

APPENDIX 8P

**Addition Ecological
Survey Supplementary
Report**

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1. INTRODUCTION

1.1 Background

In October 2001, Drainage Services Department has commissioned Ove Arup & Partners as the Engineering Consultant for "Agreement No. CE29/2001 Outlying Islands Sewerage Stage 1 Phase 1 Ngong Ping Sewage Treatment Works and Sewerage Investigation, Design and Construction".

Ecological survey at Tai O and Ngong Ping was required for the Environmental Impact Assessment Study. According to the study brief, ecological surveys should cover at least nine months and cover the wet and dry seasons. Due to the tight programme, ecological surveys had been carried out under the PPFs for the study entitled "Outlying Islands Sewerage Master Plan Stage 2 Review" to cover six months of wet and early dry seasons. Hence additional ecological field surveys were carried out in mid January to mid April 2002, under the above agreement, in order to fulfil the requirement of the study brief.

1.2 Study Objectives

The objectives of the ecological surveys are to provide terrestrial and marine ecological information at Tai O and Ngong Ping for the Environmental Impact Assessment study of the proposed sewerage works according to the EIA Study Brief ESB- 074/2001.

The baseline survey results covering late dry season survey period from January to March 2002 were incorporated into the EIA Report finalised in May 02. This supplementary report provides results of field surveys carried out during early wet season (April 2002). Due to the tight programme schedule, these survey results were not included in the EIA, but is presented separately for reader's reference.

1.3 Structure of the Report

The report has been organised in the following Sections:

- *Section 2 - Environmental Legislation and Criteria:* this section of the report presents the Environmental Legislation and Criteria related to the study of ecological impacts of *Outlying Islands Sewerage Master Plan Stage 2 Review*.
- *Section 3 - Assessment Methodology:* this section of the report presents the methodologies used for the ecological surveys.
- *Section 4 - Baseline Ecological Conditions:* this section of the report describes the results of the surveys conducted during early wet season (April 2002).
- *Section 5 - Conclusions:* this section summarises the current ecological conditions of the surveyed areas according to early wet season conditions (April 2002).

2. ENVIRONMENTAL LEGISLATION AND CRITERIA

A number of international and local regulations, legislation and guidelines provide the framework for the protection of species and habitats of ecological importance. Those related to the Study are:

- Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislation the Forestry Regulations;
- Town Planning Ordinance (Cap. 131);
- Wild Animals Protection Ordinance (Cap. 170);
- Country Parks Ordinance (Cap. 208) and associated subsidiary legislation;
- Marine Parks Ordinance (Cap. 476) and associated subsidiary legislation; and
- Environmental Impact Assessment Ordinance (Cap. 499) and associated Technical Memorandum on Environmental Impact Assessment Process (the "TMEIAP").
- United Nations *Convention on Biodiversity* (1992).

2.1 Country Parks Ordinance

The *Country Parks Ordinance* provides for the designation and management of Country Parks and Special Areas. Country Parks are designated for the purpose of nature conservation, countryside recreation and outdoor education. Special Areas are created mainly for the purpose of nature conservation.

2.2 Forests and Countryside Ordinance

The *Forests and Countryside Ordinance* prohibits felling, cutting, burning or destroying of trees and growing plants in forests and plantations on Government land. Related subsidiary Regulations prohibit the picking, felling or possession of listed rare and protected plant species. The list of protected species in Hong Kong which comes under the Forestry Regulations was last amended on 11 June 1993 under the *Forestry (Amendment) Regulation 1993* made under Section 3 of the *Forests and Countryside Ordinance*.

2.3 Wild Animals Protection Ordinance

Under the *Wild Animals Protection Ordinance*, designated wild animals are protected from being hunted, whilst their nests and eggs are protected from destruction and removal. All birds and most mammals are protected under this Ordinance. The Second Schedule of the Ordinance that lists all the animals protected was last revised in June 1992. All cetaceans are protected under this Ordinance.

2.4 Town Planning Ordinance

The recently amended *Town Planning Ordinance* provides for the designation of coastal protection areas, Sites of Special Scientific Interest (SSSIs), Green Belt or other specified uses that promote conservation or protection of the environment, e.g., conservation areas. The authority responsible for administering the *Town Planning Ordinance* is the Town Planning Board.

2.5 Hong Kong Planning Standards and Guidelines Chapter 10

Chapter 10 of the *HKPSG* covers planning considerations relevant to conservation. This chapter details the principles of conservation, the conservation of natural landscape and habitats, historic buildings, archaeological sites and other antiquities. It also addresses the issue of enforcement. The appendices list the legislation and administrative controls for

conservation, other conservation related measures in Hong Kong and Government departments involved in conservation.

2.6 EIAO TMEIA

Annex 16 of the *TMEIA* sets out the general approach and methodology for assessments of ecological impacts arising from a project or proposal, to allow a complete and objective identification, prediction and evaluation of the potential ecological impacts. *Annex 8* recommends the criteria that can be used for evaluating ecological impacts.

2.7 United Nations Convention on Biodiversity

The Peoples' Republic of China (PRC) is a Contracting Party to the *United Nations Convention on Biological Diversity* of 1992. The Convention requires signatories to make active efforts to protect and manage their biodiversity resources. The Government of the Hong Kong Special Administrative Region has stated that it will be 'committed to meeting the environmental objectives' of the Convention.

