



PROJECT No.: TCS/00512/09

**DSD CONTRACT NO. DC/2009/13
CONSTRUCTION OF SEWAGE TREATMENT WORKS AT
YUNG SHUE WAN AND SOK KWU WAN**

**YUNG SHUE WAN PORTION AREA
Quarterly Environmental Monitoring and Audit
(EM&A) Summary Report No. Q4
(June to August 2011)**

PREPARED FOR
**LEADER CIVIL ENGINEERING CORPORATION
LIMITED**

Quality Index Date	Reference No.	Prepared By	Certified By
12 October 2011	TCS00512/09/600/R0337v2		
		Nicola Hon Environmental Consultant	T.W. Tam Environmental Team Leader

Version	Date	Description
1	26 September 2011	First submission
2	12 October 2011	Amended against IEC's comments on 7 October 2011

Scott Wilson CDM Joint Venture

Chief Engineer/Harbour Area Treatment Scheme
Drainage Services Department
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Hong Kong

Your reference:

Our reference: 05117/6/16/382475

Date: 25 October 2011

Attention: Mr. C K Au

BY FAX ONLY

Dear Sirs,

Contract No. DC/2009/13

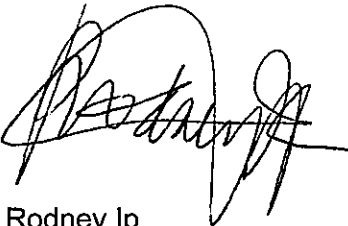
**Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Yung Shue Wan Portion Area**

Quarterly EM&A Summary Report No. Q4 (June to August 2011)

We refer to the Environmental Permit (EP-282/2007/A) and the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), with the revised report for the captioned project, dated 24 October 2011. We have no comment and have verified the captioned report.

Yours faithfully

SCOTT WILSON CDM JOINT VENTURE



Rodney Ip

ICWR/SYSL/ecwc

cc Leader Civil Engineering (Attn: Mr Vincent Chan)
 AUES (Attn: Mr T.W. Tam)
 ER/LAMMA (Attn: Mr Neil Wong)
 CDM (Attn: Mr Mark Sin)

EXECUTIVE SUMMARY

ES.01 The Leader Civil Engineering Corporation Limited (Leader) has been awarded the *Contract DC/2009/13 - Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan* (the Project) by the Drainage Services Department (DSD) on 4 May 2010.

ES.02 This is the 4th Quarterly EM&A summary report for Yung Shue Wan Portion Area under the Project, covering the construction period from **1 June to 31 August 2011**.

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.03 Environmental monitoring activities under the EM&A program in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	102
	24-hour TSP	32
Construction Noise	Leq (30min) Daytime	17
Water Quality	Marine Water Sampling	37
Ecology	Coral Monitoring	12
Inspection / Audit	ET Regular Environmental Site Inspection	13

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.04 In this Reporting Quarter, no exceedance was recorded in construction noise, air quality, marine water quality and ecology monitoring. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	Leq _{30min} Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	0	0	--	--
	SS	0	0	0	--	--
Ecology (Coral)	Sediment Cover (%)	0	0	0	--	--
	Bleaching (%)	0	0	0	--	--
	Mortality (%)	0	0	0	--	--

Note: NOE – Notification of Exceedance

ENVIRONMENTAL COMPLAINT

ES.05 No environmental complaint was recorded or received in this Reporting Period. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 - 30 June 2011	0	0	NA
1 - 31 July 2011	0	0	NA
1 - 31 August 2011	0	0	NA

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.06 No environmental summons or successful prosecutions were recorded in this Reporting Period. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 - 30 June 2011	0	0	NA
1 - 31 July 2011	0	0	NA
1 - 31 August 2011	0	0	NA

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 - 30 June 2011	0	0	NA
1 - 31 July 2011	0	0	NA
1 - 31 August 2011	0	0	NA

REPORTING CHANGE

ES.07 There are no reporting changes in this Reporting Period.

SITE INSPECTION BY EXTERNAL PARTIES

ES.08 No site inspection was undertaken by external parties i.e. EPD or AFCD within the Reporting Period.

FUTURE KEY ISSUES

ES.09 During wet season, the Contractor shall pay attention on the potential water impact as the construction site is adjacent to the coastline. Muddy water and other water quality pollutants via site surface water runoff into the coral zones of Yung Shue Wan seawall, Shek Kok Tsui and O Tsai should be avoided. Therefore, mitigation measures for water quality should be fully implemented also.

ES.10 Moreover, the construction dust mitigation measures identified at the EM&A Manual such as watering at haul road and covering of dusty material should also be implemented and properly maintained during wet season.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.01 The Leader Civil Engineering Corporation Limited (Leader) has been awarded the *Contract DC/2009/13 - Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan* (the Project) by the Drainage Services Department (DSD) on 4 May 2010. The Project is part of an overall plan approved under a statutory EIA for Outlying Islands Sewerage Stage 1 Phase 2 Package J – Sok Kwu Wan Sewage Collection and Treatment (Register No. AEIAR-075/2003) and Disposal Facilities and Outlying Islands Sewerage Stage 1 Phase 1 Package C – Yung Shue Wan Sewage Treatment Works and Outfall (Register No. EIA-124/BC). The Environmental Permit No. EP-281/2007 and EP-282/2007 for the Project have been obtained by the DSD on 29 June 2007 for the relevant works. After July 2009, EP-281/2007/A instead EP-281/2007 is EP for Sok Kwu Wan relevant Works.
- 1.02 The Project involves construction of sewage treatment works at Sok Kwu Wan and Yung She Wan with a capacity of 1,430m³/day and 2,850m³/day to provide secondary treatment. The majority of works include construction of pumping stations, construction of submarine outfall from the coastline and laying of underground sewerage pipeline. The site layout plan for the captioned work under the Project is showing in *Annex A*.
- 1.03 According to the Particular Specification (PS) and *Appendix 25* of the Project, Leader should establish an Environmental Team to implement the environmental monitoring and auditing works to fulfill the requirements as stipulated in the Environmental Monitoring and Audit (EM&A) Manuals.
- 1.04 Action-United Environmental Services and Consulting (AUES) has been commissioned by Leader as the ET to implement the relevant EM&A program. Organization chart of the Environmental Team for the Project is shown in *Annex B*. For ease of reporting, the proposed EM&A programme for baseline and impact monitoring is split to two copies:
- (a) Proposed EM&A Programme for Baseline and Impact Monitoring – Sok Kwu Wan (under EP No. 281/2007/A, varied on 23 September 2009)
 - (b) Proposed EM&A Programme for Baseline and Impact Monitoring – Yung Shue Wan (under EP No. 282/2007)
- 1.05 According to the EM&A Manuals of Sok Kwu Wan and Yung Shue Wan, baseline water quality monitoring should be carried out for consecutive six months before commencement of the marine work. Therefore, the baseline reports of Sok Kwu Wan and Yung Shue Wan are divided to two volumes, i.e. the Volume 1 for air quality and noise monitoring; and the Volume II for water quality monitoring for separate submission.
- 1.06 This is the 4th Quarterly EM&A Summary report for Yung Shue Wan Portion Area presenting the monitoring results and inspection findings for the Reporting Period from **1 June to 31 August 2011**.

1.2 REPORT STRUCTURE

The Quarterly Environmental Monitoring and Audit (EM&A) Summary Report is structured by following sections:-

SECTION 1	INTRODUCTION
SECTION 2	PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS
SECTION 3	SUMMARY OF MONITORING REQUIREMENTS
SECTION 4	IMPACT MONITORING RESULTS
SECTION 5	WASTE MANAGEMENT
SECTION 6	SITE INSPECTION
SECTION 7	ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE
SECTION 8	IMPLEMENTATION STATUS OF MITIGATION MEASURES
SECTION 9	CONCLUSIONS AND RECOMMENTATIONS

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

2.01 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in [Annex B](#).

2.2 CONSTRUCTION PROGRESS

2.02 The master and three month rolling construction programs are enclosed in [Annex C](#) and the major construction activities undertaken in this quarter are listed below:-

Reporting Period	Major Construction Activities
June 2011	<ul style="list-style-type: none"> • Excavation • Rebar bending & fixing • Erection of formwork and falsework • Concreting • Boulder removal • Horizontal directional drilling (HDD)
July 2011	<ul style="list-style-type: none"> • Construction of Buttress • U-channel behind barrier wall bay 4 • steel staircase on cut-slope, Switch Room • Genset Room • Fuel Tanks Room • Grit Chambers and Equalization Tanks • Excavation of Grease Separators • Horizontal directional drilling (HDD)
August 2011	<ul style="list-style-type: none"> • Construction of Buttress • Maintenance Stairway • Control Room & Offices • Grit Chambers • Grease Separators & EQ Tanks. • Horizontal directional drilling (HDD) • Drainage works • Boulders removal

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Period is presented in [Table 2-1](#).

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust) Regulation	Notified 19/5/2010 Case No: 317486
2	Chemical Waste Producer Registration	Issued on 8/6/2010 WPN 5213-912-L2720-01
3	Water Pollution Control Ordinance	Issued on 22/9/2010 WT00007566-2010
4	Billing Account for Disposal of Construction Waste	Issued on 26 May 2010 A/C No: 7010815
5	Construction Noise Permit (no. GW-RS0084-11)	Issued on 1 Feb 2011 Valid from 21 Feb 2011 until 20 Aug 2011
6	Construction Noise Permit (no. GW-RS0624-11)	Issued on 8 July 2011 Valid from 8 July 2011 until 24 December 2011

3 SUMMARY OF MONITORING REQUIREMENTS

3.1 ENVIRONMENTAL ASPECT

- 3.01 The EM&A baseline monitoring program cover the following environmental issues:
- Air quality;
 - Construction noise;
 - Marine water quality; and
 - Ecology
- 3.02 The ET implements the EM&A programme in accordance with the aforementioned requirements. Detailed air quality, construction noise, water quality and ecology monitoring of the EM&A program are presented in the following sub-sections.
- 3.03 A summary of the air, noise, marine water and ecology monitoring parameters is presented in **Table 3-1**:

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> • 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and • 24-hour TSP Monitoring by High Volume Air Sampler.
Noise	<ul style="list-style-type: none"> • Leq (30min) during normal working hours; and • Leq (15min) during Restricted Hours.
Marine Water Quality	<p><i>In-situ Measurements</i></p> <ul style="list-style-type: none"> • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Salinity (ppt); • Water depth (m); and • Temperature (°C). <p><i>Laboratory Analysis</i></p> <ul style="list-style-type: none"> • Suspended Solids (mg/L)
Ecology	<ul style="list-style-type: none"> • Coral Monitoring

3.2 MONITORING LOCATIONS

Air Quality

- 3.04 Two designated monitoring stations, AC02a located at Yung Shue Wan Refuse Transfer Station and AC04 located at residential area nearby Yung Shue Wan football pitch, were recommended in the *EM&A Manual Section 2.5*. In order to identify and seek for the access of the air monitoring locations designated in the EM&A Manual, site visit was conducted by Leader and ET.
- 3.05 At the site visit, all designated monitoring locations were identified, however the premises for high volume sampler installation were objected by the owner or the residents of nearby. Therefore, an alternative air monitoring locations were proposed in accordance with the criteria set out in *EM&A manual Section 2.5.2 and 2.5.3*. The proposed alternative air monitoring stations was accepted by the ER and IEC, and EPD endorsed. Details of renewal air monitoring stations are described in **Table 3-2**. The graphical of air monitoring stations is shown in **Annex D**.

Table 3-2 Locations of Air Quality Monitoring Station

Sensitive Receiver	Location
AC02b	The entrance of RE's site office
AC04c	Next to a power transformer station TP208 Yung Shue Wan and adjacent to the road direct to the construction site

Construction Noise

- 3.06 According to *EM&A Manual Section 3.4*, one noise sensitive receivers (NC05) designated for the construction noise monitoring was recommended at Yung Shue Wan Portion Area of the Project. The designated monitoring station is identified and successfully granted the premises. The detailed construction noise monitoring station is described in **Table 3-3** and graphical is shown in *Annex D*.

Table 3-3 Location of Construction Noise Monitoring Station

Sensitive Receiver	Location
NC05	Roof of North Lamma Clinic

Marine Water Quality

- 3.07 Two control stations (CY1 and CY2) and three impact stations (WY1-WY3) were recommended in the *EM&A Manual Section 4.5*. Impact stations WY1-WY3 were identified close to the sensitive receivers (the coral colonies in the vicinity of Yung Shue Wan, and secondary contact recreation subzone). It is proposed to monitor the impacts from the construction of the submarine outfall as well as the effluent discharge from the proposed STW on water quality. Two control stations: CY1 and CY2 were recommended at locations representative of the project site in its undisturbed condition and located at upstream and downstream of the works area. The marine water quality monitoring stations to be performed under the Project is described in **Table 3-4** and shown in *Annex D*.

Table 3-4 Locations of Marine Water Quality Monitoring Station

Station	Description	Coordinates	
		Easting	Northing
WY1	Coral colonies on seawall at STW site	829 170	809 550
WY2	Coral colonies at Shek kok Tsui	829 000	810 400
WY3	Coral colonies at O Tsai (headland N at SW ferry pier)	829 200	809 850
CY1 (flood)	Control Station	828 400	810 800
CY2 (ebb)	Control Station	828 000	808 800

Coral Monitoring

- 3.08 One control station at North Beaufort Island and one impact stations at boulder seawall at YSW STW site were recommended in the *EM&A Manual Section 7.2*. These sites represent the coral site where uncommon coral species were recorded from the coral surveys carried out as part of the Review Report on the EIA Study. However, change of Monitoring Location was recommended by the Ecologist based on the experience. The rationale for the re-location is summarised as below:-
- ◆ Sham Wan is located at the southeast part of Lamma Island which is less exposed and more transition water than that in Beaufort Island in which it is quite similar to Yung Shue Wan;
 - ◆ Recent EIA surveys showed that the coral diversity is higher in Sham Wan;
 - ◆ Same coral monitoring had been carried out at both Yung Shue Wan and Sham Wan in 2007 for the project of “Construction of Helipads at Peng Chau and Yung Shu Wan, Lamma Island, Agreement No. CE 18/2002).
- 3.09 It is concluded that Sham Wan is more suitable as a control site than Beaufort Island. The proposal for relocation of control station was submitted to IEC and AFCD and both parties have no comment on the proposal. The coral monitoring stations to be performed under the Project is described in **Table 3-5** and shown in *Annex D*.

Table 3-5 Location of Coral Monitoring

Dive Site	Number	Coordinates	
		Easting	Northing
Yung Shu Wan, Lamma Island	1	829180.06E	809555.76N
Sham Wan, Lamma Island	2	832160.86E	805738.31N

3.3 MONITORING FREQUENCY AND PERIOD

3.10 The Impact monitoring carried out in the EM&A programme is basically in accordance with the requirements in *EM&A Manual Sections 2.7, 3.6, 4.7, 4.8, 7.3 and 7.4*. The monitoring requirements are listed as follows:

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.

Frequency: Once in every six days for 24-hour TSP and three times in every six days for 1-hour TSP.

Duration: Throughout the construction period.

Noise Monitoring

Parameters: Leq (30min) & Leq (5min), L10 and L90.
Leq (15min) & Leq (5min), L10 and L90 during the construction undertaken during Restricted Hours (19:00 to 07:00 hours next of normal working day and full day of public holiday and Sunday).

Frequency: Once per week during 0700-1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.

Duration: Throughout the construction period.

Marine Water Quality Monitoring

Parameters: Duplicate in-situ measurements: water depth, temperature, Dissolved Oxygen, pH, turbidity and salinity;
HOKLAS-accredited laboratory analysis: Suspended Solids

Frequency: Three days a week, at mid ebb and mid flood tides. The interval between 2 sets of monitoring will be more than 36 hours.

Sampling Depth

- (i.) Three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m.
- (ii.) If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above sea bottom.
- (iii.) If the water depth is less than 3m, 1 sample at mid-depth is taken

Duration: During the course of marine works

Coral Monitoring

Parameters: Presence and coverage of hard and soft corals such as diversity, abundance and health status of the corals in the general area, plus other physical and biological condition at the underwater environment. The monitoring parameters are categorized in (1) percentage sediment cover; (2) percentage bleached tissue; and (3) percentage dead of each tagged coral

Frequency: One per week for the first three months of the marine works;
If no exceedances are reported during the first three months, the frequency

may be reduced to twice every month. Monitoring frequency shall be increase if there is indication/trend of increase in the monitoring parameters, upon the decision of Inspecting Officer

Duration: During the course of marine works

Post-Construction Monitoring – Marine Water

- 3.11 Upon the marine works (dredging and HDD pipe installation) completion, 4 weeks of post-construction monitoring would be undertaken in accordance with the *Section 4.8 of EM&A Manual*. The requirements of post-construction monitoring such as the parameter, frequency, location and sampling depth is same as the impact monitoring.

3.4 MONITORING EQUIPMENT

Air Quality Monitoring

- 3.12 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve. The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

Noise Monitoring

- 3.13 Sound level meter in compliance with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s⁻¹.

Water Quality Monitoring

- 3.14 ***Dissolved Oxygen and Temperature Measuring Equipment*** – The instrument should be a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment should be capable of measuring as included a DO level in the range of 0 – 20mg L⁻¹ and 0 – 200% saturation; and a temperature of 0 – 45 degree Celsius.
- 3.15 ***pH Meter*** – The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1 pH in arrange of 0 to 14.
- 3.16 ***Turbidity (NTU) Measuring Equipment*** – The instrument should be a portable and weatherproof turbidity measuring instrument using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.
- 3.17 ***Water Sampling Equipment*** – A water sampler should 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 should 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.
- 3.18 ***Water Depth Detector*** – A portable, battery-operated echo sounder should 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.
- 3.19 ***Salinity Measuring Equipment*** – A portable salinometer capable of measuring salinity in the range of 0 - 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring location.

- 3.20 **Sample Containers and Storage** – Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).
- 3.21 **Monitoring Position Equipment** - A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for maritime (RTCM) Type 16 error message ‘screen pop-up’ facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, should be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.
- 3.22 **Suspended Solids Analysis** – Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

Coral Monitoring

- 3.23 The monitoring equipment used for the coral monitoring are listed below:-

Equipment	Model
A4 size underwater slates	Handmade A4 size underwater slates
Coral Photos	Laminated Tagged Coral Photos
Quadrat	50 cm x 50 cm plastic quadrat (with 10 cm x 10 cm grid)
Underwater Camera	Canon G10 digital camera
Scuba Diving Equipment	Scubapro regulator, BCD and fins
Diving Boat	33 feet long diving boat with two 200hp outboard engines, registration #128328

3.5 EQUIPMENT CALIBRATION

- 3.24 Calibration of the HVS is performed upon installation in accordance with the manufacturer’s instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The calibration data are properly documented and the records are maintained by ET for future reference.
- 3.25 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment was checked before and after each monitoring event. In-house calibration with the High Volume Sampler (HVS) in same condition was undertaken in yearly basis.
- 3.26 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.
- 3.27 The Water Quality Monitoring equipment such as Dissolved Oxygen meter, pH meter, Turbidity Measuring Instrument and Salinometer, are calibrated by HOKLAS accredited laboratory of three month intervals.
- 3.28 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in the relevant Monthly EM&A Report.

3.6 METEOROLOGICAL INFORMATION

- 3.29 The meteorological information during the construction phase is obtained from the Wong Chuk Hang Station of the Hong Kong Observatory (HKO) which near the Project site. The meteorological information in this Reporting Period is presented in *Annex F*.

3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.30 The impact monitoring data are handled by the ET's systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring program.

3.31 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, noise meter and Multi-parameter Water Quality Monitoring System, are downloaded directly from the equipments at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

3.8 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.32 According to the Yung Shue Wan Environmental Monitoring and Audit Manual, the air quality, construction noise, marine water quality and coral monitoring were established, namely Action and Limit levels are listed in *Tables 3-5, 3-6, 3-7 and 3-8* as below.

