3. RELEVANT ENVIRONMENTAL LEGISLATION

3.1 Introduction

This section presents a summary of current environmental legislation which is relevant for the assessment of potential environmental impacts associated with the proposed project.

3.2 Environmental Impact Assessment Ordinance

Preparation of the EIA itself has been undertaken in accordance with the requirements of the EIA Study Brief (no. ESB-004/1998 issued on 30.6.98). The Study Brief was prepared by the Government based on the Technical Memorandum on Environmental Impact Assessment (EIA-TM) (Environmental Impact Assessment Ordinance, Cap. 499, S.16).

3.3 Air

The Air Pollution Control Ordinance, Cap 311 (APCO) provides the statutory authority for controlling air pollutants from a variety of stationary and mobile sources, including fugitive dust emissions from construction sites. It encompasses a number of Air Quality Objectives (AQOs) which stipulate concentrations for a range of pollutants including Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Respirable Suspended Particulates (RSP) and Total Suspended Particulates (TSP).

3.3.1 Air Quality Objectives (AQOs)

The Hong Kong Air Quality Objectives (AQOs) stipulate the statutory limits for a number of pollutants and the maximum allowable number of exceedances over specified periods. The AQOs are given in Table 3.1.

Table 3.1 Hong Kong Air Quality Objectives

Pollutant	Concentration ($\mu g/m^3$)(1) Averaging Time				
	1 Hour(2)	8 Hour(3)	24 Hours(3)	3 Months(4)	1 Year(4)
Sulphur Dioxide SO_2	800	–	350	–	80
Total Suspended Particulates (TSP)	–	–	260	–	80
Respirable Suspended Particulates (RSP)(5)	–	–	180	–	55
Nitrogen Dioxide NO_2	300	–	150	–	80
Carbon Monoxide CO	30000	10000	–	–	–
Photochemical Oxidants (as ozone(6))	240	–	–	–	–
Lead	–	–	–	1.5	–

Notes:

(1) Measured at 298 K and 101.325 kPa (one atmosphere).
(2) Not to be exceeded more than three times per year.
(3) Not to be exceeded more than once per year.
(4) Arithmetic means.
(5) Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 micrometers or less.
(6) Photochemical oxidants are determined by measurement of ozone only.

3.4 Noise

3.4.1 Construction Noise

The control of construction noise during restricted periods (anytime for percussive piling) is carried out under the Noise Control Ordinance (NCO) and three subsidiary Technical Memoranda (TMs) covering Noise from Percussive Piling (PP-TM), Noise from Construction Work Other Than Percussive Piling (GW-TM) and Noise from Construction Work in Designated Areas (DA-TM). The TMs establish the permitted noise levels for construction work depending upon working hours and the existing noise climate.

"Despite any description or assessment made in the subsequent paragraphs, the Noise Control Authority will be guided by the relevant Technical Memorandum (Memoranda) in assessing an application, once filed, for a Construction Noise Permit. He will consider all the factors affecting his decision taking contemporary situations/conditions into account. Nothing in this Report shall bind the Authority in making his decision. There is no guarantee that a Construction Noise Permit will be issued. If a permit is to be issued, the Authority shall include any condition he thinks fit and such conditions are to be followed while the works covered by the permit are being carried out. Failing which will lead to cancellation of the permit and prosecution action under the NCO.

There are some factors affecting the assessment results of a CNP application, such as the assigning of Area Sensitivity Rating, Acceptable Noise Levels etc. The Noise Control Authority would decide these at the time of assessment of such an application based on the contemporary situations/conditions. It should be noted that the situations/conditions around the sites may change from time to time."

The NCO criteria for the control of noise from Power Mechanical Equipment (PME) at a particular noise sensitive receiver (NSR) is based on its Area Sensitivity Rating (ASR), which "ranks" the background noise conditions with respect to the type of area in which the NSR is located. Table 3.2 shows the ASR selection criteria as stated in GW-TM.

