Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung

Monthly Environmental Monitoring & Audit (EM&A) Report for March 2007

(Report No. 382210/015)

Report Authorized For Issue By:	For and on Behalf of Black & Veatch Hong Kong Limited

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Table of Content

List of Figure

List of Table

List of Annex

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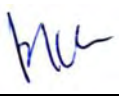
Reviewed	**PK Lee**		Apr 2007

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Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung
(Independent Environmental Checker)

CHECK CERTIFICATE

1. We certify that professional skill and care have been used in the checking of the Environmental Team's (ET) No.15 Monthly EM&A Report for March 2007 for the construction of Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung.

2. We certify that the ET's EM&A programme for the reporting period has been satisfactorily executed and the No.15 Monthly EM&A report for March 2007 has been verified.

3. We would comment that our evaluation of the ET's EM&A is based on a random audit process which cannot be guaranteed to have all non-conformities identified.

Signed 

_____
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Date 4th April 2007

Executive Summary

This is the fifteen Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Black & Veatch, the designated Environmental Team (ET), for the Project "Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung". The construction works of golf course was commenced on 16th January 2006. This report presents the results of the EM&A works conducted in the month of March 2007 (25th February to 24th March 2007).

Summary of construction works undertaken during this report period

No dredging of the permanent intake and outfall pipelines for the desalination plant has been carried out. Hong Kong Jockey Club (HKJC) is still gathering supplementary information to EPD. Construction work of Irrigation Lake 1D and associated pipelines for the desalination plant were still in progress (storage of the product water from the desalination plant for East Course irrigation in future) and expected to complete in mid-April 2007. As there is no discharge licence for the desalination plant, the plant will not be operated until successful application from EPD.

Site formation work at the scaring areas within the East Course boundary was carried out during the reporting month and completed in end-March 2007. However, some hydroseeding areas were not fully covered with hydroseed and re-hydroseeding was required. According to the latest construction programme prepared by the Contractor, most of the northern portion of East Course will be planted with turf in the dry season of 2007 (February to March). For southern portion of the East Course, major construction works were site formation and construction of permanent drainage system. Construction of permanent bridges will be completed before end March 2007 (nos. 10 at Stream B1 and 15 at Stream C) during the reporting month. Central portion will be the last portion to be planted with turf and mainly in wet season of 2007.

Turfing was commenced at Hole 8 on 12 February 2007 and completed (except green area) during the reporting month. For Hole 5, turfing was commenced on 6 March 2007 and was still in progress during the reporting month. Two applications of fertilizers were recorded at Hole 8 only. No chemical/pesticide was applied to the Holes 5 and 8. The current construction status indicated turfing delay at northern portion of East Course. In addition, no new turf or sand supply to the construction site was observed during the report month. The construction site was mainly hydroseeded at permanent slope/work areas.

Closed low flow drainage system includes lake formation, gravity drains, rising main, underground water tanks and pumping stations. The construction of gravity drains from Lake 1D to existing reservoir was mostly completed and reinstatement work was in progress during the reporting month. The construction of the closed low flow drainage for the East Course is in progress. The expected completion date for all lakes was in mid-April 2007. All underground tanks and related pumping stations were completed.

Regarding the vegetation clearance of Stream B2 buffer zone on 17 November 2006, the buffer zone at Stream B2 was reinstated by planting native shrub mix (*Gordonia axillaries*, *Melastoma candidum*, *Melastoma sanguineum*, *Rhaphiolepis indica*, *Rhodomyrtus tomentosa*) with approximate 400mm height at four plots per metre square density in late March 2007.

All permanent bridges were constructed and all temporary bridges were dismantled at Streams A, B, C and fresh water inland marsh. The floating pontoon was located and operated at the designated location according to Environmental Permit (EP). Concrete batching plant has been in operation.

The Contractor submitted the Temporary Drainage Management Plan (TDMP) to the Engineer for approval. ET and the Engineer reviewed the TDMP and provided comments. ET and the Engineer reminded the Contractor to prevent silty/nutrient/pesticides runoff to the streams and marine water. The Contractor will submit the revised TDMP early April 2007. The Engineer reminded that the Contractor

had to properly install and provide sufficient temporary drainage system on site before and during the coming wet season.

Environmental Monitoring and Audit Progress

A summary of monitoring activities in this reporting period is shown as follows:

24-hour Total Suspended Particulates (TSP) monitoring at GCA B1	6 times
Water quality monitoring (marine + freshwater)	12 times
Terrestrial Ecology	1 time
Marine Ecology	1 time*
Landscaping & Visual	2 times

* For marine ecology, it will be carried out on quarterly basis and the next coral monitoring will be in June 2007.

Air Quality

6 sets of 24-hour TSP monitoring were carried out on 26th February, 2nd, 3rd, 9th, 15th and 21st March 2007 at Bungalow A (GCA B1) at Kau Sai Chau during this reporting month. 24-hour TSP record on 2nd March 2007 was an additional sample due to the exceedance occurred on 14 February 2007.

Water Quality

12 sets of water quality monitoring were carried out on 26th and 28th February, 2nd, 5th, 7th, 9th, 12th, 14th, 16th, 19th, 21st and 23rd March 2007 at 9 marine and 7 freshwater monitoring locations. No rainstorm signal was hoisted during the reporting month.

Terrestrial Ecology

Terrestrial ecology was conducted on 16th and 19th March 2007. The demarcation of the stream buffer zone had been established for Streams A, B and C. The permanent access bridge for Stream C had been constructed except decking within Stream C buffer zone demarcation. The downstream section of Stream A channel was accidentally filled up by boulders before and remedial work will be implemented by the Contractor to clear the rubbles manually and restore the downstream. The condition of the Stream B2 buffer zone (partially cleared) remained the same as the previous reporting month. In general, Streams B, C and D and the riparian vegetation were in natural conditions similar to the condition during the Baseline Survey.

Marine Ecology

Marine ecology was conducted on 16th, 17th, 28th and 29th March 2007 at Site B2, Site C, Control Site and the transplanted coral site. A seawall had constructed at Site B2 as the landing point of the temporary barging point. The number of tagged corals at Site B2 was increased from 20 to 50 in April 2006, which included the original B11 to B-20 and newly established B-21 to B-60. The distribution of these tagged corals was 20 to the north of the barge, 20 to the south of the barge, and 10 within the area of the barge.

In the present survey, most of these tagged corals at Site B2 were in similar conditions as in the last monitoring (December 2006), but one colony which had previously been found toppled were missing in the present survey. Mortality on B-13 and damages (mortality and anchor damages) on other tagged corals (such as C-04 and C-10) recorded in previous monitoring were found similar in the present survey. The Control Site still remained similar conditions as during the Baseline Survey (no mortality, sedimentation or bleaching was found), except the missing of X-05 colony. All 89 transplanted corals were recovered and their conditions were similar to the baseline conditions (during the transplantation

process).

Landscaping & Visual

Landscape and visual monitoring and site audits were carried out on 7th and 21st March 2007. During the site audit, site formation, shaping, planting and building construction were carried out.

Shrub seedlings were planted on slopes of Holes 5 and 8. The newly planted shrubs are in fair health. Health condition of hydroseeded grass has declined due to the dry climate. The Contractor shall irrigate all the plants more frequently. The base of Hole 8 Green was shaped and base materials were ready. Sod is expected to be laid in April 2007 and the visual impact to the golfer will be greatly reduced afterward.

The Contractor shall take measures to improve the condition of damaged trees. Damaged trees next to administration building were still unprotected after being damaged by the adjacent construction activities.

The following works have been outstanding since July 2006: (i) no rectification work has been carried out for all mal-pruning transplanted trees, (ii) no provision of any tree protection zones for all retain trees near administration building - construction materials were stockpiled and surrounded at the tree base area, (iii) the cause of the tree death T925 was outstanding, (iv) transplanted tree T848 was in poor condition, and (v) soil around the transplanted trees was dry and more frequent watering (recommended dosage is 20L/day) is required in particular in dry season.

Environmental Site Auditing

Four weekly joint environmental site audits were carried out on 27th February, 6th, 13th and 20th March 2007, with the Engineer and Contractor's representatives. A monthly joint environmental site audit was carried out on 20th March 2007 by the Contractor's Representative, ET's representative and Independent Environmental Checker (IEC).

Environmental Non-conformance

Air Quality

No exceedance of 24-hour TSP was recorded at GCA B1 during the reporting month. Additional sample were taken on 2nd March 2007 due to the exceedance occurred in the previous monitoring month on 14th February 2006.

Marine Water Quality

Eleven exceedances of ammonia nitrogen and chlorophyll were recorded at Tai Tau Chau and M_Marsh. All exceedances were considered not project-related.

Freshwater Quality

Seven exceedances of turbidity and seven exceedances of suspended solids were recorded at Streams A, B, C and fresh water inland marsh. All exceedances were considered not project-related.

Eleven exceedances of ammonia nitrogen, eleven exceedances of nitrate nitrogen, one exceedance of nitrite nitrogen, twelve exceedances of total inorganic nitrogen and seven exceedances of chlorophyll a were recorded at downstream of fresh water inland marsh. Possible reasons could be due to (i) continuous wastewater discharge from temporary sewage treatment plant at the contractor's site office, (ii) the change of physical condition of fresh water inland marsh which may decrease the secondary treatment removal capacity and (iii) reinstatement work at upstream desilting at the upstream of fresh water inland marsh which was accumulated due to the rainstorms occurred in wet season 2006. Further review of action and

limit levels of ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, total inorganic nitrogen and chlorophyll is recommended.

As the upstream monitoring locations at Streams B & C (F_UB and F_UC) are located within the construction work area since September 2006, they represent and become impact monitoring stations instead of control stations.

All notifications of exceedances and the subsequent exceedance incident reports have been forwarded to the relevant parties.

For those considered project-related exceedances at all streams and freshwater and marine water, the Contractor was required to critically review the temporary drainage management plan and implement necessary improvement to prevent runoff from the construction site to the marine water and stream courses. The Contractor was also requested to rectify the situation as soon as possible. The water quality monitoring results revealed that the temporary drainage installed on site was insufficient and should be improved especially at those concern areas.

No environmental complaint was received in this reporting month.

Implementation Status of Environmental Mitigation Measures

The Contractor was reminded the following issues and to take actions if necessary:

Air Quality

- Increase frequency of watering at main haul roads and rock breaking areas;
- Pave major haul roads with gravels/concrete to minimize the dust emission due to the heavy traffic;
- Cover all soil/sand/aggregates stockpiles with tarpaulin or other measures to reduce the dust emission; and
- Install hoarding at the main exit/entrance of the construction site;

Waste Management

- Properly dispose of the vegetation stockpiles, general refuse and construction waste off-site;
- Provide construction waste sorting area; and
- Provide sufficient mobile toilets at remote site areas;

Ecology

- Remove remaining rubbles at downstream of Stream A after temporary bridge dismantling;
- Maintain the reinstated (planting shrub) at Stream B2 buffer zone since March 2007; and
- Rectify and remediate the silt deposit at Stream C after the rainstorm occurred in November 2006.

Water Quality

- Submit the revised and implement temporary drains according to Temporary Drainage Management Plan (TDMP) to ER for approval for the coming wet season in 2007 to avoid silty/nutrient/pesticide runoff;
- Provide sufficient mitigation measure for the permanent bridges to avoid silty runoff;
- Minimize the water quality impact when undertaking cut-and-fill works and turfing. It is important to provide sufficient temporary drainage at critical areas to confine, collect and provide proper treatment before discharging to marine water and stream courses to ensure that the water quality is complied with WPCO requirements;
- Provide sufficient treatment facilities especially at water sensitive areas before water discharges from

construction site;
- Maintain the integrity of silt curtains and remove settled silt within the silt curtain which have been installed outside the fresh water inland marsh, near Hole 2, near Hole 4, inactive culture zone and Stream A;
- Strengthen the preventive/interim measures for avoiding silty runoff from the exposed areas to the low lying areas. More frequent maintenance of the silt fence is necessary; and
- Provide sufficient temporary drainage system at all temporary bridges.

Landscape & Visual

- Protect the retain trees with sufficient watering mainly located at the administration building;
- Provide sufficient water to the retain trees, transplanted trees, hydroseeding areas;
- Provide tree protection zone for all retain tree at the administration building; and
- Provide incident report for the death of the trees.

Future Key Issues

General issues to be considered in the coming month include:

- Potential dust generation from activities on-site : permanent drainage/irrigation system construction, concrete batching plant operation and soil/sand/aggregates stockpiles;
- Provide sufficient temporary drainage system and mitigation measures for construction temporary/permanent crossings at Streams A, B1, B2 and C;
- Turf establishment at northern East Course (Holes 4, 5, 6 & 8);
- Implement sufficient and improve the temporary drainage system (and make use of the permanent drainage system) on site to prevent silty/nutrients/pesticides runoff discharging to marine and stream courses before the coming wet season 2007;
- Apply the discharge licence for the desalination plant near to the existing KSC pier before operation;
- Dispose of construction wastes, vegetation and general refuse off-site; and
- Hydroseed the bare ground/temporary/permanent slopes according to the golf course design.