Table 3-5 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AC02b	288	161	500	260
AC04c	290	176	500	260

Table 3-6 Action and Limit Levels for Construction Noise Monitoring

Recommended Action & Limit Levels of Construction Noise		
Monitoring Location	Action Level	Limit Level
	0700-1900 hours on normal weekdays	
NC05	When one or more documented complaints are received	75 dB(A)*

Note: * Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.

Table 3-7 Action and Limit Levels for Marine Water Quality Monitoring

Parameter	Performance Criteria	Impact Station		
		WY1	WY2	WY3
DO Concentration (Surface and Middle) (mg/L)	Action Level	3.63	3.53	3.61
	Limit Level	3.32	3.47	3.42
DO Concentration (Bottom) (mg/L)	Action Level	3.33	2.92	3.36
	Limit Level	3.23	2.63	3.14
Turbidity (Depth-Average) (NTU)	Action Level	10.94	14.16	14.99
	Limit Level	17.35	15.20	16.21
Suspended Solids (Depth-Average) (mg/L)	Action Level	17.52	14.04	14.52
	Limit Level	25.62	16.51	16.88

Table 3-8 Action and Limit Levels for Coral Monitoring

Step	Action
1	Commence tagged coral monitoring at the impact site. If no increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality on the soft/black corals, no action is required. The coral survey specialist should present this information to the IC(E) at the end of each survey day

Step	Action
	for verification. If an increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality on the soft/black corals at one or more impact monitoring stations Step 3 should be enacted, if not, Step 2.
2	If non actions are triggered a formal report should be issued along with evidentiary photographs following completion of the survey. Meanwhile monitoring work and construction works should continue uninterrupted.
3	If during the impact monitoring a 15% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Action Level is exceeded (Step 4).
4	If the Action Level is exceeded the IC(E) should inform all parties. The data from the water quality monitoring should also be reviewed. If the water quality monitoring shows no attributable effects of the installation works, then the Action Level is not triggered. If the water quality data indicate exceedances (for SS and/or turbidity) the IC(E) should discuss with the Contractor the most appropriate method of reducing suspended solids during construction (e.g. reduce rate of dredging). The water quality data reviewed should then be enacted on the next working day.
5	Monitoring should proceed the following day as per Step 1. If during the Impact Monitoring a 25% increase in the percentage of sedimentation on the hard corals at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Limit Level is exceeded (Step 6). If the Limit Level is not exceeded Step 2 is enacted and work continues according to the mitigated method.
6	If the Limit Level is exceeded the Inspector Officer should inform all parties immediately. Should the Limit Level be exceeded, the Contractor should stop works immediately and work out a solution to the satisfaction of the IC(E), EPD and AFCD. The IC(E) should inform the Contractor to suspend marine construction works until an effective solution is identified. Once the solution has identified and agreed with all parties, backfilling works may re-commence.

4 IMPACT MONITORING RESULTS

4.01 The environmental monitoring results will be compared against the Action and Limit Levels established based on the baseline monitoring results and statutory criteria. In case the measured data exceed the environmental quality criteria, remedial actions will be triggered according to the Event and Action Plan. In the Reporting Period, the graphical plots of the trends of monitored parameter over the past four months are presented in *Annex E*.

4.1 RESULTS OF AIR QUALITY MONITORING

4.02 The monitoring results of air quality monitoring at the identified locations during the Reporting Period are summarized in *Tables 4-1*. In this quarterly period, a total of **102** events of 1-hour TSP and **32** events of 24-hour TSP measurements were performed.

4.01 The 1-hour and 24-hour TSP monitoring values fluctuated well below the Action Level during the Reporting Period. No Notification of Exceedance (NOE) of air quality criteria or corrective action was therefore required.

Table 4-1 Summary of 1-hour and 24-hour TSP Monitoring Results

Monitoring Location	1-hour TSP ($\mu\text{g}/\text{m}^3$)			24-hour TSP ($\mu\text{g}/\text{m}^3$)		
	Max	Min	Mean	Max	Min	Mean
AC02b	137	38	69	151	17	48
Record Date	7-Jun-11	29-Jun-11	51 events	25-Aug-11	22-Jun-11	16 events
AC04c	132	44	70	102	14	47
Record Date	2-Jun-11	29-Jun-11	51 events	25-Aug-11	4-Jun-11	16 events

4.2 RESULTS OF CONSTRUCTION NOISE MONITORING

4.03 Summary of construction noise monitoring at the identified locations during the Reporting Period are summarized in *Table 4-2*. In this reporting quarter, a total of **17** events of construction noise measurement were conducted while no documented construction complaint was received and all the construction noise results were below the Limit level. No NOE or corrective action was recommended for this parameter.

Table 4-2 Summary of Construction Noise Monitoring Results

Station	Leq, 30min (dB(A))	
	Max	Min
NC05	65.4	56.6
Record Date	7 Jun 11	11 Jul 11

4.3 RESULTS OF MARINE WATER QUALITY MONITORING

4.04 The construction of marine outfall works was commenced on 9 May 2011 and marine water quality monitoring is required according the EM&A Manual requirement. In this reporting period, two event of marine water quality monitoring on 23 June 2011 and 29 July 2011 were cancelled due to inclement weather and marine condition. Therefore, **37** monitoring events have been carried out at the designated locations in this reporting quarter.

4.05 The statistical analysis result for the parameters of DO, turbidity and suspended solids in this reporting quarter are shown in *Tables 4-3 to 4-6*.

Table 4-3 Statistic of Monitoring Result for DO concentration (mg/L) (Surface & Mid-layers)

Station	WY1	WY2	WY3	CY1(F)	CY2(E)
Average	7.63	7.21	7.46	6.56	6.71
Min	5.03	4.92	5.20	4.19	4.59
Max	10.63	10.94	10.42	12.06	18.30

Table 4-4 Statistic of Monitoring Result for DO concentration (mg/L) (Bottom layers)

Station	WY1	WY2	WY3	CY1(F)	CY2(E)
Average	6.20	5.33	6.23	4.33	4.11
Min	3.69	2.93	3.86	1.78	1.15
Max	9.88	10.10	9.61	9.96	10.85

Table 4-5 Statistic of Monitoring Result for Turbidity (NTU)

Station	WY1	WY2	WY3	CY1(F)	CY2(E)
Average	4.78	4.92	4.87	5.18	5.43
Min	1.68	1.58	1.90	1.43	1.67
Max	10.23	12.65	13.30	14.78	15.92

Table 4-6 Statistic of Monitoring Result for Suspended Solids (mg/L)

Station	WY1	WY2	WY3	CY1(F)	CY2(E)
Average	6.24	4.49	5.19	4.59	4.78
Min	2.10	1.30	1.30	0.93	1.40
Max	16.40	14.03	14.30	16.43	13.70

4.06 A summary of exceedances for the three parameters: dissolved oxygen (DO), turbidity and suspended solids are shown in **Table 4-7**.

Table 4-7 Summary of Exceedances in Marine Water Quality

Station	DO (Ave of Surf. & mid-depth)		DO (Ave. of Bottom Layer)		Turbidity (Depth Ave.)		SS (Depth Ave)		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit	Action	Limit
Mid-Ebb										
WY1	0	0	0	0	0	0	0	0	0	0
WY2	0	0	0	0	0	0	0	0	0	0
WY3	0	0	0	0	0	0	0	0	0	0
Mid-Flood										
WY1	0	0	0	0	0	0	0	0	0	0
WY2	0	0	0	0	0	0	0	0	0	0
WY3	0	0	0	0	0	0	0	0	0	0
No of Exceedance	0	0	0	0	0	0	0	0	0	0

4.07 For marine water monitoring, no exceedance of Action/Limit level was recorded in this reporting period. Therefore, no associated corrective actions were then required.

4.4 RESULTS OF ECOLOGY MONITORING

- 4.08 Since the construction of marine outfall works was commenced on 9 May 2011, impact coral monitoring were performed on **3, 9, 15, 21 and 29 June, 7, 14, 22 and 28 July and 5, 10 and 25 August 2011** at Yung Shue Wan and Sham Wan where 20 hard coral colonies were monitored at each sites.
- 4.09 During the Impact Coral Monitoring on 14 July 2011, it is reported that the tagged coral No. SW12 *Favia fавus* at Sham Wan was partially dead. Under investigation by the coral specialist, the partial dead coral was killed by predation by a coral feeding snails *Drupella sp.* It is concluded that the dead of the tagged coral No. SW12 is not related to the construction activities under the Project. Since the partial dead coral is not suitable for monitoring, a health coral *Coscinaraea n sp.* was selected to replace the dead one during monitoring work on 22 July 2011.
- 4.10 During the Impact Coral Monitoring on 22 July 2011, it was reported that the tagged coral No. SW16 *Favia rutomana* at Sham Wan was found 10 % mortality. Under investigation by the coral specialist, it is suspected that the partial dead coral was eaten by coral feeding snails *Drupella sp.* Since there is no further increased in % mortality to the coral during the next monitoring on 28 July 2011, the ecologist decides to closely monitor the health condition of the coral and no replacement would be made at this stage.
- 4.11 During the Impact Coral Monitoring on 5 August 2011, it is reported that the tagged coral No. 11 *Favia fавus* at Yung Shue Wan was found 80% dead. Under investigation by the coral specialist, the partial dead coral is quite close to the shore and grown on the rock at the bottom and it was covered by sediment. However, other tagged corals at the vicinity appeared to be normal without any sediment covered and no obvious sediment level increase in the boulder or rock along the survey areas. It was concluded that the mortality of coral no.11 is caused by the sediment cover during the typhoon Nock-ten on 28 July 2011. A healthy coral *Goniopora stutchburyi* was re-tagged on 10 August 2011 to replace for future monitoring works.
- 4.12 In general, no sediment cover or bleaching on coral was recorded during the survey in both sites. Although partial mortality of coral was recorded, it did not trigger the Action Level as no significant sediment cover observed. Investigation reports also concluded that all the mortality cases were not related to the work under the Project. No exceedance of Action/Limit level was recorded in coral monitoring in this reporting period.
- 4.13 No deterioration in the general condition of the coral fauna was observed. No adverse deterioration of the coral community was observed in the ecological monitoring results when compared with the baseline ecological monitoring results.

5 WASTE MANAGEMENT

5.01 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

5.1 RECORDS OF WASTE QUANTITIES

5.02 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

5.03 The quantities of waste for disposal in this Reporting Period are summarized in *Table 5-1* and *5-2* and the Monthly Summary Waste Flow Table is shown in *Annex G*. Whenever possible, materials were reused on-site as far as practicable.

Table 5-1 Summary of Quantities of Inert C&D Materials

Type of Waste	Quantity			Disposal Location
	Jun 11	Jul 11	Aug 11	
C&D Materials (Inert) ('000m ³)	0	0	0.004	Tuen Mun Area 38
Reused in this Contract (Inert) ('000m ³)	0	0	0	-
Reused in other Projects (Inert) ('000m ³)	0	0	0	-
Disposal as Public Fill (Inert) ('000m ³)	0.505	0.824	0.491	Tuen Mun Area 38

Table 5-2 Summary of Quantities of C&D Wastes

Type of Waste	Quantity			Disposal Location
	Jun 11	Jul 11	Aug 11	
Recycled Metal (kg)	0	0	0	-
Recycled Paper / Cardboard Packing (kg)	0	0	0	-
Recycled Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	
General Refuses (tonne)	9.610	5.0	7.990	Yung Shue Wan RTS

5.04 There was no site effluent discharged but the estimated volume of surface runoff was less than 50m³ in this reporting quarter.

6 SITE INSPECTION

- 6.01 According to the Final Report Environmental Monitoring and Audit Manual, the environmental site inspection should be formulated by ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. In this Reporting Period, site inspection was carried out on **9, 14, 21 and 29 June 2011, 5, 12, 19 and 26 July 2011 and 2, 9, 16, 23 and 30 August 2011**. Besides, routine joint-site visit by IEC, RE, Leader and ET was carried out on **9 June 2011, 19 July 2011 and 9 August 2011**.
- 6.02 Observations for the site inspections and monthly audit within this Reporting Period are summarized in *Table 6-1*.

Table 6-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
9 June 2011	<ul style="list-style-type: none"> • Overflow of turbid water was observed. The sedimentation facilities need to be further modified to improve the de-silting effectiveness. • Turbid water was observed at the outfall of the site. The Contractor should carry out immediate action to rectify the problem of water quality. 	<p>The water quality in the sed-tank was improved on 14 June 2011.</p> <p>No further discharge of turbid water was observed on 14 June 2011.</p>
14 June 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
21 June 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
29 June 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
5 July 2011	<ul style="list-style-type: none"> • Stagnant water was accumulated on the roof of building structure. The Contractor should drain away stagnant water or apply larvicidal oil to avoid mosquito breeding. 	The stagnant water was found to be removed on 12 July 2011.
12 July 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
19 July 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
26 July 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
2 August 2011	<ul style="list-style-type: none"> • Water leakage was observed. The Contractor should repair the pipeline to avoid stagnant water accumulation. 	The pipeline was repaired on 9 September 2011.
9 August 2011	<ul style="list-style-type: none"> • Stagnant water on the covering and drip tray should be removed to avoid mosquito breeding. 	The stagnant water was found to be removed on 16 September 2011.
16 August 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
23 August 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A
30 August 2011	<ul style="list-style-type: none"> • No environmental issue was observed during the site inspection. 	N.A

7 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

7.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.01 No environmental complaint, summons and prosecution was received in this Reporting Period. The statistical summary table of environmental complaint is presented in [Tables 7-1, 7-2](#) and [7-3](#).

Table 7-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 - 30 June 2011	0	0	NA
1 - 31 July 2011	0	0	NA
1 - 31 August 2011	0	0	NA

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 - 30 June 2011	0	0	NA
1 - 31 July 2011	0	0	NA
1 - 31 August 2011	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 - 30 June 2011	0	0	NA
1 - 31 July 2011	0	0	NA
1 - 31 August 2011	0	0	NA

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Yung Shue Wan Environmental Monitoring and Audit Manual covered the issues of dust, noise, water and waste and they are summarized as following:

Dust Mitigation Measure

8.02 Installation of 2m high solid fences around the construction site of Pumping Station P2 is recommended. Implementation of the requirements stipulated in the Air Pollution Control (Construction Dust) Regulation and the following good site practices are recommended to control dust emission from the site:

- (a) Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather;
- (b) Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses;
- (c) Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like.
- (d) Any vehicle used for moving sands, aggregates and construction waste shall have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin.

Noise Mitigation Measure

8.03 As detailed in the EIA report, concreting work of the Pumping Station P1a and sewer alignment construction activities would likely cause adverse noise impacts on some of the noise sensitive receivers. Appropriate mitigation measures have therefore been recommended. The mitigation measures recommended in the EIA report are summarised below:

- (a) Use of quiet equipment for the construction activities of the Pumping Stations and sewer alignment;
- (b) Use of temporary noise barrier around the site boundary of Pumping Station P1a;
- (c) Use of kick ripper (saw and lift) method to replace the breaker for pavement removal during sewer alignment construction;
- (d) Restriction on the number of plant during sewer alignment construction;
- (e) Use of noise screening structures in the form of acoustic shed or movable barrier wherever practicable and feasible in areas with sufficient clearance and headroom during the construction of sewer alignment;
- (f) Adoption of manual working method wherever practicable and feasible in areas where the worksites of the proposed sewer alignment are located less than 20m from the residential noise sensitive receivers and less than 30m from the temple and the public library; and
- (g) Implementation of the following good site practices:
 - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.
 - Mobile plant, if any, should be sited as far away from NSRs as possible.
 - Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.
 - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.
 - Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

Water Quality Mitigation Measure

8.04 No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of outfall pipe of about 480 m from shore to minimize the potential water quality impacts arising from the dredging works required for the submarine outfall construction. For the

remaining outfall pipe of about 240m and the diffuser section, open trench dredging would still be required.

- 8.05 During the dredging works, the Contractor should be responsible for the design and implementation of the following mitigation measures.
- Dredging should be undertaken using closed grab dredgers with a total production rate of 55m³/hr;
 - Deployment of 2-layer silt curtains with first layer enclosing the grab and the second layer at around 50, from the dredging area while dredging works are in progress;
 - all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;
 - all pipe leakages should be repaired promptly and plant shall not be operated with leaking pipes;
 - excess material should be cleaned from the decks and exposed fittings of barges before the vessel is moved;
 - adequate freeboard (i.e. minimum of 200m) should be maintained on barges to ensure that decks are not washed by wave action;
 - all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and
 - loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and barges and hoppers should not be filled to a level which would cause the overflow of materials or sediment laden water during loading or transportation; and
 - the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.

Construction Run-off and Drainage

- 8.06 The Contractor should observe and comply with the Water Pollution Control Ordinance and the subsidiary regulations. The Contractor should follow the practices, and be responsible for the design, construction, operation and maintenance of all the mitigation measures as specified in ProPECC PN 1/94 “Construction Site Drainage”. The design of the mitigation measures should be submitted by the Contractor to the Engineer for approval. These mitigation measures should include the following practices to minimise site surface runoff and the chance of erosion, and also to retain and reduce any suspended solids prior to discharge:
- Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks.
 - Works programmes should be designed to minimize works areas at any one time, thus minimising exposed soil areas and reducing the potential for increased siltation and runoff.
 - Sand/silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand/silt particles from run-off. These facilities should be properly and regularly maintained. These facilities shall be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site.
 - Careful programming of the works to minimise soil excavation works during rainy seasons.
 - Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion.
 - Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections.
 - Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric.

General Construction Activities

- 8.07 Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. All fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse.

Wastewater Arising from Workforce

- 8.08 Portable toilets shall be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor shall also be responsible for waste disposal and maintenance practices

Sediment Contamination Mitigation Measure

- 8.09 The basic requirements and procedures for dredged mud disposal are specified under the WBTC No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by the MFC, while the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP).
- 8.10 The uncontaminated dredged sediment will be loaded onto barges and transported to the designated marine disposal site. Appropriate dredging methods have been incorporated into the recommended water quality mitigation measures including the use of closed-grab dredgers and silt curtains. Category L sediment would be suitable for disposal at a gazetted open sea disposal ground.
- 8.11 During transportation and disposal of the dredged marine sediments, the following measures should be taken to minimize potential impacts on water quality:
- Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.
 - Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self-monitoring devices as specified by the DEP.

Construction Waste Mitigation Measure

Good Site Practices and Waste Reduction Measures

- 8.12 It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are strictly followed. Recommendations for good site practices for the construction waste arising include:
- Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site.
 - Training of site personnel in proper waste management and chemical handling procedures.
 - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.
 - Provision of sufficient waste disposal points and regular collection for disposal.
 - Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.
 - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.
 - Maintain records of the quantities of wastes generated, recycled and disposed.
- 8.13 In order to monitor the disposal of C&D waste at landfills and to control fly tipping, a

trip-ticket system should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. An Independent Environmental Checker should be responsible for auditing the results of the system.

- 8.14 Good management and control can prevent the generation of significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:
- segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
 - to encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the work force;
 - any unused chemicals or those with remaining functional capacity should be recycled;
 - use of reusable non-timber formwork to reduce the amount of C&D material;
 - prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
 - proper storage and site practices to minimise the potential for damage or contamination of construction materials; and
 - plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.

General Site Wastes

- 8.15 A collection area should be provided where waste can be stored prior to removal from site. An enclosed and covered area is preferred for the collection of the waste to reduce 'wind blow' of light material.

Chemical Wastes

- 8.16 After use, chemical waste (eg. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Any unused chemicals or those with remaining functional capacity should be recycled. Spent chemicals should be properly stored on site within suitably designed containers, and should be collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordinance.
- 8.17 Any service shop and minor maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakages and spillage should only be undertaken with the areas appropriately equipped to control these discharges.

