

PROJECT NO.: TCS/00512/09

DSD CONTRACT NO. DC/2009/13 Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan

SOK KWU WAN PORTION AREA Quarterly Environmental Monitoring and Audit (EM&A) Summary Report No.Q17 (August to October 2014)

PREPARED FOR Leader Civil Engineering Corporation Limited

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Version	Date	Description
1	29 December 2014	First submission

# **URS CDM Joint Venture**

Chief Engineer/Harbour Area Treatment Scheme Drainage Services Department 5/F Western Magistracy 2A Pok Fu Lam Road Hong Kong Your reference:

Date:

Our reference: 05117/6/16/436930

26 January 2015

BY FAX ONLY

Attention: Mr. F.K. Pong

Dear Sir,

Contract No. DC/2009/13 Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan Portion Area Quarterly EM&A Summary Report No. Q17 (Aug to Oct 2014)

We refer to the Environmental Permit (EP-281/2007/A) and the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), with the report for the captioned project, dated 14 January 2015. We have no comment and have verified the captioned report.

Yours faithfully URS CDM JOINT VENTURE

Rodney Ip Independent Environmental Checker

ICWR/CKCH/wwsc

cc Leader Civil Engineering AUES ER/LAMMA CDM (Attn: Mr Ron Hung) (Attn: Mr T.W. Tam) (Attn: Mr Kenneth Kwong) (Attn: Mr Sylvester Hsu)



## **EXECUTIVE SUMMARY**

ES.01 This is the 17<sup>th</sup> Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for Sok Kwu Wan (hereinafter 'this Report') for the designated works under the Environmental Permit [EP-281/2007/A], covering the construction period from 26 July 2014 to 25 October 2014 (hereinafter 'the Reporting Period').

#### **ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES**

ES.02 Environmental monitoring activities under the EM&A programme in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	144
Air Quality	24-hour TSP	37
Construction Noise	L <sub>eq(30min)</sub> Daytime	52
Water Quality	Marine Water Sampling	0
Inspection / Audit	ET Regular Environmental Site Inspection	13

#### BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.03 No exceedance of air quality, construction noise and marine water quality monitoring were recorded in this Reporting Period. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental	Monitoring	Action Level	Limit Level	Event & Action		
Issues	Parameters			NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0		
	24-hour TSP	0	0	0		
Construction Noise	L <sub>eq(30min)</sub> Daytime	0	0	0		
Water Quality	DO	0	0	0		
	Turbidity	0	0	0		
	SS	0	0	0		

*Note: NOE* – *Notification of Exceedance* 

ES.04 13 events of site inspection were carried out by ET in this Reporting Period 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.

# ENVIRONMENTAL COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05 No written or verbal environmental complaint, summons or successful prosecutions were recorded in this Reporting Period.

#### **REPORTING CHANGE**

ES.06 No reporting change was made in this Reporting Period.

#### **FUTURE KEY ISSUES**

ES.07 During wet season, muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.



ES.08 Muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish Culture Zone (FCZ) at Picnic Bay and the secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.

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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 (EP) 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 stead 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 Shue Wan with a capacity of  $1,430m^3/day$  and  $2,850m^3/day$  respectively to provide secondary treatment, construction of 2 pumping stations at Sok Kwu Wan and 1 pumping station at Yung Shue Wan, construction of submarine outfall from the coastline and lying of underground sewerage pipeline. The site layout plan for the captioned work under the Project is showing in *Appendix 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. This EM&A Manual is referred to the Appendix B of the Review Report on EIA Study Sok Kwu Wan (Final) in January 2007 (Agreement No. CE 20/2005(DS)).
- 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 *Appendix B*. For ease of reporting, the proposed EM&A programme for baseline and impact monitoring is spilt to following two stand-alone parts:
  - (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 This is the **17<sup>th</sup>** Quarterly EM&A Summary Report for Sok Kwu Wan Portion Area presenting the monitoring results and inspection findings for the reporting period from **26 July 2014** to **25 October 2014**.

#### **1.2 REPORT STRUCTURE**

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

- SECTION 1 INTRODUCTION
- SECTION 2 SUMMARY OF IMPACT ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS
- SECTION 3 MONITORING RESULTS AND BREACHES OF ENVIRONMENTAL QUALITY CRITERIA
- SECTION 4 NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS
- SECTION 5 CONCLUSION



## 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 *Appendix B*.

#### 2.2 CONSTRUCTION PROGRESS

2.02 The master and three month rolling construction programs are enclosed in *Appendix C* and the major construction activities undertaken in this quarter are listed below:-

#### August, September and October 2014

- Excavation for utilities construction under EVA in SKWSTW
- Soil nailing in SKWSTW
- Finishing works in SKWSTW & PS2
- E&M installation in SKWSTW & PS2

#### 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 Month is presented in *Table 2-1*.

#### Table 2-1Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air pollution Control (Construction Dust) Regulation	Notified EPD on 19 May 2010
		Ref.: 317486
2	Chemical Waste Producer Registration	Issued on 8/6/2010
		WPN 5213-912-L2720-01
3	Water Pollution Control Ordinance	Approved on 29/9/2010
		Valid to: 30/09/2015
		Licence no.: WT00007567-2010
4	Billing Account for Disposal of Construction Waste	Issued on 26 May 2010
		A/C No: 7010815



## **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; and
  - Marine water quality
- 3.02 The ET implements the EM&A programme in accordance with the aforementioned requirements. Detailed air quality, construction noise and water quality of the EM&A programme are presented in the following sub-sections.
- 3.03 A summary monitoring parameters for the air quality, noise and marine water monitoring is presented in *Table 3-1*:

Table 3-1Summary of the Air and Noise monitoring parameters of EM&ARequirements

Environmental Issue	Parameters
Air Quality	• 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and
	24-hour TSP Monitoring by High Volume Air Sampler.
Noise	• L <sub>eq(30min)</sub> during normal working hours; and
110130	• L <sub>eq(15min)</sub> during Restricted Hours.
	In-situ Measurements
	<ul> <li>Dissolved Oxygen Concentration (DO) (mg/L);</li> </ul>
	• Dissolved Oxygen Saturation (%);
	• Turbidity (NTU);
Marine Water Quality	• pH unit;
Marine water Quanty	• Salinity (ppt);
	• Water depth (m); and
	• Temperature (°C).
	Laboratory Analysis
	• Suspended Solids (SS) (mg/L)

#### 3.2 MONITORING LOCATIONS

#### Air Quality

3.04 Three air monitoring stations: AM1, AM2 and AM3 were designated in the *EM&A Manual Section 2.5.* The detailed air monitoring stations is described in *Table 3-2* and graphical is shown in *Appendix D*.

Table 3-2Location of Air Quality Monitoring Station

Sensitive Receiver	Location
AM1	Squatter house in Chung Mei Village
AM2	Squatter house in Chung Mei Village
AM3	Football court

#### **Construction Noise**

3.05 According to *EM&A Manual Section 3.4* stipulations, there were four noise sensitive receivers (NM1-NM4) designated for the construction noise monitoring. NM1, NM2 and NM4 of the three designated monitoring stations were identified and are monitored by the current DSD contract DC/2007/18. However, the premises monitoring station NM3 was rejected by the owner of 1B Sok Kwu Wan and an alternative noise monitoring station RNM3 replacement was proposed by the contract DC/2007/18 ET and accepted by the IEC and EPD before the baseline monitoring commencement in April 2008. The location RNM3 is located at Sok Kwu Wan sitting-out area which just 3m width footpath away from the original location house 1B.



detailed construction noise monitoring stations to also under the Project is described in *Table 3-3* and graphical is shown in *Appendix D*.

Sensitive Receiver	Location
NM1	1, Chung Mei Village
NM2	20, Sok Kwu Wan
RNM3	Sok Kwu Wan Sitting-out Area
NM4	2-storey village house at Ta Shui Wan

Table 3-3Location of Construction Noise Monitoring Station

#### Water Quality

3.06 Three control stations (C1-C3) and three impact stations (W1-W3) were recommended in the *EM&A Manual Section 4.5*. Impact stations W1-W3 identified at the sensitive receivers (FCZ and secondary contact recreation subzone) to monitor the impacts from the construction of the submarine outfall as well as the effluent discharge from the proposed STW on water quality. Three control stations: C1, C2 & C3 were specified at locations representative of the project site in its undisturbed condition and located at upstream and downstream of the works area. Detailed and co-ordnance of marine water quality monitoring stations is described in *Table 3-4* and the graphical is shown in *Appendix D* and would be performed for EM&A programme.

#### Table 3-4 Location of Marine Water Quality Monitoring Station

Station	Description	<b>Co-ordnance</b>	
	Description	Easting	Northing
W1	Secondary recreation contact subzone at Mo Tat Wan	832 968	807 732
W2	Fish culture zone at Picnic Bay	832 670	807 985
W3	Fish culture zone at Picnic Bay	832 045	807 893
C1 (flood)	Control Station	833 703	808 172
C2	Control Station	831 467	807 747
C3 (ebb)	Control Station	832 220	808 862

## 3.3 MONITORING FREQUENCY AND PERIOD

3.07 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 and 4.8. The monitoring requirements are listed as follows:

## Air Quality Monitoring

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

- <u>Frequency</u>: Once in every six days for 24-hour TSP and three times in every six days for 1-hour TSP.
- <u>Duration</u>: Throughout the construction period.