3. ASSESSMENT METHODOLOGY

The establishment of the baseline terrestrial ecological profile of the Study Area (covering all areas within 500m of the proposed Effluent Export Pipeline and Village Sewerage Catchment Area at Ngong Ping) are based on field surveys including habitat/vegetation and wildlife, as well as a review of the available literature.

3.1 Literature Review

Readers can refer to Additional Ecological Survey Report (January- March 2002) issued separately for the results of literature review.

3.2 Ecological Surveys

All the field data were collected in April 2002, covering the early wet season. The ecological surveys covered terrestrial (egretry count, amphibians and reptiles, invertebrates and stream fauna, as well as applicable night surveys) and marine (dolphin survey) aspects, and the methodologies used are presented below.

3.2.1 Terrestrial Ecology

Egretry Count

Tai O egretry (DRAWING NO. 23400/EN/077) was surveyed on 29 April 2002. Number of nests with incubating adults or chicks of each species was recorded.

Amphibians & Reptiles

Reptiles and amphibians were recorded by direct observation and active searching in potential hiding places such as among leaf litter, inside holes, under stones and logs. Auditory detection of species-specific advertisement calls was also used to survey frogs and toads. Survey was undertaken on 22 April 2002. Night survey (22 April 2002) was undertaken in Ngong Ping, mainly focusing on Romer's Tree Frog *Philautus romeri*. Taxonomy of reptiles followed Karsen et al. (1998) while taxonomy of amphibians followed Lau and Dudgeon (1999).

Invertebrates (Butterfly, Dragonfly and Damselfly)

Adult butterfly, dragonfly and damselfly fauna were surveyed qualitatively, in streams, woodlands, plantations and abandoned cultivated lands in Ngong Ping and Keung Shan on 22 and 29 April 2002. Taxonomy of odonates followed Wilson (1997) while taxonomy of butterflies followed Bascombe *et al.* (1999).

Aquatic Fauna

Freshwater aquatic fauna were investigated through direct observation and active searching, as well as kick sampling and sweep netting. Captured or observed aquatic invertebrates were identified to species or the lowest practicable taxonomic level and counted. The freshwater fish survey used hook and line and hand-nets. Freshwater aquatic fauna surveys were undertaken on 17 April 2002.

3.2.2 Marine Ecology

Subtidal Benthos Survey

Grab-samples from 9 locations were taken in Tai O Creek and coastal areas in dry season. The methodology were detailed in the Additional Ecological Survey Report. Due to the time required for identification of the samples, results of the subtidal benthos survey was presented in this report.

The 9 locations for benthic ecological sampling are shown on the map in DRAWING NO. 23400/EN/077. Site H was intended to represent the main inflow/outflow to/from the western channel. Site G is approximately 200 m west of Site H. Site A was approximately 200 m from Site H. Site I was within the proposed sheltered boat anchorage, approximately 350 m further south from Site H and approximately 100m from the seawall.

Dolphin Survey

A land-based visual survey conducted to estimate dolphin use of Tai O Bay and nearby offshore waters was carried out on 4 April 2002. The survey covered 4 hours. The observation point is located at the ferry pier near Shek Tsai Po (DRAWING NO. 23400/EN/077).

The locations of dolphin sightings were recorded on topographic maps. Number of dolphins, age class, distance from observers, and direction of travel were recorded on data sheets, together with remarks on behaviour. Sea state (measured on the Beaufort Scale), weather and visibility were recorded.

4. ECOLOGICAL SURVEY RESULTS

Egretty Survey Results

Night Heron *Nycticorax nycticorax* (5 nests) and Little Egret *Egretta garzetta* (6 nests) were recorded nesting in Tai O egretty in April 2002 (Table 1). No Chinese Pond Heron *Ardeola bacchus* nest was recorded during the survey. Chinese Pond Heron nested in Tai O egretty in 1995, 1999 and 2000 (Young and Cha 1995, Wong *et al.* 2000, Kwok *et al.* 2001) (Table 2). There was a decline in total ardeid nesting population between 2001 and 2002 (Wong and Kwok 2002). However, no obvious trend of nesting population with time is detected between 1995 and 2002 (DRAWING NO. 23400/EN/079). No chick was observed in any nest in April

2002. Juvenile birds, however, were recorded at similar time of the year (4 May) in 2001 (Wong and Kwok 2002).

Table 1 Breeding population at Tai O egretty in 2002

Species	Number of nests
Little Egret	6
Night Heron	5

Table 2 Total numbers of nesting birds at Tai O egretty between 1995 and 2002 (Young and Cha 1995, Wong et al. 2000, Kwok et al. 2001, Wong and Kwok 2002)

Year	Chinese Pond Heron	Little Egret	Night Heron	Total	% of total nests in Hong Kong
1995	10	20	3	33	2.5
1999	1	8	13	22	2.7
2000	1	5	0	6	0.8
2001	0	12	7	19	2.3
2002	0	6	5	11	- *

* surveys in 2002 not completed while report writing

Dolphin Survey

The only marine mammal recorded during the surveys in proximity to Tai O Bay was the Chinese White Dolphin (Table 3, DRAWING NO. 23400/EN/078). There was only one sighting of a subadult Chinese White Dolphin during the survey, which was recorded at 1325 hrs (DRAWING NO. 23400/EN/078). The dolphin was observed far away from the observation site (at least 2.0 km away) under beaufort 3 condition.

Table 3 Results of dolphin survey in April 2002.