Construction and Demolition Material

- 8.18 The C&D material should be separated on-site into three categories: (i) public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area; (ii) C&D waste for re-use and/or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, wood, glass and plastic); (iii) C&D waste which cannot be re-used and/or recycled. The waste producers are responsible for its disposal at strategic landfills.
- 8.19 In order to minimise the impact resulting from collection and transportation of material for off-site disposal, it was recommended that inert material should be re-used on-site where possible. Prior to disposal of C&D material, it was also recommended that steel and other metals should be separated for re-use and/or recycling where practicable to minimise the

quantity of waste to be disposed of to landfill.

Ecology Mitigation Measure

- 8.20 The following general good practice measures should be adopted to mitigate ecological impacts during marine works (including dredging and HOD);
- Excess material from vessel loading should be cleaned from the decks and exposed fittings before vessels are moved to the backfilling location;
 - Dredging should cause no foam, oil, grease, scum, litter or other objectionable matter to be present on the water;
 - Adequate freeboard should be maintained to ensure that decks are not washed by wave action;
 - All pie leakages should be repaired promptly and plant Should not be operated with leaking pipes; and
 - All barges and other vessels should maintain adequate clearance between vessels and the seabed at all states of the tide and reduce operational speeds to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.
- 8.21 In the event of exceedances of ecological action or limit level, the Contractor will be required to revise his operations as a further mitigation measure. Revisions to the operation method may include (but not be limited to):
- Reduction in dredging rate'
 - Restriction of dredging in particular areas to specific periods in the tidal cycle
- 8.22 Should repeated non-compliances with limit level(s) occur the Contractor shall modify his working method until he is able to achieve the required compliances with the limit levels to the satisfaction of the IC(E)

Fisheries Mitigation Measure

- 8.23 Closed grab dredger, deployment of silt curtains around the immediate dredging area and low dredging rate have been recommended in Water Quality of the EIA report in order to minimise sediment release into the water column.

Landscape & Visual Mitigation Measure

- 8.24 Mitigation measures recommended in the EIA Report for landscape and visual impacts during the construction stage are summarised below.
- Screening of site construction works by use of hoarding that is appropriate to its site context;
 - Retaining existing trees and minimising damage to vegetation where possible by close co-ordination and on site alignment adjusted of rising main and gravity sewer pipelines. Tree protective measures should be implemented to ensure trees identified as to be retained are satisfactorily protected during the construction phase;
 - Careful and efficient transplanting of affected trees (1 no.) to temporary or final transplant location (the proposed tree to be transported is a semi-mature *Macaranga tanarius* and is located at the proposed Pumping Station P2 location);
 - Short excavation and immediate backfilling of sections upon completion of works to reduce active site area;
 - Conservation of top-soil for reuse.
 - Night-time light source from marine fleets should be directed away from the residential units
- 8.25 The implementation schedule of mitigation measures is presented in [Annex H](#).

- 8.26 Leader had been implementing the required environmental mitigation measures according to

the Yung Shue Wan Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by Leader in this Reporting Month are summarized in *Table 8-1*.

Table 8-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> • Drainage channels were provided to convey run-off into the treatment facilities; and • Drainage systems were regularly and adequately maintained.
Air Quality	<ul style="list-style-type: none"> • Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; and • Tarpaulin covering of any dusty materials on a vehicle leaving the site.
Noise	<ul style="list-style-type: none"> • Good site practices to limit noise emissions at the sources; • Use of quiet plant and working methods; • Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs; and • To minimize plant number use at the worksite.
Waste and Chemical Management	<ul style="list-style-type: none"> • Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible; • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill; and • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	<ul style="list-style-type: none"> • The site was generally kept tidy and clean.

9 CONCLUSIONS AND RECOMMENTATIONS

9.1 CONCLUSIONS

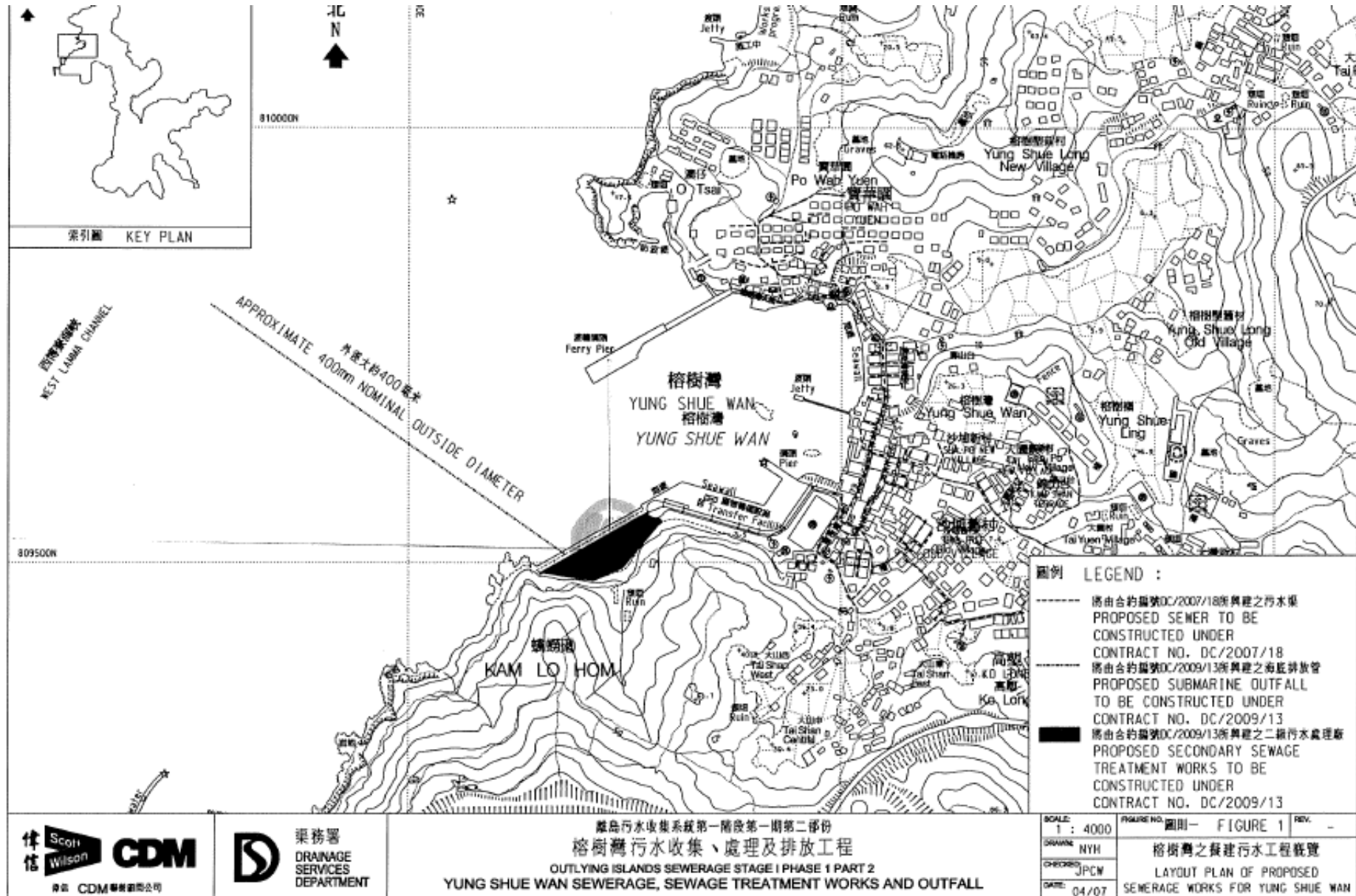
- 9.01 This is the 4th Quarterly EM&A summary report for Yung Shue Wan Portion Area under the Project covering the construction period from **1 June to 31 August 2011**.
- 9.02 No noise complaint (an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this reporting quarter. No NOE or the associated corrective actions were therefore issued.
- 9.03 In this reporting quarter, no monitoring result of 1-hour and 24-hour TSP was found to be triggered the Action or Limit Level.
- 9.04 No exceedance of Action/Limit level was recorded in marine water monitoring in this reporting period.
- 9.05 No exceedance of Action/Limit level was recorded in coral monitoring in this reporting period.
- 9.06 No documented complaint, notification of summons or successful prosecution was received.
- 9.07 **13** events of site inspection were carried out by ET in this Reporting Quarter and no non-compliance was observed during the inspection. In general, all the observation has been rectified during the next week site inspection. The environmental performance of the Project was therefore considered as satisfactory.
- 9.08 No site inspection was undertaken by external parties i.e. EPD or AFCD within the Reporting Period.

9.2 RECOMMENDATIONS

- 9.09 During wet season, the Contractor shall pay attention on the potential water impact as the construction site is adjacent to the coastline. Muddy water and other water quality pollutants via site surface water runoff into the coral zones of Yung Shue Wan seawall, Shek Kok Tsui and O Tsai should be avoided. Therefore, mitigation measures for water quality should be fully implemented.
- 9.10 Moreover, the construction dust mitigation measures identified at the EM&A Manuel such as watering at haul road and covering of dusty material should also be implemented and properly maintained in wet season.

Annex A

Site Layout Plan – Yung Shue Wan Portion Area



Annex B

Organization Structure and Contact Details of Relevant Parties

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. AU Chi Kwong	-	-
SCJV	Engineer's Representative	Mr. Neil Wong	2982 0240	2982 4129
SCJV	Resident Engineer	Mr. Jacky Poon	2982 0240	2982 4129
SCJV	Resident Engineer	Mr. Alfred Cheung	2982 0240	2982 4129
Leader	Project Manager	Mr. Vincent Chan	2982 1750	2982 1163
Leader	Site Agent	Mr. Stephen Leung	2982 1750	2982 1163
Leader	Environmental Officer	Mr. K.Y. So	2982 8652	2982 8650
Leader	Section Engineer (Yung Shue Wan)	Mr. Burgess Yip	2982 1750	2982 1163
Leader	Project Manager	Mr. Vincent Chan	2982 1750	2982 1163
Leader	Safety Officer	Mr. Edwin Leung	2982 1750	2982 1803
Leader	Site Engineer (Yung Shue Wan)	Mr. Justin Cheng	2982 1750	2982 1163
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Assistance Environmental Consultant	Mr. Ray Cheung	2959 6059	2959 6079
AUES	Team Supervisor	Mr. Ben Tam	2959 6059	2959 6079

Legend:

DSD (Employer) – Drainage Services Department

CDM (Engineer) – Scott Wilson CDM Joint Venture

Leader (Main Contractor) – Leader Civil Engineering Corporation Limited










Scott Wilson (IEC) – Scott Wilson Limited

AUES (ET) – Action-United Environmental Services & Consulting

Annex C

Master and Three Months Rolling Construction Programs

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	MAY	JUN	JUL	2011 AUG	SEP	OCT	NOV
Project Key Date																	
KD0010	Receive Letter of Acceptance	0	100		05/05/10 A		05/05/10 A			KD0125							
KD0020	Project Commencement Date	0	100		17/05/10 A		17/05/10 A			E&M0010, E&M0070, E&M1001,							
KD0050	Section W3 - Footpath Diversion in Ptn G (273d)	0	100		24/03/11 A		24/03/11 A		SKW0551	KD0125							
KD0115	Start Operate Temp Sewage Treatment in Port. A&H	0	0		01/12/11		30/06/11 *	-154d	E&M0510	KD0125							
Preliminary (Civil)																	
PRE0020	Pre-condition Survey	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A		KD0020								
PRE0040	Erection of Engineer's Site Accommodation at YSW	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A		KD0020								
PRE0050	Taking over the Secondary Engineer's Site Accom	75	100	17/05/10 A	30/07/10 A	17/05/10 A	30/07/10 A		KD0020								
PRE0060	Application of Consent from Marine Department	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A		KD0020								
PRE0090	Working Group Meeting for Outfall Construction	120	100	17/05/10 A	23/11/10 A	17/05/10 A	23/11/10 A		KD0020	SKW1151							
PRE0100	Application & Consent of XP from HyD (Mo Tat Rd)	120	100	17/05/10 A	13/10/10 A	17/05/10 A	13/10/10 A		KD0020	SKW1491, SKW1501							
PRE0130	Setup Web-site for EM&A Reporting	90	100	17/05/10 A	31/08/10 A	17/05/10 A	31/08/10 A		KD0020								
Preliminary (E&M)																	
Technical Submission																	
Process Design of SKWSTW & YSWSTW																	
E&M0010	Submission	38	100	17/05/10 A	23/06/10 A	17/05/10 A	23/06/10 A		KD0020	E&M0020, E&M0040, E&M0235							
E&M0020	Vetting and Comment by ER	21	100	24/06/10 A	14/07/10 A	24/06/10 A	14/07/10 A		E&M0010	E&M0030, E&M0040							
E&M0030	Revision and Resubmission	125	98	17/05/10 A	02/08/11	17/05/10 A	16/06/11	-47d	E&M0020	E&M0080							
E&M0080	Approval from the Engineer	14	0	02/08/11	16/08/11	17/06/11	30/06/11	-47d	E&M0030	E&M0295							
Hydraulic Design																	
E&M0040	Submission	21	100	17/05/10 A	16/09/10 A	17/05/10 A	16/09/10 A		E&M0010, E&M0020	E&M0050, E&M0101, E&M0240,							
E&M0050	Vetting and Comment by ER	14	100	17/09/10 A	09/11/10 A	17/09/10 A	09/11/10 A		E&M0040	E&M0060							
E&M0060	Revision and Resubmission	97	95	19/08/10 A	04/08/11	19/08/10 A	28/06/11	-38d	E&M0050	E&M0430							
E&M0430	Approval from the Engineer	7	60	29/03/11 A	07/08/11	29/03/11 A	30/06/11	-38d	E&M0060	E&M0295							
Equipment Submission & Approval																	
E&M0070	Submission of Membrane Module	50	100	17/05/10 A	05/07/10 A	17/05/10 A	05/07/10 A		KD0020	E&M0090							
E&M0090	Vetting and Comment by ER	14	100	06/07/10 A	19/07/10 A	06/07/10 A	19/07/10 A		E&M0070	E&M0100							
E&M0100	Revision and Resubmission	14	100	20/07/10 A	24/02/11 A	20/07/10 A	24/02/11 A		E&M0090	E&M0160							
E&M0101	Submission of Equipment	90	95	04/08/10 A	04/08/11	04/08/10 A	15/02/11	-170d	E&M0040	E&M0102							
E&M0102	Vetting and Comment by ER	60	95	18/11/10 A	07/08/11	18/11/10 A	18/02/11	-170d	E&M0101	E&M0103							
E&M0103	Revision and Resubmission	60	80	01/02/11 A	19/08/11	01/02/11 A	02/03/11	-170d	E&M0102	E&M0110, E&M0120, E&M0130,							
E&M0110	Approval on Coarse Screens	30	100	25/05/11 A	25/05/11 A	25/05/11 A	25/05/11 A		E&M0103	E&M0390							
E&M0120	Approval on Fine Screens	30	0	19/08/11	18/09/11	29/04/11	28/05/11	-113d	E&M0103	E&M0400, E&M3060							
E&M0130	Approval on Pumps	30	0	19/08/11	18/09/11	03/03/11	01/04/11	-170d	E&M0103	E&M0410, E&M3070							
E&M0140	Approval on Submersible Mixers	30	100	23/03/11 A	23/03/11 A	23/03/11 A	23/03/11 A		E&M0103	E&M0420, E&M3080							
E&M0150	Approval on Grit Removal Equipment	30	0	19/08/11	18/09/11	29/04/11	28/05/11	-113d	E&M0103	E&M0380, E&M3030							
E&M0160	Approval on MBR Membrane Modules (M.M.)	105	100	02/08/10 A	24/02/11 A	02/08/10 A	24/02/11 A		E&M0100	E&M0360, E&M0370, E&M3010							
E&M0170	Approval on Sludge Dewatering Equipment	30	0	19/08/11	18/09/11	03/03/11	01/04/11	-170d	E&M0103	E&M0440, E&M3090							
E&M0180	Approval on Valves, Pipes & Fittings	30	0	19/08/11	18/09/11	28/06/11	27/07/11	-53d	E&M0103	E&M0450, E&M3100							
E&M0190	Approval on Penstocks	30	0	19/08/11	18/09/11	11/06/11	10/07/11	-70d	E&M0103	E&M0460, E&M3110							
E&M0200	Approval on Instrumentation	30	0	19/08/11	18/09/11	09/10/11	07/11/11	51d	E&M0103	E&M0470, E&M3130							
E&M0210	Approval on MCC & LVSB	30	0	19/08/11	18/09/11	03/03/11	01/04/11	-170d	E&M0103	E&M0480, E&M3140							
E&M0220	Approval on BS Equipment	30	0	30/08/11	28/09/11	31/07/11	29/08/11	-30d	E&M0103, E&M0280	E&M0490, E&M3150							
E&M0230	Approval on FS Equipment	30	0	30/08/11	28/09/11	01/06/11	30/06/11	-90d	E&M0103, E&M0290	E&M0295, E&M0320, E&M0500,							
Drawings Submission & Approval																	
E&M0235	Sub. P&ID Drawings	100	100	24/06/10 A	22/08/10 A	24/06/10 A	22/08/10 A		E&M0010								
E&M0240	Sub. Plant GA Drawings	45	90	04/08/10 A	04/08/11	04/08/10 A	30/06/11	-35d	E&M0040	E&M0250, E&M0280, E&M0290							
E&M0250	Sub. Builder's Works Requirements Drawings	15	90	04/08/10 A	10/08/11	04/08/10 A	01/07/11	-40d	E&M0240, E&M0260, E&M0270	E&M0280, E&M0290							
E&M0260	Sub. Mechanical Installation Drawings	60	85	27/09/10 A	08/08/11	27/09/10 A	30/06/11	-40d	E&M0040	E&M0250							
E&M0270	Sub. Electrical Installation Drawings	60	85	27/09/10 A	08/08/11	27/09/10 A	30/06/11	-40d	E&M0040	E&M0250, E&M0280							
E&M0280	Sub. BS Installation Drawings	120	75	27/09/10 A	29/08/11	27/09/10 A	30/07/11	-30d	E&M0240, E&M0250, E&M0270	E&M0220							
E&M0290	Sub. FS Installation Drawings	120	75	13/11/10 A	29/08/11	13/11/10 A	31/05/11	-90d	E&M0240, E&M0250	E&M0230							
Statutory Submission																	
E&M0295	Preparation of Submission to HEC	39	0	29/09/11	06/11/11	01/07/11	08/08/11	-90d	E&M0080, E&M0230, E&M0430	E&M0300							

Start date	05/05/10		Early bar
Finish date	13/03/15		Progress bar
Data date	31/07/11		Critical bar
Run date	08/08/11		Summary bar
Page number	1A		Progress point
			Critical point
			Summary point
			Start milestone point
			Finish milestone point

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

(Marked on 31 Jul 2011)