#### <u>Noise Monitoring</u>

Parameters:	L <sub>eq(30min)</sub> & L <sub>eq(5min)</sub> , L10 and L90.
	$L_{eq(15min)}$ & $L_{eq(5min)}$ , 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.
<u>Sampling</u> 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

#### **Post-Construction Monitoring – Marine Water**

3.08 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

3.09 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

3.10 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

- 3.11 **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.
- 3.12 *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.
- 3.13 **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.
- 3.14 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.

- 3.15 *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.
- 3.16 *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.
- 3.17 *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).
- 3.18 *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.
- 3.19 **Suspended Solids Analysis** Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

## 3.5 EQUIPMENT CALIBRATION

- 3.20 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.
- 3.21 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.
- 3.22 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.
- 3.23 The Water Quality Monitoring equipments such as Dissolved Oxygen meter, pH meter, Turbidity Measuring Instrument and Salinometer, are calibrated by HOKLAS accredited laboratory of three month intervals.
- 3.24 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

3.25 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 Appendix F.

## 3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.26 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.

3.27 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, sound level 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

3.28 According to the Sok Kwu Wan Environmental Monitoring and Audit Manual, the air quality, construction noise and marine water quality were set up, namely Action and Limit levels are listed in *Tables 3-5* and *3-7* as below.

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

Monitoring Station	Action Le	vel (µg/m <sup>3</sup> )	Limit Level (µg/m <sup>3</sup> )	
Monitoring Station	1-hour	24-hour	1-hour	24-hour
AM1	343	173	500	260
AM2	331	175	500	260
AM3	353	191	500	260

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

Monitoring	Action Level	Limit Level
Location	0700-190	0 hours on normal weekdays
NM1 NM2 RNM3 NM4	When one or more documented complaints are received	75 dB(A) of $L_{eq(30min)}$ during normal hours from 0700 to 1900 hours on normal weekdays, reduced to 70 dB(A) of $L_{eq(30min)}$ for schools and 65 dB(A) during school examination periods

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

Parameter	Performance		Impact Station		
Farameter	Criteria	W1	W2	W3	
DO Concentration (Surface and Middle)	Action Level	5.39	4.64	4.71	
(mg/L)	Limit Level	5.29	4.56	4.54	
DO Concentration (Bottom)	Action Level	N/A	3.60	3.37	
(mg/L)	Limit Level	N/A	3.06	3.18	
Turbidity (Depth-Average)	Action Level	4.39	4.84	6.48	
(NTU)	Limit Level	6.06	5.99	6.71	
Suspended Solids (Depth-Average)	Action Level	12.41	9.24	10.79	
(mg/L)	Limit Level	12.68	11.28	12.25	



## 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 three months are presented in *Appendix E*.

#### 4.1 **RESULTS OF AIR QUALITY MONITORING**

4.02 In this Reporting Period, a total of **144** events of 1-hour TSP and **37** events of 24-hour TSP measurements were conducted at designated Location AM1, AM2 and AM3. Results of air quality monitoring at the identified locations during the Reporting Period are summarized in *Tables 4-1*.

Station	1-h	our TSP (µg/	m <sup>3</sup> )	24-hour TSP (µg/m <sup>3</sup> )		m <sup>3</sup> )
Station	Max	Min	Mean	Max	Min	Mean
AM1	245	17	73	71	4	27
Record Date	4-Oct-14	13-Aug-14	48 events	15-Oct-14	12-Aug-14	11 events
AM2	266	14	68	71	22	39
Record Date	4-Oct-14	13-Aug-14	48 events	22-Sep-14	12-Aug-14	13 events
AM3	233	16	68	84	11	36
Record Date	4-Oct-14	25-Aug-14	48 events	4-Sep-14	23-Aug-14	13 events

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

4.03 1-hour and 24-hour TSP results fluctuated well below the Action Level during the Reporting Period. No NOE was issued and therefore no corrective measures are required.

#### 4.2 **RESULTS OF CONSTRUCTION NOISE MONITORING**

4.04 Summary of construction noise monitoring at the identified locations during the Reporting Period are summarized in *Table 4-2* below. In this Reporting Period, a total of 52 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.

Station	Leq(30mi	in) (dB(A))
Station	Max	Min
NM1	63.6	44.1
Record Date	13-Aug-14	11-Sep-14
NM2	66.5	53.8
Record Date	13-Aug-14	1-Aug-14
RNM3	66.6	58.7
Record Date	23-Sep-14	1-Aug-14
NM4	62.7	45.1
Record Date	13-Aug-14	5-Sep-14

 Table 4-2
 Summary of Construction Noise Monitoring Results

#### 4.3 **RESULTS OF MARINE WATER QUALITY OF MONITORING**

4.05 Marine water quality monitoring should be carried out during the course of marine work. As informed by the Contractor in April 2014, the marine works in Sok Kwu Wan has been completed in April 2014. Marine water quality monitoring was therefore terminated from May 2014 after consent was obtained with IEC. In this regards, an associated letter ref.



TCS00512/10/300/L0783 dated 19 May 2014 has been issued to EPD for approval and no comment was received.

#### 4.4 ECOLOGICAL MONITORING

- 4.06 According to Clause 3.7 and Figure 4 in the Environmental Permit No. EP-281/2007/A, a total of 12 numbers *Celtis Timorensis* (uncommon species) in Chung Mei at Sok Kwu Wan, are identified to require labeling, fencing and protection. Out of these, four numbers located in the Pumping Station No.1 area are required to be transplanted in advance of pumping station construction and the transplantation proposal has been submitted to EPD previously.
- 4.07 Since the health condition of CT7 to CT10 are poor, as a contingency measure in case that CT7 to CT10 can no longer be recovered, additional 7 no. of *Celtis Timorensis* were planted adjacent to the under-monitoring *Celtis Timorensis* CT7 to CT10 on 30 April 2011. In April 2012, CT\_1A and CT\_7A were damaged by the fell broken tree trunk due to tree decayed by white ants. Therefore, only 5 no. of additional *Celtis Timorensis*, namely CT\_2A, CT\_3A, CT4A, CT\_5A and CT\_6A were inspected since May 2012. Furthermore, during tree inspection on 30 July, CT4A was disappeared after typhoon No.10 on 24 July and it was certified as dead. Eventually, 4 no. of additional *Celtis Timorensis*, namely CT\_2A, CT\_3A, CT\_6A were inspected in the remaining period.
- 4.08 Regular inspection of the transplanted tree was carried out by the landscaping sub-Contractor (Melofield Nursery and Landscape Contractor Limited) on 31 July, 15, 30 August, 15, 30 September, and 15 October 2014. The copies of the inspection reports were attached in relevant Monthly EM&A Report (August 2014, September 2014, and October 2014).



## 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 *Appendix 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
Type of waste	Aug 14	Sep 14	Oct 14	Disposal Location
C&D Materials (Inert) ('000m <sup>3</sup> )	0	0	0	-
Reused in the Contract (Inert) ('000m <sup>3</sup> )	0	0	0	-
Reused in other Projects (Inert) ('000m <sup>3</sup> )	0	0	0	-
Disposal as Public Fill (Inert) ('000m <sup>3</sup> )	0	0	0	-

Type of Weste	Quantity			Dignogal Logation
Type of Waste	Aug 14	Sep 14	Oct 14	<b>Disposal Location</b>
Metal (kg)	0	0	0	-
Paper / Cardboard Packing (kg)	0	0	0	-
Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	
General Refuses (tonne)	3.540	3.270	5.490	Outlying Islands Transfer Facilities (Sok Kwu Wan)

5.04 There was no site effluent discharged but the estimated volume of surface runoff was less than  $50m^3$  in this reporting quarter.



## 6 SITE INSPECTION

- 6.01 According to the Final Report Environmental Monitoring and Audit Manual [2095/13.3], the environmental site inspection should been formulation by ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. In this Reporting Period, routine joint site inspections by RE, Leader and ET were carried out on 29 July, 5, 12, 19, 27 August, 2, 12, 17, 25 September, 7, 14, and 21 October 2014.
- 6.02 Observations for the site inspections and monthly audit within this Reporting Period are summarized in *Table 6-1*.

Date	Findings / Deficiencies	Follow-Up Status
29 July 2014	• No environmental issue was observed during the site inspection	NA
5 August 2014	• No environmental issue was observed during the site inspection	NA
12 August 2014	• The Contractor should prevent the release of loose soil into the sea.	The stockpile of loose soil has been removed.
19 August 2014	• No environmental issue was observed during the site inspection	NA
27 August 2014	• No environmental issue was observed during the site inspection	NA
2 September 2014	• The Contractor was reminded to better cover the stockpile with tarpaulin sheet to reduce dust generation during dry and windy season.	The stockpile has been better covered.
12 September 2014	• No environmental issue was observed during the site inspection	NA
17 September 2014	• No environmental issue was observed during the site inspection	
25 September 2014	• No environmental issue was observed during the site inspection	NA
30 September 2014	• The Contractor was reminded to clean the stagnant water at drip tray for mosquito breeding prevention.	Stagnant water was cleaned and the drip tray was better covered to prevent storing of stagnant water.
7 October 2014	• No environmental issue was observed during the site inspection	NA
14 October 2014	• No environmental issue was observed during the site inspection	NA
21 October 2014	• No environmental issue was observed during the site inspection	NA

Table 6-1Site Observations



## 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 7-1Statistical Summary of Environmental Complaints

Departing Devied	Environmental Complaint Statistics			
Reporting Period	Frequency	Cumulative	<b>Complaint Nature</b>	
27 July 2010 – 25 July 2014	1 (Nov 2011)	1 (Nov 2011)	Marine water quality	
August 2014	0	1	NA	
September 2014	0	1	NA	
October 2014	0	1	NA	

#### Table 7-2Statistical Summary of Environmental Summons

Departing Devied	Env	ironmental Summons S	Statistics
Reporting Period	Frequency	Cumulative	<b>Complaint Nature</b>
27 July 2010 – 25 July 2014	0	0	NA
August 2014	0	0	NA
September 2014	0	0	NA
October 2014	0	0	NA

#### Table 7-3 Statistical Summary of Environmental Prosecution

Depending Devied	Envi	ronmental Prosecution	Statistics
Reporting Period	Frequency	Cumulative	<b>Complaint Nature</b>
27 July 2010 – 25 July 2014	0	0	NA
August 2014	0	0	NA
September 2014	0	0	NA
October 2014	0	0	NA

## 8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Sok Kwu 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 55m<sup>3</sup>/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**

## <u>Terrestrial Ecology</u>

- 8.20 The uncommon tree species should be labelled and probably fenced to avoid direct or indirect disturbance during construction. Works areas should avoid woodland habitats, in particular where these trees are located.
- 8.21 Construction and maintenance of site runoff control measures would be required at all work sites



during construction. These should include barriers to direct runoff to sand/silt removal facilities (sand/silt/traps and/or sediment basins); minimisation of earthworks during rainy season (May to September); and coverage of sand/fill piles and exposed earth during storms.