Survey Date	4 April 2002
Survey time	1155 – 1555
Tide	Flood
Weather	Cloudy
Beaufort sea state	3-4
Number of sighting	1
Species recorded	<i>Sousa chinensis</i>
Total number of dolphins recorded	1

Amphibian and Reptile

A total of two species of amphibian were recorded in Ngong Ping. These were the Gunther's Frog *Rana guentheri* and Asiatic Painted Frog *Kaloula pulchra*. Both are common and widely distributed in Hong Kong (Lau and Dudgeon 1999).

A Red-necked Keelback *Rhabdophis subminiatus* was recorded in a stream in Ngong Ping. This species is common and widespread in Hong Kong (Karsen et al., 1998).

Invertebrates

No dragonfly species additional to those recorded during the late dry season was recorded during the surveys in April 2002.

Two butterfly species additional to those recorded during the late dry season was recorded during the surveys in April 2002. These were the Common Mapwing *Cyrestis thyodamas* and Red Lacewing *Cethosia biblis*. Common Mapwing were recorded in abandoned cultivated

lands in Keung Shan. This species is common and widespread in Hong Kong and is usually seen in wetland habitats (Bascombe *et al.* 1999). Red Lacewing was recorded in woodland in Ngong Ping. This species is commonly recorded in Lantau, e.g., Tai O and Pui O (Bascombe *et al.* 1999). Red Lacewing is uncommon in Hong Kong (Walthew 1997).

Aquatic Fauna

Table 4 Aquatic Invertebrates recorded within the Study Area.

Common name	Scientific name	Location	Relative Abundance*
Atyid shrimp	<i>Caridina cantonensis</i>	Tai O main stream	+++
Palaemonid shrimp	<i>Macrobrachium</i> sp.	Tai O main stream	++
Caridean shrimp	<i>Lender</i> sp.	Tai O main stream	++
Local mitten crab	<i>Eriocheir japonicus</i>	Tai O main stream	++

*Relative abundance: +++ abundant; ++ common; + occasional

Atyid shrimp *Caridina cantonensis*, Palaemonid shrimp *Macrobrachium* sp., another Caridean shrimp *Lender* sp. and Local mitten crab *Eriocheir japonicus* were recorded in Tai O main stream (Table 4). During the surveys, abundant individuals of *Caridina cantonensis* were found in the upper course of the Tai O main stream, close to the joining point for the streams from Keung Shan and Ngau Kwo Tin.

The genus *Caridina* belongs to the Family Atyidae, Infraorder Caridea. The Atyidae has the first two pairs of pereopods (walking legs) chelate and is characterized by well-developed tufts of setae for the collection of food. *Caridina* sp. are tiny animals with the body length around 2 cm. They are detritivores feeding mainly on leaf litter from riparian vegetation. Members of this genus are usually found in mountain streams with clean water. In Hong Kong, there are three species of this genus reported, namely, *Caridina cantonensis*, *C. apodosis* and *C. serrata*. *Caridina cantonensis* is the commonest one, and can be found in various locations throughout Hong Kong.

Twenty-two species of fish including *Anguilla marmorata* were recorded within the Study Area (Table 5, DRAWING NO. 23400/EN/077). No freshwater water fish were recorded in Ngong Ping during the survey. Except *Anguilla marmorata*, listed as vulnerable in the China Red Data Book (Yue and Chen, 1998), no recorded species are rare, endangered, or endemic. *Anguilla marmorata* listed as vulnerable in the China Red Data Book because it is widely hunted for its meat and is believed to be overfished, but this species may still be widespread in Hong Kong.

Table 5 Freshwater fish recorded within the Study Area

Species	Location	Status	Relative Abundance
<i>Ambassis</i> sp.	Upper and lower sections of Tai O main stream	Cap.	+++
<i>Anguilla marmorata</i>	Stream sections of upper Keung Shan to Ngau Kwo Tin, upper and lower sections of Tai O main stream	Obs	NA
<i>Chelon subviridis</i>	Upper and lower sections of Tai O main stream	Obs	+++
<i>Clarius fuscus</i>	Stream sections of upper Keung Shan to Ngau Kwo Tin, upper and lower sections of Tai O main stream	Obs & Int.	+
<i>Eleotris oxycephala</i>	Upper and lower sections of Tai O main stream	Obs.	+
<i>Gambusia affinis affinis</i>	Stream sections of upper Keung Shan to Ngau Kwo Tin, upper and lower sections of Tai O main stream	Obs & Int	+
<i>Glossogobius giuris</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Glossogobius olivaceus</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Liza</i> sp.		Cap.	+++
<i>Lutjanus argentimaculatus</i>		Obs	

Species	Location	Status	Relative Abundance
<i>Misgurnus anguillicaudatus</i>	Stream sections of upper Keung Shan to Ngau Kwo Tin, upper and lower sections of Tai O main stream	Obs	+
<i>Monopterus albus</i>	Upper and lower sections of Tai O main stream	Obs	NA
<i>Mugil cephalus cephalus</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Mugilogobius abei</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Mugilogobius chulae</i>	Upper and lower sections of Tai O main stream	Obs	++
<i>Periophthalmus modestus</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Poecilia reticulata</i>	Stream sections of upper Keung Shan to Ngau Kwo Tin, upper and lower sections of Tai O main stream	Obs & Int	+
<i>Pseudogobius javanicus</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Rhinogobius duospilus</i>	Stream sections of upper Keung Shan to Ngau Kwo Tin, upper and lower sections of Tai O main stream	Obs	+
<i>Rhinogobius giurinus</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Tridentiger bifasciatus</i>	Upper and lower sections of Tai O main stream	Obs	+
<i>Tridentiger trigonocephalus</i>	Upper and lower sections of Tai O main stream	Obs	+++

*Cap = Capture; Obs = Observed; Int = Introduced species.