Table 3.2 Area Sensitivity Rating Criteria

Type of area containing the NSR		Degree to which NSR is affected by IF[4]		
		Not Affected[1]	Indirectly Affected[2]	Directly Affected[3]
(i)	Rural area, including country parks or village type developments	A	B	B
(ii)	Low density residential area consisting of low rise or isolated high-rise developments	A	B	C
(iii)	Urban area	B	C	C
(iv)	Area other than those above	B	B	C

Notes:

(1) Not Affected means that the NSR is at such a location that the noise generated by the influencing factors[4] (IFs) is not noticeable at the NSR.
(2) Indirectly Affected means that the NSR is at such a location that the noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR.
(3) Directly Affected means that the NSR is in such a location that the noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR.
(4) IFs are defined as industrial areas, major roads or the area within the boundary of Hong Kong International Airport.

Construction activities during restricted hours and on Sundays and public holidays, are controlled by the NCO. Works requiring the use of Power Mechanical Equipment during these times must be carried out under the provisions of a Construction Noise Permit (CNP).

As such, they must achieve the required Basic Noise Level (BNL) as shown in Table 3.3 below.

Table 3.3 Basic Noise Levels in $L_{eq(30\ min)}$ dB(A)

Time Period	Area Sensitivity Rating		
	A	B	C
All days during the evening (1900-2300) and general holidays (including Sundays) during the day and evening (0700-2300)	60	65	70
All days during the night-time (2300-0700)	45	50	55

The BNL is corrected using the TM Methodology to produce the Acceptable Noise Level (ANL) which will be used in the CNP approval process. A Construction Noise Permit (CNP) is required by the regulations of the NCO for the use of all PME during restricted hours. The procedures set out in GW-TM, PP-TM, DA-TM are used by EPD to determine whether or not a CNP should be issued. CNPs will not automatically be granted and will be assessed on a case by case basis by EPD.

In table 1B of the EIA-TM, noise standards for daytime construction activities are proposed at a limit of $L_{eq(30\ min)}$ 75 dB(A) for all domestic premises including temporary housing accommodation, hotels and hostels. For schools, a daytime noise level of $L_{eq(30\ min)}$ 70 dB(A), lowered to 65 dB(A) during examination periods is recommended.

Subsidiary regulations of the NCO include *the Noise Control (Hand Held Percussive Breakers)* and *Noise Control (Air Compressors) Regulations*. These require compliance with relevant noise emission standards and the fixing of noise emission labels to hand-held percussive breakers and air compressor. Whilst these requirements are not directly relevant to the construction noise impact assessment, contractors must ensure that compliance with these regulations are met during the construction phase of a project.

Percussive piling is only permitted where a CNP has been granted by the Noise Control Authority. PP-TM sets out the permitted hours of operation of percussive piling and Acceptable Noise Level (ANL) requirements, which are dependent on the architectural characteristics of the NSR. The ANL criteria for percussive piling are reproduced in Table 3.4. ANLs for hospitals, schools, clinics, courts of law and other particularly sensitive receivers are 10 dB(A) below the figures quoted in Table 3.4.

Table 3.4 Acceptable Noise Levels for Percussive Piling

Architectural Characteristics of NSR	ANL, dB(A)
No windows or other openings	100
With central air conditioning system	95
With windows or other openings but without central air conditioning system	85

3.4.2 Road Traffic Noise

The noise standards stipulated in Table 1A of Annex 5 of the EIA-TM applies to road traffic noise assessment. The criteria for road traffic noise is $L_{10(1hr)}$ 70 dB(A) for all domestic premises, hotels and offices and $L_{10(1hr)}$ 65 dB(A) for educational institutions, places of public worships and courts of law. The standards outlined above apply to uses which rely on opened windows for ventilation.

