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

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

(Report No. 382210/016)

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

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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.16 Monthly EM&A Report for April 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.16 Monthly EM&A report for April 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 30th April 2007

Executive Summary

This is the sixteen 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 April 2007 (25th March to 24th April 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 mostly completed (storage of the product water from the desalination plant for East Course irrigation in future). 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 completed in previous reporting month. Some hydroseeding areas were not fully covered with hydroseed and re-hydroseeding was required. The shrub planting was commenced in late April 2007 at the hydroseeded slopes. 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 2007). For southern portion of the East Course, major construction works were site formation and construction of permanent drainage/irrigation systems. Central portion will be the last portion to be planted with turf and mainly in wet season of 2007. The actual site progress indicated that only Holes 5 & 8 were planted with turf (except green areas), turf planting at Hole 4 was in progress during the reporting month. Other construction areas were mostly exposed (permanent drainage/irrigation system installation) during the reporting month. Two applications of fertilizers at Holes 5 were recorded. No chemical/pesticide was applied to the all turfing areas at East Course.

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 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 (all underground tanks and related pumping stations were completed). The expected completion date for all lakes was in mid-April 2007. However, there will be some rectification work need to be carried out after the rainstorm occurred in 24 April 2007 and shrub planting at Lake 1D. It is expected to be completed in the coming reporting month.

The Contractor submitted the revised Temporary Drainage Management Plan (TDMP) to the Engineer for approval. ET and the Engineer repeatedly reminded the Contractor to prevent silty/nutrient/pesticides runoff to the streams and marine water. Regarding the water quality monitoring results, high limit level exceedances on suspended solids (ranged from 83 mg/L to 388 mg/L) and turbidity (ranged from 53.5 NTU to 451 NTU) was recorded on 26 March 2007. The rainfall record on 26 March 2007 was low. Additional water samples were taken on 27 March 2007. In addition, heavy rainstorm (amber and red signal) was hoisted on 24 April 2007. An *ad hoc* site audit was carried out and heavy silty runoff was observed at all streams, fresh water inland marsh and marine water. Water sampling was carried out 25 April 2007 also indicated that high limit level exceedances on suspended solids (ranged from 22 mg/L to 126 mg/L) and turbidity (ranged from 23 NTU to 63 NTU). The temporary drainage installed on site was considered insufficient and ineffective. The Contractor was reminded to critically review and revise the TDMP according to the actual site progress, install sufficient temporary drains and provide sufficient desilting facilities in order to prevent/divert/collect the silty runoff and discharge to marine/streams according to the discharge licence and Water Quality Objectives (WQO) of Port Shelter.

Long-term nutrient exceedances are recorded at the downstream of fresh water inland marsh since February 2007. As agreed with Jockey Club, a joint sampling with our sampling team (ET) and the Contractor (CHEC) was carried out on 16 April 2006 and water sample was collected at the effluent discharge outlet of the temporary sewage treatment plant near to the Contractor's site office. High level of ammonia nitrogen was recorded at 287 mg/L (exceeds the required standard of the discharge licence, 20 mg/L). Sight exceedance of suspended solids was recorded at 32 mg/L (exceeds the required standard of the discharge licence, 30 mg/L). The nitrate nitrogen and nitrite nitrogen were undetectable which indicated that there was neither nitrification nor de-nitrification process of the plant. The resident engineer (RE) immediately requested the Contractor to stop the plant to avoid any hazard to the public and environment (directly discharge to fresh water inland marsh) until the plant can perform according to the EPD's discharge licence.

During the site audit, improper berthing at the temporary barging point was observed which could lead to coral damage again (coral damage incident at the temporary barging point had been occurred in March 2006). EPD was informed regarding this incident occurred on 2 April 2007.

Regarding the reinstated Stream B2 buffer zone in late March 2007, some of the newly planted native shrub mix were dried up and died. The Contractor was reminded to water frequently at all permanent slope where nearly planted with shrub.

Construction of permanent bridges at Streams A, B, C and fresh water inland marsh were completed before wet season (March 2007). Remaining work is mainly finishing work and in progress.

Concrete batching plant has been in operation and is expected to be dismantled by the end of May 2007 after all cart tracks for the East Course was completed.

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)	11 times
Terrestrial Ecology	1 time
Marine Ecology	0 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 27th March, 2nd, 4th, 13th, 17th and 19th April 2007 at Bungalow A (GCA B1) at Kau Sai Chau during this reporting month.

Water Quality

11 sets of water quality monitoring were carried out on 26th, 28th, 30th March , 2nd, 4th, 10th, 12th, 16th, 18th, 20th and 23rd April 2007 at 9 marine and 7 freshwater monitoring locations. Rainstorm signal was hoisted on 24th April 2007 during the reporting month.