Relative abundance: + = <5 individuals, ++ = 5-10 individuals, +++ = >10 individuals

Benthic Fauna

A total 39 species of benthos, dominated by molluscs and polychaetes, were previously recorded from grab samples in Tai O Bay (Scott Wilson 2000).

During the current survey, a total of 43 species and 4234 individual benthic organisms were recorded at the nine sites (Sites A to I, 3 replicates in each site) at Tai O in the wet season, and 933 individuals from 34 species were recorded in the dry season sampling (Table 6).

Raw data for the wet season and dry season survey are presented in Appendix 1. Six major taxa (Phylum) were recorded. Crustaceans dominated at Sites C, D, E and F (over 85%), and polychaetes dominated at Sites B and G (over 87%) during wet season survey. Results of dry season survey show that crustacean still dominated at Sites C & F (over 60%) but polychaetes dominated at another 3 sites besides Sites B & G, i.e. Sites A, D & E. At Site I, the abundance of polychaetes and crustaceans were similar in dry season (both about 45%). No rare species were recorded in the samples during the wet and dry season surveys. The amphipod *Apseudes mortoni* was the dominant species in wet season and comprised over 70% (2999 individuals) of the total abundance. The total number of individuals and density were highest at Site F in wet season (total number was 1959), which is located in the inner Tai O Creek, while lowest were in Site H (no living organisms recorded in both wet and dry seasons), which is located at the mouth of the Tai O Creek (Table 6). The total number of species recorded was highest at Sites B (19 species in wet season and 23 species in dry season), which is located away from the Tai O Creek, and lowest at Site H (no record in both wet and dry seasons) (Table 6).

Table 6 Mean number of individuals per grab (standard deviation) of benthos recorded from Sites A to I during the survey.

Phylum	Abundance (Mean No. of individuals/grab \pm SD)								
	Site A	Site B	Site C	Site D	Site E	Site F	Site G	Site H	Site I
Wet season									
Polychaeta	7.7 \pm 4 (29)	115 \pm 56 (88.2)	11 \pm 5.7 (3.9)	3.7 \pm 3.8 (2.9)	3.3 \pm 2.9 (2.1)	14 \pm 1 (2.1)	15 \pm 8 (87)	0	15 \pm 7.8 (58.4)
Oligochaeta	2 \pm 2 (7.7)	1 \pm 1.7 (0.8)	25 \pm 21 (9.0)	0 (0)	0 (0)	33.7 \pm 4 (5.2)	0 (0)	0	0 (0)
Bivalvia	0 (0)	5 \pm 4.4 (3.8)	5.3 \pm 6.1 (2)	0 (0)	0.7 \pm 1.2 (0.4)	17.7 \pm 6. 8 (2.7)	0.0 \pm 1 (2)	0	1.7 \pm 0.6 (6.5)
Gastropoda	0.3 \pm 0.6 (1.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0	0.3 \pm 0.6 (1.3)
Crustacea	16 \pm 9.6 (62)	9.3 \pm 4.9 (7.2)	230 \pm 17 5 (85)	123 \pm 42 (96.8)	156 \pm 15 (97.5)	587 \pm 71 (89.8)	2 \pm 2 (9)	0	8.3 \pm 0.6 (32.5)
Osteichthyes	0 (0)	0 (0)	0.3 \pm 0.6 (0.1)	0.3 \pm 0.6 (0.3)	0 (0)	1 \pm 1 (0.2)	0.0 \pm 1 (2)	0	0.3 \pm 0.6 (1.3)
Total no. of species	11	19	12	12	14	15	12	0	17
Total no. of individuals	78	391	814	381	481	1959	53	0	77
Dry season									
Polychaeta	14.7 \pm 5.9 (54)	88.3 \pm 91. 7 (93)	11.7 \pm 2. 5 (27)	14.7 \pm 6. 1 (68)	12.3 \pm 9. 9 (49)	10.7 \pm 4. 2 (19)	11 \pm 9.5 (54)	0	7.7 \pm 4 (47)
Oligochaeta	1 (4)	1 (1)	0 (0)	0 (0)	1 (4)	4 (7)	0 (0)	0	0 (0)
Bivalvia	2.7 \pm 2.5 (10)	0.7 \pm 1.2 (1)	2.7 \pm 2.5 (6)	3 \pm 3.6 (14)	1.7 \pm 1.5 (7)	0.3 \pm 0.6 (0.5)	2.7 \pm 2.5 (13)	0	0.3 \pm 0.6 (1.8)
Gastropoda	1.5 \pm 0.7 (5)	2 (2)	3 (7)	1 (4)	2 (8)	0 (0)	0 (0)	0	1 (6.2)
Crustacea	7.3 \pm 6.6 (27)	3 \pm 3 (3)	26.3 \pm 13 .2 (60)	3 \pm 1.7 (14)	8 \pm 12.2 (32)	42 \pm 16.5 (73.5)	6.7 \pm 2.1 (33)	0	7.3 \pm 10.1 (45)
Total no. of species	20	23	16	17	20	18	15	0	16
Total no. of individuals	78	339	125	63	56	163	62	0	47

Note: Grab size is 0.1m². The percentage of the abundance (pooling the 3 replicates) of each taxa (Phylum) recorded in the site was presented as the number within the bracket.