3.5 Water

The major assessment criteria relating to the protection of water quality are stipulated in the WPCO (Cap.358) which has been established since 1980. This legislation allows water

control zones (WCZs) to be established, in which objectives are set for quality. The project is located within the catchment of the Tolo Harbour and Channel Water Control Zone (WCZ) which was designated in 1987. The WCZ is subdivided into three subzones: the harbour subzone, the buffer subzone and the channel subzone. Inland watercourses within the WCZ are also divided into various subzones for Shing Mun, Tai Po and Lam Tsuen catchment. Water Quality Objectives (WQOs) have been set for each subzone (refer to Figure 3.1) and the subzones relevant to this study are the inland water control subzones Tai Po River (TP) and Lam Tsuen River (LT). WQOs for selected parameters are listed in Table 3.5.

Table 3.5 Water Quality Objectives for the Tolo Harbour and Channel Water Control Zone

Water Quality Objective	Part or Parts of Zone
	Tolo Harbour and Channel Waters
A. AESTHETIC APPEARANCE	
Wastes discharges shall not cause waters of the subzone to contain substances that-	
(a) settle to form objectionable deposits;	Whole zone
(b) float as debris, scum, oil or other matter to form nuisances;	Whole zone
(c) produce objectionable colour, odour, taste or turbidity;	Whole zone
(d) Injure or are toxic or produce adverse physiological responses in humans, animals or plants; or	Whole zone
(e) are conducive to undesirable aquatic or a nuisance to aquatic life	Whole zone
B. BACTERIA	
(a) Waste discharges shall not cause the level of *Escherichia coli* to exceed 1000 per 100 ml in waters of the subzone, levels to be calculated as a running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days (or 14 and 42 days).	TP(B), TP(C)
(b) Waste discharges shall not cause the level of *Escherichia coli* to exceed 0 per 100 ml in waters of the subzone, levels to be calculated as a running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days (or 14 and 42 days).	LT(C) , LT(D), TP(A)
C. COLOUR	
(a) Waste discharges shall not cause the colour of water of the subzone to exceed 50 Hazen units at any time.	TP(B), TP(C)
(b) Waste discharges shall not cause the colour of waters of the subzone to exceed 30 Hazen units at any time.	LT(C), LT(D), TP(A)
D. PH	
(a) Waste discharges shall not cause the pH of waters of the subzone to exceed the range of 6.0 to 9.0 at any time.	
(b) Waste discharges shall not cause the pH of waters of the subzone to exceed the range of 6.5 to 8.5 at any time.	LT(C), LT(D), TP(A), TP(B), TP(C)
E. TEMPERATURE	
Waste discharges shall not cause the natural daily temperature range in waters of the subzone to be extended by greater than $\pm$ 2.0 degrees Celsius at any location or time.	Whole zone
F. SUSPENDED SOLIDS	
(a) Waste discharges shall not cause the annual median of suspended solids in waters of the subzone to exceed 25 mg per litre.	
(b) Waste discharges shall not cause the annual median of suspended solids in waters of the subzone to exceed 20 mg per litre.	LT(C), LT(D), TP(A), TP(B), TP(C)

	Water Quality Objective	Part or Parts of Zone Tolo Harbour and Channel Waters
G.	**DISSOLVED OXYGEN** Waste discharges shall not cause the level of dissolved oxygen in waters if the subzone to be less than 4mg per litre or 40% saturation (at 15 degree Celsius) at any time.	Whole zone
H.	**5-DAY BIOCHEMICAL OXYGEN DEMAND** (a) Waste discharges shall not cause the 5-days biochemical oxygen demand in waters of the subzone to exceed 5 mg per litre at any time. (b) Waste discharges shall not cause the 5-days biochemical oxygen demand in waters of the subzone to exceed 3 mg per litre at any time.	TP(B), TP(C) LT(C), LT(D), TP(A)
I.	**CHEMICAL OXYGEN DEMAND** (a) Waste discharges shall not cause the chemical oxygen demand in waters of the subzone to exceed 30 mg per litre at any time. (b) Waste discharges shall not cause the chemical oxygen demand in waters of the subzone to exceed 15 mg per litre at any time.	TP(B), TP(C) LT(C), LT(D), TP(A)
J.	**AMMONIACAL NITROGEN** Waste discharges shall not cause the ammoniacal nitrogen in waters of the subzone to exceed 0.5 mg per litre at any time.	Whole zone
K.	**TOXINS** Waste discharges shall not cause the toxins in water of the subzone to attain such a level as to produce significant toxic effects in humans, fish or any other aquatic organism, with due regard to biologically cumulative effects in food chains and to toxicant interactions with each other.	Whole zone