8.22 Special attention should be paid during the breeding season of Romer's Tree Frog (March to September) to ensure their habitat landward to Pumping Station P2 site is well protected from site runoff. Barriers should be deployed completely along the landward side of the pumping station site boundary to prevent any site runoff from entering the tree frog habitat. Intactness of the barriers should be frequently inspected.

#### Intertidal and Subtidal Ecology

- 8.23 Construction and maintenance of site runoff control measures would be required at all work sites during construction. These should include barriers to direct runoff to sand/silt removal facilities (sand/silt/traps and/or sediment basins); use of silt curtains along coastline; minimisation of earthworks during rainy season (May to September); and coverage of sand/fill piles and exposed earth during storms.
- 8.24 To reduce impacts of sediment resuspension upon nearby habitats and organisms during dredging, all dredging should be done using a closed-grab dredger, and silt curtains should be deployed around the dredger during all dredging activity

#### **Fisheries Mitigation Measure**

8.25 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

- 8.26 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
- 8.27 Leader had been implementing the required environmental mitigation measures according to the Sok Kwu 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	• Drainage channels were provided to convey run-off into the treatment facilities;
Quality	and
	<ul> <li>Drainage systems were regularly and adequately maintained.</li> </ul>
Air Quality	• 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
	<ul> <li>Tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul>
Noise	<ul> <li>Good site practices to limit noise emissions at the sources;</li> </ul>
	<ul> <li>Use of quite plant and working methods;</li> </ul>
	• 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	• Excavated material should be reused on site as far as possible to minimize off-site
Chemical	disposal. Scrap metals or abandoned equipment should be recycled if possible;
Management	• Waste arising should be kept to a minimum and be handled, transported and
Bernen	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> <li>The site was generally kept tidy and clean.</li> </ul>



## 9 CONCLUSIONS AND RECOMMENTATIONS

#### 9.1 CONCLUSIONS

- 9.01 This is the 17<sup>th</sup> Quarterly EM&A Summary Report for Sok Kwu Wan Portion Area under the Project covering the construction period from 26 July 2014 to 25 October 2014.
- 9.02 No 1-hour and 24-hour TSP results were found to be triggered the Action or Limit Level in this Reporting Period.
- 9.03 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this Reporting Period. No NOE or the associated corrective actions were therefore issued.
- 9.04 No notification of summons or successful prosecution was received in this Reporting Period.
- 9.05 **13** events of site inspection were carried out by ET in this Reporting Period 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.

#### 9.2 **RECOMMENDATIONS**

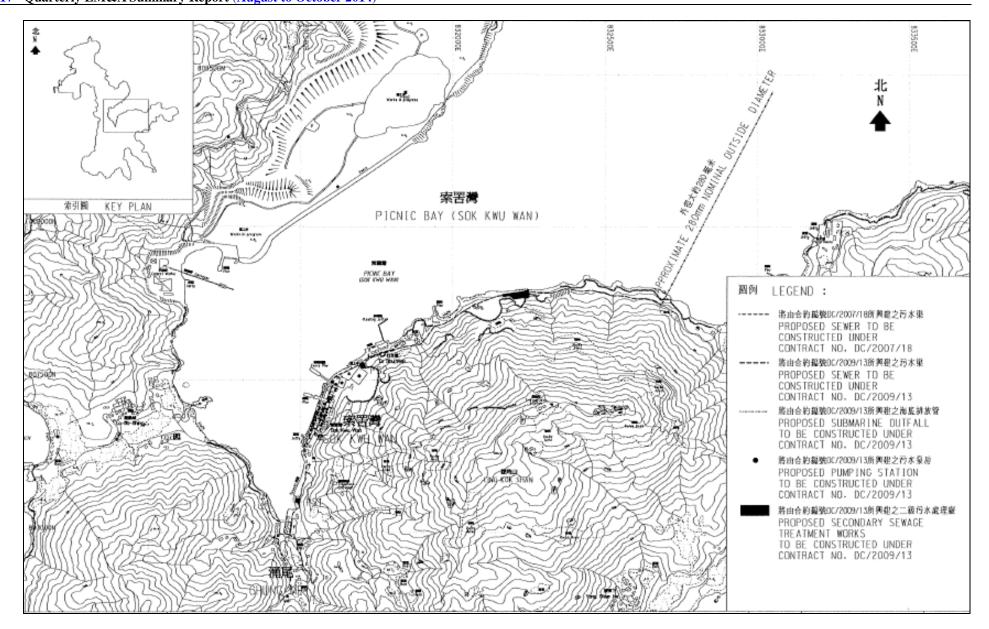
- 9.06 During wet season, muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.
- 9.07 Muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish Culture Zone (FCZ) at Picnic Bay and the secondary recreation contact subzone at Mo Tat Wan is the key issue of the Project. Mitigation measures for water quality should be properly maintained to prevent any muddy or sandy runoff from the loose soil surface overflow on the site boundary.



## Appendix A

## Site Layout Plan – Sok Kwu Wan Portion Area





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## Appendix 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. F K Pong	2159-3550	2833-9162
UCJV	Engineer's Representative	Mr. Kenneth WK Kwong	2982 0240	2982 4129
URS	Independent Environmental Checker	Mr. Rodney Ip	2410 3750	2428 9922
Leader	Director	Mr. Wilfred So	2982 1750	2982 1163
Leader	Contracts Manager	Mr. Vincent Chan	2982 1750	2982 1163
Leader	Site Agent	Mr. Ron Hung	2982 1750	2982 1163
Leader	Environmental Officer	Mr. Leung Man Kin	2982 8652	2982 8650
Leader	Environmental Supervisor	Mr. Chan Chi Kau	2982 8652	2982 8650
Leader	Sub-Agent	Mr. Leung Man Kin	2982 1750	2982 1163
Leader	Safety Officer	Ms. Vanessa Chan	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	Team Supervisor	Mr. Ben Tam	2959 6059	2959 6079

Legend:

DSD (Employer) – Drainage Services Department

URS CDM JV (Engineer) – URS- CDM Joint Venture

Leader (Main Contractor) – Leader Civil Engineering Corporation Limited

URS (IEC) – URS Hong Kong Limited

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



## Appendix C

## **Master and Three Months Rolling Construction Programs**

Activity ID	Description	Original Percent Duration Complete	Early Start	Early Finish	Late Start	Late Finish	Total Float	OCT NOV DEC JAN	FEB
Project Key	Date	Buration Complete	Start	Finish	Start	Finish	Float	at 28 05 12 19 26 02 09 16 23 30 07 14 21 28 04 11 18 25 01 0	08 15 22
D0040	Section W2 - YSW STW & Submarine Outfall (1370d)	0 0	0	31/10/14 *		31/10/14 *	0	0*Outfall (1370d)	
D0050	Section W3 - Footpath Diversion in Ptn G	0 0	)	31/10/14 *		31/10/14	0	0* Section W3 - Footpath Diversion in Ptn G	
00060	Section W4 - Slope Works in Portios H & I	0 0	) )	31/10/14 *		31/10/14 *	0		
00070	Section W5 - P.S. No. 1 in Portion D	0 0	)	31/10/14 *		31/10/14	0		
D0080	Section W6 - Sewer & PS No2 in Ptn. E & F	0 0	)	31/10/14 *		31/10/14	0	0* Section W6 - Sewer & PS No2 in Ptn. E & F	
D0090	Section W7 - SKW STW, RM & Sm. Outfall		>	02/03/15 *		02/03/15 *	0		
D0030				02/03/13		02/03/13			
D0100	Section W8 - Landscape Softworks	0 0	)	11/11/14 *		11/11/14	0	0 *Softworks	
D0110	Section W9 - Establishment Works	0 0	)	24/05/15 *		24/05/15	0		
00125	Project Completion	0 0	)	24/05/15		24/05/15	0		
00130	Completion of Maintenance Period of W1	1 100	) 13/10/12 A	13/10/12 A	12/10/12 A	13/10/12 A			
0132	Completion of Maintenance Period of W2		) 15/06/15	15/06/15 *	15/06/15	15/06/15 *	(		
0132	Completion of Maintenance Period of W4		) 01/11/14	01/11/14 *	01/11/14	01/11/14 *		0 Completion of Maintenance Period of W4	
0135	Completion of Maintenance Period of W5		) 01/11/14	01/11/14 *	01/11/14	01/11/14 *		0 Completion of Maintenance Period of W5	
0145	Completion of Maintenance Period of W6		) 01/11/14	01/11/14 *	01/11/14	01/11/14 *		0 Completion of Maintenance Period of W6	
0155	Completion of Maintenance Period of W8 Completion of Maintenance period of W7		) 06/10/15	06/10/15 *	06/10/15	06/10/15 *			
0100			100/10/15	00/10/15	00/10/15	10/10/15			
eliminary	(Civil)								
E0020	Pre-condition Survey	60 100	) 17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A			
E0040	Erection of Engineer's Site Accommodation at YSW		) 17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A			
RE0050	Taking over the Secondary Engineer's Site Accomm		) 17/05/10 A	30/07/10 A	17/05/10 A				
RE0060	Application of Consent from Marine Department		) 17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A			
E0090	Working Group Meeting for Outfall Construction		) 17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A			
E0100	Application & Consent of XP from HyD (Mo Tat Rd)		) 17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A			
E0130	Setup Web-site for EM&A Reporting		) 17/05/10 A	14/08/10 A		14/08/10 A			
eliminary			· · · · ·	1					
echnical Sub	· · ·								
YSW0820	ABWF installation	90 100	15/01/13 A	05/09/14 A	15/01/13 A	05/09/14 A			
	gn of SKWSTW & YSWSTW	100	/						
E&M0010	Submission	38 100	) 17/05/10 A	23/06/10 A	17/05/10 A	23/06/10 A			
E&M0020	Vetting and Comment by ER		) 24/06/10 A	14/07/10 A		14/07/10 A			
E&M0030	Revision and Resubmission		) 15/07/10 A			16/11/10 A			
E&M0080	Approval from the Engineer			30/11/10 A					
Hydraulic Des			,						
E&M0040	Submission	21 100	) 15/07/10 A	04/08/10 A	15/07/10 A	04/08/10 A			
E&M0050	Vetting and Comment by ER		) 05/08/10 A			18/08/10 A			
E&M0060	Revision and Resubmission		) 19/08/10 A			10/10/10 A			
E&M0430	Approval from the Engineer		) 24/11/10 A			30/11/10 A			
YSW1536	Water tightness test		) 12/08/13 A			26/08/13 A			
	Ibmission & 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			
E&M0090	Vetting and Comment by ER		) 06/07/10 A			19/07/10 A		Image: serie seri	
E&M0100	Revision and Resubmission		) 20/07/10 A			24/02/11 A			
E&M0101	Submission of Equipment		) 05/08/10 A			30/11/11 A			
E&M0102	Vetting and Comment by ER		) 03/11/10 A			30/11/11 A			
E&M0103	Revision and Resubmission		) 01/02/11 A			30/11/11 A			
E&M0110	Approval on Coarse Screens		) 25/05/11 A			25/05/11 A			
E&M0120	Approval on Fine Screens		) 12/09/11 A			12/09/11 A			
E&M0130	Approval on Pumps		) 23/06/11 A			23/06/11 A			
E&M0140	Approval on Submersible Mixers		) 23/03/11 A			23/03/11 A			
E&M0150	Approval on Grit Removal Equipment		) 10/10/11 A			10/10/11 A			
E&M0160	Approval on MBR Membrane Modules (M.M.)		) 03/08/10 A			24/02/11 A			
E&M0170	Approval on Sludge Dewatering Equipment		) 01/09/11 A			01/09/11 A	-		
					31,3311 A		1		
art date	05/05/10 Early bar							Date Revision Chec	ked Appro
nish date	31/01/17 Progress bar			14	eader Civ	vil Engine	erina	ag Corp. Ltd. 31/10/14 Revision 0 RH	VC
ta date	01/11/14 Critical bar Summary bar					tract No.			
in date	10/11/14 Progress point		Co	nstruction				t Works at YSW & SKW	
ige number	1A Critical point Summary point							Nov 2014 - Jan 2015	

Start date 05/05/10	Early bar
Finish date 31/01/17	Progress bar
Data date 01/11/14	Critical bar     Summary bar
Run date 10/11/14	Progress point
Page number 1A	Critical point
c Primavera Systems, Inc.	<ul> <li>Start milestone point</li> </ul>
	Finish milestone point

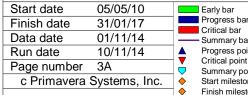
3-month Rolling Programme (Nov 2014 - Jan 2015

Activity		Original P	ercent Early	Early	Late	Late	Total		2014			2015	
ID	Description	Duration Co		Finish	Start	Finish	Float	OCT 28 05 12 19 26 02	NOV 09 16 23	DEC 30 07 14 21	JAN 28 04 11 18	F 25 01 08	FEB 15 22
E&M0180	Approval on Valves, Pipes & Fittings	30	100 19/11/11 A	04/08/13 A	19/11/11 A	04/08/13 A							
E&M0190	Approval on Penstocks	30	100 15/11/11 A		15/11/11 A	15/11/11 A				i i i i i i i ++++++++			   
E&M0200	Approval on Instrumentation	30	100 21/06/11 A		21/06/11 A	08/03/12 A							
E&M0210	Approval on MCC & LVSB	30	100 19/11/11 A		19/11/11 A	01/01/14 A							
E&M0220	Approval on BS Equipment	30	98 30/11/11 A		30/11/11 A	13/09/14 *	-490		pproval on BS Equipment				
E&M0230	Approval on FS Equipment	30	100 30/11/11 A	02/10/14 A	30/11/11 A	02/10/14 A		Approval on FS Equipment					
E&M0235	nission & Approval Sub. P&ID Drawings	100	98 24/06/10 A	02/11/14	24/06/10 A	07/09/14	-560		Sub. P&ID Drawings				
E&M0240	Sub. Plant GA Drawings	45	95 04/08/10 A	02/11/14	04/08/10 A	07/09/14	-560		Sub. Plant GA Drawings				
E&M0250	Sub. Builder's Works Requirements Drawings	15	100 04/08/10 A	31/01/13 A	04/08/10 A	31/01/13 A			5				
E&M0260	Sub. Mechanical Installation Drawings	60	98 27/09/10 A	01/11/14	27/09/10 A	07/09/14	-550		ub. Mechanical Installation D	Prawings			
E&M0270	Sub. Electrical Installation Drawings	60	98 27/09/10 A	01/11/14	27/09/10 A	07/09/14	-550	d <b>S</b> u	ub. Electrical Installation Dra	wings			
E&M0280	Sub. BS Installation Drawings	120	98 27/09/10 A	04/11/14	27/09/10 A	12/09/14	-530		Sub. BS Installation Drawin	ngs			
E&M0290	Sub. FS Installation Drawings	120	100 13/11/11 A	08/10/14 A	13/11/11 A	08/10/14 A		Sub. FS Installation Drawing	S				
Statutory Subm	nission	-1	1	1	1	1							
E&M0295	Preparation of Submission to HEC	39	100 01/11/11 A	30/11/11 A									
E&M0300	Application & Approval from HEC	150	100 01/11/11 A	03/03/14 A		03/03/14 A							
E&M0305	Provision of Cables to the STWs	180	100 03/03/14 A			30/08/14 A							
E&M0320	Form 314 Submission to FSD	14	0 01/11/14		01/11/14	14/11/14 *	(		Form 314 Subn	nission to FSD			
E&M0325	Submission to WSD Form 501 Submission to FSD (YSW)	14	100 01/11/11 A		01/11/11 A	29/02/12 A			i i i	Form 501 Submission to FSD			
E&M0330 E&M0340	Form 501 Submission to FSD (YSW) Form 501 Submission to FSD (SKW)	28	0 01/11/14 *	28/11/14 * 28/11/14 *	01/11/14 01/11/14	28/11/14 * 28/11/14 *				Form 501 Submission to FSD			
E&M0350	Form 501 Submission to FSD (SKW)	28	0 01/11/14		01/11/14	28/11/14 *				Form 501 Submission to FSD			
Yung Shue V		20	0 01/11/14	20/11/14	01/11/14	20/11/14							
Preliminary													
KD0020	Project Commencement Date	0	100	17/05/10 A		17/05/10 A							
			100										
KD0030	Section W1 - Slope Works in Portion A & C	0	100	14/10/11 A		14/10/11 A							
YSW0020	Approval of Environmental Team	16		01/06/10 A	17/05/10 A	01/06/10 A							
YSW00201	Change Baseline Monitoring Location (Air&Noise)	59	100 02/06/10 A	30/07/10 A		30/07/10 A							
YSW0030	Baseline monitoring (Air & Noise)	23				22/08/10 A							
YSW0035	Baseline Monitoring Report Submission (A & N)	16											
YSW00351	Submission & Approval for Monitoring Method (W)	58	100 02/06/10 A	29/07/10 A	02/06/10 A	29/07/10 A							
YSW0040	Baseline monitoring (Water)	155	100 30/07/10 A	31/12/10 A	30/07/10 A	31/12/10 A							
YSW0050	Erect Hoarding and Fencing	60	100 19/05/10 A	17/07/10 A	19/05/10 A	17/07/10 A							
	ope Works in Portion A & C				1	1							
YSW0075	Mobilization	30	100 17/05/10 A			15/06/10 A							
YSW0080	Site Clearance	30	100 16/06/10 A			15/07/10 A		_					
YSW0085		14	100 02/07/10 A		02/07/10 A	15/07/10 A							
YSW0090	Verify the Rock Boulder required Stablization Wk Removal of Rock Boulder	249	100 16/07/10 A	21/03/11 A		21/03/11 A							
YSW0100 YSW0110	Stablizing work for rock boulder	257 35	100 20/09/10 A 100 16/07/11 A			03/06/11 A 19/08/11 A							
YSW0110	Cut the slope to design profile	35	100 16/07/11 A 100 24/09/10 A	19/08/11 A 25/09/10 A		19/08/11 A 25/09/10 A							
YSW0131	Mobilization of Plant and Material of Soil Nails	14	100 24/09/10 A	25/09/10 A		25/09/10 A							
YSW0132	Erect Scaffold and Working Platform	2	100 26/09/10 A	27/09/10 A		27/09/10 A							
YSW0133	Setting out and Verify Locations of Soil Nails	45	100 28/09/10 A			11/11/10 A							
YSW0134	Drilling and Soil Nails Installation	43	100 19/10/10 A	30/11/10 A	19/10/10 A	30/11/10 A				+ +			
YSW0135	Construction of Nail Heads	12	100 01/12/10 A	12/12/10 A	01/12/10 A	12/12/10 A							
YSW0136	Mesh Installation on Cut Slope	3	100 13/12/10 A	15/12/10 A	13/12/10 A	15/12/10 A							
YSW01361	Verify alignment of access & channels on slope	118	100 16/12/10 A	12/04/11 A	16/12/10 A	12/04/11 A							
YSW0140	Construct U-channels & Step Channel on Cut Slope	182	100 13/04/11 A	-		11/10/11 A				· · · · · · · · · · · · · · · · · · ·			
YSW0153	Removal of Ex U-Channel where clash with B. Wall	151	100 10/05/11 A	07/10/11 A	10/05/11 A	07/10/11 A							
Start date	05/05/10 Early bar									Date	Revisio	n Checked	Approved
	31/01/17 Progress bar			L	eador Civ	vil Enging	orina	J Corp. Ltd.		31/10/14	Revision 0	RH	Approved VC
Data date	01/11/14 Critical bar Summary bar					ract No. [				01/10/14			
Run date	10/11/14 Progress point		Cor	structior				Works at YSW & SKW					
	ZA Summary point							ov 2014 - Jan 2015					
c Primavera S	Systems, Inc.  Start milestone point					5							