Terrestrial Ecology

Terrestrial ecology was conducted on 19th and 23rd April 2007. The demarcation of the stream buffer zone had been established for Streams A, B and C. However, Stream A buffer zone was partially demarcated.

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) was reinstated. 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 not required in April 2007. The next marine monitoring will be conducted in June 2007.

Landscaping & Visual

Landscape and visual monitoring and site audits were carried out on 4th and 18th April 2007. During the site audits, site formation, shaping, planting and building construction were carried out. Shrub seedlings were planted on slopes of Holes 2, 4, 5, 10 and 11. The newly planted shrubs are in fair conditions. The coverage of newly hydroseeded area is not in good condition especially at Holes 12 and 13. The Contractor shall irrigate all the plants and hydroseeded area more frequently.

Damaged trees next to the administration building were still unprotected after being damaged by the adjacent construction activities. Wooden boards and garbage were put adjacent to the retained trees. Most of the labels of the retained trees were disappeared.

All transplanted trees were in fair condition except for T848. Mal-pruning of transplanted trees has not been rectified. Construction material was stockpiled within tree protection zones. A statement on the cause of death of tree T925 recorded in the last report is still outstanding.

The following works have been outstanding since July 2006: (i) Carry out surgery to damaged trees, (ii) Report the cause of death of tree T925, (iii) Re-fix the label of retained tree for easy identification, (iv) Maintain the tree protection zone required and remove all construction material / debris from the tree protection zone, (v) More frequent watering for transplanted trees, planted vegetation and hydroseeded grass and (vi) Rectify the mal-pruning practice of the transplanted trees.

Environmental Site Auditing

Five weekly joint environmental site audits were carried out on 27th March, 2nd, 10th, 17th and 24th April 2007, with the Engineer and Contractor's representatives. A monthly joint environmental site audit was carried out on 17th April by the Contractor's Representative, ET's representative and Independent Environmental Checker (IEC).

Environmental Non-conformance

Air Quality

One action and one limit level exceedances of 24-hour TSP were recorded at GCA B1 on 2nd and 13th April 2007. The record levels were at 262 μg/m³ and 246.7 μg/m³ respectively. Additional samples were taken on 17th April 2007 and 2nd May 2007 respectively (next reporting month). All exceedances were considered project-related.

Marine Water Quality

Thirteen exceedances of ammonia nitrogen and chlorophyll were recorded at Tai Tau Chau, M_Marsh and M_BP. Two exceedances of suspended solids were recorded at TTC and KS. All exceedances were considered not project-related.

Freshwater Quality

Twenty exceedances of turbidity and twenty-seven exceedances of suspended solids were recorded at Streams A, B, C and fresh water inland marsh.

Seven exceedances of ammonia nitrogen, eleven exceedances of nitrate nitrogen, four exceedance of nitrite nitrogen, eleven exceedances of total inorganic nitrogen and nine exceedances of chlorophyll a were recorded at downstream of fresh water inland marsh. Main reason is due to the continuous wastewater discharge of high concentrations of ammonia nitrogen and reactive phosphorus from temporary sewage treatment plant at the contractor's site office (confirmed after water sample collected at the discharge outlet of the sewage treatment plant). In addition, the change of physical condition of fresh water inland marsh which may decrease the secondary treatment removal capacity and reinstatement work (upstream desilting work) at the upstream of fresh water inland marsh could also lead to the deterioration of water quality. 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.

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;
- Provide sufficient mobile toilets at remote site areas; and
- Properly maintain the temporary sewage treatment plant

Ecology

- Remove remaining rubbles at downstream of Stream A after temporary bridge dismantling;
- Maintain the reinstated conditions (planting shrub) at Stream B2 buffer zone since March 2007; and
- Rectify and remediate the silt deposit at Streams A, B and C after rainstorm events.

Water Quality

- Implement temporary drains according to Temporary Drainage Management Plan (TDMP) to avoid silty/nutrient/pesticide runoff;
- Provide sufficient preventing and/or mitigation measure at all open cut areas 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 system 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 WQO requirements;
- Provide sufficient treatment facilities 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 retain 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;
- Turf establishment at northern East Course (Holes 4-8);
- 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:

- Review and revise the 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
- Monitoring ADS filter system installation at Hole 6 (5 units) while ADS filter system had already been implemented at Hole 5.

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 April 2007 (from 25th March to 24th April 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 March** to **24th April 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 May 2007 – 24 July 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.	**<u>For Site D2 and the Control Site:</u>** 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. **<u>For Site C, B2 and the Control Site:</u>** 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 has 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. If no exceedance was recorded during these three months, the monitoring schedule would be 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 commencement date for the dredging works has yet to be confirmed, the transplantation works were conducted in November 2006. The transplanted corals were also monitored quarterly for one year from December 2006. The second monitoring was conducted in March 2007. No monitoring is required in this month.