Date	Revision	Checked	Approved
31/07/10	Revision 0	StL	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	2011																			
											MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC												
E&M0300	Application & Approval from HEC	150	0	07/11/11	04/04/12	09/08/11	05/01/12	-90d	E&M0295	E&M0305																				
E&M0320	Form 314 Submission to FSD	14	0	29/09/11	12/10/11	15/04/12	28/04/12	199d	E&M0290	E&M0325, E&M0670																				
E&M0325	Submission to WSD	14	0	13/10/11	26/10/11	29/04/12	12/05/12	199d	E&M0320	E&M0670, E&M0680																				
E&M0350	Form 501 Submission to FSD (PS1 & PS2)	28	0	27/11/11	25/12/11	04/02/15	13/03/15	1103d	E&M2016																					
Yung Shue Wan																														
Preliminary																														
YSW0020	Approval of Environmental Team	16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A		KD0020	YSW0030, YSW0040																				
YSW0030	Baseline monitoring (Air & Noise)	14	100	31/07/10 A	22/08/10 A	31/07/10 A	22/08/10 A		YSW0020	YSW0035																				
YSW0035	Baseline Monitoring Report Submission (A & N)	14	100	23/08/10 A	07/09/10 A	23/08/10 A	07/09/10 A		YSW0030	YSW0120, YSW0152, YSW0500,																				
YSW0040	Baseline monitoring (Water)	213	100	30/07/10 A	31/12/10 A	30/07/10 A	31/12/10 A		YSW0020	YSW0350																				
YSW0050	Erect Hoarding and Fencing	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A																							
Section W1 - Slope Works in Portion A & C																														
YSW0075	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020	YSW0100																				
YSW0080	Site Clearance	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A			YSW0085, YSW0120																				
YSW0085	Initial Survey	14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A		YSW0080	YSW0120																				
YSW0090	Verify the Rock Boulder required Stablization Wk	30	100	19/07/10 A	21/03/11 A	19/07/10 A	21/03/11 A			YSW0100, YSW0110																				
YSW0100	Removal of Rock Boulder	280	100	20/09/10 A	03/06/11 A	20/09/10 A	03/06/11 A		YSW0075, YSW0090	YSW0150																				
YSW0110	Stablizing work for rock boulder	280	50	16/07/11 A	17/12/11 A	16/07/11 A	15/08/11 A	-124d	YSW0090	YSW0150																				
YSW0120	Cut the slope to design profile	100	100	13/09/10 A	14/09/10 A	13/09/10 A	14/09/10 A		YSW0035, YSW0080, YSW0085	YSW0131, YSW0165																				
YSW0131	Mobilization of Plant and Material of Soil Nails	20	100	01/09/10 A	14/09/10 A	01/09/10 A	14/09/10 A		YSW0120	YSW0132																				
YSW0132	Erect Scaffold and Working Platform	20	100	15/09/10 A	16/09/10 A	15/09/10 A	16/09/10 A		YSW0131	YSW0133																				
YSW0133	Setting out and Verify Locations of Soil Nails	10	100	14/09/10 A	31/10/10 A	14/09/10 A	31/10/10 A		YSW0132	YSW0134																				
YSW0134	Drilling and Soil Nails Installation	20	100	08/10/10 A	19/11/10 A	08/10/10 A	19/11/10 A		YSW0133	YSW0135																				
YSW0135	Construction of Nail Heads	10	100	24/11/10 A	01/12/10 A	24/11/10 A	01/12/10 A		YSW0134	YSW0136																				
YSW0136	Mesh Installation on Cut Slope	10	100	04/12/10 A	04/12/10 A	04/12/10 A	04/12/10 A		YSW0135	YSW0137																				
YSW0137	Hydroseeding	30	0	31/07/11 A	29/08/11 A	27/06/11 A	27/07/11 A	-33d	YSW0136	YSW0140																				
YSW0140	Construct U-channels & Step Channel on Cut Slope	116	90	02/04/11 A	10/09/11 A	02/04/11 A	08/08/11 A	-33d	YSW0137	YSW0150																				
YSW0150	Construction of access, u-channels and catch pit	76	90	10/01/11 A	17/12/11 A	10/01/11 A	15/08/11 A	-124d	YSW0100, YSW0110, YSW0140,	KD0030																				
YSW0165	Construction of Barrier Wall (below Ground Lev)	226	92	10/09/10 A	18/08/11 A	10/09/10 A	08/08/11 A	-10d	YSW0120	YSW0150, YSW0154, YSW0155																				
Section W2 - YSW STW & Submarine Outfall																														
Civil & Structural Work																														
YSW0412	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020	YSW0422																				
YSW0422	Site Clearance	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A		KD0020, YSW0412	YSW0432, YSW0500, YSW0610,																				
YSW0432	Initial Survey	14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A		YSW0422	YSW0510																				
YSW STP - GL H - T																														
YSW0500	ELS & Excavation for Inlet Pumping Station	62	100	17/09/10 A	16/12/10 A	17/09/10 A	16/12/10 A		YSW0035, YSW0422	YSW0510																				
YSW0510	Sub-structure construction (Inlet Pumping Stn)	30	100	17/12/10 A	04/04/11 A	17/12/10 A	04/04/11 A		YSW0432, YSW0500	YSW0520																				
YSW0520	Backfill & Remove ELS (Inlet Pumping Stn)	30	100	03/01/11 A	05/05/11 A	03/01/11 A	05/05/11 A		YSW0510	YSW0530, YSW0610																				
YSW0530	ELS & Excavation for Equalization Tank	40	100	11/01/11 A	08/06/11 A	11/01/11 A	08/06/11 A		YSW0520	YSW0540																				
YSW0540	Sub-structure construction (Equalization Tank)	40	85	13/06/11 A	05/08/11 A	13/06/11 A	13/02/11 A	-173d	YSW0530	YSW0550																				
YSW0550	Backfilling & Remove ELS (Equalization Tank)	40	0	06/08/11 A	14/09/11 A	14/02/11 A	25/03/11 A	-173d	YSW0540	YSW0570																				
YSW0570	Excavate to formation by open cut	30	80	02/07/11 A	20/09/11 A	02/07/11 A	31/03/11 A	-173d	YSW0550	YSW0580																				
YSW0580	Base slab construction	30	10	06/07/11 A	17/10/11 A	06/07/11 A	27/04/11 A	-173d	YSW0570	YSW0590																				
YSW0590	G/F to 1/F construction	50	0	18/10/11 A	06/12/11 A	28/04/11 A	16/06/11 A	-173d	YSW0580	YSW0600																				
YSW STP - GL T - X																														
YSW0610	Excavate to formation	50	100	08/09/10 A	17/09/10 A	08/09/10 A	17/09/10 A		YSW0035, YSW0422, YSW0520	YSW0620																				
YSW0620	Base slab construction	60	100	18/09/10 A	23/05/11 A	18/09/10 A	23/05/11 A		YSW0610	YSW0630																				
YSW0630	G/F to 1/F construction	95	100	27/12/10 A	19/07/11 A	27/12/10 A	19/07/11 A		YSW0620	YSW0640																				
YSW0640	1/F to Roof Construction	91	10	20/07/11 A	20/10/11 A	20/07/11 A	21/08/11 A	-60d	YSW0630	YSW0810, YSW0840																				
YSW0810	ABWF Installation	86	0	30/08/11 A	24/11/11 A	02/07/11 A	25/09/11 A	-60d	YSW0640	E&M0610, E&M0620, E&M0630,																				
YSW STP - GL F - H & DN Tanks																														
YSW0650	ELS & Excavation for DN Tanks	70	100	21/08/10 A	14/10/10 A	21/08/10 A	14/10/10 A		YSW0035, YSW0422	YSW0660																				
YSW0660	Sub-structure construction (DN Tanks)	40	100	15/10/10 A	31/12/10 A	15/10/10 A	31/12/10 A		YSW0650	YSW0670																				
YSW0670	Backfill & Remove ELS (DN Tanks)	32	100	08/01/11 A	15/03/11 A	08/01/11 A	15/03/11 A		YSW0660	YSW0680																				
YSW0680	Base slab construction	30	100	16/03/11 A	28/03/11 A	16/03/11 A	28/03/11 A		YSW0670	YSW0690																				

Start date 05/05/10
 Finish date 13/03/15
 Date date 31/07/11
 Run date 08/08/11
 Page number 2A

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Progress point
- Critical point
- Summary point
- Start milestone point
- Finish milestone point

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

(Marked on 31 Jul 2011)

Date	Revision	Checked	Approved
31/07/10	Revision 0	StL	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	2011								
											MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
SKW0250	Approval of Environmental Team	16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A		KD0020	SKW0260									
SKW0260	Baseline monitoring (Air & Noise)	14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A		SKW0250	SKW0242, SKW0265, SKW0592,									
SKW0265	Baseline Monitoring Submission (A & N)	14	100	16/06/10 A	08/07/10 A	16/06/10 A	08/07/10 A		SKW0260	SKW0242, SKW0592, SKW0681,									
Section W3 - Footpath Diversion in Portion G																			
Civil & Geotechnical Works																			
SKW0240	Site Clearance	21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A			SKW0241									
SKW0241	Initial Survey	9	100	07/06/10 A	15/06/10 A	07/06/10 A	15/06/10 A		SKW0240	SKW0242									
SKW0242	Excavation to formation for Bay 1 to 5	50	100	16/06/10 A	11/08/10 A	16/06/10 A	11/08/10 A		SKW0241, SKW0260, SKW0265	SKW0251									
SKW0251	Drill & Install Dowel Bar for Bay 1 & 3	20	100	02/08/10 A	01/09/10 A	02/08/10 A	01/09/10 A		SKW0242	SKW0301									
SKW0301	Erect Formwork, mesh & weep hole for Bay 1 & 3	12	100	02/09/10 A	15/09/10 A	02/09/10 A	15/09/10 A		SKW0251	SKW0311									
SKW0311	Concreting for Bay 1 & 3	12	100	19/06/10 A	29/09/10 A	19/06/10 A	29/09/10 A		SKW0301	SKW0321									
SKW0321	Drilling & install Dowel Bar for Bay 2 & 5	6	100	30/09/10 A	06/10/10 A	30/09/10 A	06/10/10 A		SKW0311	SKW0331									
SKW0331	Erect Formwork, mesh & weep hole for Bay 2 & 5	7	100	07/10/10 A	13/10/10 A	07/10/10 A	13/10/10 A		SKW0321	SKW0341									
SKW0341	Concreting for Bay 2 & 5	7	100	14/10/10 A	20/10/10 A	14/10/10 A	20/10/10 A		SKW0331	SKW0351									
SKW0351	Excavation to formation for Bay 6 to 9	20	100	21/10/10 A	10/11/10 A	21/10/10 A	10/11/10 A		SKW0341	SKW0361									
SKW0361	Drill & install dowel Bar for Bay 4 & 7	6	100	11/11/10 A	16/11/10 A	11/11/10 A	16/11/10 A		SKW0351	SKW0371									
SKW0371	Erect formwork, mesh & weep hole for Bay 4 & 7	7	100	11/11/10 A	16/11/10 A	11/11/10 A	16/11/10 A		SKW0361	SKW0381									
SKW0381	Concreting for Bay 4 & 7	7	100	17/11/10 A	23/11/10 A	17/11/10 A	23/11/10 A		SKW0371	SKW0391									
SKW0391	Drill & install dowel Bar for Bay 6 & 9	3	100	24/11/10 A	27/11/10 A	24/11/10 A	27/11/10 A		SKW0381	SKW0401									
SKW0401	Erect formwork, mesh & weep hole for Bay 6 & 9	7	100	28/11/10 A	05/12/10 A	28/11/10 A	05/12/10 A		SKW0391	SKW0411									
SKW0411	Concreting for Bay 6 & 9	7	100	06/12/10 A	12/12/10 A	06/12/10 A	12/12/10 A		SKW0401	SKW0421									
SKW0421	Drill & install dowel Bar for Bay 8	1	100	13/12/10 A	13/12/10 A	13/12/10 A	13/12/10 A		SKW0411	SKW0431									
SKW0431	Erect formwork, mesh & weep hole for Bay 8	4	100	15/12/10 A	21/12/10 A	15/12/10 A	21/12/10 A		SKW0421	SKW0441									
SKW0441	Concreting for Bay 8	4	100	22/12/10 A	27/12/10 A	22/12/10 A	27/12/10 A		SKW0431	SKW0461									
SKW0461	Excavation for no fine concrete Bay (1-9)	3	100	26/07/11 A	28/07/11 A	26/07/11 A	28/07/11 A		SKW0441	SKW0471									
SKW0471	Concreting for no fine concrete	7	100	01/02/11 A	07/02/11 A	01/02/11 A	07/02/11 A		SKW0461	SKW0481									
SKW0481	Installation of Wall tie & stone facing	14	100	08/02/11 A	11/02/11 A	08/02/11 A	11/02/11 A		SKW0471	SKW0491									
SKW0491	Construction of Gabion Wall	7	100	08/02/11 A	14/02/11 A	08/02/11 A	14/02/11 A		SKW0481	SKW0501									
SKW0501	Place Geotextile	3	100	08/01/11 A	28/02/11 A	08/01/11 A	28/02/11 A		SKW0491	SKW0511									
SKW0511	Backfill behind the retaining wall to approx. +4	7	100	11/01/11 A	28/02/11 A	11/01/11 A	28/02/11 A		SKW0501	SKW0521									
SKW0521	Watermain Laying and Diversion	14	100	01/04/11 A	10/05/11 A	01/04/11 A	10/05/11 A		SKW0511	SKW0531									
SKW0531	Concreting for Pavement	7	100	02/06/11 A	30/07/11 A	02/06/11 A	30/07/11 A		SKW0521	SKW0541									
SKW0541	Installation of Flower Pot	7	0	31/07/11	06/08/11	15/02/11	22/02/11	-166d	SKW0531	SKW0551									
SKW0551	Permanent Footpath Diversion	1	100	30/07/11 A	30/07/11 A	30/07/11 A	30/07/11 A		SKW0541	KD0050, SKW1261, SKW1311									
Section W4 - Slope Works in Portions H & I																			
Geotechnical Works																			
SKW0588	Construct scaffolding access	30	100	15/06/10 A	14/07/10 A	15/06/10 A	14/07/10 A		KD0020	SKW0590									
SKW0590	Site Clearance for Slope	100	100	15/07/10 A	22/10/10 A	15/07/10 A	22/10/10 A		SKW0588	SKW0591									
SKW0591	Initial Survey for Slope	28	100	21/09/10 A	18/10/10 A	21/09/10 A	18/10/10 A		SKW0590	SKW0592									
SKW0592	Temporary Rockfall fence at ex. Footpath	43	100	19/10/10 A	06/01/11 A	19/10/10 A	06/01/11 A		SKW0260, SKW0265, SKW0591	SKW05931									
SKW05931	Construction of Haul Road (To +21mPD)	50	100	28/11/10 A	30/12/10 A	28/11/10 A	30/12/10 A		SKW0592	SKW05932									
SKW05932	Construction of Haul Road (To +42mPD)	60	100	15/12/10 A	31/01/11 A	15/12/10 A	31/01/11 A		SKW05931	SKW05933, SKW05940, SKW0595									
SKW05933	Excavation of Rock Berm (+50mPD to +42.5mPD)	30	100	01/03/11 A	03/05/11 A	01/03/11 A	03/05/11 A		SKW05932	SKW05934									
SKW05934	Excavation of Rock Berm (+42.5mPD to +35mPD)	30	100	04/05/11 A	31/05/11 A	04/05/11 A	31/05/11 A		SKW05933	SKW05935, SKW05941									
SKW05935	Excavation of Rock Berm (+35mPD to +27.5mPD)	30	20	02/07/11 A	23/08/11	02/07/11 A	21/03/11	-155d	SKW05934	SKW05936									
SKW05936	Excavation of Rock Berm (+27.5mPD to +20mPD)	30	0	24/08/11	22/09/11	22/03/11	20/04/11	-155d	SKW05935	SKW05937, SKW05942									
SKW05937	Excavation of Rock Berm (+20mPD to +12.5mPD)	30	0	23/09/11	22/10/11	21/04/11	20/05/11	-155d	SKW05936	SKW05938									
SKW05938	Excavation of Rock Berm (+12.5mPD to +5mPD)	28	0	23/10/11	19/11/11	21/05/11	17/06/11	-155d	SKW05937	SKW05943, SKW1311, SKW1371									
SKW05940	Slope Drainage & Misc. at 50mPD	60	100	01/04/11 A	03/05/11 A	01/04/11 A	03/05/11 A		SKW05932	SKW05941									
SKW05941	Slope Drainage & Misc. (+50 to +35mPD)	60	40	04/05/11 A	04/09/11	04/05/11 A	20/04/11	-137d	SKW05934, SKW05940	SKW05942									
SKW05942	Slope Drainage & Misc. (+35 to +20mPD)	58	0	23/09/11	19/11/11	21/04/11	17/06/11	-155d	SKW05936, SKW05941	SKW05943									
SKW0595	Rock Meshing & Rockfall Fence	260	0	31/07/11	15/04/12	29/11/10	15/08/11	-244d	SKW05932	KD0060									
Section W5 - P.S. No. 1 in Portion D																			
Civil & Geotechnical Works																			
SKW0651	Site Clearance	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A		KD0020	SKW0652									
SKW0652	Initial Survey	7	100	24/05/10 A	30/05/10 A	24/05/10 A	30/05/10 A		SKW0651	SKW0661, SKW0681									

Start date 05/05/10
 Finish date 13/03/15
 Data date 31/07/11
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Early bar
 Progress bar
 Critical bar
 Summary bar
 Progress point
 Critical point
 Summary point
 Start milestone point
 Finish milestone point

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
 Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

(Marked on 31 Jul 2011)

