 units for 95% of samples collected during the whole year. In addition, waste discharges shall not cause the natural pH range to be extended by more than 0.5 unit.	Bathing Beach Subzones
Temperature	Waste discharges shall not cause the natural daily temperature range to change by more than 2.0 degrees Celsius.	Whole zone
Salinity	Waste discharges shall not cause the natural ambient salinity level to change by more than 10%.	Whole zone
Suspended solids	(a) Waste discharges shall neither cause the natural ambient level to be raised by more than 30% nor give rise to accumulation of suspended solids which may adversely affect aquatic communities.	Marine waters
	(b) Waste discharges shall not cause the annual median of suspended solids to exceed 20 mg per litre.	Tuen Mun (A) and Tuen Mun (B) Tuen Mun (C) Subzones and water gathering ground subzones
	(c) Waste discharges shall not cause the annual median of suspended solids to exceed 25 mg per litre.	Other inland waters
Ammonia	The un-ionized ammoniacal nitrogen level should not be more than 0.021 mg per litre, calculated as the annual average (arithmetic mean).	Whole zone
Nutrients	(a) Nutrients shall not be present in quantities sufficient to cause excessive or nuisance growth of algae or other aquatic plants.	Marine waters
	(b) Without limiting the generality of objective (a) above, the level of inorganic nitrogen should not exceed 0.3 mg per litre, expressed as annual water column average (arithmetic mean of at least 3 measurements at 1 m below surface, mid-depth and 1 m above seabed).	Castle Peak Bay Subzone
	(c) Without limiting the generality of objective (a) above, the level of inorganic nitrogen should not exceed 0.5 mg per litre, expressed as annual water column average (arithmetic mean of at least 3 measurements at 1 m below surface, mid-depth and 1 m above seabed).	Marine waters excepting Castle Peak Bay Subzone
5-Day Biochemical Oxygen Demand	(a) Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 3 mg per litre.	Tuen Mun (A) and Tuen Mun (B) Tuen Mun (C) Subzones and water gathering ground subzones

Parameter	Water Quality Objective	Part(s) of Zone
	(b) Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 5 mg per litre not to exceed 5 mg/L Other inland waters	
Chemical Oxygen Demand	(a) Waste discharges shall not cause the chemical oxygen demand to exceed 15 mg per litre.	Tuen Mun (A) and Tuen Mun (B) Tuen Mun (C) Subzones and water gathering ground subzones
	(b) Waste discharges shall not cause the chemical oxygen demand to exceed 30 mg per litre.	Other inland waters
Toxins	(a) Waste discharges shall not cause the toxins in water to attain such levels as to produce significant toxic, carcinogenic, mutagenic or teratogenic effects in humans, fish or any other aquatic organisms, with due regard to biologically cumulative effects in food chains and to toxicant interactions with each other.	Whole zone
	(b) Waste discharges shall not cause a risk to any beneficial use of the aquatic environment	Whole zone
Phenol	Phenols shall not be present in such quantities as to produce a specific odour, or in concentration greater than 0.05 mg per litre as C_6H_5OH.	Bathing Beach Subzones
Turbidity	Waste discharges shall not reduce light transmission substantially from the normal level.	Bathing Beach Subzones

Water Quality Objectives for Western Buffer Water Control Zone

Parameter	Water Quality Objective	Part(s) of Zone
Aesthetic Appearance	(a) There should be no objectionable odours or discolouration of the water.	Whole zone
	(b) Tarry residues, floating wood, articles made of glass, plastic, rubber or of any other substances should be absent.	Whole zone
	(c) Mineral oil should not be visible on the surface. Surfactants should not give rise to a lasting foam.	Whole zone
	(d) There should be no recognisable sewage-derived debris.	Whole zone
	(e) Floating, submerged and semi-submerged objects of a size likely to interfere with the free movement of vessels, or cause damage to vessels, should be absent.	Whole zone
	(f) The water should not contain substances which settle to form objectionable deposits.	Whole zone
Bacteria	(a) The level of Escherichia coli should not exceed 610 per 100 mL, calculated as the geometric mean of all samples collected in a calendar year.	Secondary Contact Recreation Subzones and Fish Culture Subzones
	(b) The level of Escherichia coli should not exceed 180 per 100 mL, calculated as the geometric mean of all samples collected from March to October inclusive in 1 calendar year. Samples should be taken at least 3 times in 1 calendar month at intervals of between 3 and 14 days.	Recreation Subzones
	(c) The level of Escherichia coli should be less than 1 per 100 mL, calculated as the geometric mean of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Water Gathering Ground Subzones
	(d) The level of Escherichia coli should not exceed 1000 per 100 mL, calculated as the geometric mean of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Other inland waters
Colour	(a) Human activity should not cause the colour of water to exceed 30 Hazen units.	Water Gathering Ground Subzones
	(b) Human activity should not cause the colour of water to exceed 50 Hazen units.	Other inland waters
Dissolved Oxygen	(a) The level of dissolved oxygen should not fall below 4 mg per litre for 90% of the sampling occasions during the whole year; values should be calculated as water column average (arithmetic mean of at least 3 measurements at 1 m below surface, mid-depth and 1 m above seabed). In addition, the concentration of dissolved oxygen should not be less than 2 mg per litre within 2 m of the seabed for 90% of the sampling occasions during the whole year.	Marine waters excepting Fish Culture Subzones