Start date	05/05/10		Early bar
Finish date	31/01/17		Progress bar Critical bar
Data date	01/11/14		Summary bar
Run date	10/11/14		Progress point
Page number	2A		Critical point Summary point
c Primavera	Systems, Inc.	Ò	Start milestone point
		_ ♦	Finish milestone point

Date	
31/10/14	

Activity		Original	Percent Early	Early	Late	Late	Total				2014							2015	
ID	Description		Complete Start	Finish	Start	Finish	Float	OCT 28 05 12 19 26	02	09	NOV 16	23 3(	07	DEC 14	21 28	04	JAN 11 18	25 01 08	FEB 15 22
YSW01545	Temporary Diversion of Drainage	244	100 08/09/10 A	09/05/11 A	08/09/10 A	09/05/11 A													
YSW0155	RC Barrier Wall Bay 1-13 (below Ground Level)	256	100 26/09/10 A		26/09/10 A	08/06/11 A													
YSW0170	RC Barrier Wall Bay 1-13 (above Ground Level)	125			09/06/11 A	11/10/11 A													
YSW0175	Construct U-channels and Catchpits (Phase 1)	76			09/06/11 A	23/08/11 A			( ))))))     										
YSW01750 YSW01755	Construction of subsoil drain (phase 1) Construct subsoil drain (phase 2)	14	100 12/10/11 A 100 06/12/12 A		12/10/11 A 06/12/12 A	08/02/12 A 31/12/12 A													
YSW01800	RC Barrier Wall Bay 14 (below & above Ground)	87	100		03/09/12 A	28/11/12 A													
YSW01805	Hydroseeding	14			02/03/13 A	02/03/13 A												1 I I I I I I	
YSW01810	Construct U-channels and Catchpits (Phase 2)	30				22/12/12 A													
Section W2 - YS	W STW & Submarine Outfall																		
Civil & Structura	al Work																		
E&M1120	Hydraulic Test of Pipeworks	7	98 09/05/13 A	31/10/14	09/05/13 A	31/10/14	0		Hyd	raulic Tes	st of Pipew	orks							
KD0010	Receive Letter of Acceptance	0	100	05/05/10 A		05/05/10 A													
YSW0412	Mobilization	30	100 17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A													
YSW0422	Site Clearance	30	100 17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A													
YSW0432	Initial Survey	14	100 02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A												1 I I I I I I	
YSW STW - (	GLH-T			1		-													
YSW0500	ELS & Excavation for Inlet Pumping Station	105	100 08/09/10 A	21/12/10 A	08/09/10 A	21/12/10 A													
YSW0510	Sub-structure construction (Inlet Pumping Stn)	129	100 22/12/10 A	29/04/11 A	22/12/10 A	29/04/11 A												1 I I I I I I	
YSW0520	Backfill & Remove ELS (Inlet Pumping Stn)	40	100 30/04/11 A	08/06/11 A	30/04/11 A	08/06/11 A													
YSW0530	ELS & Excavation for Equalization Tank	159	100 01/01/11 A	08/06/11 A	01/01/11 A	08/06/11 A													
YSW0540	Sub-structure construction (Equalization Tank)	112	100 09/06/11 A	28/09/11 A	09/06/11 A	28/09/11 A							+	-++					
YSW0550	Backfilling & Remove ELS (Equalization Tank)	20			29/09/11 A	18/10/11 A													
YSW05701	ELS & Excavation for Grit Chambers	28			09/06/11 A	06/07/11 A													
YSW05711	Construct sub-structure for Grit Chambers	106			07/07/11 A														
YSW05721	Backfill & Remove ELS for Grit Chambers	12			21/10/11 A														
YSW05731 YSW05741	ELS & Excavation for Grease Separators (GS) Construct sub-structure for Grease Separators	52			07/07/11 A 10/08/11 A														
YSW05751	Install Dia.400 Puddles in Grease Separators	27			01/10/11 A														
YSW05752	Construct sub-structure for GS (above puddles)	48			28/10/11 A													1 I I I I I I	
YSW05761	Backfill & remove ELS for Grease Separators	10			15/12/11 A														
YSW0580	Excavate to Formation for Deodorizer Room	10	100 25/12/11 A		25/12/11 A														
YSW05801	Excavate to formation - Grid J-N/5-7	40	100 04/01/12 A	12/02/12 A	04/01/12 A	12/02/12 A			1-14144 - 4 1 11111 1 1 11111 1 1 11111 1 1 11111 1		+	+-	+ ! !	-++	+ !				
YSW05802	Excavate to formation - Grid GA-H/5-7	10	100 13/02/12 A	22/02/12 A	13/02/12 A	22/02/12 A													
YSW05901	G/F to 1/F Construction Grid GA-K/1-5	90	100 29/09/11 A	27/12/11 A	29/09/11 A	27/12/11 A													
YSW05911	G/F to 1/F Construction Grid N-S/1-5	80	100 21/10/11 A	08/01/12 A	21/10/11 A	08/01/12 A													
YSW05921	G/F to 1/F Construction Grid K-N/1-5	45			25/12/11 A								+						
YSW05922	G/F to 1/F Construction for Deodorizer Room	80			04/01/12 A														
YSW05923	G/F to 1/F Construction for Grid J-N/5-7	60			13/02/12 A														
YSW05924	G/F to 1/F Construction for Grid GA-H/5-7	50			28/05/12 A														
YSW06001	1/F to Roof Constuction for Grid GA-K/1-5	87			28/12/11 A														
YSW06011 YSW06021	1/F to Roof Constuction for Grid N-S/1-5 1/F to Roof Constuction for Grid K-N/1-5	75 44			09/01/12 A 08/02/12 A														
YSW06022	1/F to Roof Constuction for Deodorizer Room	60			24/03/12 A														
YSW06022	1/F to Roof Constuction for Grid J-N/5-7	45			13/04/12 A														
YSW06034	1/F to Roof Constuction for Grid GA-H/5-7	28			27/07/12 A														
YSW06035	Construct buffle walls in Grease Separators	90			18/04/12 A														
YSW07201	Water tightness test for Inlet Pumping Station	60			23/03/12 A				-       -  								- <del>-</del>		
YSW07202	Water tightness test for Equalization Tanks	42																	
YSW07203	Water tightness test for Grit Chambers	42			17/09/12 A														
YSW07204	Water tightness test for Grease Separators	32	100 03/10/12 A	31/10/12 A	03/10/12 A	31/10/12 A													
YSW07205	Water tightness test for water channels	21	100 31/08/13 A	23/09/13 A	31/08/13 A	23/09/13 A				1									
YSW0800	ABWF installation	271	100 03/07/12 A	03/07/14 A	03/07/12 A	03/07/14 A													
YSW STW - 0	GLT-X						1												
YSW0610	Excavate to formation	10	100 08/09/10 A	17/09/10 A	08/09/10 A	17/09/10 A													
Start date	05/05/10 Early bar													Dat	۵		Revision	Chacked	Approved
	31/01/17 Progress bar			I	eader Civ	vil Enging	erina	Corp. Ltd.					31	/10/14	U	Revisi		RH	VC
Data date	01/11/14 Critical bar Summary bar			L		tract No.							51	10/14		1.00101	011 0		
	10/11/14 Progress point		Con	structio				Vorks at YSW & SKW											
	3A Summary point							v 2014 - Jan 2015											
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				-	-	-													