Marine Waters

Protection of existing or potential beneficial uses from the effects of implementing the Scheme is a key concern to be addressed in the EIA. Beneficial uses of marine and coastal waters include the following sub-divisions:

- Areas of ecological or conservation values including marine conservation areas, existing or gazetted proposed marine parks and marine reserves, sites of special scientific interest (SSSI), existing or gazetted proposed country parks and special areas, wetlands, mangroves and important freshwater habitats;
- Areas for abstraction of water for potable water supply;
- Water abstraction for irrigation and aquaculture;
- Fish spawning grounds, fish culture zones, shellfish harvesting/culture site and brackish/freshwater fish ponds;
- Beaches and other recreational areas;
- Water abstraction for cooling, flushing and other industrial purposes; and
- Area for navigating/shipping including typhoon shelters, marinas and boat parks.

Surface Waters

For surface water the beneficial uses are defined in the Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters as follows:

Group A abstraction for portable water supply
Group B irrigation
Group C pond fish culture
Group D general amenity and secondary contact recreation

The majority of inland waters within the Study Area are defined as Group D

During construction the criteria for the protection of water quality are stipulated in the Technical Memorandum TM on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters. The TM was issued under Water Pollution Control Ordinance (WPCO) and give guidance on the permissible effluent discharges based on the type of receiving waters (foul sewers, storm water drains, inland and coastal waters). The limits control the physical, chemical and bacterial quality of effluents.

Any person(s) discharging into the receiving waters should apply for a licence issued. In the absence of any licensing conditions at this stage, the TM standards can be adopted as a reference. Relevant TM standards for Group D waters (generally encountered in the Study Area) for selected parameters are listed in Table 3.6.

Table 3.6 TM Standards for Discharges to Group D Water (all units in mg/l unless otherwise stated)

Flow Rate m^3/day Determinand	≤200	>200 and ≤400	>400 and ≤600	>600 and ≤800	>800 and ≤1000	>1000 and ≤2000	>2000 and ≤3000	>2000 and ≤3000
pH (pH units)	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10
Temperature (°C)	30	30	30	30	30	30	30	30
Colour (lovibond units) (25mm cell length)	1	1	1	1	1	1	1	1
Suspended solids	30	30	30	30	30	30	30	30
BOD	20	20	20	20	20	20	20	20
COD	80	80	80	80	80	80	80	80
Oil & Grease	10	10	10	10	10	10	10	10
Iron	10	8	7	5	4	2.7	2	1.3
Boron	5	4	3.5	2.5	1	1.5	1	0.7
Barium	5	6	3.5	2.5	1	1.5	1	0.7
Mercury	0.1	0.05	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.1	0.05	0.001	0.001	0.001	0.001	0.001	0.001
Other toxic metals individually	1	1	0.8	0.8	0.5	0.5	0.2	0.2
Total toxic metals	2	2	1.6	1.6	1	1	0.5	0.4
Cyanide	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.05
Phenols	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1
Sulphide	1	1	1	1	1	1	1	1
Sulphate	800	600	600	600	600	400	400	400
Chloride (count/100ml)	1000	800	800	800	600	600	400	400
Fluoride	10	8	8	8	5	5	3	3
Total phosphorus	10	10	10	8	8	8	5	5
Ammonia nitrogen	20	20	20	20	20	20	20	10
Nitrate + nitrite nitrogen	50	50	50	30	30	30	30	20
Surfactants (total)	15	15	15	15	15	15	15	15
E. coli (count/100ml)	1000	1000	1000	1000	1000	1000	1000	1000

For the discharge of surface water drainage into Foul Sewers Leading to Government Sewage Treatment Works the standards are given in Table 3.7.