Key issues at particular areas:

- Submit the revised Temporary Drainage Master Plan (TDMP) for the silty runoff and turf establishment period prepared by the Contractor for Engineer and Jockey Club's approval;
- Carry out water quality monitoring for nutrients/pesticides due to turf establishment;
- Carry out coral monitoring for the transplanted corals on quarterly basis;
- Carry out coral monitoring when desalination plant operates in dry season and
- ADS filter system (nutrients and pesticides removal) at Hole 5 has already implemented on 12 February 2006 (3 units). There were 3 out of 5 units of ADS filter systems had been implemented at Hole 6. The remaining 2 units will be installed during the next reporting month.

1. Introduction

1.1 Background of the Project

1.1.1 Black & Veatch (hereinafter called the "ET") was appointed by Hong Kong Jockey Club (hereinafter called the "Project Proponent") to undertake Environmental Monitoring and Audit (EM&A) for "Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung" (hereinafter called the "Project"). Under the requirements of Section 4 of Environmental Permit EP-224/2005, EM&A programme as set out in the EM&A Manual is required to be implemented. In accordance with the EM&A Manual, environmental monitoring of air quality, water quality, terrestrial and marine ecology, landscape and visual, archaeology (watching brief) and land contamination are required for the Project.

1.1.2 This report summarises the environmental monitoring and audit works for the Project in March 2007 (from 25th February to 24th March 2007).

1.2 Purpose of the Report

1.2.1 This is the fifteen EM&A report which summarizes the impact monitoring results and audit findings for the EM&A programme during the reporting period from **25th February** to **24th March 2007.**

1.3 Structure of the Report

1.3.1 The structure of the report is shown in Table 1.1.

Table 1.1 Structure of the Report

Section		Description
1	Introduction	Details the scope and structure of the report
2	Project Information	Summarizes background and scope of the project, site description, project organization and contact details, construction programme, the construction works undertaken and the status of environmental permits/licenses during the reporting period.
3	Environmental Monitoring Requirement	Summarizes the monitoring parameters, programmes, methodology, frequency, location, action and limit levels, event action plans, environmental mitigation measures as recommended in the EIA report and relevant environmental requirements.
4	Implementation Status on Environmental Mitigation Measures	Summarizes the implementation of environmental protection measures during the reporting period.
5	Monitoring Results	Summarizes the monitoring results obtained in the reporting period.
6	Environmental Site Auditing	Summarizes the audit findings of the weekly site inspections undertaken within the reporting period.
7	Environmental Non-conformance	Summarizes any monitoring exceedance, environmental complaints and environmental summons within the reporting period.
8	Future Key Issues	Summarizes the impact forecast and monitoring schedule for the next three month (25 Apr 2007 – 24 Jun 2007).
9	Recommendations and Conclusions	Lists out any recommendations and provides an overall conclusion of the results and findings of the EM&A programme for the reporting period.

2. Project Information

2.1 Background

2.1.1 The Project comprises the following major components:

- Construction of the third 18-hole public golf course on the east side of the island, south of the existing golfing area;
- A new irrigation lake to collect surface runoff from the new 18-hole golf course. Water stored at the new irrigation lake can also be diverted to existing reservoir for tertiary treatment and recycling;
- A new desalination plant adjacent to the existing pier to serve as an additional irrigation water supply for the new golf course during dry season; and
- Expansion of existing administration and maintenance buildings.

2.1.2 The potential environmental impacts of the Project have been studied in the Environmental Impact Assessment (EIA) report (EIAO Register No. AEIAR- 091/2005). The EIA was approved on 14 November 2005 under the EIAO. An Environmental Permit (EP-224/2005) was granted on 28 November 2005.

2.2 Site Description

2.2.1 A layout plan of the Project is provided in **Figure 1.1**.

2.3 Project Organization

2.3.1 Project organization and lines of communication are shown in **Figure 1.2**.

2.4 Construction Programme

2.4.1 The tentative construction programme for the Project is presented in **Annex A**. The construction works were commenced on 16 January 2006 and are scheduled to be completed by end of July 2007.

2.5 Status of Environmental Submission

2.5.1 A summary of the reporting requirement for compliance with EP conditions of the Project is listed in Table 2.1.

Table 2.1 Summary of Compliance with EP Conditions

EP-224/2005	Environmental Permit Submission	Status	Remarks
2.3	Management organization of the main construction companies and/or any form of joint ventures associated with the construction of the Project.	Submitted	At least one week before the commencement of construction of the Project.
2.4	Contamination Assessment Plan (CAP) submission. If land contamination is confirmed by the site investigation, submission of a Remediation Assessment	Submitted	The Final Site Remediation Report (FSRR) was approved by EPD in this reporting month.

EP-224/2005	Environmental Permit Submission	Status	Remarks
	Plan (RAP) including a Contamination Assessment Report (CAR) is required.		
3.6	Detailed methodology for Coral Transplantation submission to the Director for approval.	Approved	Approved on 16th November 2006. Coral transplantation at Site D2 was completed in early December 2006. No dredging work for the desalination plant's intake and outfall pipelines was carried out. AFCD has no comment for the coral donor site survey, coral mapping survey and coral transplantation reports.
4.1	EM&A Manual (revised)	Submitted	At least two weeks before commencement of construction of the Project.
4.3	Baseline Monitoring Report	Submitted	At least two weeks before commencement of construction of the Project
4.5	Monthly EM&A Report	Submitted	within 10 working days after the end of the reporting month
5.1	Set up a dedicated web site and notify the Director in writing the Internet address.	Completed	Within 6 weeks after the commencement of construction of the Project (http://www.kscgolf.com/ema/index.asp)
3.4	Variation of Environmental Permit for the construction of the temporary crossings at Stream B during wet season.	Completed	Variation of Environmental Permit was approved on 18th August 2006. The revised registered EP was EP-224/2005/A.

2.6 Summary of EM&A Requirements

2.6.1 The EM&A programme requires environmental monitoring for air quality, water quality, terrestrial and marine ecology, landscape and visual, archaeology (watching brief) and land contamination. The EM&A requirements for each parameter are described in subsequent sections, including:

- All monitoring parameters;
- Action and Limit Levels for all environmental parameters;
- Event and Action Plans; and
- Environmental mitigation measures, as recommended in the project EIA final report.

2.6.2 A summary of impact EM&A requirements is presented in Table 2.2.

Table 2.2 Summary of Impact EM&A Requirements

Impacts	Parameters/descriptions	Locations	Frequencies	Duration
Air Quality	24-Hour TSP	1 Location	Once every 6 days	During Construction
	1-Hour TSP	1 Location	Three times in every 6 days	During Construction (As required when complaint received)
Water Quality	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity and SS	9 marine and 7 freshwater locations	**First 3 months** 3 times a week, mid-ebb and mid-flood tides. If there is no exceedance occurs for the first 3 months, reduce to once per week.	During Construction
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP and selected pesticides.	9 marine and 7 freshwater locations	Once per week. If there is no exceedance occurs, monitoring frequency is subjected to change and shall be agreed with EPD.	During Construction: turf establishment period (permanent low flow drainage is not completed)
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP, Chl-a and selected pesticides.	9 marine and 6 freshwater locations	A 2-year of monitoring period for the operation phase is proposed. Monitoring should be carried out on bi-weekly basis for the first 12 months, after when the frequency will be reviewed by EPD.	During Operation
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP, Chl-a and selected pesticides	8 marine locations	Additional water quality monitoring shall be carried out after heavy rain storm or when there is an overflow event from the reservoir, irrigation buffer lake or detention ponds/tanks.	During Construction and Operation
Terrestrial Ecology	Monitoring aquatic fauna	Streams B, C & D	Once a month	During Construction
	Environmental Site Inspection mainly on intact of buffer zones	Streams A, B and C	Once a week	During Construction

Impacts	Parameters/descriptions	Locations	Frequencies	Duration
Marine Ecology	Transplanted corals	Site D2	Quarterly for one year after transplantation	During construction
	Natural corals	Site C, Site B2, Site D2, and the Control Site.	**For Site D2 and the Control Site:** Weekly at the first two weeks of dredging works for the desalination plant pipelines. If no exceedance was recorded, the monitoring schedule would be changed to biweekly till the pipeline construction works are finished. **For Site C, B2 and the Control Site:** Monthly for the first three months of the construction phase. If no exceedance was recorded, the monitoring schedule would be changed to quarterly during the rest of the construction phase.	During Construction
		Site C, Site D2 and the Control Site.	First three months would be monthly conducted during the first two years of the operation phase. If no exceedance was recorded, the monitoring schedule would be changed to semi-annually, i.e. once in dry season and once in wet season.	During Operation
	Seagrass bed	Site D3, and at Site D2 if seagrasses were found during the baseline monitoring.	Weekly during the first two weeks of dredging works, and then biweekly till the pipeline construction works are finished.	During Construction
		Site D3, and at Site D2 if seagrasses were found during the baseline monitoring.	During the first two years of the operation phase. The monitoring schedule during the first three months would be monthly. After that, the monitoring schedule would be changed to semi-annually, i.e. once in dry season and once in wet season.	During Operation
Landscape and Visual	Audits to ensure effective implementation of mitigation measures	Project area and at visual sensitive receivers	Auditing inspections and reporting shall be undertaken once every two weeks of the construction phase and once every two months of the operation phase.	During Construction and Operation
Archaeology (Watching Brief)	Monitor archaeological potential sites at major cut areas	Hole 2, Hole 11, Hole 12, Hole 14, Hole 15 and Hole 16.	The archaeologist should keep the AMO informed of the progress of watching brief. The archaeologist should submit progress reports every 3 months during the programme of the watching brief.	During Construction
Land Contamination	Total Sulphur and Total Lead	Locations 2, 3, 6, 7 & 8	One month before commencement of work at the identified 5 hotspots	During Construction
General Site Conditions	Environmental Site Inspection	Works areas and areas affected by works	Periodically (weekly basis)	During Construction

3. Environmental Monitoring Requirements

3.1 Air Quality

Monitoring Requirement

3.1.1 24-hour TSP monitoring was carried out at GCA B1 to monitor the construction dust impact level in this reporting period.

3.1.2 The established Action/Limit Levels (AL levels) for the 1-hour and 24-hour TSP monitoring works are summarized in Table 3.1 and Table 3.2.

Table 3.1 Action and Limit Levels for 1-hour TSP

Location	Description	Action Level	Limit Level
GCA B1	**Bungalow A** adjacent to Kau Sai Chau Public Golf Course Administration Building	277.2 μg m^{-3}	500 μg m^{-3}

Note: The action levels for GCA B1 are developed based on baseline monitoring result.

Table 3.2 Action and Limit Levels for 24-hour TSP

Location		Action Level	Limit Level
GCA B1	**Bungalow A** adjacent to Kau Sai Chau Public Golf Course Administration Building	187.4 μg m^{-3}	260 μg m^{-3}

Note: The action levels for GCA B1 are developed based on baseline monitoring result.

Monitoring Parameters, Frequency and Programme

3.1.3 The monitoring parameters and frequency are summarized in Table 3.3. The monitoring programme for the reporting period is shown in **Annex B**.

Table 3.3 TSP Monitoring Parameter and Frequency

Parameter	Frequency
24-hour TSP	Once every 6 days
1-hour TSP	3 times every 6 days (as required in case of complaints)

Monitoring Locations

3.1.4 In accordance with the EM&A Manual, one monitoring station (GCA B1) was selected and shown in **Figure 3.1**.

Monitoring Equipment

3.1.5 24-hour and 1-hour TSP (in case of complaints received) were performed using High Volume Samplers (HVS) and measured in-situ respectively. 24-hour TSP level of samples were collected using filters and High Volume Sampler and the collected samples were determined by a local HOKLAS accredited laboratory upon receipt of the samples and 1-hour TSP level will be performed in-situ.

3.1.6 High volume samplers (HVS - Model GS-2310 Accu-vol) complete with the appropriate sampling inlets were installed for 24-hour TSP sampling. The HVS is composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B). A portable dust meter was used for the 1-hour TSP monitoring. Table 3.4 summarises the equipment used.

Table 3.4 Air Quality Monitoring Equipment

Equipment	Model
HVS Sampler	GS 2310 Accu-vol system
Calibrator	GMW 25
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD-1 (L)

Monitoring Methodology and Calibration Details

24-hour TSP Monitoring

(i) Field Monitoring, Operation & Analytical Procedures

3.1.7 Operating/analytical procedures for the operation of HVS are as follows. The sampler was placed on a horizontal platform with appropriate supporting structure such that:

- the filter was at least 1.3 meters above ground;
- no two samplers were placed less than 2 metres apart;
- the distance between the sampler and an obstacle, such as buildings, were at least twice the height that the obstacle protrudes above the sampler;
- a minimum of 2 metres separation from walls, parapets and penthouses were required for the rooftop samplers;
- a minimum of 2 metres separation from any supporting structure, measured horizontally was provided;
- airflow around the sampler was unrestricted;
- no furnaces or incineration flues were operating near the sampler;
- the sampler was more than 20 metres from the dripline; and
- any wire fence and gate to protect the sampler, did not cause any obstruction during monitoring.