Activity		Original	Percent	Early	Early	Late	Late	Total			2014					2015	
ID	Description		Complete	Start	Finish	Start	Finish	Float		02	NOV 09 16 23	30 (	DEC 17 14 21	28 04	JAN 11 18	F 25 01 08	EB 15 22
YSW0620	Base slab construction	248			23/05/11 A		23/05/11 A										
YSW0630	G/F to 1/F construction	205		) 24/05/11 A	14/12/11 A		14/12/11 A										
YSW0640	1/F to Roof Construction	64			16/02/12 A		16/02/12 A										
YSW0810	ABWF installation	80	100	) 28/12/11 A	16/03/12 A	28/12/11 A	16/03/12 A								 		
YSW STW	GL F - H & DN Tanks				-	1	1	1									
YSW0650	ELS & Excavation for DN Tanks	37	100	) 08/09/10 A	14/10/10 A	08/09/10 A	14/10/10 A										
YSW0660	Sub-struction construction (DN Tanks)	78	100	) 15/10/10 A	31/12/10 A	15/10/10 A	31/12/10 A										
YSW0670	Backfill & Remove ELS (DN Tanks)	70	100	) 01/01/11 A	11/03/11 A	01/01/11 A	11/03/11 A										
YSW0680	Base slab construction (SD1, SD2 & MBR4)	17	100	) 12/03/11 A	28/03/11 A	12/03/11 A	28/03/11 A									I I I I I I I I	
YSW 0690	Construct Superstructure SD1, SD2 & MBR4	82	100	) 29/03/11 A	18/06/11 A	29/03/11 A	18/06/11 A			11 (11) (1 ) 11 (11) (1 ) 11 (11) (1 ) 11 (11) (1 )			L	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·
YSW06901	Construct Superstructure of DN Tanks	28	100	) 15/05/12 A	11/06/12 A	15/05/12 A	11/06/12 A										
YSW0705	Water test for MBR 4	47	100	) 01/10/12 A	16/11/12 A	01/10/12 A	16/11/12 A										
YSW07055	Water test for SD1 & SD2	54		) 17/11/12 A	10/01/13 A		10/01/13 A										
YSW0710	Apply protective paint for MBR 4	7			30/09/12 A		30/09/12 A										
YSW07105	Apply protective paint for SD1 & SD2	7		-	07/10/12 A		07/10/12 A			11 11111   1 11 11111   1 11 11111   1 11 11111   1							
YSW0830	Water test for DN Tanks	28	100	) 14/07/13 A	13/09/13 A		13/09/13 A										
YSW0850	Apply protecitve paint for DN Tanks	6	100	) 27/04/13 A	11/07/13 A	27/04/13 A	11/07/13 A			H H H H H H H H H H H H H H H H H H H							
YSW STW						1											
YSW0730	Completion of HDD	0		) 21/01/12 A		21/01/12 A											
YSW0732	Excavate for MBR 2 & 3	20		) 21/01/12 A	09/02/12 A	21/01/12 A	09/02/12 A										
YSW0733	Construct basement of MBR 2 & 3	20			29/02/12 A	10/02/12 A	29/02/12 A										
YSW0735	Construct superstructure of MBR 2	75	100	) 01/03/12 A	14/05/12 A	01/03/12 A	14/05/12 A									1 I I I I I I	
YSW0736	Construct superstructure of MBR 3	100	100	) 15/05/12 A	14/05/12 A	15/05/12 A	14/05/12 A			11 (11) (1 11 (1)) (1))		· · · · · · · · · · · · · · · · · · ·	     				· · · · · · · · · · · · · · · · · · ·
YSW0740	ELS & excavate for Outfall Shaft	75	100	) 01/03/12 A	14/05/12 A	01/03/12 A	14/05/12 A										
YSW0750	Construct basement of Outfall Shaft	19	100	) 15/05/12 A	02/06/12 A	15/05/12 A	02/06/12 A										
YSW07501	Connect additional flange to HDPE pipe (VO 042)	5			07/06/12 A												
YSW07502	Construct sub-structure of Outfall Shaft	16	100	) 08/06/12 A												I I I I I I I I	
YSW0760	Backfill & remove ELS (outfall shaft)	8		) 24/06/12 A						11 11111   1 11 11111   1 11 11111   1 11 11111   1	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	++	++			   
YSW07601	Construct superstructure for Outfall Shaft	30	100	) 03/07/12 A													
YSW07603	ELS & excavate for FSH Water Supply Tank	25		) 01/06/12 A													
YSW07604	Construct substructure for FSH Water Supply Tank	24		) 26/06/12 A						11 11011   1 11 11011   1 11 11011   1 11 11011   1							
YSW07605	Backfill & remove ELS for FSH Water Supply Tank	12		) 20/07/12 A												I I I I I I I I	
YSW07607	Construct basement of MBR 1 & Workshop	24	100	01/08/12 A						uuuu uuuu uuun		·	$\frac{1}{1}$		$\frac{1}{\Gamma}\frac{1}{\Gamma}$		
YSW07608	Construct superstructure for FSH Water Supply Tk	37		) 25/08/12 A					E E E E E E E E E E E E E E E E E E E								
YSW07609	Construct superstructure for MBR 1	37		) 25/08/12 A													
YSW07610	Construct Workshop, FSSH Pump Rm, PW Pump Rm	31		) 03/10/12 A													
YSW08301	Water tightness test for Outfall Shaft	42			18/04/13 A											I I I I I I I I	
YSW08302	Water tightness test for MBR 2 & 3	95			24/08/13 A					4000		·			$\frac{1}{\Gamma}\frac{1}{\Gamma}$		
YSW08303	Water tightness test for MBR 1	19		) 30/11/12 A													
YSW08304	Water tightness test for FSH Water Supply Tank	32	100	) 31/08/13 A	01/10/13 A	31/08/13 A	01/10/13 A										
YSW08305	eel / Sprinkler Pump Rm Apply protective paint	120	100	) 02/10/12 A	15/08/13 A	02/10/12 4	15/09/12 4										
	ELS & excavate to formation (+0 mPD approx.)	40			18/04/13 A		18/04/13 A									I I I I I I I I	
YSW0840	Sub-structure construction	40			12/06/13 A		12/06/13 A										
YSW 0860 YSW 0880	Backfill & remove ELS	35			26/08/13 A		26/08/13 A										
	Construction Ground Slab at +5.2mPD	40		) 21/06/13 A	14/07/13 A		14/07/13 A										
YSW0890 YSW0900	Superstructure construction upto +9.2mPD	35	100		01/08/13 A		01/08/13 A					·					
YSW0900	Water test	28			27/01/14 A		27/01/14 A										
YSW0910	Apply protective paint	14			13/01/14 A		13/01/14 A										
YSW0915	ABWF installation	30			19/01/14 A												
	Storage Tank		100	10/07/13 A	19/01/14 A	10/07/13 A	19/01/14 A	<u> </u>									
YSW1470	ELS & excavate to formation (-1.5mPD Approx.)	16	100	) 17/09/12 A	02/10/12 A	17/09/12 A	02/10/12 A										
YSW1480	Sub-structure construction	14		) 03/10/12 A													
YSW1490	Backfill & extract sheetpile	3		) 17/10/12 A													
YSW1500	Superstructure construction upto +10.5mPD	41		) 20/10/12 A													
			100							111111		i i		i i	i i		1
Start date	05/05/10 Early bar												Date		Revision	Checked	Approved
Finish date	31/01/17 Progress bar				Le	eader Civ	/il Engine	erina	Corp. Ltd.				31/10/14	Rev	ision 0	RH	VC
Data date	01/11/14 Summary bar						ract No. I										
Run date	10/11/14 Progress point			Con	struction				Norks at YSW & SKW								

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 Run date
 10/11/14
 Progress point

 Page number
 4A
 Critical point

 C Primavera Systems, Inc.
 Start milestone point

Construction of Sewage Treatment Works at YSW & SKW 3-month Rolling Programme (Nov 2014 - Jan 2015