Table 3.7 Standards for effluent discharged into foul sewers leading into Government sewage treatment plants (All units in mg/L unless otherwise stated; all figures are upper limits unless otherwise indicated)

Flat rate (m^3 day) Determinand	≤10	>10 and ≤100	>100 and ≤200	>200 and ≤400	>400 and ≤600	>600 and ≤800	>800 and ≤1000	>1000 and ≤1500	>1500 and ≤2000	>2000 and ≤3000	>3000 and ≤4000	>4000 and ≤5000	>5000 and ≤6000
pH (pH units)	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10
Temperature (°C)	43	43	43	43	43	43	43	43	43	43	43	43	43
Suspended solids	1200	1000	900	800	800	800	800	800	800	800	800	800	800
Settleable solids	100	100	100	100	100	100	100	100	100	100	100	100	100
BOD	1200	1000	900	800	800	800	800	800	800	800	800	800	800
COD	3000	2500	2200	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Oil & Grease	100	100	50	50	50	40	30	20	20	20	20	20	20
Iron	30	25	25	25	15	12.5	10	7.5	5	3.5	2.5	2	1.5
Boron	8	7	6	5	4	3	2.4	1.6	1.2	0.8	0.6	0.5	0.4
Barium	8	7	6	5	4	3	2.4	1.6	1.2	0.8	0.6	0.5	0.4
Mercury	0.2	0.15	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.2	0.15	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Copper	4	4	4	3	1.5	1.5	1	1	1	1	1	1	1
Nickel	4	3	3	2	1.5	1	1	0.8	0.7	0.7	0.6	0.6	0.6
Chromium	2	2	2	2	1	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.1
Zinc	5	5	4	3	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6	0.6
Silver	4	3	3	2	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6	0.6
Other toxic metals individually	2.5	2.2	2	1.5	1	0.7	0.6	0.4	0.3	0.2	0.15	0.12	0.1
Total toxic metals	10	10	8	7	3	2	2	1.6	1.4	1.2	1.2	1.2	1
Cyanide	2	2	2	1	0.7	0.5	0.4	0.27	0.2	0.13	0.1	0.08	0.06
Phenols	1	1	1	1	0.7	0.5	0.4	0.27	0.2	0.13	0.1	0.1	0.1
Sulphide	10	10	10	10	5	5	4	2	2	2	1	1	1
Sulphate	1000	1000	1000	1000	1000	1000	1000	900	800	600	600	600	600
Total nitrogen	200	200	200	200	200	200	200	100	100	100	100	100	100
Total phosphorus	50	50	50	50	50	50	50	25	25	25	25	25	25
Surfactants (total)	200	150	50	40	30	25	25	25	25	25	25	25	25

3.6 Waste

The Waste Disposal Ordinance (WDO) (Cap 354) was enacted in 1980 and the formulation of a strategic Waste Disposal Plan for Hong Kong was founded upon this legislation. The relevant waste management legislation which will require compliance during the construction phase include :

- the Waste Disposal Ordinance (Cap. 354);
- the Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354); and
- the Dumping at Sea Ordinance.

Under the WDO, construction waste is classified as a trade waste and the site contractor is responsible for its disposal. Under the Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354) chemical waste includes scrap material and unwanted substances specified under Schedule 1 of the Waste Disposal Regulation. Such materials are considered

to have the potential to cause serious environmental, health and safety hazards if they are not stored and disposed of in an appropriate manner. If chemical wastes are to be generated, requiring handling, storage and subsequent disposal, the contractor must register with EPD as a chemical waste generator.