Parameter	Water Quality Objective	Part(s) of Zone
	(b) The level of dissolved oxygen should not be less than 5 mg per litre for 90% of the sampling occasions during the years; values should be calculated as water column average (arithmetic mean of at least 3 measurements at 1 m below surface, mid-depth and 1 m above seabed). In addition, the concentration of dissolved oxygen should not be less than 2 mg per litre within 2 m of the seabed for 90% of the sampling occasions during the whole year.	Fish Culture Subzones
	(c) The level of dissolved oxygen should not be less than 4 mg per litre.	Water Gathering Ground Subzones and other inland waters
pH	(a) The pH of the water should be within the range of 6.5-8.5 units. In addition, human activity should not cause the natural pH range to be extended by more than 0.2 unit.	Marine waters
	(b) Human activity should not cause the pH of the water to exceed the range of 6.5-8.5 units.	Water Gathering Ground Subzones
	(c) Human activity should not cause the pH of the water to exceed the range of 6.0-9.0 units.	Other inland waters
Temperature	Human activity should not cause the natural daily temperature range to change by more than 2.0 degrees Celsius.	Whole zone
Salinity	Human activity should not cause the natural ambient salinity level to change by more than 10%.	Whole zone
Suspended solids	(a) Human activity should neither cause the natural ambient level to be raised by more than 30% nor give rise to accumulation of suspended solids which may adversely affect aquatic communities.	Marine waters
	(b) Human activity should not cause the annual median of suspended solids to exceed 20 mg per litre.	Water Gathering Ground Subzones
	(c) Human activity should not cause the annual median of suspended solids to exceed 25 mg per litre.	Other inland waters
Ammonia	The un-ionized ammoniacal nitrogen level should not be more than 0.021 mg per litre, calculated as the annual average (arithmetic mean).	Whole zone
Nutrients	(a) Nutrients should not be present in quantities sufficient to cause excessive or nuisance growth of algae or other aquatic plants.	Marine waters
	(b) Without limiting the generality of objective (a) above, the level of inorganic nitrogen should not exceed 0.4 mg per litre, expressed as annual water column average (arithmetic mean of at least 3 measurements at 1 m below surface, mid-depth and 1 m above seabed).	Marine waters
5-Day Biochemical Oxygen Demand	(a) The 5-day biochemical oxygen demand should not exceed 3 mg per litre. (b) The 5-day biochemical oxygen demand should not exceed 5 mg per litre.	Water gathering ground subzones Other inland waters
	(b) The 5-day biochemical oxygen demand should not exceed 5 mg per litre.	Other inland waters
Chemical Oxygen Demand	(a) The chemical oxygen demand should not exceed 15 mg per litre.	Water gathering ground subzones

Parameter	Water Quality Objective	Part(s) of Zone
	(b) The chemical oxygen demand should not exceed 30 mg per litre.	Other inland waters
Toxins	(a) Toxic substances in the water should not attain such levels as to produce significant toxic, carcinogenic, mutagenic or teratogenic effects in humans, fish or any other aquatic organisms, with due regard to biologically cumulative effects in food chains and to interactions of toxic substances with each other.	Whole zone
	(b) Human activity should not cause a risk to any beneficial use of the aquatic environment.	Whole zone
Turbidity	Waste discharges should not reduce light transmission substantially from the normal level.	Bathing Beach Subzones