Date	Revision	Checked	Approved
31/07/10	Revision 0	StL	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	2011											
											MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC				
SKW0661	Transplantation for uncommon vegetation	30	100	31/05/10 A	29/06/10 A	31/05/10 A	29/06/10 A		SKW0652	SKW0681												
SKW0681	Excavate to lower the working platform to +3mPD	49	100	30/06/10 A	17/08/10 A	30/06/10 A	17/08/10 A		SKW0260, SKW0265, SKW0652	SKW0691												
SKW0691	ELS to +2.2mPD	40	100	18/08/10 A	26/09/10 A	18/08/10 A	26/09/10 A		SKW0681	SKW0721												
SKW0721	Excavate to formation	92	100	17/09/10 A	31/03/11 A	17/09/10 A	31/03/11 A		SKW0691	SKW0741												
Structural Works																						
SKW0741	Base Slab (BSD2 & BSD3)	15	100	20/04/11 A	28/07/11 A	20/04/11 A	28/07/11 A		SKW0721	SKW0751												
SKW0751	Wall & Column (CA1-3, CB1-3, CC1-3, CD1-2) Approx.	14	0	31/07/11	13/08/11	01/01/11	14/01/11	-211d	SKW0741	SKW0761												
SKW0761	Base Slab (BSD1) to +3.98	14	0	13/08/11	26/08/11	14/01/11	27/01/11	-211d	SKW0751	SKW0771												
SKW0771	Wall & Column (CA1-3, CB1-3, CC1-3, CD1-2) to +6.3	14	0	26/08/11	08/09/11	27/01/11	09/02/11	-211d	SKW0761	SKW0781												
SKW0781	Base Slab (GSB1-3, GSC1-5, GSD1-2)	14	0	08/09/11	21/09/11	09/02/11	22/02/11	-211d	SKW0771	SKW0791												
SKW0791	Base Slab (GSE1 & GSF1)	14	0	21/09/11	04/10/11	22/02/11	07/03/11	-211d	SKW0781	SKW0801												
SKW0801	Wall & Column (CE1-3, CF1-3)	14	0	04/10/11	17/10/11	07/03/11	20/03/11	-211d	SKW0791	SKW0811												
SKW0811	Ground Beam (GB1-1, 2 GB2-1, 2 GB3-1, GBA-1, GBB1-4)	14	0	18/10/11	31/10/11	21/03/11	03/04/11	-211d	SKW0801	SKW0821												
SKW0821	Wall & Column (CA1-3, CB1-3, CC1-3, CD1-2) to +10.	14	0	01/11/11	14/11/11	04/04/11	17/04/11	-211d	SKW0811	SKW0831												
SKW0831	Roof Beams & Parapet	14	0	15/11/11	28/11/11	18/04/11	01/05/11	-211d	SKW0821	E&M1101, E&M1102, E&M1103,												
SKW0841	ABWF installation	45	0	15/11/11	29/12/11	18/04/11	01/06/11	-211d	SKW0831	E&M1101, E&M1102, E&M1103,												
SKW0861	300mm U-channel & 675mm Step Channel	168	0	29/11/11	14/05/12	01/06/11	15/11/11	-181d	SKW0831, SKW0841	KD0070												
Section W 6 - Sewer and PS No.2 in Portions E&H																						
Civil & Geotechnical Works																						
SKW0881	Site Clearance	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A		KD0020	SKW0891												
SKW0891	Plant mobilization	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A		SKW0881	SKW0892												
SKW0892	Initial Survey	30	100	24/05/10 A	22/06/10 A	24/05/10 A	22/06/10 A		SKW0891	SKW0901												
SKW0901	Tree Transplantation	30	100	23/06/10 A	22/07/10 A	23/06/10 A	22/07/10 A		SKW0892	SKW0921												
SKW0921	Cut Slope & U-Channel	14	100	23/07/10 A	31/01/11 A	23/07/10 A	31/01/11 A		SKW0260, SKW0265, SKW0901	SKW0931, SKW0951												
SKW0931	Hoarding & Fencing	14	100	15/09/10 A	07/10/10 A	15/09/10 A	07/10/10 A		SKW0921	SKW0951												
SKW0951	Excavate to formation	106	100	04/10/10 A	13/06/11 A	04/10/10 A	13/06/11 A		SKW0921, SKW0931	SKW0961, SKW0971												
SKW0961	Mass Conc. Retaining Wall	257	0	31/07/11	12/04/12	04/03/11	15/11/11	-149d	SKW0951	KD0080												
SKW1491	Concrete Trough (ChA0+45 - ChA1+75)	180	97	01/03/11 A	05/08/11	01/03/11 A	19/04/11	-108d	PRE0100	SKW15111												
SKW15111	Twin DN150 DI Rising Main (ChA0+45 - ChA5+79)	150	25	16/05/11 A	25/11/11	16/05/11 A	09/08/11	-108d	SKW1491	SKW1531												
SKW1531	Extent village sewers S163.1 & S164.1	34	0	25/11/11	29/12/11	10/08/11	12/09/11	-108d	SKW15111	SKW1581												
Structural Works																						
SKW0971	Base Slab to -3.2mPD	14	40	02/05/11 A	08/08/11	02/05/11 A	17/12/10	-233d	SKW0951	SKW0981												
SKW0981	Basement Beam (BBB-1, BBC-1, BBD-1)	14	0	08/08/11	22/08/11	18/12/10	31/12/10	-233d	SKW0971	SKW0991												
SKW0991	Wall & Column to +1.5mPD	14	0	22/08/11	05/09/11	01/01/11	14/01/11	-233d	SKW0981	SKW1001												
SKW1001	Base Slab (BSC-4) to +3mPD	14	0	05/09/11	19/09/11	15/01/11	28/01/11	-233d	SKW0991	SKW1011												
SKW1011	Wall & Column to +5.35mPD	14	0	19/09/11	03/10/11	29/01/11	11/02/11	-233d	SKW1001	SKW1021												
SKW1021	Ground Slab	20	0	03/10/11	23/10/11	12/02/11	03/03/11	-233d	SKW1011	SKW1031												
SKW1031	Ground Beam	14	0	23/10/11	06/11/11	04/03/11	17/03/11	-233d	SKW1021	SKW1041												
SKW1041	Wall & Column to +9.35mPD	14	0	06/11/11	20/11/11	18/03/11	31/03/11	-233d	SKW1031	SKW1051												
SKW1051	Roof Beams & Parapet	14	0	20/11/11	04/12/11	01/04/11	14/04/11	-233d	SKW1041	E&M2101, E&M2102, E&M2103,												
SKW1061	ABWF installation (wet tray/dry tray)	90	0	20/11/11	18/02/12	18/04/11	16/07/11	-216d	SKW1051	E&M2101, E&M2102, E&M2103,												
SKW1081	375mm U-channel with catchpits	215	0	04/12/11	06/07/12	15/04/11	15/11/11	-233d	SKW1051	KD0080												
E&M Works (PS2)																						
Submission & Delivery																						
E&M2001	Submission of Pumps	198	95	17/05/10 A	09/08/11	17/05/10 A	02/02/11	-188d	KD0020	E&M2011												
E&M2002	Submission of Gen-Set	198	95	17/05/10 A	09/08/11	17/05/10 A	02/02/11	-188d		E&M2012												
E&M2003	Submission of DeO System	198	95	17/05/10 A	09/08/11	17/05/10 A	02/02/11	-188d		E&M2013												
E&M2004	Submission of LV SB & MCC	271	95	17/05/10 A	13/08/11	17/05/10 A	13/02/11	-181d		E&M2014												
E&M2005	Submission of Instrumentation	243	95	17/05/10 A	12/08/11	17/05/10 A	31/01/11	-192d		E&M2015												
E&M2006	Submission of FS System	243	95	17/05/10 A	12/08/11	17/05/10 A	14/01/11	-209d		E&M2016												
E&M2007	Submission of BS System	243	95	17/05/10 A	12/08/11	17/05/10 A	14/01/11	-209d		E&M2017												
E&M2011	Delivery of Pumps	150	0	09/08/11	06/01/12	03/02/11	02/07/11	-188d	E&M2001	E&M2101												
E&M2012	Delivery of Gen-Set	150	0	09/08/11	06/01/12	03/02/11	02/07/11	-188d	E&M2002	E&M2102												
E&M2013	Delivery of DeO System	150	0	09/08/11	06/01/12	03/02/11	02/07/11	-188d	E&M2003	E&M2103												
E&M2014	Delivery of LV SB & MCC	150	0	31/07/11	27/12/11	03/12/10	01/05/11	-240d	E&M2004	E&M2104												
E&M2015	Delivery of Instrumentation	90	0	12/08/11	10/11/11	01/02/11	01/05/11	-192d	E&M2005	E&M2105												

Start date	05/05/10		Early bar
Finish date	13/03/15		Progress bar
Data date	31/07/11		Critical bar
Run date	08/08/11		Summary bar
Page number	5A		Progress point
			Critical point
			Summary point
			Start milestone point
			Finish milestone point

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
 Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

Date	Revision	Checked	Approved
31/07/10	Revision 0	StL	VC

(Marked on 31 Jul 2011)

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	2011							
											MAY	JUN	JUL	AUG	SEP	OCT	NOV	
E&M2016	Delivery of FS Equipment	107	0	12/08/11	27/11/11	15/01/11	01/05/11	-209d	E&M2006	E&M0350, E&M2106								
E&M2017	Delivery of BS Equipment	107	0	12/08/11	27/11/11	15/01/11	01/05/11	-209d	E&M2007	E&M2107								
Installation, T&C																		
E&M2105	Install Instrumentation	55	0	04/12/11	28/01/12	02/05/11	25/06/11	-216d	E&M2015, SKW1051, SKW1061	E&M2140								
E&M2106	Install FS Equipment	55	0	04/12/11	28/01/12	02/05/11	25/06/11	-216d	E&M2016, SKW1051, SKW1061	E&M2140								
E&M2107	Install BS Equipment	55	0	04/12/11	28/01/12	02/05/11	25/06/11	-216d	E&M2017, SKW1051, SKW1061	E&M2110, E&M2140								
Section W7 - SKW STW, Sewer and Submarine Outfall																		
Submarine Outfall																		
SKW1130	Approval of IHS Consultant	180	100	17/05/10 A	27/08/10 A	17/05/10 A	27/08/10 A			SKW1131								
SKW1131	Hydrographical Survey (SKW)	300	100	01/02/11 A	28/02/11 A	01/02/11 A	28/02/11 A		KD0020, SKW1130	SKW1231								
SKW1141	Baseline Monitoring (Water)	213	100	27/07/10 A	31/12/10 A	27/07/10 A	31/12/10 A		SKW0260, SKW0265	SKW1151								
SKW1151	Set up Temporary Working Platform	185	80	15/06/11 A	05/09/11	15/06/11 A	15/09/11	10d	PRE0090, SKW1141	SKW1171								
SKW STW																		
Submission & Delivery (E&M)																		
E&M3010	Delivery of MBR M.M. - 1st shipment for Temp STP	150	0	31/07/11	27/12/11	10/03/14	20/08/14	953d	E&M0160	E&M3170								
E&M3030	Delivery of Grit Removal Equipment	180	0	18/09/11	16/03/12	31/08/11	26/02/12	-19d	E&M0150	E&M3190								
E&M3060	Delivery of Fine Screens	136	0	18/09/11	01/02/12	15/08/11	28/12/11	-35d	E&M0120	E&M3210								
E&M3070	Delivery of Pumps	136	0	18/09/11	01/02/12	15/08/11	28/12/11	-35d	E&M0130	E&M3220								
E&M3080	Delivery of Submersible Mixers	180	0	19/08/11	15/02/12	15/09/11	12/03/12	27d	E&M0140	E&M3230								
E&M3090	Delivery of Sludge Dewatering Equipment	210	0	18/09/11	15/04/12	18/07/11	12/02/12	-63d	E&M0170	E&M3240								
E&M3100	Delivery of Valves, Pipes & Fittings	180	0	18/09/11	16/03/12	22/12/13	19/06/14	826d	E&M0180	E&M3250								
E&M3110	Delivery of Penstocks	180	0	18/09/11	16/03/12	04/01/14	02/07/14	839d	E&M0190	E&M3260								
E&M3130	Delivery of Instruments	180	0	18/09/11	16/03/12	20/03/14	15/10/14	914d	E&M0200	E&M3270								
E&M3140	Delivery of MCC LVSB	180	0	18/09/11	16/03/12	09/05/11	04/11/11	-133d	E&M0210	E&M3261								
E&M3150	Delivery of BS Equipment	180	0	29/09/11	26/03/12	06/01/14	04/07/14	830d	E&M0220	E&M3291								
E&M3160	Delivery of FS Equipment	180	0	29/09/11	26/03/12	14/01/12	11/07/12	107d	E&M0230	E&M0340, E&M3300								
Construction of Grid A-G																		
SKW1261	Excavate for SKW STW Structure (Grid A -G)	164	5	30/07/11 A	09/01/12	30/07/11 A	27/07/11	-166d	SKW0551	SKW1271, SKW1371								
Construction of Grid G-N																		
SKW1311	Excavate for SKW STW Structure (Grid G-N)	36	0	20/11/11	25/12/11	29/06/11	03/08/11	-144d	SKW0551, SKW0598	SKW1321								
Rising Main																		
SKW1481	Subm, Approval & Delivery of DI pipes	120	100	17/05/10 A	28/02/11 A	17/05/10 A	28/02/11 A		KD0020	SKW1501								
SKW1501	Concrete Trough (ChB0+00 - ChB1+20)	300	0	31/07/11	25/05/12	14/09/10	10/07/11	-320d	PRE0100, SKW1481	SKW1521								
Section W8 - Landscape Softworks in All Portions																		
SKW1591	Tree Survey	21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A		KD0020	SKW1621								
SKW1611	Preservation & Protection of Trees	822	55	17/05/10 A	03/08/12	17/05/10 A	03/08/12	0	KD0020	KD0100, SKW1631								
SKW1621	Transplantation at SKW	60	100	07/06/10 A	05/10/10 A	07/06/10 A	05/10/10 A		SKW1591									

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- Start milestone point
- Finish milestone point

Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
 Construction of Sewage Treatment Works at YSW & SKW
 3-month Rolling Programme (Aug 2011 - Oct 2011)

(Marked on 31 Jul 2011)

Date	Revision	Checked	Approved
31/07/10	Revision 0	StL	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	2011							
											MAY	JUN	JUL	AUG	SEP	OCT	NOV	
+Project Key Date																		
		451	0	05/05/10 A	01/12/11	05/05/10 A	30/06/11	-154d										
+Preliminary (Civil)																		
		191	100	17/05/10 A	23/11/10 A	17/05/10 A	23/11/10 A		KD0020									
Preliminary (E&M)																		
Technical Submission																		
+Process Design of SKWSTW & YSWSTW																		
		457	92	17/05/10 A	16/08/11	17/05/10 A	30/06/11	-47d										
+Hydraulic Design																		
		448	95	17/05/10 A	07/08/11	17/05/10 A	30/06/11	-38d										
+Equipment Submission & Approval																		
		500	58	17/05/10 A	28/09/11	17/05/10 A	07/11/11	40d										
+Drawings Submission & Approval																		
		432	84	24/06/10 A	29/08/11	24/06/10 A	30/07/11	-30d										
+Statutory Submission																		
		189	0	29/09/11	04/04/12	01/07/11	13/03/15	1001d										
Yung Shue Wan																		
+Preliminary																		
		229	100	17/05/10 A	31/12/10 A	17/05/10 A	31/12/10 A											
+Section W 1 - Slope Works in Portion A & C																		
		580	84	17/05/10 A	17/12/11	17/05/10 A	15/08/11	-124d										
Section W 2 - YSW STW & Submarine Outfall																		
+Civil & Structural Work																		
		668	56	17/05/10 A	15/03/12	17/05/10 A	04/05/12	51d										
+Submarine Outfall																		
		612	83	17/05/10 A	18/01/12	17/05/10 A	17/10/13	638d										
+E&M Works - YSW STP																		
		283	6	18/06/11 A	26/03/12	02/04/11 A	05/05/12	40d										
Sok Kwu Wan																		
+Preliminary																		
		53	100	17/05/10 A	08/07/10 A	17/05/10 A	08/07/10 A											
Section W 3 - Footpath Diversion in Portion G																		
+Civil & Geotechnical Works																		
		447	98	17/05/10 A	06/08/11	17/05/10 A	30/07/11	-166d										
Section W 4 - Slope Works in Portions H & I																		
+Geotechnical Works																		
		671	50	15/06/10 A	15/04/12	15/06/10 A	15/08/11	-244d										
Section W 5 - P.S. No. 1 in Portion D																		
+Civil & Geotechnical Works																		
		319	100	17/05/10 A	31/03/11 A	17/05/10 A	31/03/11 A											
+Structural Works																		
		391	4	20/04/11 A	14/05/12	01/01/11 A	15/11/11	-181d										
Section W 6 - Sewer and PS No.2 in Portions E&H																		
+Civil & Geotechnical Works																		
		697	51	17/05/10 A	12/04/12	17/05/10 A	15/11/11	-149d										
+Structural Works																		
		431	1	02/05/11 A	06/07/12	18/12/10 A	15/11/11	-233d										
E&M Works (PS2)																		
+Submission & Delivery																		
		600	61	17/05/10 A	06/01/12	17/05/10 A	02/07/11	-188d										
+Installation, T&C																		
		55	0	04/12/11	28/01/12	02/05/11	25/06/11	-216d										
Section W 7 - SKW STW, Sewer and Submarine Outfall																		
+Submarine Outfall																		
		477	96	17/05/10 A	05/09/11	17/05/10 A	15/09/11	10d										

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Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Aug 2011 - Oct 2011)










(Outline page 1 of 2)

(Marked on 31 Jul 2011)

Date	Revision	Checked	Approved
31/07/10	Revision 0	StL	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	Predecessors	Successors	2011						
											MAY	JUN	JUL	AUG	SEP	OCT	NOV
SKW STW																	
+Submission & Delivery (E&M)																	
		260	0	31/07/11	15/04/12	09/05/11	15/10/14	884d									
+Construction of Grid A-G																	
		164	5	30/07/11 A	09/01/12	30/07/11 A	27/07/11	-166d									
+Construction of Grid G-N																	
		36	0	20/11/11	25/12/11	29/06/11	03/08/11	-144d									
+Rising Main																	
		740	29	17/05/10 A	25/05/12	17/05/10 A	10/07/11	-320d									
+Section W 8 - Landscape Softworks in All Portions																	
		810	59	17/05/10 A	03/08/12	17/05/10 A	03/08/12	0									

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Leader Civil Engineering Corp. Ltd.
 Contract No. DC/2009/13
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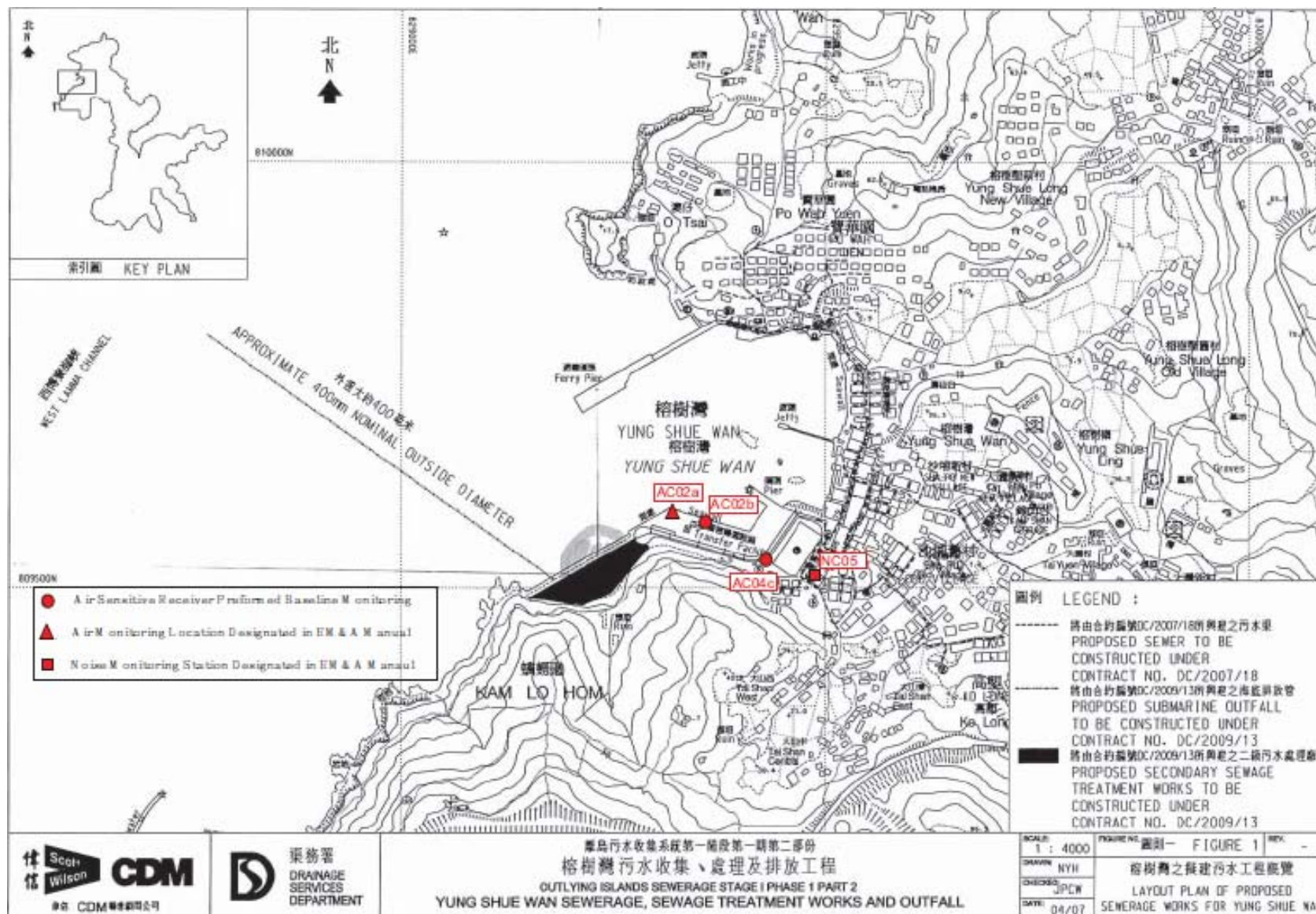
(Outline page 2 of 2)