3.7 Ecology

In addition to Annex 8 and 16 of the EIA-TM the Ecological Impact Assessment will need to consider the following Hong Kong regulatory and legislation requirements and international conventions.

Wild Animals Protection Ordinance (Cap 170) that contains provisions to protected wild animals enlisted, including most of the mammals, all birds, some reptiles and one species of butterfly.

Forests and Countryside Ordinance (Cap 96) that includes general provisions to protect forest and plantation on Government land. It prohibits damage to forest and plantations, by lighting fire, cutting grass, removing earth, damaging parts of plants, felling and cutting of trees, etc.

Forestry Regulations (Cap 96 Subsidiary Legislation) that contain a list of protected plants, preventing the selling, offering for sale, or possession of them. These include all species of wild orchids, camellias, rhododendrons, tree ferns and some other species. It provides the major instrument for protection of specific plant species in the countryside and basically all public land.

Country Parks Ordinance (Cap 208) together with its subsidiary legislation, that outlines the protection mechanism for the vast area of Country Parks and special areas in the Territory. The Country Park Authority has the power to eradicate any use of land within the Country Park, which would "substantially reduce the enjoyment and amenities of the country park". The Ordinance and the subsidiary Country Parks and Special Areas Regulations cover a wide range of management mechanisms, to exert control over activities, prohibit and restrict entry, prohibit hunting or disturbance of wildlife; as well as removal or destruction or vegetation or interference with the soil, prohibit and restrict lighting of fires.

Animals and Plants (Protection of Endangered Species) Ordinance (Cap 187) that aimed at restricting the import, export and possession of certain endangered animals and plant species, with special relevance to the trafficking of globally endangered flora and fauna.

Hong Kong Planning Standards and Guidelines (HKPSG) that is a Government guideline for the preparation of land use plans, and the planning of major development projects. Chapter 10 of the HKPSG addresses the principles of conservation in land use planning. Measures for the conservation of natural landscapes and habitats are briefly discussed in the guidelines. In terms of planning consideration areas designated for conservation, such as Country Parks, Conservation Area, SSSI, etc., should be prevented from development whereas possible.

Bonn's Convention requires member states to provide strict protection for species listed in Appendix of the Convention, and management of Appendix II species. The Convention applies to Hong Kong which became a party in 1985.

Rio Convention of Biodiversity is a treaty for the conservation of biological diversity and the sustainable use of its components. Contracting parties should identify, monitor and safeguard their biological and genetic resource, while developing national strategies for the conservation and sustainable use of biological diversity. EIAs of projects that may possibly cause adverse effect on biological diversity should be required. Hong Kong is currently not a signatory but

the policy is that the Government will abide to the obligations of the Convention, the key notions being sustainable development and conservation of biodiveristy.

3.8 Landscape and Visual Impact Assessment

The methodology for undertaking the landscape and visual impact assessment is in general accordance with Annex 18 of the Technical Memorandum to the Environmental Impact Assessment Ordinance (EIAO). The main elements of the assessment are given below.

The Landscape and Visual Impacts are considered as follows:

- landscape impact assessment shall assess the source and magnitude of developmental effects on the existing landscape elements, character and quality in the context of the site and its environs; and,
- visual impact assessment shall assess the source and magnitude of effects caused by the proposed development on the existing views, visual amenity, character and quality of the visually sensitive receivers within the context of the site and its environs.

These are evaluated in accordance with Annex 10 of the Technical Memorandum to the EIAO.

3.9 Cultural Heritage Impact Assessment

The Cultural Heritage Impact Assessment has been undertaken by the Antiquities and Monuments Office (AMO). The methodology is in general accordance with the EIA Study Brief and Annexes 10, 19 and 20 of the EIA-TM.