3.1.8 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m3/min. and 1.4 m3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

3.1.9 For TSP sampling, fibreglass filters (G810) were used [Note: these filters have a collection efficiency of > 99% for particles of 0.3 mm diameter].

3.1.10 The power supply was checked to ensure the sampler worked properly.

3.1.11 On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.

3.1.12 The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.

3.1.13 The filter was aligned on the screen so that the gasket formed an air-tight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.

3.1.14 The shelter lid was closed and secured with the aluminum strip.

3.1.15 The timer was then programmed. Information was recorded on the record sheeting, which included the starting time, the weather condition, and the filter number (the initial weight of the filter paper can be found out by using the filter number).

3.1.16 After sampling, the filter was transferred from the filter holder of the HVS to a sealable plastic bag and sent to the laboratory for weighing. The elapsed time was also recorded.

3.1.17 Before weighing, all filters were conditioned for 24 hours before weighing under temperature of 25°C ±3°C and the relative humidity (RH) < 50% ±5%, preferably 40%. The HOKLAS laboratory (ALS Technichem (HK) Pty Ltd) has comprehensive quality assurance and quality control programmes.

(ii) Maintenance

3.1.18 Proper maintenance would be provided for the HVS as described below:

3.1.19 The HVS motors and their accessories have been properly maintained. Appropriate maintenance such as routine motor brushes replacement (time interval for replacement is about 500 hours) and electrical wiring checking have been conducted to ensure that the equipment and necessary power supply were in good working condition.

3.1.20 Initial calibration of HVS was conducted upon installation of equipment. The subsequent calibration would be provided at 2-month intervals using GMW-25 Calibration Kit.

1-hour TSP Monitoring

(i) Measuring Procedures

3.1.21 The measuring procedures of the 1-hour dust meter have been in accordance with the Manufacturer's Instruction Manual as follows:

- Set POWER to "ON", push BATTERY button, make sure that the meter's indicator is in the range with a red line and allow the instrument to stand for about 3 minutes (Then, the air sampling inlet has been capped).
- Push the knob at MEASURE position.
- Push "O-ADJ" button. (Then meter's indication is 0).
- Push the knob at SENSI ADJ position and set the meter's indication to S value described on the Test Report using the trimmer for SENSI ADJ.
- Pull out the knob and return it to MEASURE position.
- Push "START" button.
- All measurement procedures in section 2.3 of the approved EM&A Manual are followed during the reporting period.

(ii) Maintenance

3.1.22 The 1-hour TSP meter would be checked at 3 month intervals and calibrated at 1-year intervals throughout all stages of the air quality baseline monitoring.

Event and Action Plans

3.1.23 The Event and Action Plan (EAP) for air quality monitoring is presented in **Annex C**.

3.2 Water Quality

Monitoring Requirement

3.2.1 Water quality monitoring was conducted in accordance with the EM&A Manual. Tables 3.5 & 3.6 show the established Action/Limit Levels for the water environmental monitoring parameters.

Table 3.5 Derived Summaries of Action and Limit Levels for Marine Water Quality

Parameters	Location	Action	Location	Limit
DO (Surface & Middle)	FCZ	6.0 mg/L	FCZ	5.3 mg/L
	All except FCZ	4.9 mg/L	All except FCZ	4.6 mg/L
DO (Bottom)	All	3.7 mg/L	All	3.4 mg/L
pH (depth-averaged)		N/A	All	6.5 - 8.5
SS (Depth-averaged)☆	FCZ	4.5 mg/L	FCZ	5.6 mg/L
	All except FCZ	6.1 mg/L	All except FCZ	10.6 mg/L
SS (Depth-averaged) Dredging for submarine pipelines⊕	M_RO1	6.1 mg/L	M_RO1	10.6 mg/L
Turbidity (Tby) (depth-averaged) ☆	FCZ	2.9 NTU☼	FCZ	3.9 NTU☼
	All except FCZ	3.3 NTU☼	All except FCZ	6.2 NTU☼
Ammonia Nitrogen (depth-averaged)	FCZ	0.02 mg/L	FCZ	0.03 mg/L
	All except FCZ	0.05 mg/L Δ	All except FCZ	0.05 mg/L Δ
Nitrate Nitrogen (depth-averaged)	FCZ	0.08 mg/L	FCZ	0.09 mg/L
	All except FCZ	0.09mg/L Δ	All except FCZ	0.09 mg/L Δ
Nitrite Nitrogen (depth-averaged)	FCZ	0.02 mg/L θ	FCZ	0.02 mg/L θ
	All except FCZ	0.02 mg/L	All except FCZ	0.04 mg/L
TIN (depth-averaged)	FCZ	0.12 mg/L	FCZ	0.14 mg/L
	All except FCZ	0.16 mg/L	All except FCZ	0.18 mg/L
Total Phosphorus (depth-averaged)	All	0.09 mg/L Δ	All	0.09 mg/L Δ

Remarks:
☆ : Action and limit levels are subjected to review especially for wet season throughout the construction phase of the project.
⊕ : Action and limit levels are subjected to review before the dredging works.
☼ : All are based on EM&A baseline monitoring data due to marked difference between EPD turbidity data and those from the baseline survey.
Δ : For nutrient monitoring (except NO_2-N) at non-FCZ stations, the trigger level has made reference to the existing golf course guideline values. The guideline value of NO_2-N is below the current detection limit of 0.01mg/L and thus not used.

θ : The same action and limit level of 0.02 mg/L is determined from the EM&A baseline data as 78% of the NO_2-N data are <= 0.01 mg/L and all remaining 22% equal to 0.02 mg/L.
FCZ including fish culture zones of Kai Lung Wan, Tai Tau Chau and Kau Sai
All except FCZ including remaining impact monitoring station of M_RO1, M_Marsh, M_BP and M_Coral.
Control monitoring locations: M_A & M_B

Table 3.6 Derived Summaries of Action and Limit Levels for Freshwater Water Quality

Parameters	Location	Action	Location	Limit
DO (mid-depth)		6.3 mg/L	All	4 mg/L ξ
pH (mid-depth)		N/A	All	6.0 - 9.0
SS (mid-depth) ☆	All	3.8 mg/L or 120% of upstream control station's SS at the same tide of the same day	All	8 mg/L or 130% of upstream control station's SS at the same tide of the same day
Turbidity (Tby) (mid-depth) ☆	All	3.1 NTU or 120% of upstream control station's Tby at the same tide of the same day	All	4 NTU or 130% of upstream control station's Tby at the same tide of the same day
Ammonia Nitrogen (mid-depth)		N/A	All	0.01 mg/L
Nitrate Nitrogen (mid-depth)	All	0.10 mg/L	All	0.11 mg/L
Nitrite Nitrogen (mid-depth)		N/A	All	0.01 mg/L
TIN (mid-depth)	All	0.12 mg/L	All	0.13 mg/L
Total Phosphorus (mid-depth)		N/A	All	0.02 mg/L

Remarks:
☆ : Action and limit levels are subjected to review especially for wet season.
Freshwater monitoring locations: F_UA, F_DA, F_UB, F_DB, F_UC, F_DC and F_Inland Marsh
As most of the freshwater samples were reported of NH_3-N, NO_2-N levels below the detection limit of 0.01 mg/L, limit level is set at 0.01 mg/L. Similarly for TP, a limit level of 0.02 mg/L (the detection limit of TP) is imposed.
ξ : Water Quality Objectives of the Port Shelter

Monitoring Parameters, Frequency and Programme

3.2.2 For marine water quality, measurements shall be taken at both mid-flood and mid-ebb tides and at three water depths (1 m below water surface, mid-depth and 1 m above sea bed, except where the water depth is less than 6 m, in which case the mid-depth station may be omitted). Should the water depth be less than 3 m, only the mid-depth station will be monitored.

3.2.3 For the stream course, measurements shall be taken at mid-water depth.

3.2.4 The water quality parameters which need to be monitored are as follows:

- Marine water quality - dissolved oxygen (DO), temperature, turbidity, suspended solids (SS), pH and salinity
- Freshwater water quality - dissolved oxygen (DO), temperature, turbidity, suspended solids (SS) , pH and salinity

3.2.5 Additional marine and freshwater water quality monitoring parameters for the impact monitoring during construction include nitrate nitrogen (NO_3-N), nitrite nitrogen (NO_2-N), ammonia nitrogen (NH_3-N), total phosphate (TP) and selected pesticides.

3.2.6 The ET Leader shall propose the additional monitoring parameters for approval by IC(E), Engineer, EPD and AFCD, and shall submit such information for approval at least 2 weeks before the turf establishment period.

3.2.7 Additional water quality monitoring at Tai Tau Chau FCZ (TTC), Kai Lung Wan FCZ (KLW), Kau Sai FCZ (KS), downstream of the existing marsh (M_Marsh), marine water of Port Shelter (M_Coral), existing reservoir (F_Inland M) and Control stations (M_A and M_B) shall be carried out after heavy rain storm or when there is an overflow event from the reservoir, irrigation buffer lake or detention ponds/tanks. The heavy rain storm shall be defined when there is an amber/red/black rainstorm warning signal issued by the Hong Kong Observatory. The water sample shall be taken within 24 hours after the black/red/amber rainstorm warning signal is cancelled. Please refer to revised EM&A manual for the sampling condition requirement after a heavy rain storm event occurs. The monitoring parameters shall include dissolved oxygen, temperature, turbidity, suspended solids, pH and salinity. Additional parameters shall be the same as stated in paragraphs 3.2.5-3.2.6.

Monitoring Frequency

3.2.8 The monitoring parameters and frequency are summarized in Table 3.7. The monitoring programme for the reporting period is shown in **Annex B**.

Table 3.7 Water Quality Monitoring Parameter, Frequency and Locations

Parameters	Frequency	Location
Dissolved Oxygen (mg/L)	**3 days per week** Marine water : 2 times per day – 1 for mid-flood and 1 for mid-ebb Freshwater : once per day	**Marine Water** Fish culture zone stations: TTC, KLW, KS Control stations: M_A, M_B Impact stations: M_BP, M_RO1, M_Marsh, M_Coral **Freshwater Water** Stream A (F_UA, F_DA) Stream B (F_UB, F_DB) Stream C (F_UC, F_DC) Inland Marsh (F_lnland_M)
Temperature (ºC)		
Turbidity (NTU)		
pH		
Salinity (ppt)		
Suspended Solids (mg/L)		

Monitoring Locations

3.2.9 The water quality monitoring locations for marine and freshwater (**Figure 3.2**) are summarized in Table 3.8.

Table 3.8 Water Quality Monitoring Locations during Construction Phase

Identification Number	Location	Co-ordinates		Approx. Water Depth	No. of Depth
Marine Water (9 stations)		**latitude**	**longitude**		
TTC	Tai Tau Chau Fish Culture Zone	22° 22' 03.7"	114° 19' 19.6"	9.5 m	3
KLW	Kai Lung Wan Fish Culture Zone	22° 22' 10.6"	114° 18' 01.4"	13 m	3
KS	Kau Sai Fish Culture Zone	22° 20' 26.5"	114° 18' 59.9"	11 m	3
M_BP	Temporary barging point	22° 21' 50.6"	114° 19' 16.7"	9.6 m	3
M_RO1	Desalination plant south of the existing pier	22° 21' 51.8"	114° 18' 17.7"	5 m	2
M _ Marsh	Discharge point at the existing marsh	22° 22' 19.8"	114° 19' 05.4"	7.7 m	3
M _ Coral	Marine water of Port Shelter	22° 21' 21.3"	114° 19' 42.7"	10.2m	3
M _ A	Water Control Station of Port Shelter	22° 22' 51.3"	114° 18' 34.5"	7.5 m	3
M _ B	Water Control Station of Port Shelter	22° 20' 26.4"	114° 20' 11.8"	16.5 m	3
Fresh Water (7 stations)					
F_UA	Upstream and downstream of stream A	22° 21' 32.3"	114° 19' 06.5"	-	1
F_DA		22° 21' 33.5"	114° 19' 06.8"		1
F_UB	Upstream and downstream of stream B	22° 21' 23.9"	114° 19' 16.1"	-	1
F_DB		22° 21' 27.2"	114° 19' 16.0"		1
F_UC	Upstream and downstream of stream C	22° 21' 14.8"	114° 19' 26.4"	-	1
F_DC		22° 21' 03.5"	114° 19' 32.0"		1
F _ Inland M	Downstream of the existing marsh (Inland)	22° 22' 17.9"	114° 18' 59.1"	-	1

Monitoring Equipment

3.2.10 The equipment listed below shall be supplied by the ET and approved by the IC(E) and the Engineer for water quality monitoring.