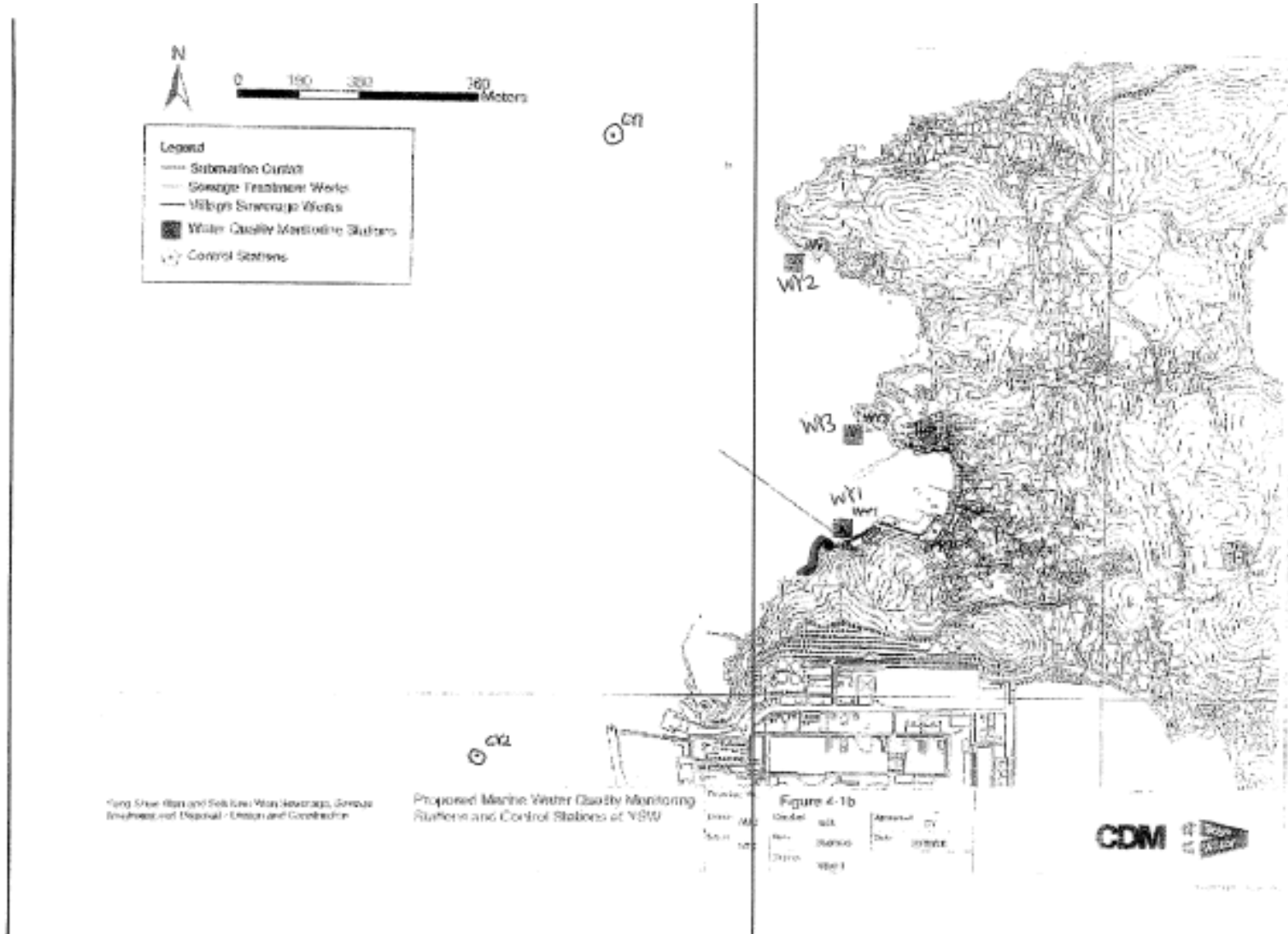
(Marked on 31 Jul 2011)

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31/07/10	Revision 0	StL	VC

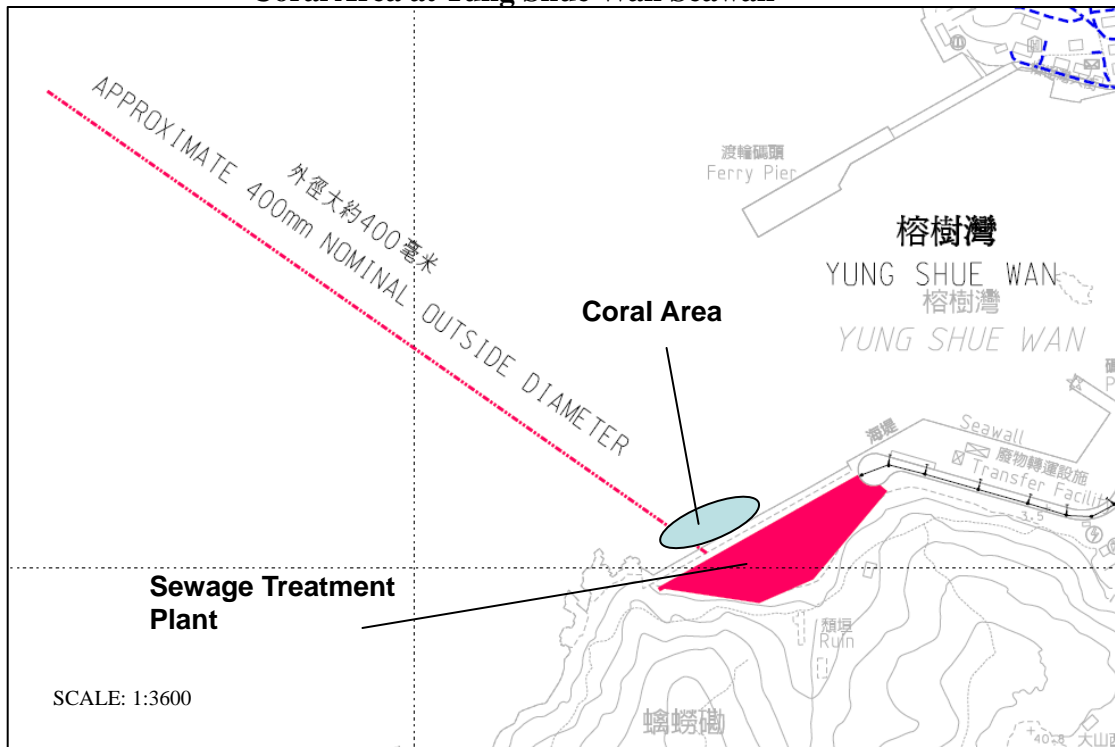
Annex D

Location of Monitoring Stations (Air Quality / Construction Noise / Marine Water Quality / Ecology)

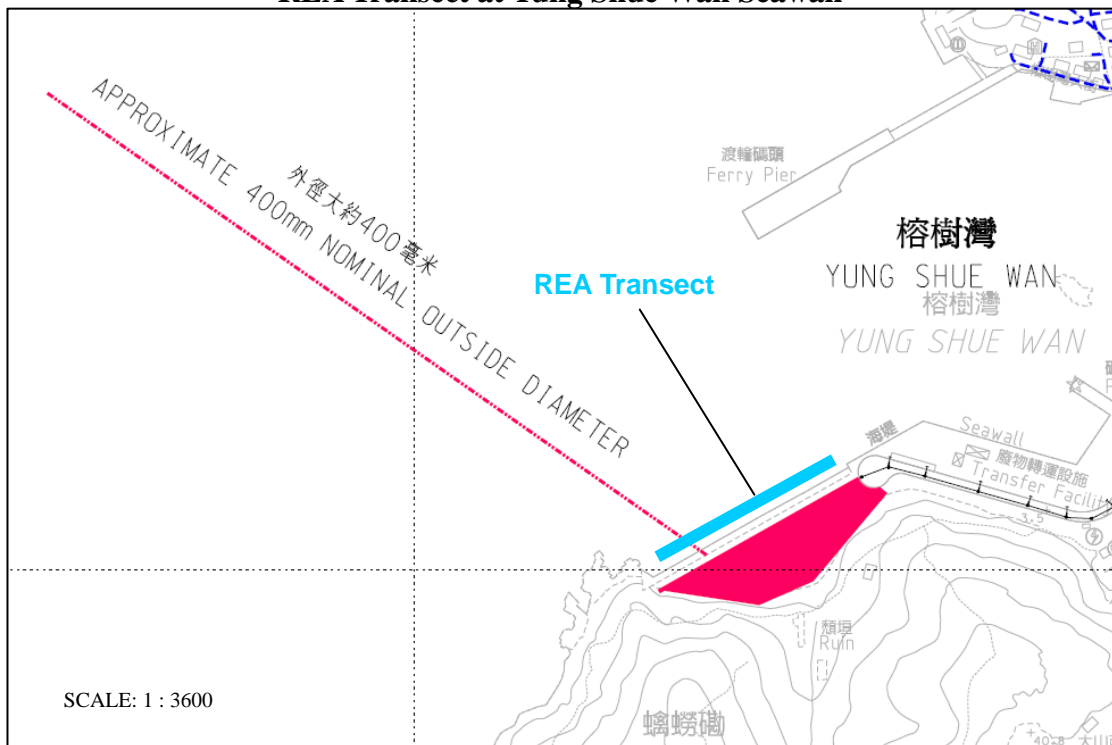




Coral Area at Yung Shue Wan Seawall



REA Transect at Yung Shue Wan Seawall



Coral Area at Sham Wan



REA Transect at Sham Wan

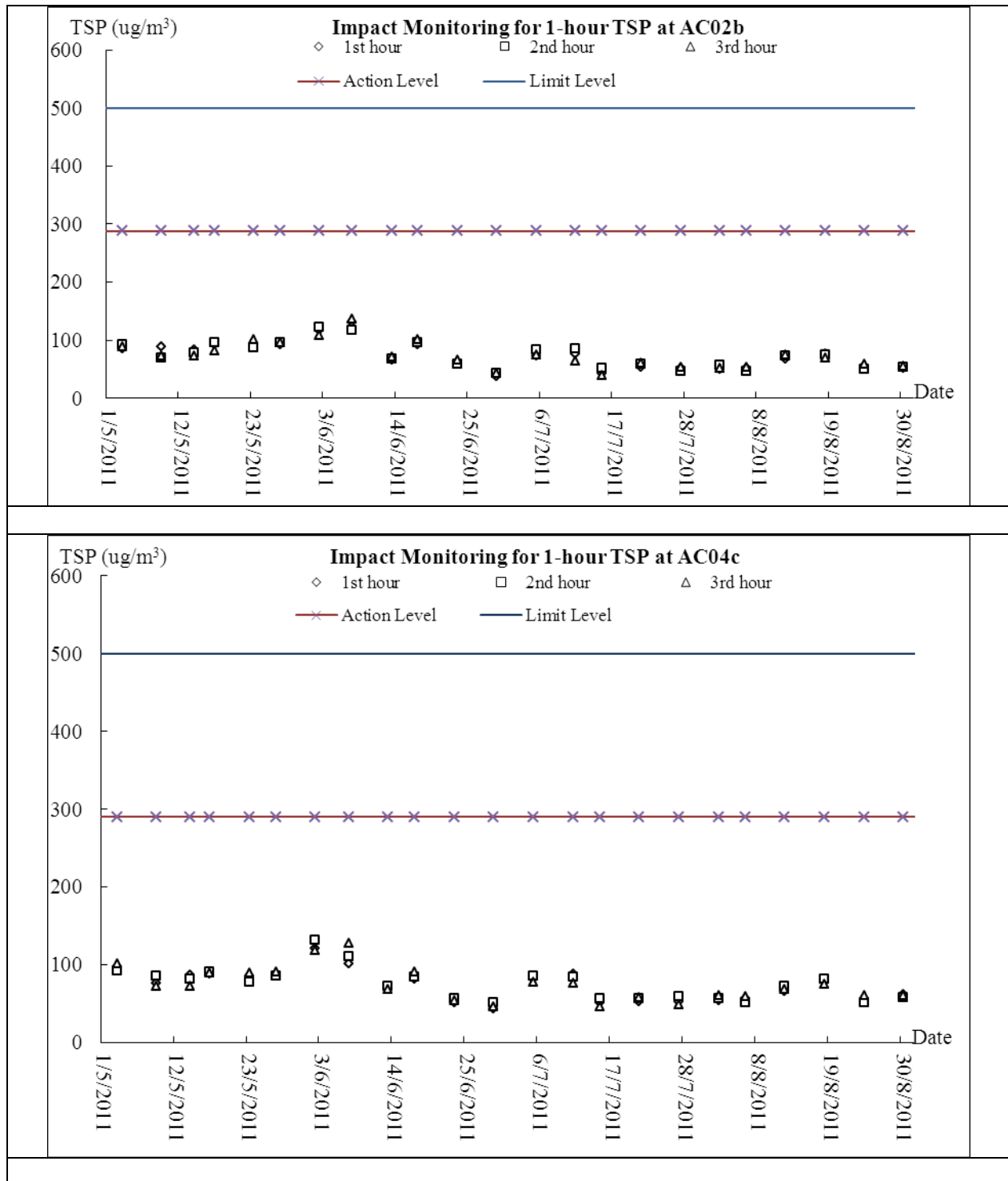


Annex E

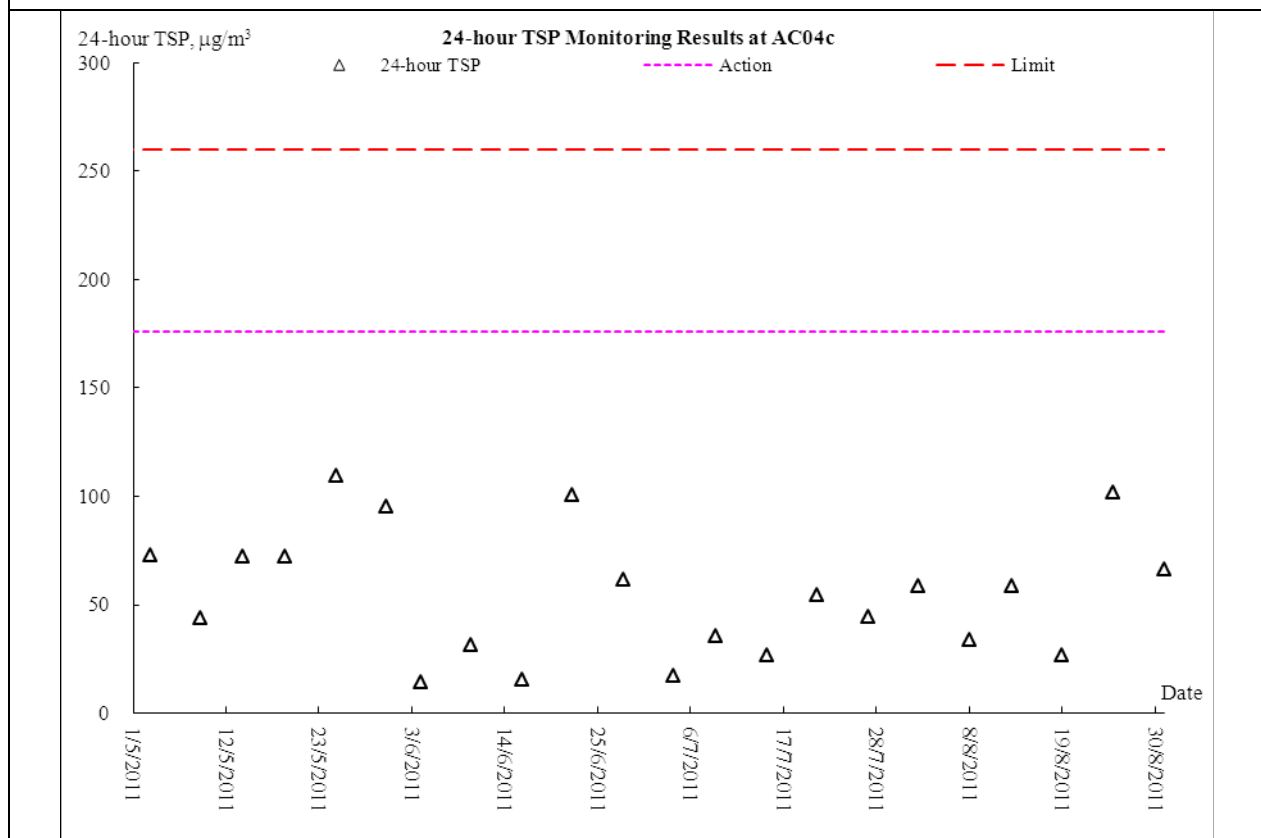
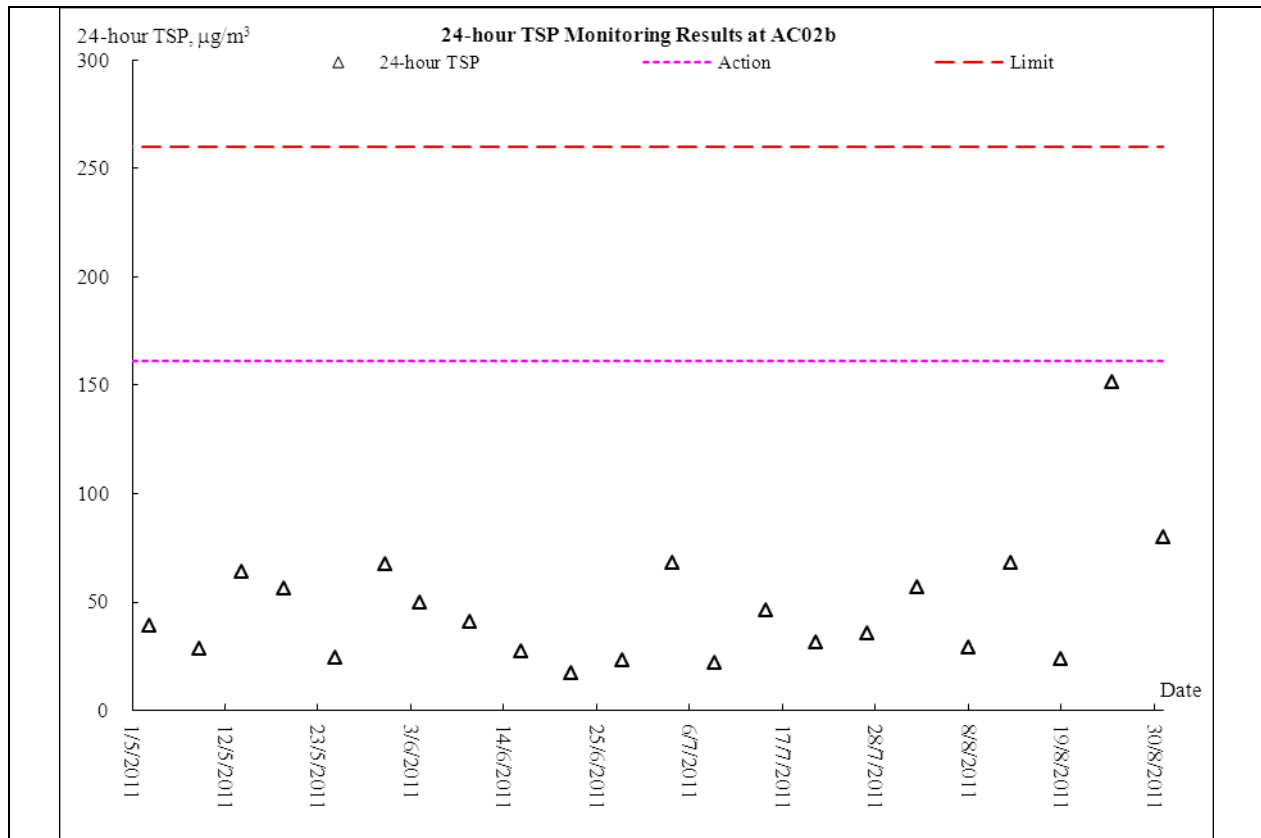
Graphical Plots of Impact Monitoring