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 were presented in the Baseline 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 monitoring Report for April 2006.

3.3.8 As the dredging works for the desalination plant had not been commenced, the impact sites to be monitored in this monitoring programme 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 yet.

3.3.9 Transplantation for the natural corals at Site D2 was originally planned to be conducted one month before dredging works. Although the commencement date for the dredging works has yet to be confirmed, the transplantation works were conducted in November 2006. The transplanted corals were also monitored quarterly for one year from December 2006. The baseline conditions of the transplanted corals had been recorded during the transplantation and would be checked during the follow-up monitoring. The third quarterly coral monitoring will be scheduled in June 2007.

3.3.10 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 until the end of the construction phase.

3.3.11 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

3.3.12 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) permanent drainage/irrigation system installation work at southern part (Holes 11-16) and filling work central part (Holes 1, 2 and 17) of East Course, (ii) permanent closed low flow drainage system installation, (iii) irrigation system installation, (iv) sub-soil drains installation, (v) hydroseeding at the permanent slope/bare grounds, (vi) finishing work at permanent bridges, (vii) lakes construction and (viii) partial turfing at Hole 4.

4.1.2 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. The water source for dust suppression was mainly pumped from the downstream of the fresh water inland marsh, underground water generated near Lake 1D and downstream of stream A (during wet season).

4.1.3 Implementation of temporary drains on site according to the TDMP. However, the water quality results at streams and fresh water inland marsh revealed that improvement and strengthen of temporary drainage system installed on site is required.

4.1.4 Hydroseeding at scar areas within the East Course was completed before March 2007. However, some areas were required re-hydroseeding and will follow up with shrub planting. Vegetation stockpiles, general refuse and construction waste stockpiles were temporary stored at Hole 2 and not disposed off-site after accumulation during this reporting month. The Contractor was reminded to dispose all other remaining construction wastes gradually off-site and submitted the trip tickets record (construction/general waste, disposal record for chemical toilets and chemical waste) for our reference.

4.1.5 Reinstated Stream B2 buffer zone was carried out in March 2007 by planting native shrub. According to the site observation, some of the newly planted shrubs were dried up and dead. More frequent watering and fertilizer may be required.

4.1.6 Insufficient mobile toilets were available on site at remote areas, only few units were located at the southern portion of construction site.

4.1.7 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 March to April 2007. All monitoring data are provided in **Annex E**. Monitoring of 24-hour TSP was conducted at GCA B1 on 27th March, 2nd, 4th, 13th, 17th and 19th April 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 One action and one limit level exceedances of 24-hour TSP were recorded at GCA B1 on 2nd and 13th April 2007. The record levels were at 262 μg/m³ and 246.7 μg/m³ respectively. Additional samples were taken on 17th April 2007 and 2nd May 2007 respectively (next reporting month). All exceedances were considered project-related.

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 11 occasions in March to April 2007 (26th, 28th, 30th March , 2nd, 4th, 10th, 12th, 16th, 18th, 20th and 23rd April 2007). The QA/QC results for laboratory testing in the reporting month were acceptable. The QA/QC results are summarised in **Annex F**. Rainstorm signal was hoisted on 24th April 2007 and the total rainfall was 64.4 mm during the reporting month.

5.2.3 Turf establishment progress is shown as follows:

- Hole 8 – February 2007 (except green);
- Hole 5 – March 2007 (except green); and
- Hole 4 – April 2007 (partially)

5.2.4 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: two limit level exceedances of ammonia nitrogen;
- TTC: (i) one action level exceedance of suspended solids, (ii) three limit level exceedances of ammonia nitrogen and (iii) two limit and four action level exceedances of chlorophyll.
- M_BP: one limit level exceedances of ammonia nitrogen; and
- KS: one action level exceedance of suspended solids.

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

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

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
M_Marsh	Limit Level	28th Mar 07	NH_3-N	No
	Limit Level	4th Apr 07	NH_3-N	No
TTC	Action Level	26th Mar 07	Chl a	No
	Limit Level	28th Mar 07	NH_3-N	No
	Action Level	2nd Apr 07	Chl a	No
	Limit Level	4th Apr 07	NH_3-N	No
	Limit Level	10th Apr 07	Chl a	No
	Limit Level	12th Apr 07	Chl a	No
	Action Level	18th Apr 07	Chl a	No
	Limit Level	18th Apr 07	NH_3-N	No
	Limit Level	20th Apr 07	NH_3-N	No
	Action Level	23rd Apr 07	Chl a, SS	No
KS	Action Level	2nd Apr 07	SS	No