Dissolved Oxygen and Temperature Measuring Equipment

3.2.11 The instrument shall be a portable and weatherproof DO measuring instrument complete with cable and sensor, and use a DC power source. The equipment shall be capable of measuring:

- dissolved oxygen levels in the range of 0 - 20 mg L^{-1} and 0 - 200% saturation; and
- a temperature of 0 - 45 degrees Celsius.

3.2.12 It shall have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables shall be available for replacement where

necessary. (For example, YSI model 59 meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable or an approved similar instrument).

3.2.13 Should salinity compensation not be built-in in the DO equipment, in-situ salinity shall be measured to calibrate the DO equipment prior to each DO measurement.

Turbidity Measurement Instrument

3.2.14 Turbidity shall be measured in situ by the nephelometric method. The instrument shall be portable and weatherproof turbidity measuring instrument using a DC power source complete with cable, sensor and comprehensive operation manuals. It shall have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU (for example, Hach model 2100P or an approved similar instrument). The cable shall not be less than 25m in length. The meter shall be calibrated in order to establish the relationship between NTU units and the levels of suspended solids.

Suspended Solids

3.2.15 A water sample at least 2.5L in capacity with messenger and using a 10m line should be collected. Samples should be submitted to HOKLAS accredited laboratory as soon as possible for gravimetric analysis for suspended.

Sampler

3.2.16 A water sampler is required. It shall comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler shall have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (for example, Kahlsico Water Sampler or an approved similar instrument).

Water Depth Detector

3.2.17 A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station. This unit can either be hand held or affixed to the bottom of the work boat, if the same vessel is to be used throughout the monitoring programme.

Salinity

3.2.18 A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) shall be provided for measuring salinity of the water at each monitoring location.

pH

3.2.19 The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1pH in a range of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 shall be used for calibration of the instrument before and after use. Details of the method shall comply with APHA, 19th ed. 4500-HTB.

Flow Rate Meter

3.2.20 A portable, battery-operated flow meter should be used for the determination of water depth at each designated monitoring location and record in m^3/s. A hand held or meter fixed to the underside of the survey boat may be used.

Sample Containers and Storage

3.2.21 Water samples for laboratory analysis shall be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen) and delivered to the laboratory and analysed as soon as possible after collection. Sufficient volume of samples shall be collected to achieve the required detection limit.

Monitoring Position Equipment

3.2.22 A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication or other equipment instrument of similar accuracy, shall be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

Monitoring Methodology and Calibration Details

3.2.23 Dissolved oxygen (DO), temperature, turbidity, pH and salinity were measured in situ at the designated water quality monitoring stations. General observation, weather conditions, with the sampling time, date and location were marked on the field record sheet.

3.2.24 Water samples were taken from each monitoring station for laboratory analysis. The sample identification number, sampling location, date, time, project name and analyses were required.

3.2.25 The samples were placed in a cooler with ice (to 4°C without being frozen) and kept away from sunlight. Samples were submitted to a Hong Kong Laboratory Accreditation Scheme (HOKLAS) or other international accredited laboratory for analysis within 24 hours of sampling.

Calibration of In-Situ Instruments

3.2.26 All in situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use and subsequently re-calibrated at three monthly intervals throughout all stages of the water quality monitoring programme. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibration for a DO meter were carried out before measurement at each monitoring location.

Laboratory Analysis

3.2.27 All laboratory work were carried out by ALS Technichem Pty Ltd (HOKLAS accredited laboratory). Water samples were collected at the monitoring and control stations for carrying out the laboratory determinations. The determination work will start within 24 hours after collection of the water samples. The analysis shall follow the standard methods according to APHA Standard Methods for the Examination of Water and Wastewater, 19th Edition, or an equivalent method approved by EPD.

Table 3.9 Analytical Methods to be applied to Water Quality Samples

Determinant	Standard Method	Reporting Limit
Suspended Solids	APHA 2540 D	2 mg/L
Nitrate Nitrogen	APHA 4500-NO_3^-	0.01 mg/L
Nitrite Nitrogen	APHA 4500-NO_2^-	0.01 mg/L
Ammonia Nitrogen	APHA 4500-NH_3(D)	0.01 mg/L
Total phosphorus	ASTM D515-88B	0.02 mg/L*
Chlorophyll a	APHA 10200 H2 &3	0.5 µg/L

Remarks: *After review baseline data, the detection limit report will be revised to 0.02 mg/L.

QA/QC Procedure

3.2.28 ALS Technichem Pty Ltd. has comprehensive quality assurance and quality control programmes. For QA/QC procedures of parameters, one duplicate sample was analysed for every batch of 20 samples as required by HOKLAS.

Event and Action Plans

3.2.29 The Event and Action Plan (EAP) for water quality monitoring is presented in **Annex C**.

3.3 Ecology

Introduction

3.3.1 The marine and terrestrial ecological monitoring surveys for the ecological EM&A were conducted in accordance with the EM&A manual.

3.3.2 As stipulated in the EM&A Manual, the ecological monitoring surveys for terrestrial ecology would be conducted monthly during the construction phase. Monitoring survey would consist of aquatic fauna survey. While the majority of the Project Area would be subject to site formation, natural streams would be partially or fully preserved and protected by buffer zones, and therefore would constitute the primary target of the terrestrial ecological monitoring. Special attention should thus be paid to ecologically sensitive streams to ensure minimum damage to existing vegetation and streams. The purpose of the monitoring survey was to check the conditions of the stream habitat and the associated aquatic fauna communities.

3.3.3 While the ecological monitoring surveys for marine ecology included coral monitoring at both the eastern and western coasts of Kau Sai Chau Island. The coral monitoring at the western coast would be conducted concurrently with the dredging works which have yet to conduct, and therefore had not been commenced. The coral monitoring at the eastern Kau Sau Chau would be monthly for the first three months of the construction phase, and if no exceedance was recorded, the monitoring schedule would be changed to quarterly during the rest of the construction phase. As a coral damage incident was recorded in March 2006, the monthly monitoring was extended for another three months from April 2006 to June 2006. No exceedance was recorded during these three months, the monitoring schedule were changed to quarterly after that till the end of the construction phase. Monitoring survey would consist of checking tagged corals at both impact sites and control site. The purpose of the monitoring survey was to check the conditions of the tagged corals and the impact sites. Although the dredging works for the desalination plant have yet to conduct, 89 natural corals near the plant were transplanted in November 2006. The transplanted corals would be monitored quarterly for a year and the first and second monitoring were conducted in December 2006 and March 2007 (this reporting month). The next reporting month will be in June 2007.

Ecological Mitigation Measures and Implementations

3.3.4 Ecological mitigation measures to be implemented during the construction phase include the following:

- Establishment of buffer zones for the natural stream courses during both construction phase.
- Provision of temporary bypass channels or pipes during construction phase for stream courses subject to pipe culverting.
- Protection of water quality of the natural stream courses and temporary bypass channels or pipes.

- Transplantation of coral colonies within the dredging area for the desalination plant prior to the dredging works.
- Avoidance of corals when the anchoring points are deployed, and to shift the floating temporary barging point to the location with least corals within the mapping area.
- Regular site audit of ecological mitigation measures and good site practice.

Monitoring Frequency and Schedule

Terrestrial Ecology

3.3.5 As reported in the EIA Report, there were four perennial natural streams (Streams A-D) within the Assessment Area for the EIA Study. Streams A, B & C were located within the Project Area, while Stream D was outside the Project Areas and acted as the main stream draining the western part of the Assessment Area. Buffer Zone would be established for the three streams within the Project Area along their partial length (Stream A) or full length (Streams B & C) (**Figure 3.3**). Moreover, Streams B, C & D would be monitored for aquatic fauna monthly during the construction phase. Monitoring on the implementation of the mitigation measures for stream protection, the effectiveness of stream buffer zones, and the aquatic fauna in streams would be conducted during the entire construction phase.

3.3.6 The objectives of the monitoring survey are to check the status of *Caridina trifasciata* and *Nanhaipotamon hongkongensis*. The surveys covered natural stream courses within the assessment area (Streams A to D), and aquatic fauna were studied by various sampling methods depending upon site conditions. Methods included direct observation, active searching, and sample collection using hand-nets. Hand nets were used to collect swimming organisms such as shrimps and fish. Where necessary boulders on the stream beds were overturned to locate aquatic organisms such as crabs. Aquatic species encountered was recorded, with special attention to rare or protected species.

Marine Ecology

3.3.7 As required in the EM&A Manual, prior to the commencement of all construction works, a baseline survey of natural corals were conducted in December 2005. At each of the Site C, Site B2, Site D2 and a Control Site near the AFCD's Coral Buoy at Sharp Island (**Figure 3.4**), 20 natural coral colonies in good conditions (i.e. generally intact and no sign of bleaching) and significant sizes (preferably over 20 cm in diameter) were selected and tagged. Each of the tagged coral colonies was identified to species level and their conditions, in terms of percentages of survival, sedimentation and bleaching, were recorded. Each coral was attached with a plastic label with assigned number and then photographed. The species and the size of each tagged corals were also recorded. The species of corals to have been tagged included the following 15 species: *Cyphastrea serailia, Favia speciosa, Favites abdita, Favites pentagona, Goniastrea aspera, Goniopora columna, Hydnophora exesa, Leptastrea pruinosa, Lithophyllon undulatum, Pavona decussata, Platygyra acuta, Platygyra carnosus, Plesiastrea versipora, Psammocora superficialis, and Turbinaria peltata.* All tagged corals were in good conditions during the baseline survey, without significant sign of bleaching or being covered by sediments, and therefore were all recommended as the monitored coral colonies (all 80 tagged corals, 20 from each site). The seagrass beds in Site D3 were also surveyed for their extent, coverage percentage and health conditions during the baseline survey. The results of the baseline survey has presented in the Baseline Monitoring Report. The original 20 tagged corals at Site B2 were re-organised in April 2006, with B-11 to B-20 retained, but 40 new tagged corals (B-21 to B-60) were established. The number of tagged corals at Site B2 was therefore increased from 20 nos. to 50 nos. The baseline conditions of these newly tagged corals (40 nos.) were presented in the monthly monitoring report of April 2006.

3.3.8 The reporting month (March 2007) was the Month fifteen of the construction programme. As the dredging works for the desalination plant had not been commenced, the impact sites to be monitored in this monitoring survey were Site B2 and Site C (impact sites on the eastern Kau Sai Chau Island for the new golf course) only, while Site D2 and Site D3 (impact sites on the western Kau Sai Chau Island for desalination plant) were not required in this survey. The coral transplantation, which should be conducted prior to the commencement of dredging works according to the EM&A manual, were conducted in November 2006 due to the possible commissioning of the desalination plant in the coming dry season 2007 to supply water for turf establishment for the third golf course. The first quarterly monitoring on transplanted corals on the bedrock at Site D2 (see **Figure 3.5**) was performed in December 2006. 89 natural corals were transplanted and each was assigned with a number. These corals would be monitored quarterly for a year after transplantation.

3.3.9 The schedule for the impact sites on the eastern Kau Sai Chau Island during construction would be monthly in the first three months of the construction programme, and if no exceedance was recorded then quarterly till the end of the construction. As coral damage incident was reported in Month Three of the construction programme, AFCD requested the monthly monitoring should be extended to cover another three months (April, May and June 2006). No exceedence was recorded during the extended three-month period and the schedule was changed to quarterly. The present survey was the eighth monitoring survey (the second quarterly survey on the eastern Kau Sai Chau Island). The survival and health conditions of the coral colonies were recorded.

3.3.10 During the weekly site inspection, ET also monitored and audited the implementation of the recommended mitigation measures for terrestrial and marine ecology. Monitoring locations for ecology are shown in **Figures 3.3 – 3.5**. The monitoring programme for the reporting period is shown in **Annex B**.

Event and Action Plans

3.3.11 The Event and Action Plan (EAP) for ecology monitoring is presented in **Annex C**.

3.4 Landscape and Visual

3.4.1 The EIA concluded that the landscape and visual impacts associated with the construction of the third golf course are anticipated to be acceptable with mitigation. In order to ensure that the effective management and implementation of landscape mitigation measures developed and defined in the EIA, the ET conducted regular site inspections of the construction work sites.

3.4.2 Auditing inspections and reporting are undertaken once every two weeks of the construction phase. The effectiveness of the mitigation works has been audited in order to ensure impact reduction levels are achieved as described in the EIA report for this monitoring month. The monitoring programme for the reporting period is shown in **Annex B.**

3.5 Archaeology (Watching Brief)

Introduction

3.5.1 The archeological impact assessment conducted in the EIA concluded that some potential for archaeological material remains at the Wan Chai Archaeological Site and a watching brief is recommended during the construction phase.

3.5.2 A watching brief is a process whereby a qualified and licensed archaeologist monitors the excavation works during the construction phase in areas identified (and agreed with the Antiquities and Monuments Office (AMO)) to be of archaeological potential.

3.5.3 The archaeologist conducting the watching brief should obtain a licence prior to commencement of works as stipulated in Section 12 of the Antiquities and Monuments Ordinance (Cap. 53). The licence was granted on 22nd December 2005.