- 1. Air Quality**
- 2. Construction Noise**
- 3. Marine Water Quality**

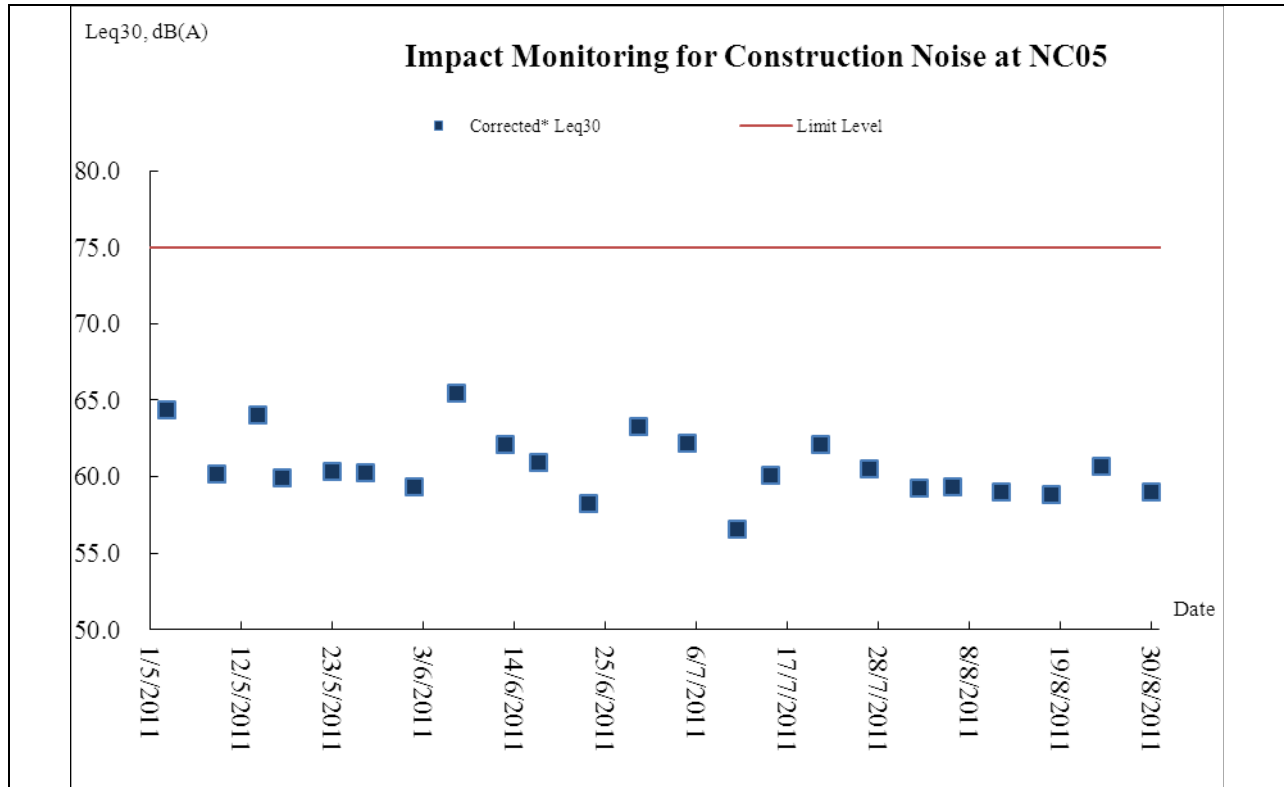
Air Quality – 1-hour TSP Monitoring



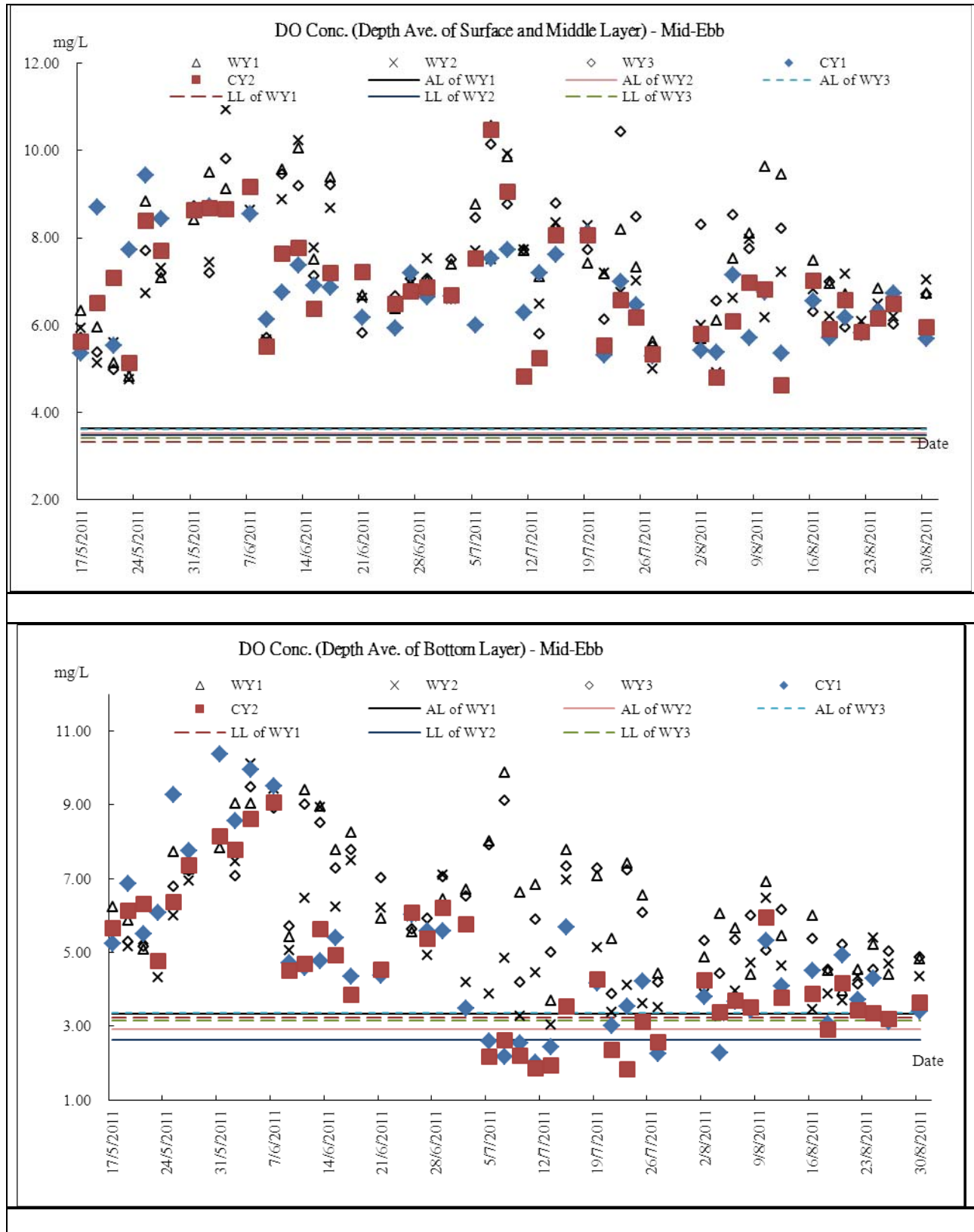
Air Quality – 24-hour TSP Monitoring

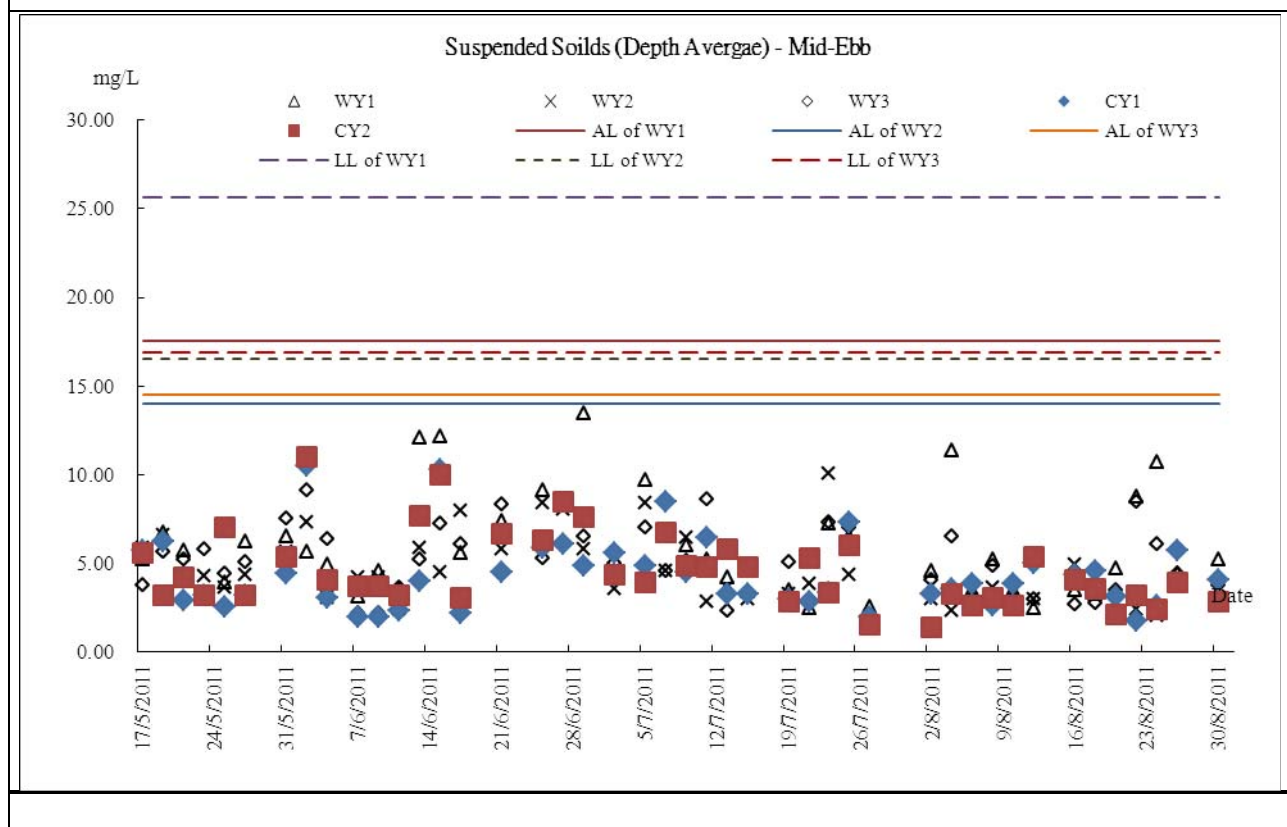
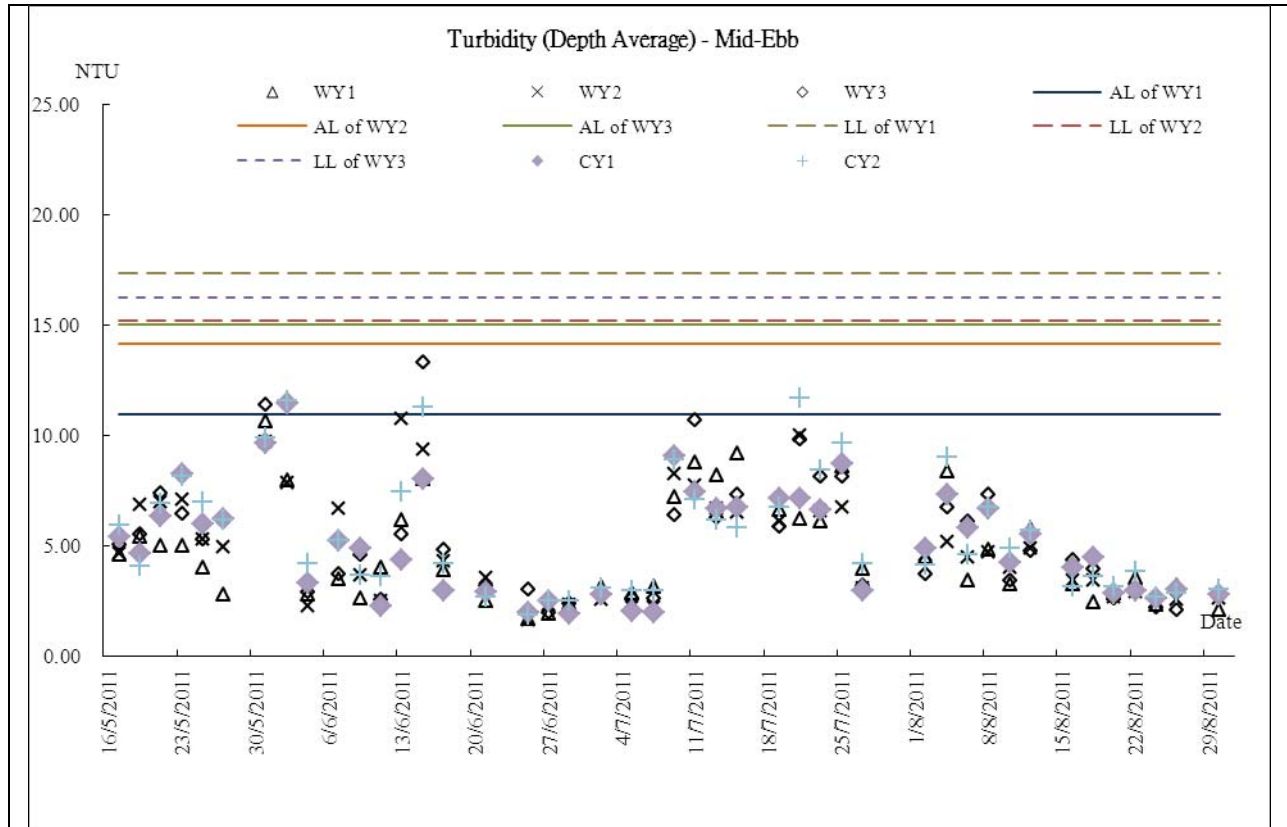


Construction Noise

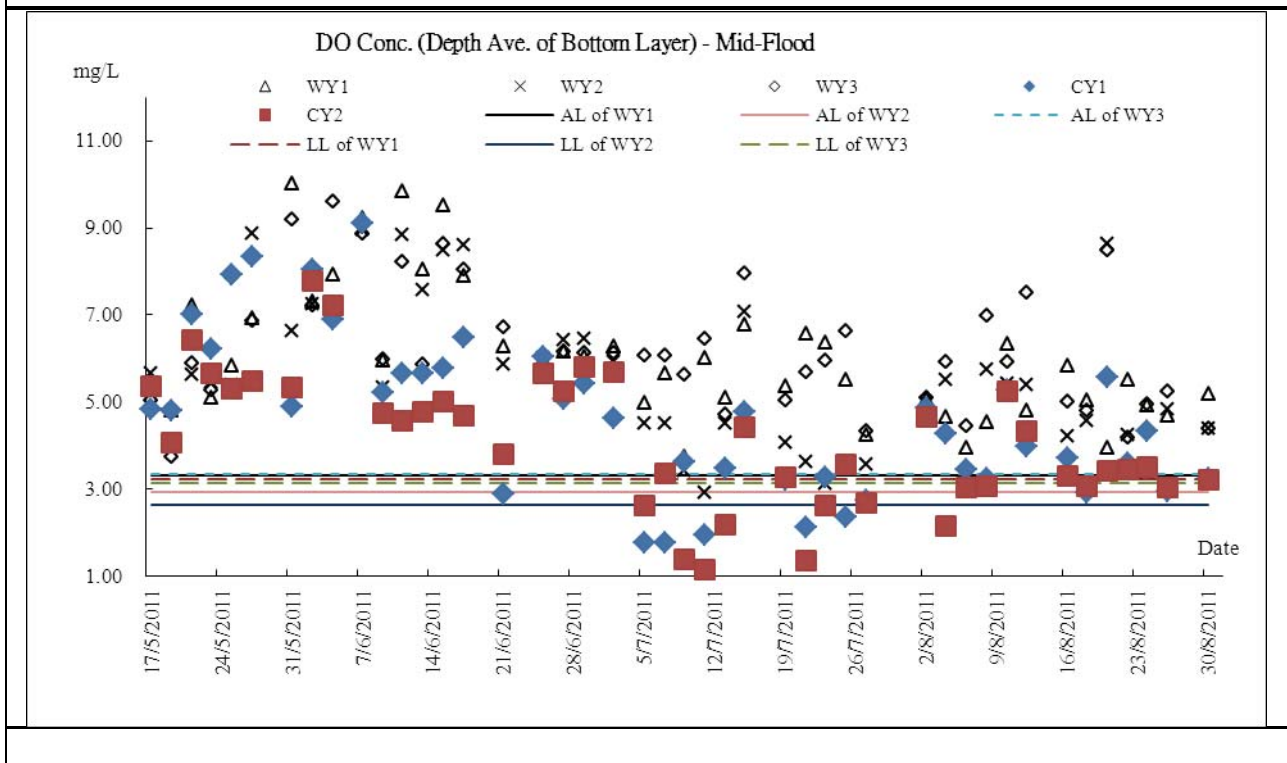
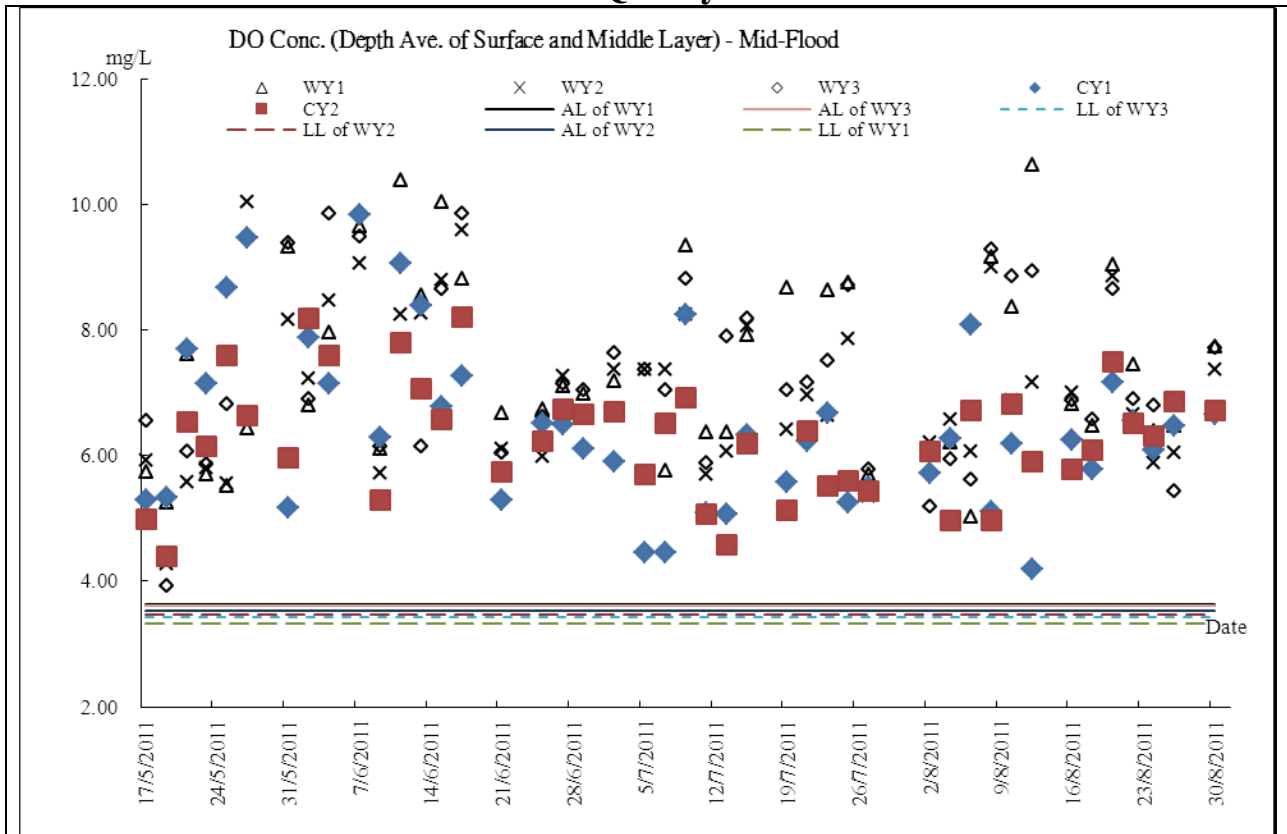