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

5.2.6 The range of the suspended solids, ammonia nitrogen and chlorophyll measured at the Control Station (M_A) was in the same order of magnitude at TTC. There is no significant difference of the measured concentrations between control station and impact stations. 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: (i) two limit level exceedances of turbidity and (ii) three limit level and one action exceedances of suspended solids.
- Stream B: (i) eight limit level exceedances of turbidity and (ii) eight limit and three action level exceedances of suspended solids.
- Stream C: (i) six limit and one action level exceedances of turbidity and (ii) six limit and two action level exceedances of suspended solid.
- F_Inland Marsh: three limit level of turbidity; three limit and one action level of suspended solids; seven limit level exceedances of ammonia nitrogen, eleven limit level exceedances of nitrate nitrogen; four limit level of nitrite nitrogen; eleven exceedances of total inorganic nitrogen and one action and eight limit level exceedances of chlorophyll a.

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

Table 5.2-2 Freshwater Exceedance Summary March to April 2007

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
F_DA	Limit Level	26th Mar 07	SS, Turbidity	Yes
	Limit Level	27th Mar 07	SS, Turbidity	Yes
	Limit Level	2nd Apr 07	SS	Yes
	Action Level	23rd Apr 07	SS	Yes
F_UB	Limit Level	26th Mar 07	SS, Turbidity	Yes
	Limit Level	27th Mar 07	SS, Turbidity	Yes
	Action Level	2nd Apr 07	SS	Yes
	Action Level	10th Apr 07	SS	Yes
	Limit Level	23rd Apr 07	SS, Turbidity	Yes
F_DB	Limit Level	26th Mar 07	SS, Turbidity	Yes
	Limit Level	27th Mar 07	SS, Turbidity	Yes
	Limit Level	2nd Apr 07	SS, Turbidity	Yes
	Action Level	10th Apr 07	SS	Yes

Monitoring Station	Exceedance Level	Date	Parameters	Project-related
	Limit Level	16th Apr 07	SS, Turbidity	Yes
	Limit Level	23rd Apr 07	SS, Turbidity	Yes
F_UC	Limit Level	26th Mar 07	SS, Turbidity	Yes
	Limit Level	27th Mar 07	SS, Turbidity	Yes
	Action Level	10th Apr 07	SS, Turbidity	Yes
	Limit Level	23rd Apr 07	SS, Turbidity	Yes
F_DC	Limit Level	26th Mar 07	SS, Turbidity	Yes
	Limit Level	27th Mar 07	SS, Turbidity	Yes
	Action Level	2nd Apr 07	SS	Yes
	Limit Level	23rd Apr 07	SS, Turbidity	Yes
F_Inland M	Limit Level	26th Mar 07	NH_3-N, NO_3-N, TIN, Chl a, SS, Turbidity	Yes
	Limit Level	27th Mar 07	SS, Turbidity	Yes
	Limit Level	28th Mar 07	NH_3-N, NO_3-N, NO_2-N, TIN, Chl a	Yes
	Limit Level	30th Mar 07	NH_3-N, NO_3-N, NO_2-N, TIN, Chl a	Yes
	Limit Level	2nd Apr 07	NH_3-N, NO_3-N, TIN, Chl a	Yes
	Limit Level	4th Apr 07	NH_3-N, NO_3-N, TIN, Chl a	Yes
	Action Level	10th Apr 07	SS	Yes
	Limit Level	10th Apr 07	NH_3-N, NO_3-N, TIN, Chl a	Yes
	Limit Level	12th Apr 07	NH_3-N, NO_3-N, NO_2-N, TIN, Chl a	Yes
	Limit Level	16th Apr 07	NO_3-N, TIN	Yes
	Action Level	16th Apr 07	Chl a	Yes
	Limit Level	18th Apr 07	NO_3-N, TIN	Yes
	Limit Level	20th Apr 07	NO_3-N, TIN	Yes
	Limit Level	23rd Apr 07	NO_3-N, NO_2-N, TIN, Chl a, SS, Turbidity	Yes

Remarks: Exceedances recorded at Streams A, B & C were mainly due to insufficient temporary drainage provided on site, in particular during and after rain. 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.

5.2.8 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 (confirmed after water sample at the discharge outlet of sewage treatment plant was taken on 16 April 2007), (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 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 (two application of fertilizer was recorded in April at Hole 5).

5.2.9 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.