Monitoring Location

3.5.4 The monitoring locations include Hole 2, Hole 11, Hole 12, Hole 14, Hole 15 & Hole 16. The monitoring locations are present in **Figure 3.6**.

Monitoring Frequency

3.5.5 A total of 18 days of monitoring is considered as minimum, and additional arrangement for watching brief should be made in consultation with AMO in case significant archaeological findings are unearthed in the course of excavation work.

Progress Report

3.5.6 Archaeologist should submit progress reports every 3 months during the programme of the watching brief.

3.5.7 A summary table for categories of archaeological find and recommended action is presented in **Annex C**.

3.6 Land Contamination

Potential Areas Recommended for Further Investigation

3.6.1 Contamination Assessment Plan (CAP) shall be submitted to EPD for approval before site investigation. If land contamination is confirmed by the site investigation, submission of a Remediation Assessment Plan (RAP) including a Contamination Assessment Report (CAR) is required. Potential 5 land contamination hotspots are presented in **Figure 3.7**.

4. Implementation Status on Environmental Protection Requirements

4.1.1 Major construction work of the third golf course were (i) site formation at south holes and Hole 17, (ii) permanent closed low flow drainage system installation including lake/pumping station construction and gravity drain from Lake 1D to existing reservoir, (iii) irrigation system installation, (iv) sub-soil drains installation and (v) hydroseeding at the permanent slope/bare grounds, (vi) partial turfing at Hole 5.

4.1.2 The huge soil stockpiles located at Holes 1 and 16 were planted with hydroseed to reduce the dust generation. No dust suppression mitigation measure was provided for all rock breaking areas. Dust suppression measures for loading/unloading activities, rough shaping and haul road (truck traffic) were insufficient.

4.1.3 The water source for dust suppression was mainly pumped from the downstream of the fresh water inland marsh and underground water generated near Lake 1D. Downstream of Streams A & C were relatively dry during the dry season, only small quantity was extracted from Stream A.

4.1.4 Temporary Drainage Management Plan (TDMP) was submitted by the Contractor for ER's approval in mid-March 2007. ET and the Engineer were provided the comments to the Contractor. The Contractor had to revise the TDMP and implement on site before the wet season.

4.1.5 Silt fence was implemented along the site boundary (major component of the temporary drainage system) for most of the exposed areas. According to the site observation, most of the temporary drains (silt fence) were removed along the site boundary of the golf hole and considered unsatisfactory (in particular at Northern and centre section of East Course). In addition, layers of silt fence were installed by surrounding the catch basins to prevent the silty runoff directly into the permanent drains. The Contractor was reminded to maintain the silt fence more frequently to prevent silty runoff to the water sensitive areas and critically review the temporary drainage provided on site. Silty runoff was recorded at all streams and freshwater inland marsh on 12 March 2006 after scattered showers. Potential heavy rain(s) could still occur during the dry season.

4.1.6 Hydroseeding at scar areas within the East Course was completed before March 2007. However, some areas were required re-hydroseeding. Vegetation stockpiles, general refuse and construction waste stockpiles were temporary stored at Hole 2 and disposed off-site after accumulation for four weeks during this reporting month. The Contractor was reminded to dispose all other remaining construction wastes gradually off-site and submitted the trip tickets record for our reference.

4.1.7 Reinstatement work at Stream B2 buffer zone was carried out during the reporting month by planting native shrub (including *Gordonia axillaries*, *Melastoma candidum*, *Melastoma sanguineum*, *Rhaphiolepis indica*, *Rhodomyrtus tomentosa*) with approximate 400mm height at four plots per metre square density.

4.1.8 Chemical waste storage area was available starting from this reporting month and located at the concrete batching plant. Insufficient mobile toilets were available on site at remote areas, only few units were located at the southern portion of construction site.

4.1.9 No dredging work has been carried out near to the existing pier for the desalination plant pipelines. Summary of implementation status is provided in **Annex D**.

5. Monitoring Results

5.1 Air Quality

5.1.1 Dust monitoring was conducted as scheduled in the reporting month. Monitoring of air quality was conducted on 6 occasions in February to March 2007. All monitoring data are provided in **Annex E**. Monitoring of 24-hour TSP was conducted at GCA B1 on 26th February, 2nd, 3rd, 9th, 15th and 21st March 2007. The QA/QC results for laboratory testing in the reporting month were acceptable. The QA/QC results are summarised in **Annex F**.

5.1.2 No exceedance of 24-hour TSP was recorded at GCA B1 during the reporting month. Additional TSP sample was taken on 2nd March 2007 due to the exceedance occurred in 14th February 2007.

5.2 Water Quality

5.2.1 Marine and freshwater water quality monitoring were conducted at the 9 and 7 designated monitoring stations respectively. All monitoring data are provided in **Annex E**.

5.2.2 Monitoring of marine and freshwater locations was conducted on 12 occasions in February to March 2007 (26th and 28th February, 2nd, 5th, 7th, 9th, 12th, 14th, 16th, 19th, 21st and 23rd March 2007). The QA/QC results for laboratory testing in the reporting month were acceptable. The QA/QC results are summarised in **Annex F**. No rainstorm signal was hoisted during the reporting month.

5.2.3 Turf was established at Hole 5 on 6 March 2007 and still in progress during the reporting month. Additional water quality parameters include NH_3-N, NO_3-N, NO_2-N, TIN, TP and Chlorophyll a. Monitoring locations for the additional parameters include F_Inland M, M_Marsh, M_BP, TTC and M_A.

Marine water

- M_Marsh: One limit level exceedance of ammonia nitrogen
- TTC: Six action level and one limit level exceedances of ammonia nitrogen; one action level and two limit level exceedances of chlorophyll.

5.2.4 The marine water exceedances were summarised in **Table 5.2-1.**

Table 5.2-1 Marine water Exceedance Summary February to March 2007

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
M_Marsh	Limit Level	28th Feb 07	NH_3-N	No
TTC	Action Level	26th Feb 07	NH_3-N	No
	Limit Level	26th Feb 07	Chl a	No
	Limit Level	28th Feb 07	NH_3-N	No
	Limit Level	5th Mar 07	Chl a	No
	Action Level	7th Mar 07	NH_3-N	No
	Action Level	12th Mar 07	NH_3-N	No
	Action Level	14th Mar 07	NH_3-N	No
	Action Level	19th Mar 07	Chl a	No
	Action Level	21st Mar 07	NH_3-N	No
	Action Level	23rd Mar 07	NH_3-N	No

Remarks: All exceedances were mainly due to natural variation of the marine water.

5.2.5 The range of the chlorophyll a measured at the Control Station (M_A) was between 0.5 μg/m^3 and 3.3 μg/m^3. The range of chlorophyll a measured at TTC was between 0.5 μg/m^3 and 1.8 μg/m^3. There is no significant difference of the measured concentrations between control station and impact stations.

5.2.6 The range of the ammonia nitrogen measured at the Control Station (M_A) and TTC the same (range between 0.01 mg/L and 0.04 mg/L). There is no significant difference of the measured concentrations between control station and impact stations.

5.2.7 Therefore, the all exceedances were considered not project-related. Further review of the action and limit levels of chlorophyll and ammonia nitrogen is recommended.

Freshwater

- Stream A: One limit level exceedance of turbidity and one limit level exceedance of suspended solids.
- Stream B: One action and one limit level exceedances of turbidity; One action and one limit level exceedances of suspended solids.
- Stream C: Two limit level exceedances of turbidity; Two limit level exceedances of suspended solid.
- F_Inland Marsh: Two limit level of turbidity, two limit level of suspended solids, eleven limit level exceedances of ammonia nitrogen, twelve limit level exceedances of nitrate nitrogen, one limit level of nitrite nitrogen, twelve exceedances of total inorganic nitrogen and seven limit level exceedances of chlorophyll a.

5.2.8 The freshwater water exceedances were summarised in **Table 5.2-2.**

Table 5.2-2 Freshwater Exceedance Summary February to March 2007

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
F_DA	Limit Level	12th Mar 07	SS, turbidity	Yes
F_UB	Action Level	12th Mar 07	SS, turbidity	Yes
F_DB	Limit Level	12th Mar 07	SS, turbidity	Yes
F_UC	Limit Level	12th Mar 07	SS, turbidity	Yes
F_DC	Limit Level	12th Mar 07	SS, turbidity	Yes
F_Inland M	Limit Level	26th Feb 07	NH_3-N, NO_3-N, TIN, Chl a	Yes
	Limit Level	28th Feb 07	NH_3-N, NO_3-N, TIN	Yes
	Limit Level	2nd Mar 07	NH_3-N, NO_3-N, TIN	Yes
	Limit Level	5th Mar 07	NH_3-N, NO_3-N, TIN, Chl a, SS, turbidity	Yes
	Limit Level	7th Mar 07	NH_3-N, NO_3-N, TIN, Chl a	Yes
	Limit Level	9th Mar 07	NH_3-N, NO_3-N, TIN	Yes
	Limit Level	12th Mar 07	NH_3-N, NO_3-N, TIN, Chl a	Yes
	Limit Level	14th Mar 07	NH_3-N, NO_3-N, TIN	Yes
	Limit Level	16th Mar 07	NO_3-N, TIN	Yes
	Limit Level	19th Mar 07	NH_3-N, NO_3-N, TIN, Chl a, SS, turbidity	Yes
	Limit Level	21st Mar 07	NH_3-N, NO_3-N, TIN, Chl a	Yes
	Limit Level	23rd Mar 07	NH_3-N, NO_3-N, NO_2-N, TIN, Chl a	Yes

Remarks: Exceedances recorded at Streams A, B & C were mainly due to insufficient temporary drainage provided on site. Exceedances recorded at F_Inland Marsh could be due to discharge from temporary sewage treatment plant and decrease of removal effectiveness within fresh water inland marsh and insufficient temporary drainage provided on site.

5.2.9 Exceedances of ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, total inorganic nitrogen and chlorophyll a were recorded at downstream of fresh water inland marsh. Possible reasons could be due to (i) continuous wastewater discharge from temporary sewage treatment plant at the contractor's site office, (ii) the change of physical condition of fresh water inland marsh which may decrease the secondary treatment removal capacity (heavily silt after rainstorms occurred in wet season 2006) and (iii) reinstatement work at upstream of fresh water inland marsh (desilting). Further review of action and limit levels of ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, total inorganic nitrogen and chlorophyll is recommended. All exceedances were considered project-related but not due to the turf establishment (only two applications of nutrients was recorded in February and March 2007 at Hole 8).

5.2.10 For the upstream monitoring location (F_UB), it is located downstream to the construction area near Hole 10 and the monitoring location cannot be relocated further upstream (temporary bridges located at Streams B1 and B2) as no water was observed and available for sampling. For Stream C, exceedances were recorded at both upstream and downstream monitoring locations. For the upstream monitoring location (F_UC), it is located downstream to the construction area near Hole 16 and the monitoring location cannot be relocated further upstream as no water was observed and available for sampling. Therefore, the F_UC is considered the most upstream location of Stream C. Same as Stream B, it is considered that F_UC is also the impact monitoring location and F_UA was used as the representative control monitoring station.

5.3 Ecology

5.3.1 Terrestrial and marine ecology monitoring photos are provided in **Annex E**.

5.3.2 The Monitoring Survey for the reporting month was conducted on 16th and 19th March 2007. The project site has been fully cleared and under construction works.

5.3.3 Although the surveyed streams have not been previously affected by developments or pollution sources, they are relatively small. Water depth was less than 0.3m in most of the stream reaches even during wet season. Currently (still within dry season) these streams had very small surface flow or even had no surface flow for most of the length.

5.3.4 Stream A is located within the Project Area. Its main stream section (downstream to the confluence of two tributaries) would be protected by stream buffer zone (**Figure 3.3**). Stream A was heavily silted with sediments from eroded hillsides all year round, particularly at the main stream section. The stream had low flow.

5.3.5 In the present monitoring survey, the main stream course of Stream A (the section downstream to the confluence of tributaries A1 and A2) was found still to be filled up by rubbles which was first report in June 2006 (see **Photo Plate 5.3-1**). The rubbles were reported to be washed down from the upper Tributary A2 which was under pipe culvert construction. Although the riparian vegetation was not affected by the rubbles, this section of stream channel was temporarily lost. Tributary A2 had been converted to underground pipeline as proposed in the EIA report. It was found in the present survey that the flow in the main stream course of Stream A was very turbid. It might be attributed to the earthworks on the stream banks of Tributary A1 (just upstream to the main stream). Stream A was of the lowest ecological value among the four natural streams as it was heavily silted with sediments from eroded hillsides all year round. No stream fish and only very limited aquatic fauna were recorded in Stream A before. The impact from this temporary loss of stream channel would not be severe. But remedial works should be implemented to clear the rubbles and restore the channel, and improve the water quality, as the condition of this stream is expected to improve after the construction of the golf course extension (in which the eroded hill slopes would be replaced by turf).