Activity	Description	Original	Percent Early	Early	Late	Late	Total	ост		2014 NOV			IAN	201		50
ID	·		Complete Start	Finish	Start		Float	28 05 12 19 26	02		DEC 07 14 21	28 04	JAN 11 18	3 25		EB 15 22
YSW1530	Underground pipeline works	40	100	-		01/10/13 A					i i i i i	·				i 
YSW1538	Apply protective paint	30	100			05/03/13 A										
YSW1540	ABWF installation	40	100 03/04/13 A	01/10/13 A	03/04/13 A	01/10/13 A										
YSW16601	Cable Draw Pits & Ducting ELS & excavate 6m deep sewer (FM1 - YFMH13)	90	100 04/08/13 A	15/01/14 A	04/08/13 A	15/01/14 A										
YSW 16602	Lay pipe & backfill 6m deep sewer (FM1 - YFMH13)	45		1		10/02/14 A										
YSW16603	Construct UU & pipes along sea side (Grid Q-X)	60	100		04/03/14 A											
YSW16604	Construct UU & pipes along sea side (Grid XA-D)	60			22/07/13 A											
YSW16605	Construct UU & pipes along sea side (Grid D-Q)	60				11/01/14 A										
YSW16606	Construct UU & pipes along hill side (Grid D-Q)	90		01/09/13 A	10/10/12 A	01/09/13 A							·			
YSW16607	Construct UU & pipes along hill side (Grid Q-X)	72	100 20/08/12 A	01/09/13 A	20/08/12 A	01/09/13 A										
YSW16608	Construct UU & pipes along hill side (Grid XA-D)	72	100 30/11/12 A	01/09/13 A	30/11/12 A	01/09/13 A										
YSW16701	Construct Boundary Wall (Grid XA-D)	80	100 10/01/13 A	15/12/13 A	10/01/13 A	15/12/13 A										
YSW16702	Construct Boundary Wall (Grid D-Q)	80	100 01/01/14 A	31/01/14 A	01/01/14 A	31/01/14 A										
YSW16703	Construct Boundary Wall (Grid Q-X)	80	100 21/02/14 A	26/03/14 A	21/02/14 A	26/03/14 A										
YSW16704	ABWF installation for Boundary Wall	240	50 31/12/13 A	31/12/14	31/12/13 A	31/10/14	-61d							or Boundary \		
YSW16705	Painting for Boundary Wall (V.O. No. 108)	61	0 01/11/14 *	31/12/14	01/09/14	31/10/14	-61d		*		i i i	Painting	for Boundar	ry Wall (V.O.	No. 108)	
YSW1680	Fire Hydrant & pipeline installation	120	100 26/01/13 A	06/10/14 A	26/01/13 A	06/10/14 A		Fire Hydrant & pipeline ins		ation						
YSW1690	Construction of Road Kerbs, Downpipes, U-channel	180	100 02/01/13 A	11/08/14 A	02/01/13 A	11/08/14 A					· · · · · · · · · · · · · · · · · · ·	, , , , , , , , , , , , , , , , , , ,		·		
YSW1700	Road Paving	110	99 23/05/14 A	01/11/14	23/05/14 A	31/10/14	-1d			Road Paving						
Submarine Out	1			00/07//07	47/05/42 4	00/07/40 1										
YSW0180	Coordination of HEC	53 60				08/07/10 A										
YSW0200 YSW0210	Submission and Approval of Ecologist			15/07/10 A		15/07/10 A										
YSW0210	Ecology Survey Submission and Approval of In. Hydro Survey	211	100 16/07/10 A 100 17/05/10 A	11/02/11 A 27/08/10 A		11/02/11 A 27/08/10 A										
YSW0220	Hydrogrophical Survey (YSW)	103	100 17/05/10 A	31/01/11 A		31/01/11 A										
YSW0240	Material Submission, Approval of HDPE pipe	319		31/03/11 A		31/03/11 A			14							
YSW02401	Clarify Coordinate of Point Y (Reply of RFI 010)	83		18/09/10 A		18/09/10 A										
YSW0250	Submit and Approval of Method Statement for HDD	188	100 19/09/10 A	25/03/11 A		25/03/11 A										
YSW0260	Submission of HDD Method Statement to HEC	14	100 26/03/11 A	08/04/11 A	26/03/11 A											
YSW0270	Additional G.I. Boreholes (YSW)	123	100 19/09/10 A	19/01/11 A	19/09/10 A	19/01/11 A										
YSW0280	Submission of propose alignment	44	100 20/01/11 A	04/03/11 A	20/01/11 A	04/03/11 A			10-1- 11-1-			· - F	·			
YSW0290	Submission of Marine Notice	69	100 20/01/11 A	29/03/11 A	20/01/11 A	29/03/11 A										
YSW0310	Construction of Entry Pit and Preparation Work	27	100 05/03/11 A	31/03/11 A	05/03/11 A	31/03/11 A										
YSW0320	Prepare of HDD Drill Rig Set-up (YSW)	28	100 01/04/11 A			28/04/11 A										
YSW0330	Establishment of HDD plant & equipment	6	100 09/04/11 A		09/04/11 A				11   19-1 -							
YSW0340	Setting up at drillhole location	14				28/04/11 A										
YSW0350	Drill pilot hole and reaming hole - NS400 - 530m	229			29/04/11 A											
YSW0360	Installation of NS400 HDPE 530m	17			14/12/11 A											
YSW03601	Demobilization of HDD plant & equipment	/	100 31/12/11 A			06/01/12 A										
YSW03605 YSW03620	Remove Entry pit of HDD Removal of Receiving Pit	14			07/01/12 A	20/01/12 A 13/01/12 A			111   1 1 H			· · · · · · · · · · · · · · · · · · ·		·		
YSW03641	Prepare backfilling material under VO 046A	14				05/05/12 A										
YSW0365	Set up of Silt Curtain as per EP	2	100 07/01/12 A 100 23/11/12 A			24/11/12 A										
YSW0370	Dredging of Marine Deposit for Diffuser (YSW)	5	100 24/11/12 A			29/11/12 A										
YSW0380	Diffuser Construction (YSW)	60				20/06/13 A										
YSW0400	Removal of silt curtain	30	100 30/04/13 A	31/05/13 A	30/04/13 A	31/05/13 A			1017- 111					·		
E&M Works - \	SW STW		I													
E&M0360	Delivery of MBR Memb. Mod. (MBR Tk 4)	118	100 24/02/11 A	21/06/11 A	24/02/11 A	21/06/11 A										
E&M0370	Delivery of MBR Membrane Modules - 2nd Shipment	236	100 24/02/11 A	17/10/11 A	24/02/11 A	17/10/11 A										
E&M0380	Delivery of Grit Removal Equipment	81				29/12/11 A								I I I		
E&M0390	Delivery of Coarse Screens	129				12/01/12 A										
E&M0400	Delivery of Fine Screens	80			12/09/11 A				::: :::					·		
E&M0410	Delivery of Pumps	75														
E&M0420	Delivery of Submersible Mixers	230				26/02/11 A										
E&M0440	Delivery of Sludge Dewatering Equipment	558	100 31/08/11 A	16/06/14 A	31/08/11 A	16/06/14 A					-					-
	05/05/10 Early bar 31/01/17 Progress bar						• <b>!</b>				Date	·	Revisio	on		Approved
	Critical bar			L				Corp. Ltd.			31/10/14	Revis	ion U		RH	VC
	10/11/14 A Progress point		<b>C</b>	otruction		tract No. I		9/13 Vorks at YSW & SKW								
Page number	5A Critical point							v 2014 - Jan 2015								
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Activity ID	Description	Original Duration	Percent Early Complete Start	Early Finish	Late Start	Late Finish	Total Float <sub>28</sub>	OCT 3 05 12 19 26	02 09	2014 NOV 16 23	30 07	DEC 14 21
E&M0450	Delivery of Valves, Pipes & Fittings	560	100 30/08/11 A	26/02/14 A	30/08/11 A	26/02/14 A						
E&M0460	Delivery of Penstocks	135	100 12/08/11 A	24/12/11 A	12/08/11 A	24/12/11 A						
E&M0470	Delivery of Instruments	232	100 03/11/11 A	21/06/11 A	03/11/11 A	21/06/11 A					+ +	++
E&M0480	Delivery of MCC LVSB	90	100 03/12/12 A	04/03/13 A	03/12/12 A	04/03/13 A						
E&M0490	Delivery of BS Equipment	180	100 10/12/11 A	15/04/15 A	10/12/11 A	15/04/15 A						
E&M0500	Delivery FS Equipment	995	100 11/12/11 A	01/11/14	11/12/11 A	01/11/14			Delivery FS	Equipment		
E&M0510	Install Membrane Modules in MBR Tank no. 4	89	100 03/11/12 A	28/02/13 A	03/11/12 A	28/02/13 A						
E&M0520	Install Membrane Modules in MBR Tank No. 1 to 3	57	100 03/12/12 A	28/02/13 A	03/12/12 A	28/02/13 A						
E&M0530	Install Grit Removal Equipment	122	100 01/06/12 A	30/09/12 A	01/06/12 A	30/09/12 A						
E&M0540	Install Coarse Screens	240	100 23/04/12 A		23/04/12 A	23/08/13 A						
E&M0550	Install Fine Screens	122	100 01/06/12 A		01/06/12 A	12/08/13 A						
E&M0560	Install Pumps	355	100 23/04/12 A	-	23/04/12 A	04/02/14 A						
E&M0570	Install Submersible Mixers	163	100 25/04/12 A	16/01/14 A		16/01/14 A		$ $ $$ $$ $$ $$ $$	H- <mark></mark>			
E&M0580	Install Sludge Dewatering Equipment	361	100 13/01/13 A	18/10/14 A	29/05/12 A	18/10/14 A		Install Slude	e Dewatering	Equipment		
E&M0590	Install Valves, Pipes & Fittings	232	100 29/03/12 A	12/10/14 A		12/10/14 A		Install Valves, Pipe		Equipment		
E&M0600		232		21/05/13 A		21/05/13 A			s a riungs			
	Install Penstocks (Batch 1, GL H - T)		100 23/04/12 A		23/04/12 A		504		Install In	atrumanta		
E&M0610		74	98 02/01/13 A	02/11/14 *	02/01/13 A	04/09/14 *	-59d			struments	i + +	i
E&M0620	Install SAT, MCC & LVSB	8	100 02/01/13 A	02/01/15 A	02/01/13 A	02/01/15 A					1	I I
E&M0630	Install BS Equipment	637	100 02/01/13 A	01/11/14	02/01/13 A	01/11/14				· · · · · · · · · · · · · · · · · · ·		
E&M0640	Install FS Equipment	180	100 02/01/13 A	05/11/14 A	02/01/13 A	05/11/14 A				I FS Equipment		
E&M0650	Hydraulic Tests of Pipeworks	153	98 02/01/13 A	03/11/14	02/01/13 A	07/11/14	4d			ic Tests of Pipework	S	
E&M0660	Cabling Works	15	99 04/02/13 A	31/10/14	04/02/13 A	30/10/14	-1d		Cabling W		 	 
E&M0670	Insulation Tests of Cables and Cable Termination	26	98 11/04/13 A	15/11/14	11/04/13 A	31/10/14	-15d			Insulation Test	s of Cables ar	nd Cable Termii
E&M0680	Energization	1	100 02/04/13 A	03/04/13 A	02/04/13 A	03/04/13 A						
E&M0690	Functional and Performance Tests of Equipment	35	100 25/03/13 A	11/04/13 A	25/03/13 A	11/04/13 A						
E&M0700	T&C Period	137	100 09/12/13 A	01/07/13 A	09/12/13 A	01/07/13 A						
E&M0730	Trial Operation Period	413	50 02/07/13 A	04/02/16	02/07/13 A	14/06/15	-235d					
Sok Kwu War	n			,								
Preliminary									II I I II I I II I			
E&M0605	Install Penstocks (Batch 2, GL A - F)	131	100 02/01/13 A	19/01/14 A	02/01/13 A	19/01/14 A			II I I II I I II I			
SKW0250	Approval of Environmental Team	16	100 17/05/10 A	01/06/10 A		01/06/10 A			II I I II I I II I			
SKW0260	Baseline monitoring (Air & Noise)	14	100 02/06/10 A	15/06/10 A		15/06/10 A			II I I II I I II I			
SKW0265	Baseline Monitoring Submission (A & N)	14	100 16/06/10 A		16/06/10 A	08/07/10 A			II I I II I I II I			
	potpath Diversion in Portion G		100 10,00,10 /1	00/01/10/1	10,00,1071	00/01/10/1						
Civil & Geotech	•											
SKW0240	Site Clearance	21	100 17/05/10 A	06/06/10 4	17/05/10 A	06/06/10 A						
SKW0241	Initial Survey	9	100 07/06/10 A		07/06/10 A	15/06/10 A						
SKW0242	Retaining Wall Bay 0-10 (Incl. VO. 001A)	177	100 30/06/10 A	-	30/06/10 A	23/12/10 A						
SKW0242	Utilities Laying and Diversion	70	100 24/12/10 A	_	24/12/10 A	03/03/11 A						
SKW0401 SKW0471	Concreting for Pavement	70	100 04/03/11 A		04/03/11 A	10/03/11 A						
		14									, ,	
SKW0481	Footpath Diversion - Stage 1		100 11/03/11 A		11/03/11 A	24/03/11 A						
SKW04811	Excavate for FP transition at CH0-35 &CH130-141	37	100 25/03/11 A		25/03/11 A	30/04/11 A						
SKW04821	Construction of Drainage outfall near bay 10	3	100 01/05/11 A		01/05/11 A	03/05/11 A						
SKW04831	Cable diversion by HEC	26	100 04/05/11 A		04/05/11 A	29/05/11 A						
SKW04841	Diversion of Ducting and Drawpit by PCCW	12	100 20/05/11 A		20/05/11 A	31/05/11 A			H II I I I H II I I I I I I I I I I I I			
SKW04851	Soil backfilling behind FP retaining wall	14	100 01/06/11 A		01/06/11 A	14/06/11 A						
SKW 04861	Concreting for footpath pavement	7	100 15/06/11 A	21/06/11 A		21/06/11 A						
SKW04871	Relocation of Temp Safety Fence at SKW STW A-G	57	100 22/06/11 A	17/08/11 A		17/08/11 A						
SKW04881	Disposal of excavation material at A-G SKW STW	138	100 18/08/11 A	02/01/12 A		02/01/12 A						
SKW 04885	Footpath Diversion - Stage 2	7	100 03/01/12 A	09/01/12 A		09/01/12 A	-		H		 	++
SKW 04891	Underground FS pipes	20	0 04/11/14 *	23/11/14	09/01/15	28/01/15	66d		►	Under	ground FS pi	·
						1	1		11 🚺 I 👘 👘 👘			ubmission and V
SKW04892	WWO46 submission and WSD inspection	7	0 24/11/14	30/11/14	29/01/15	04/02/15	66d				L L L	
SKW04892 SKW04893	WWO46 submission and WSD inspection Thrust block and water test	7 10	0 24/11/14 0 01/12/14	30/11/14 10/12/14	29/01/15 05/02/15	04/02/15 14/02/15	66d 66d				L L L	Thrust block and
	•	7 10 30	-									