The overall species diversity (H') was low, the mean value ranging from 0.10 to 0.86 in wet season and 0.68 to 1.23 in dry season. The lowest H' was recorded at Site H (no living organisms recorded), which is located at the mouth of the Tai O Creek, while the highest H' was recorded at Site I in wet season and Site C in dry season, which are both located away from the mouth of Tai O Creek (Table 8.16a). For the Shannon-Weiner index (H') a value of < 1 indicates low diversity, 1-2 indicates moderate diversity and a value of > 2 indicates higher diversity. The mean value of the evenness (J') recorded in the eight sites was ranging from 0.13 to 0.86 in wet season and 0.33 to 0.63 in dry season. The evenness index reflects how similar the abundance values for each species are within an assemblage. For example, a value of 1 indicates that all species occur in equal abundance whereas a value close to zero indicates that one species has very high abundance and the other species are recorded at very low abundance. The indices indicated that there were limited number of species of benthic organisms recorded within the sites and these were patchily distributed.

Table 7 Mean value of species diversity (H') and Evenness (J') (standard deviation) of benthos recorded from Sites A to I during the survey.

	Site A	Site B	Site C	Site D	Site E	Site F	Site G	Site H	Site I
Wet season									
Species Diversity (H')	0.52 ± 0.11	0.47 ± 0.17	0.46 ± 0.16	0.10 ± 0.05	0.19 ± 0.06	0.35 ± 0.03	0.52 ± 0.08	-	0.86 ± 0.13
Evenness (J')	0.73 ± 0.11	0.46 ± 0.09	0.51 ± 0.22	0.13 ± 0.02	0.25 ± 0.08	0.33 ± 0.05	0.74 ± 0.14	-	0.86 ± 0.06
Dry season									
Species Diversity (H')	0.68 ± 0.03	0.77 ± 0.74	1.23 ± 0.51	0.73 ± 0.26	0.75 ± 0.83	1.05 ± 0.04	0.77 ± 0.28	-	1.01 ± 0.62
Evenness (J')	0.33 ± 0.01	0.34 ± 0.36	0.60 ± 0.23	0.40 ± 0.21	0.34 ± 0.37	0.53 ± 0.04	0.53 ± 0.40	-	0.63 ± 0.53

The identification of the benthic samples was audited and passed the QA check. The results of the benthic samples were re-processed (10% of the sorted and identified samples) by another specialist and matched the list of the species identified during the first identification work.