Water Quality at Discharge Outlet of Sewage Treatment Plant (Temporary)

5.2.10 Long-term nutrient exceedances are recorded at the downstream of fresh water inland marsh since February 2007. As agreed with Jockey Club, a joint sampling with our sampling team (ET) and the Contractor (CHEC) was carried out on 16 April 2006 and water sample was collected at the effluent discharge outlet of the temporary sewage treatment plant near to the Contractor's site office. The results were summarized as below:

- SS = 32 mg/L;
- NH3-N = 287 mg/L;
- NO3-N = < 0.01 mg/L;
- NO2-N = < 0.01 mg/L;
- Reactive Phosphorus as P = 30 mg/L; and
- Chlorophyll a = 0.6 μg/m³

5.2.11 The water quality parameters for laboratory testing are selected according to the EM&A requirement, which have long-term nutrient exceedances at the downstream of freshwater inland marsh since February 2007. Therefore, the full list of the EPD discharge licence parameters was not carried out for laboratory testing, such as Biochemical Oxygen Demand (BOD), *E. coli* and Total Residual Chlorine (TRC).

5.2.12 Ammonia nitrogen concentration exceeded (287 mg/L) 13.5 times the EPD's discharge licence limit (20mg/L). Suspended solids concentration (2 mg/L) marginally exceeded the EPD' discharge licence limit (30 mg/L).

5.2.13 Typical major pollutant characteristics of domestic wastewater and relative strength of domestic wastewater comparison are shown as Tables 5.2-3 and 5.2-4 respectively. The water quality at the discharge outlet of sewage treatment plant is comparable to strong domestic wastewater.

Table 5.2-3 Typical Characteristic of Domestic Wastewater

Type	**Pollutants**		**Concentration (mg/L)**
Physical	Total Suspended Solids (TSS)		300
	Total Dissolved Solids (TDS)		440
	Temperature		10 - 25 ^{o}C
Chemical	BOD_5		250
	COD		500
	TOC		160
	Nitrogen	Total N	40
		Organic N	15
		Free ammonia N	20
		Nitrite N	0
		Nitrates N	0
	Phosphorus	Total P	9
		Organic P	4
		Inorganic P	5
		Total N	100
	Fats, oil and grease (FOGs)		100
Micro-biological	Total coliforms		10^8 - 10^9 MPN/L
	Fecal coliforms		10^7 - 10^8 MPN/L
	Non-fecal coliforms		$9x10^7$ - $9x10^8$ MPN/L
	Total viruses		1,000-10,0000 infectious units/L

Table 5.2-4 Relative Range of Typical Domestic Wastewater

Constituent	Unit	Strong	Medium	Weak
Total solids	mg/L	1200	700	350
Dissolved solids (TDS)[1]	mg/L	850	500	250
Suspended solids	mg/L	350	200	100
Nitrogen (as N)	mg/L	85	40	20
Phosphorus (as P)	mg/L	20	10	6
Chloride[1]	mg/L	100	50	30
Alkalinity (as $CaCO_3$)	mg/L	200	100	50
Grease	mg/L	150	100	50
BOD_5[2]	mg/L	300	200	100

[1] The amounts of TDS and chloride should be increased by the concentrations of these constituents in the carriage water.
[2] BOD_5 is the biochemical oxygen demand at 20°C over 5 days and is a measure of the biodegradable organic matter in the wastewater.
Source: UN Department of Technical Cooperation for Development (1985)

Nutrient Baseline Data (Wet season in 2007)

5.2.14 A set of nutrient baseline data was taken in December 2005 and used for setting up action and limit levels at streams and marine water. Only Holes 4, 5 & 8 was planted with turf in April 2007. No turf establishment was recorded at the southern part of the East Course. Therefore, additional set of nutrient baseline data were taken in April 2007 (wet season) at M_A, M_B, M_Coral, KS, F_UA, F_DA, F_UB, F_DB, F_UC and F_DC to check whether there is any difference of water quality regarding the nutrient between the wet and dry season at all streams and marine water. Water quality results for April 2007 (wet season) are summarized as follows:

Table 5.2-5a Marine Water Quality – Average, minimum and maximum values for Ammonia Nitrogen

Depth-averaged value in April 2007		M_A	M_B	M_Coral	KS
NH_3-N (mg/L)	Average	0.02	0.04	0.01	0.02
	Min	< 0.01	< 0.01	< 0.01	< 0.01
	Max	0.05	0.12	0.03	0.04

Table 5.2-5b Marine Water Quality – Average, minimum and maximum values for Total Phosphorus

Depth-averaged value in April 2007		M_A	M_B	M_Coral	KS
TP (mg/L)	Average	< 0.01	< 0.01	< 0.01	< 0.01
	Min	< 0.01	< 0.01	< 0.01	< 0.01
	Max	< 0.01	< 0.01	< 0.01	< 0.01

Table 5.2-5c Marine Water Quality – Average, minimum and maximum values for Nitrate Nitrogen