5.3.6 Stream B is located within the Project Area. It had clear flow (with little sediment in the stream beds) of moderate volume during the wet season. This stream also has two main tributaries, B1 and B2. The full length of Stream B (two tributaries and the main stream) would all be protected by buffer zone (**Figure 3.3**). Stream B also contains a long estuarine section of muddy sandy substrate.

5.3.7 In the present survey, it was found that the flow in Stream B has restored from the minor turbidity reported in November 2006. The stream bed and banks had no sign of severe sedimentation, probably due to the protection of the vegetation inside the buffer zone. Aquatic fauna including *Caridina trifasciata* were still sighted in the stream. An area of the buffer zone of Tributary B2 was however accidentally cleared (see **Figure 5.3.1**). This might affect the function of the buffer zone for the stream protection, and remedial plan such as replanting should be implemented.

5.3.8 Stream C is located within the Project Area. This stream also has two main tributaries. It has had low but clear flow. In contrast to Stream B, Stream C drains to a sandy beach at Kau Chung Wan, and therefore lacks a clear estuarine zone. The full length of Stream C (two tributaries and the main stream) were protected by buffer zone (**Figure 3.3**). The temporary access bridge across Stream C had been in place, and the piers for the permanent bridge were constructed outside the buffer zone demarcation.

5.3.9 Sedimentation in Stream C was reported previously in November 2006 because silt fences were found collapsed after the heavy rainfalls. In the present survey, it was found that the majority of the main stream course of Stream C was still covered by a thin layer of find sediment as found in November monitoring. The flow was clear during the survey, and aquatic fauna including *Caridina trifasciata* were found hiding among the aquatic plants, the sediments covered the bottoms of rock pools and reduced the habitat sizes available for the aquatic fauna. This might limit the aquatic communities in Stream C. Measures should be taken to prevent any further sedimentation incident in the future.

5.3.10 Stream D is located outside the Project Area but within the Assessment Area and is the main stream draining the west side of the Assessment Area. It had clear water and moderate flow levels. Stream D is the only stream with deeper water depth among the four streams (water depth over 0.3 m in some of the stream reaches). As Stream D is outside the construction area, buffer zone would not be needed for this stream. In the present survey, the flow was found clear in Stream D, and Atyid shrimp *Caridina trifasciata* was still recorded.

5.3.11 Photos of Streams A to C were shown in **Photo Plate 5.3-1 (Annex E)**. The habitats and vegetation generally remained intact within a large potion of the project site (beyond the works fronts), within the stream buffer zone (except an area for Tributary B2) and outside the project area. No earthwork, human disturbance or fire disturbance was observed beyond the works fronts other than the historical erosion of hillsides and the access paths to the project site.

Marine Ecology

5.3.12 The present Marine Ecological Monitoring Survey was conducted on 16th, 17th, 28th and 29th March 2007. The weather conditions were fair on those date, the underwater visibility was good (approximately 4m). At Site C, the 20 colonies of natural corals selected during the Baseline Survey were recovered and checked for conditions, while at Site B2, 50 tagged corals (with 10 established in the Baseline Survey and 40 established in April 2006) were also checked. But one of the 20 tagged colonies at Control Site (X-05) and one of the 50 tagged corals at Site B2 (B-60) were found lost in the previous monitoring surveys, probably due to the strong wave actions during typhoon weather. The 89 transplanted corals were monitored for the first time after transplantation in this month.

5.3.13 Site B2 was the location for the temporary barging point. Some rectangular concrete blocks were deployed along the seaward side of the intertidal zone to form a seawall, and the area landward to this wall was filled with boulders. This was used as the landing point of the temporary barging point. Road surface was formed near the abandoned pier and connected to the landing point. The conditions of the tagged corals during the present survey were compared with the conditions during the Baseline Survey (for B-11 to B-20) or in April 2006 (for B-21 to B-60) (**Annex E - Photo Plates 5.3-2 to 5.3-6**). Two tagged corals at this site (i.e.B-59 and B-60) were missing in previous monitoring, and were considered removed by the wave actions during the adverse weather conditions such as typhoons. The skeleton of B-59, however, was recovered in the last survey in December 2006. This colony might previously be covered by sediment or be toppled due to wave action, but was exposed again by wave action. This colony was still of 100% mortality in the present survey. B-19 was found toppled in previous monitoring survey (May 2006) and was then restored to the original posture. In the following monitoring surveys (September and December 2006), the mortality of this colonies was found at about 70%. This partial mortality of this colony should not be considered as a consequence of the operation of the temporary barging point. This colony however was found missing in the present survey. B-58 had also been found a 60% mortality during June monitoring survey and its conditions remained similar in the present survey. B-42 which was found toppled with a 90% mortality in the December 2006 survey. It had been restored to its original posture and was of similar conditions in the present survey. B-13 was also found partially buried by sediment with a 30% mortality, and the sediment was removed. There were some minor (<10%) mortality on tagged corals (see **Table 5.3-1**). Besides the above damages recorded in previous monitoring, new damages on tagged corals include B-16 and B-18. B-16 showed a 50% mortality while B-18 was covered by sediment on 15% of surface. As there was no other corals showing significant mortality, it was unlikely that the mortality of B-16 and B-18 was caused by the barging point operation or the construction of the golf course. The partial mortality of these colonies should also not be considered as a consequence of the operation of the temporary barging point. Other corals remained similar conditions with their baseline conditions during the Baseline Survey in December 2005 or in April 2006. No difference were identified on the conditions of the three groups (i.e. B11 to B20 within the barge area; B21 to B-40 to the north of the barge, and B-50 to B-60 to the south of the barge) of tagged corals.

5.3.14 Site C was on the south-eastern coast of Kau Sai Chau Island and had a high coral coverage among the sites investigated during the EIA Study. The sizes of coral colonies at Site C were also larger than those at other sites. Site C was away from the boundary of the new golf course and would not be subject to direct impacts during construction. The site and its vicinity still remained similar conditions as during the Baseline Survey. All 20 tagged corals were recovered. C-04 was found upside down on the seabed previously, while C-10 had sign of anchor damage. No other mortality, sedimentation or bleaching was found on other tagged corals (see **Table 5.3-2** and **Annex E - Photo Plates 5.3-7 to 5.3-8**).

5.3.15 The Control Site is the buoy of coral marker established by AFCD in Sharp Island. Similar with Site C, both the coral coverage percentage and the sizes of coral colonies were high at this site and would not be impacted by the Project. The site and its vicinity still remained similar conditions as during the Baseline Survey. Coral X-05 was lost in previous monitoring in June 2006. Other 19 tagged corals were recovered. No mortality, sedimentation or bleaching was found on any of the tagged corals (see **Table 5.3-3**). The corals remained similar conditions as during the Baseline Survey (**Annex E - Photo Plates 5.3-9 to 5.3-10**).

5.3.16 The 89 transplanted corals were checked for the first time after the transplantation survey. The site was the bedrock near Site D2, to the south of the existing ferry pier. This site is less exposed than other sites such as Site C as it is facing Sharp Island and the Sai Kung direction. All 89 transplanted corals were recovered and no mortality, sedimentation or bleaching was

found on any of the transplanted corals (see **Table 5.3-4**). The corals remained similar with the baseline conditions during the transplantation survey (**Annex E - Photo Plates 5.3-11 to 5.3-16**).

5.3.17 **Photo Plates 5.3-2** to **5.3-16** showed the photos of each tagged corals and transplanted corals. The assigned numbers, species, mortality percentage, sedimentation coverage percentage and bleaching percentage of the baseline conditions of tagged corals and transplanted corals and their present conditions were presented in **Tables 5.3-1** to **5.3-4** below.

Table 5.3-1 Conditions of tagged corals at Site B2

Code of tagged corals	Species*	Baseline Survey (December 2005 or April 2006)			Month Fifteen (Mar 2007)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
Within the Temporary Barging Point Area							
B-11	*Turbinaria peltata*	0	0	0	0	0	0
B-12	*Plesiastrea versipora*	0	0	0	0	0	0
B-13	*Plesiastrea versipora*	0	0	0	**30**	0	0
B-14	*Goniastrea aspera*	0	0	0	0	**3**	0
B-15	*Lithophyllon undulatum*	0	0	0	0	**10**	0
B-16	*Favia speciosa*	0	0	0	**50**	0	0
B-17	*Favia speciosa*	0	0	0	0	0	0
B-18	*Turbinaria peltata*	0	0	0	0	15	0
B-19	*Favia speciosa*	0	0	0	Missing	Missing	Missing
B-20	*Favia speciosa*	0	0	0	0	0	0
To the North of the Temporary Barging Point Area							
B-21	*Favia speciosa*	0	0	0	0	0	0
B-22	*Cyphastrea serailia*	0	0	0	0	0	0
B-23	*Favia speciosa*	0	0	0	0	0	0
B-24	*Favia speciosa*	0	0	0	0	0	0
B-25	*Favites abdita*	0	0	0	0	0	0
B-26	*Cyphastrea serailia*	0	0	0	0	0	0
B-27	*Favia speciosa*	0	0	0	0	0	0
B-28	*Goniopora columna*	0	0	0	0	0	0
B-29	*Cyphastrea serailia*	0	0	0	0	0	0
B-30	*Favia speciosa*	0	0	0	0	0	0
B-31	*Platygyra acuta*	**5**	0	0	0	0	0
B-32	*Favia speciosa*	**3**	0	0	0	0	0
B-33	*Turbinaria peltata*	0	0	0	0	0	0
B-34	*Cyphastrea serailia*	0	0	0	0	**5**	0
B-35	*Cyphastrea serailia*	0	0	0	0	0	0
B-36	*Platygyra acuta*	0	0	0	0	0	0
B-37	*Favia speciosa*	0	0	0	0	0	0
B-38	*Cyphastrea serailia*	0	0	0	0	0	0
B-39	*Cyphastrea serailia*	0	0	0	0	0	0
B-40	*Favia speciosa*	0	0	0	0	0	0
To the south of the Temporary Barging Point Area							
B-41	*Leptastrea pruinosa*	0	0	0	0	0	0
B-42	*Goniastrea aspera*	0	0	0	**90**	0	0
B-43	*Favia speciosa*	0	0	0	0	0	0

Code of tagged corals	Species*	Baseline Survey (December 2005 or April 2006)			Month Fifteen (Mar 2007)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
B-44	*Cyphastrea serailia*	0	0	0	0	**10**	0
B-45	*Platygyra acuta*	0	0	0	0	0	0
B-46	*Favia speciosa*	0	0	0	0	0	0
B-47	*Favites abdita*	0	0	0	**5**	0	0
B-48	*Cyphastrea serailia*	0	0	0	0	0	0
B-49	*Goniopora columna*	0	0	0	0	0	0
B-50	*Favia speciosa*	0	0	0	0	0	0
B-51	*Psammocora superficialis*	0	0	0	0	**3**	0
B-52	*Favia speciosa*	0	0	0	**10**	0	0
B-53	*Favia speciosa*	0	0	0	**10**	0	0
B-54	*Favia speciosa*	0	0	0	0	0	0
B-55	*Goniastrea aspera*	0	0	0	0	0	0
B-56	*Platygyra carnosus*	0	0	0	0	0	0
B-57	*Goniastrea aspera*	0	0	0	0	0	0
B-58	*Favia speciosa*	**5**	0	0	**60**	0	0
B-59	*Favia speciosa*	0	0	0	**100**	\	\
B-60	*Favia speciosa*	**5**	0	0	Missing	Missing	Missing

* Damaged corals were bold.

Table 5.3-2 Conditions of tagged corals at Site C

Code of tagged corals	Species	Baseline Survey (December 2005)			Month Fifteen (March 2007)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
C-01	*Platygyra carnosus*	0	0	0	0	0	0
C-02	*Platygyra carnosus*	0	0	0	0	0	0
C-03	*Favia speciosa*	0	0	0	0	0	0
C-04	*Favites abdita*	0	0	0	**100**	0	0
C-05	*Turbinaria peltata*	0	0	0	0	0	0
C-06	*Favia speciosa*	0	0	0	0	0	0
C-07	*Platygyra acuta*	0	0	0	0	0	0
C-08	*Platygyra acuta*	0	0	0	0	0	0
C-09	*Favia speciosa*	0	0	0	0	0	0
C-10*	*Platygyra acuta*	0	0	0	0	0	0
C-11	*Favia speciosa*	0	0	0	0	0	0
C-12	*Platygyra acuta*	0	0	0	0	0	0
C-13	*Platygyra carnosus*	0	0	0	0	0	0
C-14	*Favia speciosa*	0	0	0	0	0	0
C-15	*Goniopora columna*	0	0	0	0	0	0

Code of tagged corals	Species	Baseline Survey (December 2005)			Month Fifteen (March 2007)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
C-16	*Platygyra carnosus*	0	0	0	0	0	0
C-17	*Goniopora columna*	0	0	0	0	0	0
C-18	*Platygyra carnosus*	0	0	0	0	0	0
C-19	*Favites pentagona*	0	0	0	0	0	0
C-20	*Favia speciosa*	0	0	0	0	0	0

*C-10 had sign of anchor damages.