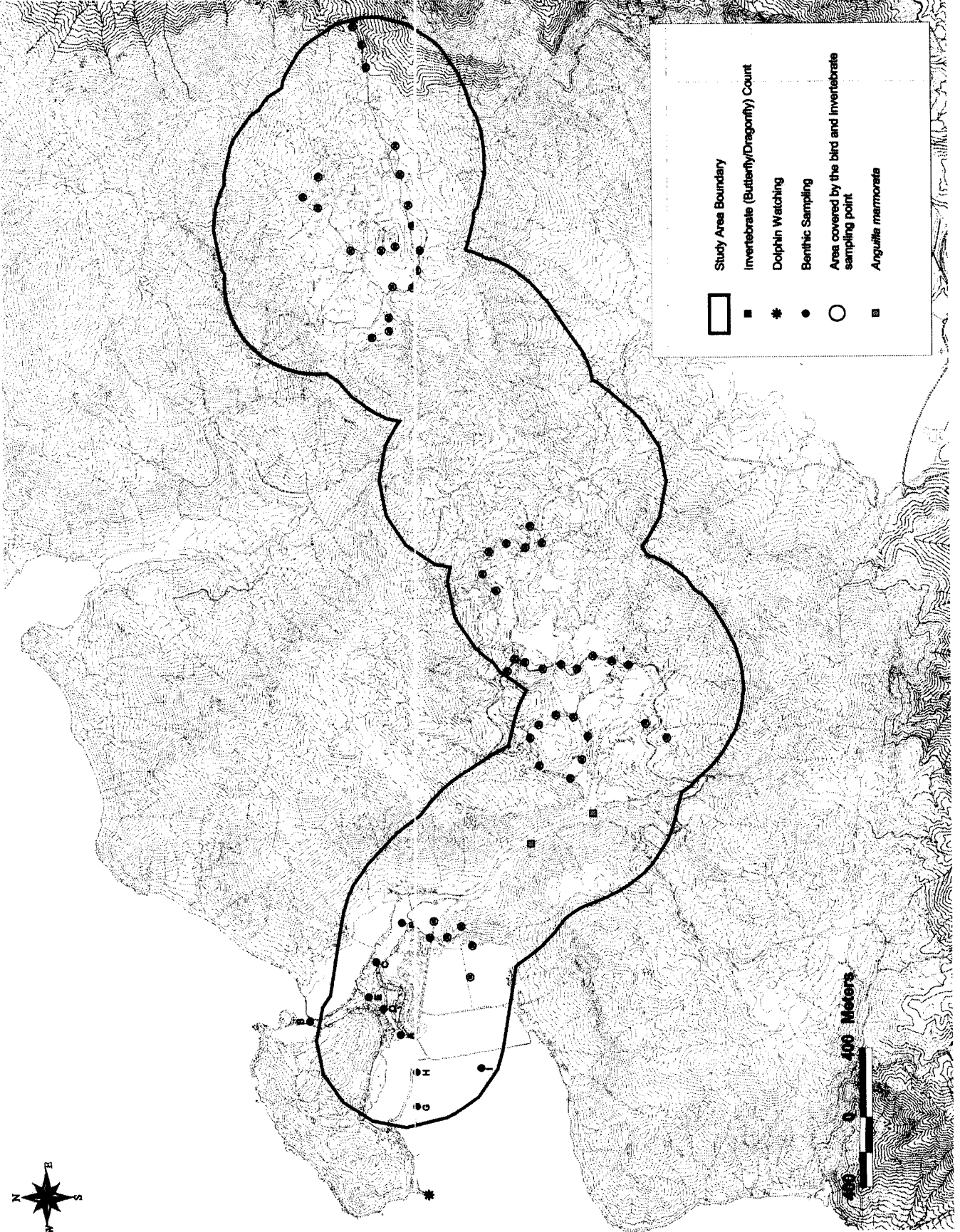
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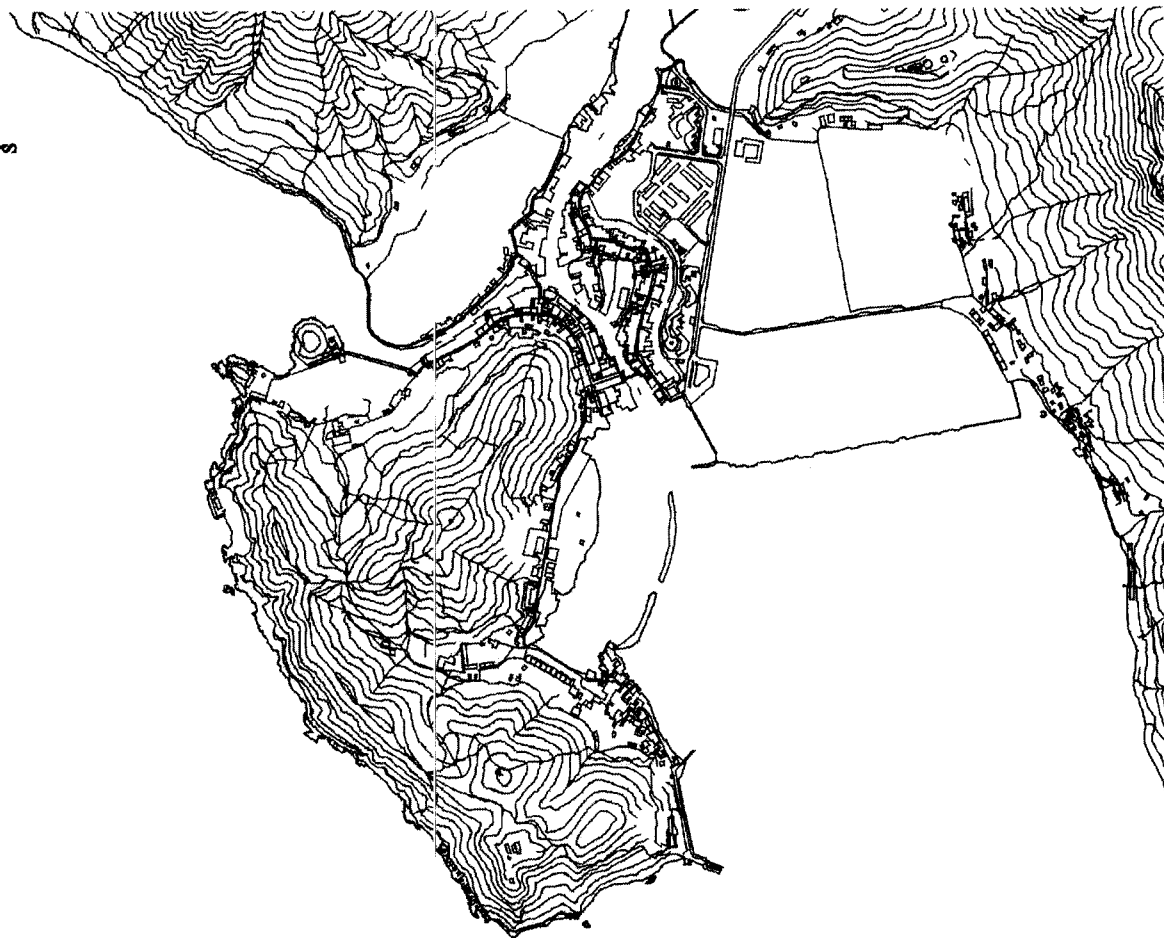
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Drawn by	Checked by	By	Date
ARUP 201 Aup & Robert Ho Yik Hong Lau Bld			
Project No. AGREEMENT NO. CE 28/01 OUTLYING ISLANDS STAGE 1 PHASE 1 NGONG PING SEWAGE TREATMENT WORKS AND SEWERAGE			
Locations of sampling and species of ecological interest <i>(Anguilla marmorata)</i>			
Project No.	23-000/EN/077	Sheet	1
Date	23 May 02	Scale	1:1000
Drawn by	Checked by	By	Date