Depth-averaged value in April 2007		M_A	M_B	M_Coral	KS
NO_3-N (mg/L)	Average	0.01	0.02	0.01	0.01
	Min	< 0.01	< 0.01	< 0.01	< 0.01
	Max	0.01	0.04	0.01	0.02

Table 5.2-5d Marine Water Quality – Average, minimum and maximum values for Nitrite Nitrogen

Depth-averaged value in April 2007		M_A	M_B	M_Coral	KS
NO_2-N (mg/L)	Average	< 0.01	< 0.01	< 0.01	< 0.01
	Min	< 0.01	< 0.01	< 0.01	< 0.01
	Max	< 0.01	< 0.01	< 0.01	< 0.01

Table 5.2-5e Marine Water Quality – Average, minimum and maximum values for Chlorophyll

Depth-averaged value in April 2007		M_A	M_B	M_Coral	KS
Chl a (μg/m³)	Average	2.1	1.8	2.8	2.4
	Min	0.6	0.5	1.2	0.5
	Max	6.8	2.9	5.5	4.5

Table 5.2-6a River Water Quality – Average, minimum and maximum values for Ammonia Nitrogen

Average value in 2007		F_UA	F_DA	F_UB	F_DB	F_UC	F_DC
NH_3-N (mg/L)	Average	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
	Min	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Max	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01

Table 5.2-5b River Water Quality – Average, minimum and maximum values for Total Phosphorus

Average value in 2007		F_UA	F_DA	F_UB	F_DB	F_UC	F_DC
TP (mg/L)	Average	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Min	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Max	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Table 5.2-5c River Water Quality – Average, minimum and maximum values for Nitrate Nitrogen

Average value in 2007		F_UA	F_DA	F_UB	F_DB	F_UC	F_DC
NO3-N (mg/L)	Average	0.08	0.15	0.15	0.12	0.11	0.14
	Min	0.04	0.03	0.08	0.08	0.04	0.05
	Max	0.14	0.28	0.21	0.16	0.18	0.25

Table 5.2-5d River Water Quality – Average, minimum and maximum values for Nitrite Nitrogen

Average value in 2007		F_UA	F_DA	F_UB	F_DB	F_UC	F_DC
NO2-N (mg/L)	Average	< 0.01	< 0.01	0.01	0.02	0.01	0.01
	Min	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Max	< 0.01	< 0.01	0.02	0.02	0.02	0.01

Table 5.2-6e River Water Quality – Average, minimum and maximum values for Chlorophyll

Average value in 2007		F_UA	F_DA	F_UB	F_DB	F_UC	F_DC
Chl a (μg/m³)	Average	0.6	1.1	0.8	0.6	0.6	1.9
	Min	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5
	Max	0.7	1.6	1.7	0.7	0.6	5.8

5.2.15 For the marine water quality results, no significant differences of ammonia nitrogen, nitrate nitrogen and nitrite nitrogen concentrations between the dry season 2005 and wet season 2007. A much lower concentrations of nitrite nitrogen and total phosphorus were recorded all marine stations. Average chlorophyll concentrations measured in wet season 2007 were slightly higher than the dry season 2005.

5.2.16 For the fresh water quality results, no significant differences of ammonia nitrogen and nitrite nitrogen concentrations between the dry season 2005 and wet season 2007. A much lower concentration total phosphorus was recorded all fresh water stations. Average nitrate nitrogen and chlorophyll concentrations measured in wet season 2007 were slightly higher than the dry season 2005.

5.2.17 The set of water quality measured in wet season 2007 will be used as reference levels for comparison when turf establishment at southern part of East Course commence in coming months.

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 19th and 23rd April 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 had been under pipe culvert construction. Although the riparian vegetation were not affected by the rubbles, this section of stream channel was temporarily lost. Tributary A2 was converted to underground pipeline as proposed in the EIA report. 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 conditions 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 were similar with the previous months, being restored from the minor turbidity reported in dry season. 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**) and reinstated during this reporting month.

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**).

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 covered by a thin layer of fine 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), and within the majority of the stream buffer zone (except and area for Tributary B2 which was accidentally cleared before) and outside the project area. No earthwork, human disturbance or fire disturbance was observed beyond the project site boundary other than the historical erosion of hillsides.

5.3.12 Aquatic fauna communities were checked during the monitoring survey. Atyid shrimp *Caridina trifasciata* were found in Stream B, Stream C & Stream D during the present monitoring survey (**Annex E - Photo Plate 5.3-1**). Although the low water levels and flow volume, Atyid shrimp *Caridina trifasciata* was still recorded in the streams, especially among the emergent plants, in the present survey. The sedimentation incident in November 2006 made a large portion of the stream bed in Stream C covered by sediment and this limit the habitat size for the shrimps. Measures should be taken to prevent any similar incidents in the future.