Table 5.3-3 Conditions of tagged corals at Control Site

Code of tagged corals	Species	Baseline Survey (December 2005)			Month Fifteen (March 2007)		
		Mortality (%)	Sedimentation (%)	Bleaching (%)	Mortality (%)	Sedimentation (%)	Bleaching (%)
X-01	*Platygyra carnosus*	0	0	0	0	0	0
X-02	*Platygyra carnosus*	0	0	0	0	0	0
X-03	*Platygyra carnosus*	0	0	0	0	0	0
X-04	*Pavona decussata*	0	0	0	0	0	0
X-05	*Hydnophora exesa*	0	0	0	Missing	Missing	Missing
X-06	*Platygyra carnosus*	0	0	0	0	0	0
X-07	*Platygyra carnosus*	0	0	0	0	0	0
X-08	*Favites abdita*	0	0	0	0	0	0
X-09	*Cyphastrea serailia*	0	0	0	0	0	0
X-10	*Cyphastrea serailia*	0	0	0	0	0	0
X-11	*Platygyra carnosus*	0	0	0	0	0	0
X-12	*Platygyra acuta*	0	0	0	0	0	0
X-13	*Platygyra acuta*	0	0	0	0	0	0
X-14	*Platygyra acuta*	0	0	0	0	0	0
X-15	*Platygyra acuta*	0	0	0	0	0	0
X-16	*Platygyra acuta*	0	0	0	0	0	0
X-17	*Favia speciosa*	0	0	0	0	0	0
X-18	*Platygyra acuta*	0	0	0	0	0	0
X-19	*Goniastrea aspera*	0	0	0	0	0	0
X-20	*Cyphastrea serailia*	0	0	0	0	0	0

Table 5.3-4 Conditions of transplanted corals

Coral #	Species	Baseline Condition	Baseline			2nd monitoring		
			Mortality (%)	Sediment (%)	Bleaching (%)	Mortality (%)	Sediment (%)	Bleaching (%)
1	*Montipora peltiformis*	Good	0	0	0	0	0	0
2	*Porites lobata*	Good	0	0	0	0	0	0
3	*Favites abdita*	Good	0	0	0	0	0	0
4	*Cyphastrea serialia*	Good	0	0	0	0	0	0
5	*Porites lobata*	Good	0	0	0	0	0	0
6	*Porites lobata*	Good	0	0	0	0	0	0
7	*Porites lobata*	Good	0	0	0	0	0	0
8	*Porites lobata*	Fairly Good	0	0	0	0	0	0
9	*Favites abdita*	Good	0	0	0	0	0	0
10	*Cyphastrea serialia*	Good	0	0	0	0	0	0
11	*Favites pentagona*	Good	0	0	0	0	0	0
12	*Cyphastrea serialia*	Good	0	0	0	0	0	0
13	*Cyphastrea serialia*	Good	0	0	0	0	0	0
14	*Favites abdita*	Good	0	0	0	0	0	0
15	*Cyphastrea serialia*	Good	0	0	0	0	0	0
16	*Goniastrea aspera*	Good	0	0	0	0	0	0
17	*Favites abdita*	Fairly Good	0	0	0	0	0	0
18	*Cyphastrea serialia*	Good	0	0	0	0	0	0
19	*Cyphastrea serialia*	Good	0	0	0	0	0	0
20	*Cyphastrea serialia*	Good	0	0	0	0	0	0
21	*Cyphastrea serialia*	Good	0	0	0	0	0	0
22	*Cyphastrea serialia*	Good	0	0	0	0	0	0
23	*Montipora peltiformis*	Fairly Good	0	0	0	0	0	0
24	*Psammocora superficialis*	Good	0	0	0	0	0	0
25	*Psammocora superficialis*	Good	0	0	0	0	0	0
26	*Porites lobata*	Fairly Good	0	0	0	0	0	0
27	*Favia speciosa*	Good	0	0	0	0	0	0
28	*Porites lobata*	Good	0	0	0	0	0	0
29	*Psammocora superficialis*	Fairly Good	0	0	0	0	0	0
30	*Favites abdita*	Good	0	0	0	0	0	0
31	*Favites pentagona*	Good	0	0	0	0	0	0
32	*Favites pentagona*	Good	0	0	0	0	0	0
33	*Montipora peltiformis*	Fairly Good	0	0	0	0	0	0
34	*Goniopora stutchburyi*	Fairly Good	0	0	0	0	0	0
35	*Porites lobata*	Good	0	0	0	0	0	0
36	*Porites lobata*	Good	0	0	0	0	0	0
37	*Cyphastrea serialia*	Good	0	0	0	0	0	0
38	*Favites abdita*	Good	0	0	0	0	0	0
39	*Psammocora superficialis*	Good	0	0	0	0	0	0
40	*Psammocora superficialis*	Fairly Good	0	0	0	0	0	0
41	*Favites pentagona*	Good	0	0	0	0	0	0
42	*Favia speciosa*	Good	0	0	0	0	0	0
43	*Cyphastrea serialia*	Fairly Good	0	0	0	0	0	0
44	*Porites lobata*	Fairly Good	0	0	0	0	0	0
45	*Porites lobata*	Good	0	0	0	0	0	0
46	*Cyphastrea serialia*	Good	0	0	0	0	0	0

Coral #	Species	Baseline Condition	Baseline			2nd monitoring		
			Mortality (%)	Sediment (%)	Bleaching (%)	Mortality (%)	Sediment (%)	Bleaching (%)
47	*Goniastrea aspera*	Good	0	0	0	0	0	0
48	*Porites lobata*	Good	0	0	0	0	0	0
49	*Porites lobata*	Fairly Good	0	0	0	0	0	0
50	*Cyphastrea serialia*	Good	0	0	0	0	0	0
51	*Favia speciosa*	Good	0	0	0	0	0	0
52	*Cyphastrea serialia*	Good	0	0	0	0	0	0
53	*Porites lobata*	Good	0	0	0	0	0	0
54	*Porites lobata*	Good	0	0	0	0	0	0
55	*Porites lobata*	Good	0	0	0	0	0	0
56	*Favia speciosa*	Fairly Good	0	0	0	0	0	0
57	*Goniastrea aspera*	Good	0	0	0	0	0	0
58	*Cyphastrea serialia*	Good	0	0	0	0	0	0
59	*Pavona descussata*	Good	0	0	0	0	0	0
60	*Cyphastrea serialia*	Good	0	0	0	0	0	0
61	*Favites abdita*	Good	0	0	0	0	0	0
62	*Pavona descussata*	Good	0	0	0	0	0	0
63	*Lithophyllon undulatum*	Good	0	0	0	0	0	0
64	*Porites lobata*	Good	0	0	0	0	0	0
65	*Psammocora superficialis*	Good	0	0	0	0	0	0
66	*Porites lobata*	Good	0	0	0	0	0	0
67	*Lithophyllon undulatum*	Good	0	0	0	0	0	0
68	*Porites lobata*	Fairly Good	0	0	0	0	0	0
69	*Favia speciosa*	Good	0	0	0	0	0	0
70	*Goniastrea aspera*	Good	0	0	0	0	0	0
71	*Porites lobata*	Good	0	0	0	0	0	0
72	*Porites lobata*	Fairly Good	0	0	0	0	0	0
73	*Cyphastrea serialia*	Fairly Good	0	0	0	0	0	0
74	*Cyphastrea serialia*	Good	0	0	0	0	0	0
75	*Porites lobata*	Good	0	0	0	0	0	0
76	*Goniastrea aspera*	Good	0	0	0	0	0	0
77	*Favites abdita*	Good	0	0	0	0	0	0
78	*Favites abdita*	Good	0	0	0	0	0	0
79	*Cyphastrea serialia*	Good	0	0	0	0	0	0
80	*Cyphastrea serialia*	Good	0	0	0	0	0	0
81	*Porites lobata*	Good	0	0	0	0	0	0
82	*Goniastrea aspera*	Good	0	0	0	0	0	0
83	*Favia speciosa*	Good	0	0	0	0	0	0
84	*Favites pentagona*	Good	0	0	0	0	0	0
85	*Goniopora stutchburyi*	Good	0	0	0	0	0	0
86	*Favites abdita*	Good	0	0	0	0	0	0
87	*Cyphastrea serialia*	Good	0	0	0	0	0	0
88	*Cyphastrea serialia*	Good	0	0	0	0	0	0
89	*Favia speciosa*	Good	0	0	0	0	0	0

5.4 Archaeology (Watching Brief)

5.4.1 Excavation was carried out at Holes 11, 12, 14 & 16 during this monitoring month and watching brief monitoring was resumed since September 2006. According to the latest construction programme, part of the Hole 2 will be completed in February 2007. Approximate 40% of the Hole 2 area was being excavated and the watching brief at Hole 2 will have to further extend. The first (January to March 2006) and second (April to September 2006) quarterly progress reports had been sent to AMO for comments on 31st March 2006 and 15th October 2006 respectively. The third (October to December 2006) and fourth (January to March 2007) quarterly progress report had also been submitted to AMO in January and March 2007 respectively.

5.4.2 The Archaeological Watching Brief (AWB) will consist of 18 days of on-site monitoring of the construction work. An initial site visit was made on 20th January 2006 to inspect preliminary vegetation clearance at Hole 2. The second site visit was undertaken on 3rd February 2006. The first day of the monitoring was agreed on 14th February 2006 after the confirmation with the Contractor that the bulk excavation was being carried out at Hole 2. The site visit at Holes 11, 12, 14, 15 & 16 were started from September 2006 once vegetation clearance commence and in progress.

5.4.3 Monitoring results were shown as follows:

Hole 2

5.4.4 Clearance of surface soil was monitored in Areas 1 and 2 (mainly the concrete batching plant and underground water tank location) which is around 60% of the actual bulk earthwork. All monitoring areas were investigated after vegetation clearance and no archaeological material was identified in the first quarterly report. A thirty minute video of the works was recorded. No works have been undertaken outside the Areas 1 and 2 up the reporting period (January to March 2006).

5.4.5 Excavation at Hole 2 was completed during this reporting month. The fourth quarterly report is under preparation. No archaeological material was identified. The archaeological watching brief at Hole 2 was completed in February 2007.

Holes 11, 12, 14, 15 & 16

5.4.6 For the excavation at watching brief concern areas (Holes 11, 12, 14, 15 & 16), the excavation programme was commended in early September 2006 after the completion of temporary bridges construction at Streams B1 and B2. Vegetation clearance was started in early September 2006 and completed in the reporting month at Holes 11, 12, 14, 15 & 16. Bulk earthwork at concerned watching brief area was concentrated Holes 11, 12, 14 and 16. No archaeological material was identified in the second quarterly report (April to September 2006) and third quarterly report (October to December 2006). The archaeological watching brief at Holes 11, 12, 14, 15 and 16 was completed in January 2007.

Final Archaeology Watching Brief Report

5.4.7 A final report is under preparation and will be submitted to AMO in next reporting month.

5.5 Land Contamination

5.5.1 The Contamination Assessment Plan (CAP) was approved by EPD 17th February 2006. Site investigation was carried out on 14th and 15th February 2006. Site audit was carried out with IEC on 14th February 2006 with the Contractor's representatives. The CAP was approved on 17th February 2006. The Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) were approved on 18th August 2006.

5.5.2 Remedial work for the contaminated soil located at the Hotspot L3 (Hole 18) is required to be implemented properly according to the RAP. A confirmation pilot trial on the ratio of cement and contaminated soil was carried out during the reporting month. According to the Contractor's submitted methodology, the contaminated soil will be transferred from Hole 18 to Hole 17 for remediation. It is because that Hole 17 is the major fill area and the remediation soil to cement mixture can be used as general fill material. The full scale remediation work was carried in the reporting month on 4th October 2006. A Final Site Remediation Report (FSRR) was submitted to EPD on December 2006 and approved by EPD on January 2007. No further remediation work is required.

6. Environmental Site Auditing

6.1.1 The weekly site inspections were conducted by the ET with Contractor's representative and/or Jockey Club's representative on 27th February, 6th, 13th and 20th March 2007, and the monthly joined site inspection with IEC and the Contractor's representative undertaken on 20th February 2007. The following observations and recommendations were made.

Dust Mitigation Measures

6.1.2 Major site formation was carried at southern part of East Course during the reporting month. No dust suppression measure was provided during rock breaking activities. Dust generation from the haul road, during earth moving operation and excavation were observed at sunny and windy weather, insufficient dust mitigation measures was provided on site.

6.1.3 Huge temporary soil stockpiles were mainly located at Holes 1 and 16. There were many sand/aggregates located at Holes 1 and 9, these stockpiles are more vulnerable to silty runoff and dust generation due to their particular size are more fine in nature and not suitable for compaction and watering. Soil stockpiles were planted with hydroseed to reduce the dust nuisance to the environment under the APCO requirement.