香港特別行政區環境局
 DEPARTMENT OF THE ENVIRONMENT
 HONG KONG
 SPECIAL ADMINISTRATIVE REGION



Survey Date: 4 April, 2002

→ SIGHTING



No.	Description	By	Date

ARUP CONSULTING ENGINEERS

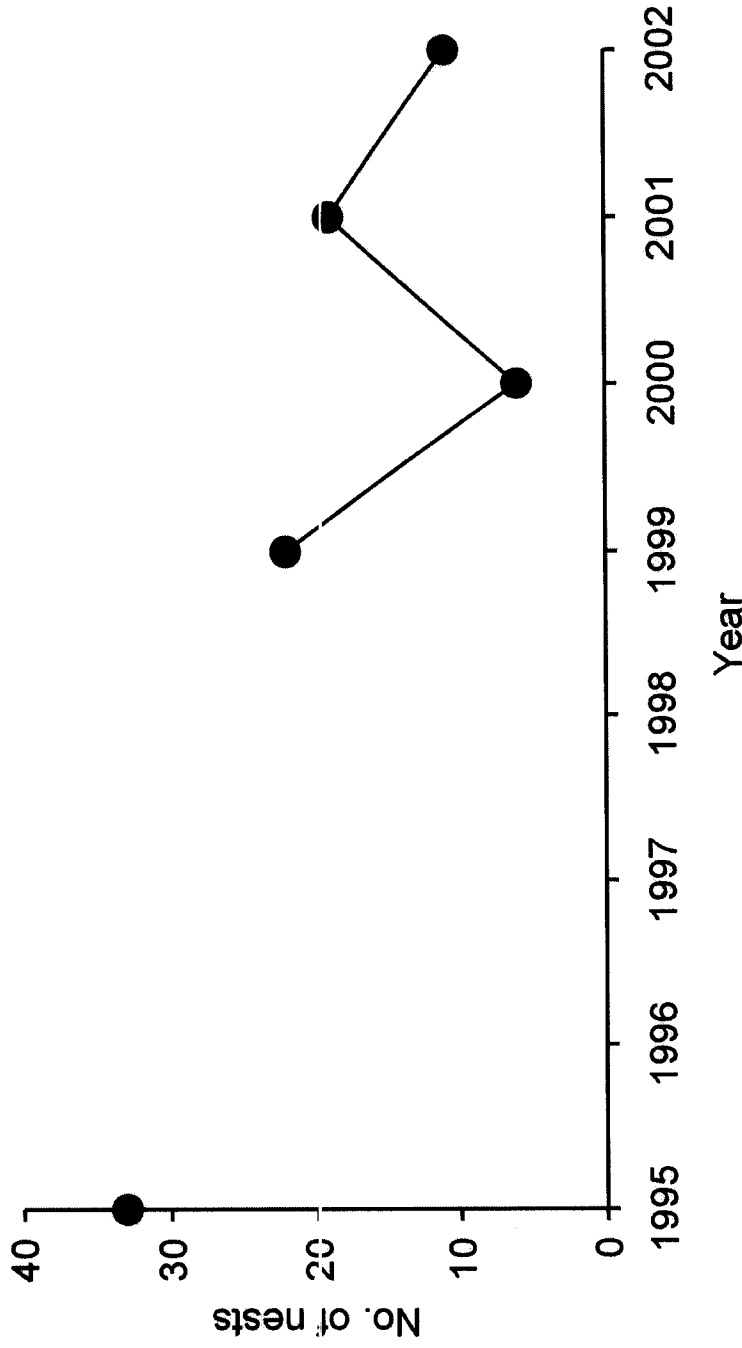
PROJECT NO. CE 28/01
AGREEMENT NO. CE 28/01
OUTLYING ISLANDS STAGE 1 PHASE 1
NGONG PING SEWAGE TREATMENT
WORKS AND SEWERAGE

Dolphin sighting records

PROJECT NO.	23-400/ENV/078	REV.	0
DATE	23 May 02	DESIGNER	KHK
SCALE	N/A	CHECKER	



香港特別行政區政府
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION



Site	Project No.	Year	Date

ARUP CONSULTANTS (HONG KONG) LIMITED
 PROJECT TITLE

AGREEMENT NO. CE 28/01
 CULIVING ISLANDS STAGE 1 PHASE 1
 NGONG PING SEWAGE TREATMENT
 WORKS AND SEWERAGE

Report Title
**Total numbers of nesting
 birds at Tai O egretty
 between 1995 and 2002**

Project No. 23400/ENV/079 No. 0
 Date YML 23 May 02 Compiler KHK
 Drawn N/A

香港特別行政區政府
 排水服務處
 DRAINAGE SERVICES DEPARTMENT
 GOVERNMENT OF THE
 HONG KONG
 SPECIAL ADMINISTRATIVE REGION

APPENIDX A

**Benthic organism and
their abundance
recorded in wet season
within the Study Area**

Appendix A Benthic organisms and their abundance recorded in wet season within the Study Area