5.3.13 Another species of Atyid shrimp, *Caridina cantonensis*, which is common and widespread in Hong Kong was found in Stream B, C and D. Other aquatic fauna and flora encountered during the monitoring included Freshwater snail *Brotia hainanensis*, which is usually found in streams with good water quality, found at B2 tributary of Stream B.

5.3.14 The demarcation of the stream buffer zone had been partially established at Stream A main stream, fully establishment at two tributaries of Stream B and Stream C at the time of the monitoring survey. Except at the temporary access bridges crossing Stream A, Stream B and Stream C, and the reinstated newly planting shrub area due to the accidentally vegetation cleared at Stream B2 buffer zone (November 2006), riparian vegetation within the buffer zone was not disturbed by construction works.

Marine Ecology

5.3.15 The reporting month (April 2007) was the Month Sixteen of the construction programme, the monitoring on corals therefore was not required. The next marine ecological monitoring is scheduled in June 2007.

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 draft final report was submitted to AMO for comments during the 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 March, 2nd, 10th, 17th and 24th April 2007, and the monthly joined site inspection with IEC and the Contractor's representative undertaken on 17th April 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. No major dust generation was observed from the concrete batching plant during operation. As the construction of the administration buildings and maintenance buildings and cart paths will complete soon, the concrete batching plant is expected to be dismantled by the end of May 2007.

6.1.7 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

6.1.8 Our initial comments on the TDMP are shown as follows:

- Regarding to the TDMP, some of the proposed temporary and permanent drainage were not observed on site or installed temporary drains layout were different from the proposed layout plans. The TDMP layout plans, therefore, did not totally match with the existing site progress of the temporary/permanent drainage system. In addition, some of the catch basins cannot function because they were not located at the relative low points within the golf hole to collect the surface runoff. The Contractor was urged to revise the TDMP layout plans and present the actual (temporary and permanent drainage system) installation/construction completion date of each golf hole. Interim reports regarding the TDMP progress should be submitted and revised from time to time. If the permanent drainage system is not available

at some particular areas, temporary drainage system should be sufficiently installed to prevent runoff entering to nearby water quality sensitive receivers directly.

- Whole schematic of the TDMP is to divert the surface runoff and discharge to marine water and streams through silt fence / lakes / underground water tanks. However, the TDMP did not indicate their respective locations and availability which claimed to be used as the temporary storage location.

- There is no proposed emergency plan when the temporary/permanent drainage system installed on site when the installed drainage system was failed to function properly and any rectification plan/action to strengthen at those vulnerable areas once found after heavy rain in this submission.

- The site progress of each golf hole will change from time to time. According to the latest site programme, the whole closed low flow drainage system is not available (connected and properly function) at this stage. The permanent drainage system was completed only and mainly on hole by hole basis.

- According to the submitted TDMP, it indicates that silty runoff is not expected in the wet season. According to the proposed temporary drainage system design, the basins located at Holes 1 and 17 were sufficient to collect the site runoff (70 mm/hr) about 4 hours. All permanent cut-off drains are completed and can separate from the construction site to prevent mixing of clear upper catchment water with constriction site. Silt fences installed along the site boundary and surround the catch basins can prevent the silty material discharge offsite. However, silty runoff was observed from numerous construction site areas and directly discharge to marine water and streams during and after rainstorm occurred on 24 April 2007. We considered that the temporary drainage system provided on site is insufficient and not match with the predicted results.

- Direct silty discharge from construction site to Streams A, B and C through silt fences were observed during and after rain. The Contractor should review the effectiveness of the silt fence, strengthen at vulnerable areas, provide sufficient desilting facilities, rectify the collapsed silt fences and is recommended to propose other effective means to confine the silty runoff and properly treated before discharge.

- When the whole golf hole has already sand cap such as Hole 4, no significant silty runoff was observed during the site inspection on 24 April 2007 after rain. If the constructed catch basins were barely covered with sand layer and localized within sub-soil drains areas within a golf hole, the catch basins were not located at the low levels of the permanent drainage system and they could not function to collect and/or divert the water to underground water tank / lake / temporary storage area. Silty runoff was observed and discharged through the low points of golf hole such as Holes 6, 7 & 18 to either marine water or streams.

6.1.9 Silt fence installation is the major temporary drainage system component in addition to the use of permanent drainage system on site during the wet season. According to the site observation, the silt fence was either not observed, poorly maintenance or in slow progress. The Contractor was repeatedly reminded to improve the effectiveness of the mitigation measures and provide sufficient temporary drainage system on site.

6.1.10 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. However, it is not observed on site.