6.1.4 The Contractor was reminded to minimize the dust generated by the site vehicles moving along the haul road by paving the heavy traffic haul road and haul road near to the existing golf course. The Contractor was repeatedly reminded to provide sufficient dust suppression measure at all other excavation / earth moving areas.

6.1.5 As permanent cart path, turfing and hydroseeding areas (permanent areas and eroded slope) will gradually completed, therefore, dust generation will gradually decrease from the construction site is expected.

6.1.6 Concrete batching plant was operating during this reporting month. The concrete produced was mainly for the extension of administration and maintenance buildings, underground water tanks, pumping stations and cart paths. No major dust generation was observed from the concrete batching plant during operation.

6.1.7 The Contractor claimed the water source for dust suppression was insufficient from the construction site. They had successfully applied the water supply from WSD to the construction site. The Contractor agreed to fill up the Hole 2 underground water tank at nighttime to reduce the queue up time at the fresh water inland marsh. However, no further action was observed at the construction site.

6.1.8 The Contractor was reminded to install the hoarding near to the main exit/entrance near S7 according to the Air Pollution Control Ordinance and its subsidiary regulations. It was outstanding for at least few months.

Water Quality

Temporary Drainage Master Plan

6.1.9 The Contractor submitted the TDMP for the coming wet season 2007 to the Engineer for approval in this reporting month. However, no TDMP for turf grass establishment period. The pesticide is a prohibited substance which is not allowed to be discharged to any water bodies under the WPCO. The Contractor was repeatedly reminded to confine, collect and reuse runoff generated from the irrigation area properly.

6.1.10 The silt fence installed on site was not observed and not well-maintenance in particular in northern portion of third golf course. The Contractor was repeatedly reminded to improve the effectiveness of the mitigation measures and provide sufficient temporary drainage system on site.

6.1.11 Permanent drainage system should be installed properly before turfing at each of the golf hole. As the installation of the closed low flow drainage system is in progress (runoff cannot pumping back to the existing reservoir directly), runoff could be concentrated and directly discharge through underground water tanks and/or lakes overflow or catch basins to the sea / streams.

6.1.12 No dredging work for the permanent intake and outfall pipelines was carried out during the reporting month.

6.1.13 All temporary bridges will dismantle before wet season (end of March). Construction of permanent bridges will be completed before the wet season. According to the EP, the construction of the permanent bridges should be completed within dry season (March 2007). All permanent bridge construction method was complied with the EP condition. Construction of a pipe culvert bridge at Stream B2 was completed. Construction of drainage system across Stream B2 buffer zone (near to the pipe culvert bridge) was commenced in later January 2007 and completed during the reporting month.

6.1.14 The Contractor was reminded to maintain the silt curtain and desilt the settled solids within the silt curtain in a routine basis and ensure the effectiveness of its intended use.

6.1.15 Turf has been established at Holes 5 and 8. The Contractor was reminded to provide temporary drainage system to collect and divert the runoff to the existing reservoir when the permanent closed low flow drainage system is not completed yet.

6.1.16 As permanent cart path, turfing and hydroseeding areas (permanent areas and eroded slope) will gradually completed, therefore, runoff from the construction site will decrease is expected.

6.1.17 ADS filter system had been installed at Hole 5 during the previous reporting month. Three out of five ADS filter system has been installed at Hole 6 during the reporting month. The remaining two units will be installed during the next reporting month.

Ecology

6.1.18 Buffer zone at Streams A, B1, B2 and C had been established. The whole buffer zone aims to protect the streams and avoid any works/equipment intrusion into the buffer zone.

6.1.19 The main stream course of Stream A was found to be filled up by rubbles to the level of the weir at its downstream end since mid-June 2006. Remedial works were implemented to clear the rubbles and restore the channel manually in early November 2006. However, the rocks were filled up the downstream A again after the rainstorm on 21st November 2006. Most of the rubbles from Hole 17 covering the downstream of Stream A were removed in the December 2006. The temporary bridge at Stream A had been dismantled during the reporting month. There were still some remaining rocks sitting on the stream bed of the downstream of Stream A.

6.1.20 Floating pontoon was berthed at EP location at the temporary barging point. No illegal berthing was observed during the site audit. Increase of loading of the sand/aggregates/drainage pipes/irrigation pipes delivery was observed during the reporting month.

Stream B2 Buffer Zone

6.1.21 For the Stream B2 buffer zone incident (vegetation clearance at part of the buffer zone area), the Contractor was proposed remedial and mitigation measures for EPD's comment. A letter was issued to Jockey Club from EPD on 12 Dec 2006 and reminded the Project Proponent should pay particular attention to the EP condition due to this incident. The Contractor submitted the detailed remediation work programme to Jockey Club, the Engineer, ET and IEC for review and agreed before carrying out any work within the buffer zone during the reporting month. Reinstatement work at Stream B2 buffer zone was carried out during the reporting month by planting native shrub (including *Gordonia axillaries*, *Melastoma candidum*, *Melastoma sanguineum*, *Rhaphiolepis indica*, *Rhodomyrtus tomentosa*) with approximate 400mm height at the four plots per metre square density.

Silt Deposit at Stream C

6.1.22 Significant silty runoff and silt were deposited at the stream bed of Stream C were recorded after the rainstorm on 22nd November 2006. Construction of permanent drainage system including cut-off drain at Holes 14 and 16 was in progress. The Contractor was reminded to enhance the temporary drainage system to prevent the same incident happened in future again.

Waste / Chemical Management

6.1.23 According to the site observation, vegetation stockpiles, construction wastes stockpiles and general refuse were accumulated for approximate four weeks and disposed off-site during the reporting.

6.1.24 A chemical waste storage area was available on site since this reporting month. The Contractor confirmed that the chemical waste generated would be disposed by their sub-contractor or store on site. The Contractor was reminded to provide trip-ticket records and disposal records for our reference.

6.1.25 Insufficient mobile/chemical toilets were provided at the construction site. The Contractor was repeatedly reminded to provide sufficient in particular distant from the Contractor's office.

Landscape and Visual

6.1.26 The eroded slopes at the southern side of stream A next to Hole 10 and at the northern side of stream A above Hole 17 were hydroseeded in mid-March 2007. Since the area of the slope is large, vegetation protection for the slope surface is essential to minimize soil erosion. The Contractor shall provide adequate water to the hydroseeded grass to ensure germination and quick coverage. The visual impact from the eroded slope is expected to be greatly mitigated after the hydroseeded grass germinated.

6.1.27 The base of Hole 8 Green was shaped and base materials were ready. Sod is expected to be laid in April and the visual impact to the golfer will be greatly reduced afterward. The newly planted shrubs were in fair health. Health condition of hydroseeded grass had declined due to the dry climate and insufficient watering.

6.1.28 Retained trees, such as but not limited to T957 and T956, next to administration building were severely damaged by construction. The Contractor was reminded to prevent further damage to those trees and carry out tree surgery works immediately.

6.1.29 Mal-pruning of transplanted trees had not been rectified since July 2006. Construction material was still stockpiled within tree protection zones of the retained trees located at Administration building since July 2006.

6.1.30 A statement on the cause of death of tree T925 recorded was still outstanding. Transplanted tree T848 was death, it was found that the tree was planted too deep and the root flare was covered by soil. The Contractor was reminded to retain the tree and submit a proposal for replacement for ER's approval before tree removal. The report is still outstanding since February 2007.

Status of Environmental Licensing and Permitting

6.1.31 Permits / licences submission and approval status are summarised in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit Status

Permit/licence/notification form title	Submission date	Status	Registration No./ Remarks
Application for a construction noise permit for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive pilling and/or the carrying out of prescribed construction work.	21st Jan 2006	Approved on 16th February 2006	GW-RE0012-06 (valid until 3rd July 2006)
Application for a construction noise permit for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive pilling and/or the carrying out of prescribed construction work.	6th Apr 2006	Approved on 9th Jun 06 (supersede the GW-RE0012-06)	GW-RE0157-06 (valid until 28th Nov 2006)
Application for a construction noise permit for the use of powered mechanical equipment for the purpose of carrying out construction work other than percussive pilling and/or the carrying out of prescribed construction work.	Nov 2006	Approved on 22nd Nov 06 (supersede the GW-RE0157-06)	GW-RE0384-06 (valid until 26 May 2007)
Notification of the air pollution control (construction dust) regulation	21st Jan 2006	Acknowledge receipt from EPD on 27th February 2006	Ref. no.: 001006902
Registration as a chemical waste producer	10th Jan 2006	Register on 7th February 2006	WPN-5213-813-C1186-04
Application for a permit to dump material at sea under the Dumping at Sea Ordinance	10th Jan 2006	Deferred by CHEC on 17th March 2006 (CHEC/KSC3.9.1/0459)	No dredging work will be carried out between May to December 2006.
Application of exemption account for the construction waste charging scheme	12th Jan 2006	Approved on 16th January 2006	A/C no. 5005322 (valid until 2nd August 2007)
Application for a licence for production pursuant to Section 14 of Air pollution Control Ordinance	2nd Mar 2006	The total silo capacity for the cement works was 45 tonnes which is lower than 50 tonnes. It is not a specified process, application is not required.	EPD letter refer. no.: EP640/EA/SK/015
Application for a licence under Water Pollution Ordinance – Construction Site	18th Mar 2006	Approved on 12th Sept 2006 (CHEC/KSC3/9.1/0414)	EPD letter refer. No: EP640/W4/J1003

7. Environmental Non-Conformance

7.1 Summary of Environmental Non-Compliance

Air Quality

7.1.1 No exceedance of 24-hour TSP was recorded at GCA B1 during the reporting month. Additional sample were taken on 2nd March 2007 due to the exceedance occurred in the previous monitoring month on 14th February 2006.

Marine Water Quality

7.1.2 Eleven exceedances of ammonia nitrogen and chlorophyll were recorded at Tai Tau Chau and M_Marsh. All exceedances were considered not project-related.

Freshwater Quality

7.1.3 Seven exceedances of turbidity and seven exceedances of suspended solids were recorded at Streams A, B, C and fresh water inland marsh. All exceedances were considered not project-related.

7.1.4 Eleven exceedances of ammonia nitrogen, eleven exceedances of nitrate nitrogen, one exceedance of nitrite nitrogen, twelve exceedances of total inorganic nitrogen and seven exceedances of chlorophyll a were recorded at downstream of fresh water inland marsh.

Terrestrial Ecology

7.1.5 No non-compliance was recorded during the monthly site audit.

Marine Ecology

7.1.6 Quarterly coral monitoring survey at Site B2, Site C and Control site was required in this reporting month. Coral transplantation was carried out in the December 2006 at Site D2, quarterly monitoring was required in this reporting month. No non-compliance was recorded during the reporting month. No dredging work was carried out at Site D2 for the desalination plant's intake and outfall construction.

7.2 Summary of Environmental Complaint

7.2.1 No environmental complaint was received in this reporting month.

7.3 Summary of Environmental Summons

7.3.1 No summon was received in this reporting month.

8. Future Key Issues

8.1 Key Issues for coming month

8.1.1 Major works to be taken for the coming monitoring period are summarized as follows.

- Operation of temporary barging point
- Operation of sewage treatment plant
- Operation of concrete batching plant
- Drainage and irrigation systems installation at Golf Holes
- Sand capping and turf establishment at Golf Holes
- Gravity drain construction from Lake 1D to existing reservoir
- Implementation of temporary drainage master plan
- Operation of desalination plant if required

8.2 Monitoring Schedule for the coming month

8.2.1 The tentative schedule of air, water, ecology and landscape & visual monitoring for the next three months is presented in **Annex F**. The environmental monitoring will be conducted at the same monitoring locations in this reporting month. The monitoring programme has been reviewed and was considered as adequate to cater the nature of works to be undertaken.

8.3 Construction programme for the next three month

8.3.1 The construction programme for the next three months is presented in **Annex G.**

9. Recommendations and Conclusions

9.1.1 The Environmental Monitoring and Audit (EM&A) Report presents the EM&A works undertaken during the period from 25th February to 24th March 2007 in accordance with EM&A Manual and the requirement under EP-224-2005/A.

9.1.2 The Contractor was repeatedly reminded to improve and provide sufficient temporary drainage system on site to prevent silty runoff to marine and stream courses. The Contractor was reminded to provide sufficient dust suppression mitigation measures especially during rock breaking activity, earth movement (loading and unloading), at haul road (vehicle movement) and large soils stockpiles. In addition, the Contractor was reminded to provide sufficient temporary drainage at the turfing areas.

9.1.3 Same as the last reporting month, no rectification work was done by the Contractor. Regarding the retained trees, the Contractor shall take the following measures:

- Carry out surgery to damaged trees;
- Report the cause of death of tree T925;
- Maintain the tree protection zone required and remove all construction material / debris from the tree protection zone; and
- Rectify the mal-pruning practice of the transplanted trees.

9.1.4 No environmental complaint / summon was received during the reporting month.

9.1.5 The ET will keep track of the EM&A programme with respect to compliance of environmental requirements and the proper implementation of all necessary mitigation measures.