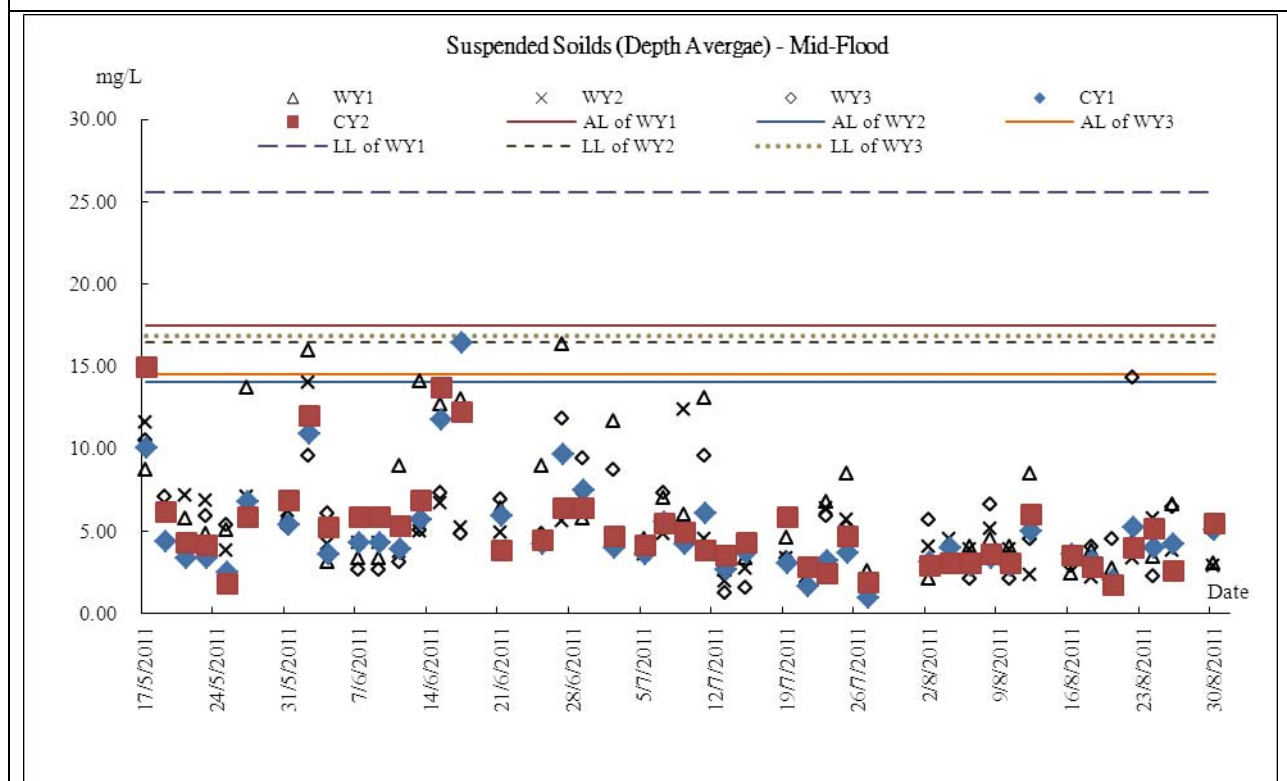
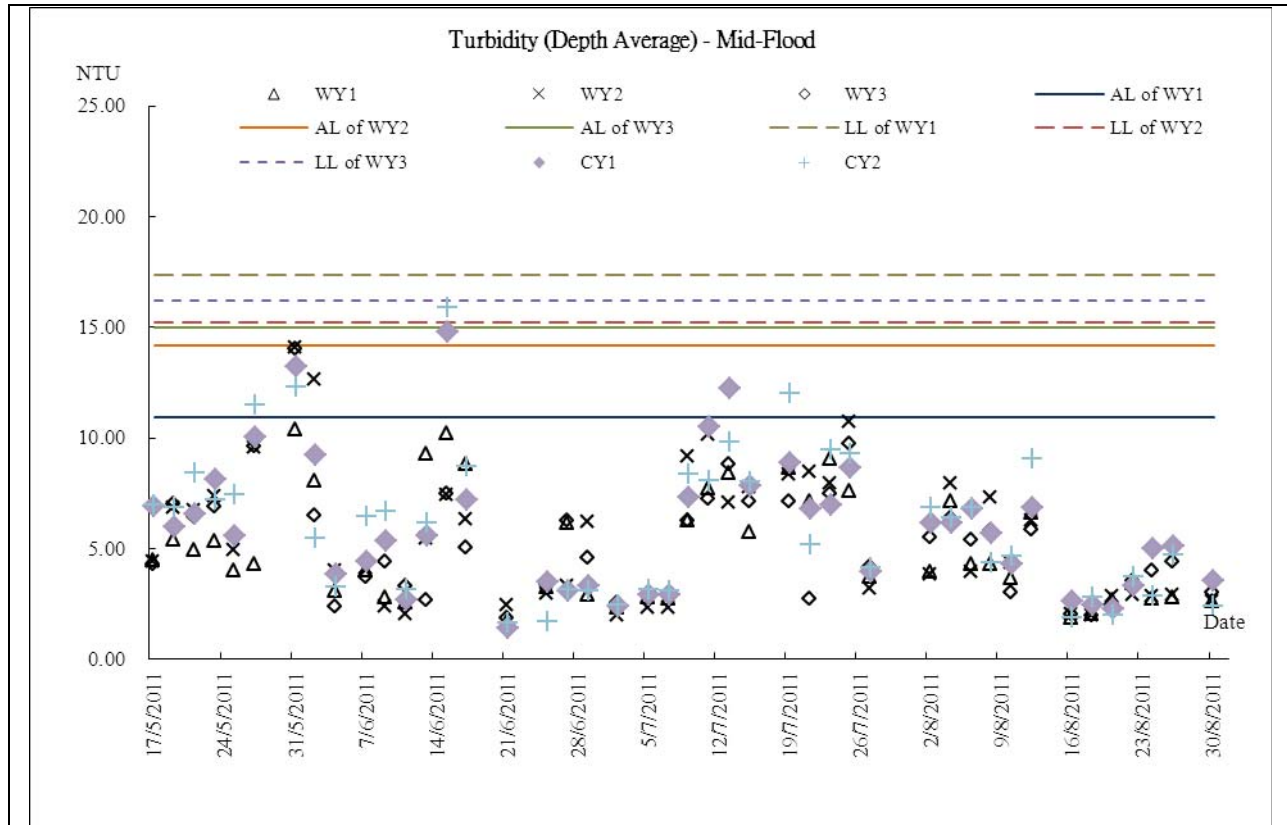
Marine Water Quality – Mid-Ebb





Marine Water Quality – Mid-Flood





Annex F

Meteorological Information

Meteorological condition – June 2011

Under the prevalence of a warm southerly airstream punctuated by episodes of inclement weather especially during the latter half of the month, June 2011 was hotter and wetter than usual. The mean temperature of the month was 28.6 degrees, 0.7 degrees above the normal figure of 27.9 degrees. Amber rainstorm warnings were issued for periods of heavy rain associated with Tropical Storm Sarika and a convective disturbance around mid June and an active trough of low pressure towards the end of the month. The monthly total rainfall recorded at the Hong Kong Observatory was 435.6 millimetres, about 12 percent above normal. In spite of a wet June, the accumulated rainfall since 1 January was only 707.9 millimetres, a deficit of 33 percent compared to the normal figure of 1054.7 millimetres for the same period.

Meteorological condition– July 2011

The effect of a prolonged rainy period in the middle of the month was more than compensated by two fine spells occurring before and after the episode, making July 2011 drier than usual. The monthly total rainfall recorded at the Hong Kong Observatory was 226.8 millimetres, about 61 percent of the normal figure. The accumulated rainfall since 1 January was only 934.7 millimetres, a deficit of 35 percent compared to the normal figure of 1429.1 millimetres for the same period. On the other hand, the month has a near-normal mean temperature of 28.8 degrees.

Meteorological condition– August 2011

Under the prolonged dominance of the sub-tropical ridge, Hong Kong experienced one of the hottest August since records began in 1884. The monthly mean temperature soared to 29.5 degrees, equaling the record set in 1990 and 1998 and was 1.1 degrees above normal. The month was sunnier than usual. The monthly total duration of bright sunshine was 242.0 hours, 52.3 hours higher than normal. The month was also dry with a total rainfall of 157.6 millimetres, only 35 percent of the normal figure and the accumulated rainfall since 1 January of 1092.3 millimetres suffered a deficit of 42 percent compared to the normal figure of 1873.7 millimetres for the same period.

Note: please refer to the monthly EM&A report (Mar-May) for the weather details on each successive day.

Annex G

Monthly Summary Waste Flow Table

Monthly Summary Waste Flow Table for August 2011

Month	Actual Quantities of Inert C&D Materials Generated Monthly												Actual Quantities of C&D Wastes Generated Monthly										
	Total Quantity Generated (a) = (c)+(d)+(e)		Hard Rock and Large Broken Concrete (b)		Reused in the Contract (c)		Reused in other Projects (d)		Disposed as Public Fill (e)		Imported Fill (f)		Metals		Paper/ cardboard packaging		Plastics		Chemical Waste		Others, e.g. rubbish		
	(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000m ³)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in tonne)		
	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	
2010	4.522	0.030	0.068	0.104	0.488	0.000	0.000	0.000	0.000	4.033	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.460
Jan	0.985	3.045	0.003	0.013	0.120	0.419	0.000	2.626	0.865	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.240
Feb	0.377	0.000	0.000	0.043	0.000	0.000	0.000	0.000	0.377	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350
Mar	0.758	1.175	0.002	0.106	0.006	0.000	0.000	1.175	0.752	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.360
Apr	1.135	1.339	0.017	0.025	0.112	0.180	0.000	1.159	1.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.830	5.160
May	0.614	1.362	0.030	0.036	0.014	0.400	0.000	0.962	0.600	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.150	0.860
Jun	0.505	1.014	0.000	0.022	0.000	0.060	0.000	0.954	0.505	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.610	1.510
Sub-total	8.8954	7.9653	0.1184	0.3497	0.7397	1.0590	0.0000	6.8760	8.1558	0.0303	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	15.5900	28.9400
Jul	0.824	1.077	0.000	0.004	0.000	0.000	0.000	1.077	0.824	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.000	0.510
Aug	0.491	3.519	0.004	0.006	0.000	0.000	0.000	3.519	0.491	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.990	1.830
Sep																							
Oct																							
Nov																							
Dec																							
Total	10.2102	12.5613	0.1229	0.3600	0.740	1.059	0.000	11.472	9.4705	0.0303	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.58	31.28
	22.771		0.483		1.799		11.472		9.501		0.000		0.000		0.000		0.000		0.000		59.86		

Remark: Assume 1.0 m³ vehicle dump load = 1.6 tonnes C&D materials

YSW: Yung Shue Wan

SKW: Sok Kwu Wan

Annex H

Implementation Schedule of Mitigation Measures

Implementation Schedule of Air Quality Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.3.18	2.10.2	Adopting the following good site practices and follow the dust control requirements of the Air Pollution Control (Construction Dust) Regulation: <ul style="list-style-type: none"> • Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather; • Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses; • Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like. • Any vehicle used for moving sands, aggregates and construction waste should have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin. 	Work site / during construction	All contractors		√		TM- EIAO, APCO, Air Pollution Control (Construction Dust) Regulation
2.10.3	Section 2	1 hour and 24 hour dust monitoring and site audit	Designated air monitoring locations / throughout construction period	Contractor/ Environmental Team		√		EM&A Manual

* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Noise Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location/Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.4.16	3.8.2	Implementation of following measures during the sewer construction: <ul style="list-style-type: none"> • Use of quiet PME or method; • Restriction on the number plant (1 item for each type of plant); and • Good Site Practices <ul style="list-style-type: none"> ➤ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. ➤ Mobile plant, if any, should be sited as far away from NSRs as possible. ➤ Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. ➤ Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. ➤ Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 	Work site /during the construction of Sewer.	Contractor		√		EIAO-TM, NCO
2.10.5 to 2.10.9	Section 35	Noise monitoring	Designated noise monitoring locations / throughout construction period	Contractor/ Environmental Team		√		EM&A Manual

* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.

** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Water Quality Control Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
Construction Phase								
2.5.23	4.12.1	No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of main portion of outfall pipes	Marine works site / During construction of submarine outfall	Contractor		√		
4.5.38	4.12.3	<p>Dredging Works</p> <p>Implementation of following measures during the dredging works:</p> <ul style="list-style-type: none"> dredging should be undertaken using closed grab dredgers with a maximum total production rate of 55m³/hr; deployment of 2-layer silt curtains with the first layer enclosing the grab and the second layer at around 50m from the dredging area while dredging works are in progress; dredging operation should be undertaken during ebb tide only; all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; all pipe leakages should be repaired promptly and plant should not be operated with leaking pipes; excess material should be cleaned from the decks and exposed fittings of barges before the vessel is moved; adequate freeboard (i.e. minimum of 200mm) should be maintained on barges to ensure that decks are not washed by wave action; all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; loading of barges should be controlled to prevent splashing of dredged material to the surrounding water, and barges should not be filled to a level which will cause the overflow of materials or polluted water during loading or transportation; and 	Marine works site and at the identified water sensitive receivers/ During construction	Contractor		√		

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
		<ul style="list-style-type: none"> the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard. 						
2.5.39	4.12.4	<p><u>Construction Run-off and Drainage</u></p> <p>Implementation of the following site practices outlined in ProPECC PN 1/94 for “Construction Site Drainage”</p> <ul style="list-style-type: none"> Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks. Works programmes should be designed to minimize works areas at any one time, thus minimizing exposed soil areas and reducing the potential for increased siltation and runoff. Sand / silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand / silt particles from run-off. These facilities should be properly and regularly maintained. These facilities should be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site. Careful programming of the works to minimise soil excavation works during rainy seasons. Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion. Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections. Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric 	Construction works sites	Contractor		√		ProPECC PN 1/94
2.5.39	4.12.5	<p><u>General Construction Activities</u></p> <ul style="list-style-type: none"> Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. 	Construction works sites	Contractor		√		

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
		<ul style="list-style-type: none"> All fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse. 						
2.5.39	4.12.6	<u>Wastewater Arising from Workforce</u> Portable toilets should be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor should also be responsible for waste disposal and maintenance practices.	Construction works sites	Contractor		√		
2.10.10	Section 4	Water quality monitoring	Designated water monitoring locations/ throughout construction period	Contractor		√		EM&A Manual

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Sediment Contamination Mitigation Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.9.24	5.2.1	Carrying out Sediment Quality Investigation	Marine works site / prior to construction	DSD	√			WBTC No. 34/2002
2.9.23	5.2.1	Follow the requirement and procedures for dredged mud disposal specified under the WBTC No. 34/2002.	Marine works site / during dredging works	Contractor		√		WBTC No. 34/2002
2.9.23	5.2.2	Implement appropriate dredging methods which have been incorporated into the recommended water quality mitigation measures.	Marine works site, during dredging works	Contractor		√		
2.9.23	5.2.3	During the transportation and disposal of the dredged sediment, the following measures should be taken: <ul style="list-style-type: none"> • Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved. • Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self monitoring devices as specified by the DEP. 	Marine works site and at the identified sensitive receivers	Contractor		√		

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N/A Not applicable

Implementation Schedule of Solid Waste Management Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.9.14	6.6.2	<u>Good site practices</u> <ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site Training (proper waste management and chemical handling procedure) should be provided for site staffs Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. Provision of sufficient waste disposal points and regular collection for disposal. Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility. Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. Maintain records of the quantities of wastes generated, recycled and disposed. 	Work sites/During construction	Contractor		√		Waste Disposal Ordinance (Cap.54)
2.9.15	6.2.3	The Contractor will be required to open a billing account under the Construction Waste Disposal Charging Scheme, and to pay for disposal of all construction waste. The construction waste will be sent to a designated reception facility, which in this case will be YSW RTS, where drivers must present a valid chit for disposal of each load.	Work sites/During construction	Contractor		√		Waste disposal (Amendment) Ordinance 2004
2.9.16	6.2.4	Recommendations to achieve waste reduction include: <ul style="list-style-type: none"> segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; to encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to 	Work sites/During construction	Contractor		√		WBTC No. 4/98, 5/98

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
		segregate this waste from other general refuse generated by the work force; <ul style="list-style-type: none"> any unused chemicals or those with remaining functional capacity should be recycled; use of reusable non-timber formwork to reduce the amount of C&D material; prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill; proper storage and site practices to minimise the potential for damage or contamination of construction materials; and plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste. 						
2.9.18	6.2.5	<u>General Site Wastes</u> <ul style="list-style-type: none"> A collection area for construction site waste should be provided where waste can be stored prior to removal from site An enclosed and covered area for the collection of the waste is recommended to reduce 'wind blow' of light material 	Work sites/During construction	Contractor		√		Public Health and Municipal Services Ordinance (Cap. 132)
2.9.19	6.2.6 and 6.2.7	<u>Chemical Wastes</u> <ul style="list-style-type: none"> After use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes Any unused chemicals or those with remaining functional capacity should be recycled Waste should be properly stored on site within suitably designed containers and should be collected by an approved licensed waste collectors for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordance. 	Work sites/During construction	Contractor		√		Waste Disposal (Chemical Waste) (General) Regulation, Code of Practice on the Packaging Labelling and Storage of Chemical Wastes

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
		<ul style="list-style-type: none"> Any service shop and minor maintenance facilities should be located on hard standing within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should be undertaken within the designated areas equipped control these discharges 						
2.9.21 and 2.9.22	6.2.8 and 6.2.9	<p><u>Construction and Demolition Material</u></p> <ul style="list-style-type: none"> The C&D waste should be separated on-site into three categories: <ul style="list-style-type: none"> ➤ public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area; ➤ C&D waste for re-use and / or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, woods, glass and plastic); ➤ C&D waste which cannot be re-used and / or recycled (e.g. wood, glass and plastic) Where possible, inert material should be re-used on-site Where practicable, steel and other metals should be separated for re-use and/or recycling prior to disposal of C&D material 	During all construction phases	Contractors		√		WBTC No. 4/98, 5/98, 21/2002, 25/99, 12/2000

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** D=Design, C=Construction, O=Operation

N/A Not applicable

Implementation Schedule of Ecological Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.10.11 and 2.10.12	7.2 and 7.3	Carry out monitoring of corals before, during and after marine works.	Work sites / during construction phase	Contractor		√		
2.6.45 to 2.6.48	7.6.1	Use horizontal directional drilling to avoid direct disturbance to corals	Marine works site / during dredging works	Contractor		√		
2.6.57 to 2.6.58	4.12.3	Deploying of 2-layer silt curtains with the first layer enclosing the grab and the second layer at around 50m from the dredging area while dredging works are in progress	All work sites / during construction phase	Contractor		√		
2.6.51	7.6.1	Fence off the slope stabilisation works area from surrounding shrubland and/ woodland, to prevent access to or disturbance of adjacent habitats. The works area should be as small as is possible, consistent with the requirements of the works.	STW/ During construction	Contractor		√		

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N/A Not applicable

Implementation Schedule of Fisheries Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.5.37	4.12.4	Use of closed grab dredging and silt curtains around the immediate dredging area and low dredging rates as recommended in Water Quality of the EIA report	Marine works site, during dredging works	Contractor		√		TM on EIA Process

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 N/A Not applicable

Implementation Schedule of Landscape and Visual Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.8.37	9.2.2	Careful and efficient transplanting of affected trees to temporary or final transplant location (the proposed tree to be transplanted is a semi-mature <i>Macaranga tanarius</i> and is located at the proposed Pumping Station P2 location).	All sites	Contractor		√		WBTC No. 14/2002
2.8.37	9.2.2	Short excavation and immediate backfilling sections upon completion of works to reduce active site area.	All sites	Contractor		√		
2.8.37	9.2.2	Screening of site construction works by use of hoarding that is appropriate to its site.	All sites	Contractor		√		WBTC No. 19/2001
2.8.37	9.2.2	Conservation of topsoil for reuse.	All sites	Contractor		√		
2.8.30	9.2.2	Night-time light source from marine fleets should be directed away from the residential units.	Outfall area.	Contractor		√		

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 ** D=Design, C=Construction, O=Operation
 N/A Not applicable