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

6.1.12 Construction of permanent bridges was completed before the wet season 2007. Remaining furnishing work was in progress during the reporting month.

6.1.13 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.

6.1.14 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.

6.1.15 ADS filter system had been installed at Hole 5. Five ADS filter system is expected to be installed at Hole 6 in the next reporting month before turfing.

Ecology

6.1.16 Buffer zone at Streams B1, B2 and C had been fully established. However, Stream A buffer zone was only partially established. The whole buffer zone aims to protect the streams and avoid any works/equipment intrusion into the buffer zone.

6.1.17 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 before wet season. There were still some remaining rocks sitting on the stream bed of the downstream of Stream A.

6.1.18 Floating pontoon was berthed at EP location at the temporary barging point. However, illegal berthing was observed during the site audit. The Contractor was strongly reminded to properly berth at the designated location during material delivery according to the EP. Increase of loading of the sand/aggregates/drainage pipes/irrigation pipes delivery was observed during the reporting month.

Stream B2 Buffer Zone

6.1.19 The reinstated shrub planting area at Stream B2 buffer zone was not healthy growth, some of them were dried up and dead. The Contractor was reminded to keep the buffer zone areas in good condition.

Silt Deposit at Streams

6.1.20 Significant silty runoff and silt deposited were recorded not only on 22nd November 2006 but also on 24th April 2007 after rainstorms at all streams. The Contractor was reminded to enhance the temporary drainage system to prevent the same incident happened in wet season 2007.

Waste / Chemical Management

6.1.21 According to the site observation, vegetation stockpiles, construction wastes stockpiles and general refuse were accumulated at Hole 2 and not disposed off-site during the reporting month.

6.1.22 The Contractor was reminded to provide trip-ticket records and disposal records on monthly basis for our reference.

6.1.23 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.

6.1.24 Due to the high exceedances of ammonia nitrogen and reactive phosphorus from the effluent discharge of the temporary sewage treatment plant located near to the contractor's site office, the Contractor has to further investigate and stop the plant immediately (instructed by RE) until the performance of the plant improve and satisfy with the EPD's discharge licence requirement.

Landscape and Visual

6.1.25 Slope adjacent to Hole 12 and 13 were newly hydroseeded. 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. For Hole 5, some hydroseeded areas were damaged by erosion.

6.1.26 During the site audits, site formation, shaping, planting and building construction were carried out. Shrub seedlings were planted on slopes of Holes 2, 4, 5, 10 and 11. The newly planted shrubs are fair in health. The coverage of newly hydroseeded area is not in good condition especially for Hole 12 and 13. The Contractor shall irrigate all the plants and hydroseeded area more frequently.

6.1.27 Retained trees, such as but not limited to T957 and T956, next to administration building were severely damaged by construction. Damaged trees next to the administration building were still unprotected after being damaged by the adjacent construction activities. Wooden boards and garbage were put adjacent to the retained trees. Most of the labels of the retained trees were disappeared. The Contractor was reminded to prevent further damage to those trees and carry out tree surgery works immediately.

6.1.28 All transplanted trees were in fair condition except for T848. Mal-pruning of transplanted trees has not been rectified. Construction material was stockpiled within tree protection zones. A statement on the cause of death of tree T925 recorded in the last report is still outstanding since February 2007.

Status of Environmental Licensing and Permitting

6.1.29 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 26th 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 Two exceedances of 24-hour TSP were recorded at GCA B1 during the reporting month.

Marine Water Quality

7.1.2 Thirteen exceedances of ammonia nitrogen and chlorophyll were recorded at Tai Tau Chau, M_Marsh and M_BP. Two exceedances of suspended solids were recorded at TTC and KS. All exceedances were considered not project-related.

Freshwater Quality

7.1.3 Twenty exceedances of turbidity and twenty-seven exceedances of suspended solids were recorded at Streams A, B, C and fresh water inland marsh. Seven exceedances of ammonia nitrogen, eleven exceedances of nitrate nitrogen, four exceedance of nitrite nitrogen, eleven exceedances of total inorganic nitrogen and nine exceedances of chlorophyll a were recorded at downstream of fresh water inland marsh. All exceedances were considered project-related.

Terrestrial Ecology

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

Marine Ecology

7.1.5 Quarterly coral monitoring survey at Site B2, Site C and Control site was not required in this reporting month. Coral transplantation was carried out in the December 2006 at Site D2, quarterly monitoring for the transplanted coral was not required in this 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
- 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 March to 24th April 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;
- Re-fix the label of retained tree for easy identification;
- Maintain the tree protection zone required and remove all construction material / debris from the tree protection zone;
- More frequent watering for transplanted trees, planted vegetation and hydroseeded grass; 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.