Wet season

Scientific Name	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	F1	F2	F3	G1	G2	G3	I1	I2	I3		
Annelida																										
Polychaeta																										
<i>Amphictene</i> sp.						1																				
<i>Capitella capitata</i> (Fabricius)	1	2					2	1	1	2					1	1		2	1						3	
<i>Cossuella dimorpha</i> Hartman		1																								
<i>Dendronereis pinnaticirris</i> Grube					14	14	2	4		1				1		1	5	6								
<i>Glycera chirori</i> Izuka					1																					
<i>Goniada</i> sp.										1																
Lumbrineris sp.																										
<i>Micropodarke dubia</i> (Hessle)	1																						2	1		
<i>Neanthes glandicincta</i> Southern	1			65	76	148	2	2	3	1				1	3	1	1	4							2	
<i>Nectoneanthes</i> sp.																1	1									
<i>Notomastus latericeus</i> Sars		1		1	2	1	2							1					16	10	3					
<i>Paraprionospio pinnata</i> (Ehlers)					4	2	3	8	2					2							1					
<i>Poecilochaetus serpens</i> Allen																			1				4	5		
<i>Potamilla</i> sp.					1	5				1					1							3	2	2		
<i>Praxillella affinis</i> (Sars)																3	1	1							1	
<i>Prionospio cirrifera</i> Wiren	3	9	3		1		1			1						1	1	1								
<i>Prionospio ehlersi</i> Fauvel																							2	1		
<i>Prionospio</i> sp.										2																
<i>Pseudopolydora kempfi</i> (Southern)																			2							
<i>Pseudopolydora paucibranchiata</i> (Okuda)																								1	1	
<i>Scoloplos</i> sp.					1																		5	5	1	
<i>Sigambra hanaokai</i> Kitamoni	1				4	4				1						5	6	5	2							
<i>Sternaspis scutata</i> (Renier)					1																		5			
<i>Tharyx</i> sp.																							2	2		
Oligochaeta																										
<i>Limnodriloides</i> sp.	4	2			3		6	47	21							30	33	38								
Mollusca																										

Wet season

Scientific Name	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	F1	F2	F3	G1	G2	G3	I1	I2	I3	
Bivalvia																									
<i>Arca</i> sp.													2												
<i>Geloina coxans</i> (Gmelin)				1																					
<i>Pseudopythina maipoensis</i> Scott				2			4	12								20	19	4							
<i>Phacoides</i> sp.				7	5												4	6						1	
<i>Saccostrea cucullata</i> (Born)																						1		1	
<i>Solen</i> sp.																						1			
Gastropoda																									
<i>Murex</i> sp.																									1
<i>Nassarius</i> sp.	1																								
Unidentified sp.																					1		1		1
Arthropoda																									
Crustacea																									
<i>Alpheus</i> sp.	1	2								1	1	1	1					2					1		1
<i>Apseudes mortoni</i>	19	21	5	4	4	4	24	270	325	109	168	87	135	135	155	470	538	523	2	1					
<i>Corophium</i> sp.1				3	2	1	8	20	39	1	1	1	6	20	17	51	37	139	1						
<i>Corophium</i> sp.2				3	1	1		3																	
<i>Ilyoplax tansuiensis</i> Sakai				5																					
<i>Paranthura kobensis</i> Nunomura													1										7	8	9
Unidentified sp.																									
Chordata																									
Osteichthyes																									
<i>Trypauchen vagina</i> (Bloch et Schneider)								1									1	1					1		
Unidentified sp.																	1						1		

Dry season

Scientific Name	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	F1	F2	F3	G1	G2	G3	I1	I2	I3	
Annelida																									
Polychaeta																									
<i>Capitella capitata</i> (Fabricius)		1	1		2		2	1	4			1		3	1		1	1		2			4	4	3
<i>Dendronereis pinnaticirris</i> Grube				4		5	4		1		3	1	1			1		2			5			3	
<i>Euclymene annandalei</i>	9		5	2	11	2		3	1		3	5				2					2				1
<i>Glycera chironi</i> Izuka						1													1	2					
<i>Glycinde kameruniana</i>	1				4					2				1									1		
<i>Heteromastus filiformis</i>	2		13	63	15								5										1		
<i>Heteromastus</i> sp.														5									1		
<i>Laonome</i> sp.		3												5		3							3		
<i>Leonnates decipiens</i>	6		1	2	2		5																2		
<i>Lumbrineris</i> sp.							3			7				6	1		5				1				
<i>Lugia</i> sp.			5		1		2			5													1		
<i>Melinna</i> sp.	2				2					2			3						6						
<i>Myriochele</i> sp.			5	20	1												1								
<i>Neanthes glandicincta</i> Southern			35	71	47				2							5			2		6				
<i>Paralacydonia paradoxa</i>	1				1																				
<i>Pectinaria</i> sp.					1					1			3		2										
<i>Poecilochaetus serpens</i> Allen			1	2	4					1	2														
<i>Polydora maculata</i>														2			5				2				
<i>Priostosio</i> sp.	3				1				1	1		9											1		
<i>Pseudopolydora kempfi</i> (Southern)			2	1	2																				
<i>Sigambra hanaokai</i> Kitamoni	2				2		1	3							3	3									
<i>Sthenolepis japonica</i>							2		1				2										1		
Oligochaeta																									
<i>Limnodriloides</i> sp.		1		1										1		4									
Mollusca																									
Bivalvia																									
<i>Arca</i> sp.		5					5							1		1				3	3				
<i>Geloina coxans</i> (Gmelin)										7			2							2				1	
<i>Phacoides</i> sp.							3							2	1										
<i>Pseudopythina maipoensis</i> Scott	3								2																

Dry season

Scientific Name	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	F1	F2	F3	G1	G2	G3	I1	I2	I3	
Gastropoda																									
<i>Cerithidea cingulata</i>	1		2		2			3			1			2					1						1
Arthropoda																									
Crustacea																									
<i>Alpheus</i> sp.		1											3								5		1		
<i>Apseudes mortoni</i>				3			2				2														
<i>Corophium</i> sp.1			9					5					2			18	9	15						2	
<i>Corophium</i> sp.2		2			1					5							1								1
<i>Ilyoplax tansuiensis</i> Sakai														2											
<i>Paranthura kobensis</i> Numomura		10			5		10	29	33			2	2			43	24	16	6		9			17	1