Start date	05/05/10	Early bar
Finish date	31/01/17	Progress bar
Data date	01/11/14	- Summary bar
Run date	10/11/14	Progress point
Page number	6A	Critical point
c Primavera	<ul> <li>Start milestone point</li> </ul>	
	-	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 (Nov 2014 - Jan 2015 Date 31/10/14

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Removal of Haul Road after SKW STW									
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Activity		Original	Percent Early	Early	Late	Late	Total			2014								2015		
ID	Description	Duration		Finish	Start	Finish	Float	OCT 28 05 12 19 26	02 09	NOV 16	3 30	DEC 07 14	21 2	28	04	JAN 11	l 18	25	01 08	FEB 15 22
SKW0501	Concreting for no-fine concrete	10	0 26/12/14	04/01/15	15/02/15	24/02/15	51d											e concrete		
SKW0511	Wall Tie & Stone Facing	20	0 05/01/15	24/01/15	25/02/15	16/03/15	51d							Þ	-			Wall Tie	e & Stone Fa	icing
SKW0521	Gabion Wall & Geotextile	20	0 25/01/15	13/02/15	17/03/15	05/04/15	51d										►			Gabion Wa
SKW0531	Installation of Flower Pot	7	0 14/02/15	20/02/15	06/04/15	12/04/15	51d								) I				1	
SKW0541	Completion of Outstanding Works	42	0 21/02/15	03/04/15	13/04/15	24/05/15	51d										 		   	
	lope Works in Portions H & I																			
Geotechnical					1		1													
SKW 0588	Construct scaffolding access	30	100 15/06/10 A		15/06/10 A				I I I I I I I I I I						1					
SKW 0590	Site Clearance for Slope	100	100 15/07/10 A	-	15/07/10 A															
SKW0591	Initial Survey for Slope	28	100 21/09/10 A	_	21/09/10 A			-												
SKW0592	Temporary Rockfall fence at ex. Footpath	43	100 31/08/10 A		31/08/10 A															
SKW 05931	Construction of Haul Road (To +30mPD)	50	100 03/09/10 A		03/09/10 A				i 1	·	·		i i i i i i i i i i i i i i i i i i i				·	$\frac{1}{2} = \frac{1}{2}$		
SKW 05932	Construction of Haul Road (To +42.5mPD)	68	100 23/10/10 A			29/12/10 A			I I I I I I I I I I						1					
SKW059321	Removal of Boulders (IBG 1 - 119, SI No. 11B)	121	100 03/11/10 A			03/03/11 A														
SKW059322	Add. Site Invest. Works (VO. No. 9,12 &16)         Revised Profile at West Slope (+56 to +42.5mPD)	174	100 11/01/11 A 100 17/03/11 A		11/01/11 A			-												
SKW 059323 SKW 059324	Construction of Haul Road (+42.5 to +56mPD)	12	100 17/03/11 A		17/03/11 A	29/03/11 A														
SKW 059324	Removal of Boulders (IBG 120-139, SI No. 11C)	12	100 18/03/11 A		30/03/11 A				1						'		·	$\begin{matrix} I \\ I \\ I \end{matrix} = \begin{matrix} I \\ I \end{matrix}$		
SKW 05933	West Slope Cutting (+56mPD to +42.5mPD)	2	100 36/03/11 A			17/04/11 A														
SKW 059331	Removal of Boulders (IBG 140-189, SI No. 11D)	45	100 18/04/11 A		18/04/11 A			-												
SKW 05934	West Slope Cutting (+42.5mPD to +35mPD)	32	100 02/06/11 A		02/06/11 A	-														
SKW059341	Revised Profile at West Slope (+20 to +4.8mPD)	1	100 04/07/11 A			04/07/11 A									i I					
SKW 05935	West Slope Cutting (+35mPD to +27.5mPD)	83	100 08/07/11 A		08/07/11 A				{- <mark>-</mark>											
SKW 05936	West Slope Cutting (+27.5mPD to +20mPD)	61	100 29/09/11 A			28/11/11 A														
SKW05937	West Slope Cutting (+20mPD to +12.5mPD)	39	100 29/11/11 A			06/01/12 A														
SKW 05938	West Slope Cutting (+12.5mPD to +4.8mPD)	90	100 07/01/12 A			27/03/12 A														
SKW05941	Slope Stormwater Drainage	300	100 28/03/12 A		28/03/12 A										1					
SKW059411	East Slope Cutting (+50mPD to +42.5mPD)	72	100 04/03/11 A	14/05/11 A	04/03/11 A	14/05/11 A				+			++							
SKW059412	East Slope Cutting (+42.5mPD to +35mPD)	82	100 15/05/11 A	04/08/11 A	15/05/11 A	04/08/11 A														
SKW059413	East Slope Cutting (+35mPD to +27.5mPD)	55	100 05/08/11 A	28/09/11 A	05/08/11 A	28/09/11 A														
SKW059414	East Slope Cutting (+27.5mPD to +20mPD)	61	100 29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A									1					
SKW059415	East Slope Cutting (+20mPD to +12.5mPD)	39	100 29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A														
SKW059416	East Slope Cutting (+12.5mPD to +4.8mPD)	81	100 07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A														
SKW 05942	Slope Miscellaneous Works	61	100 26/05/12 A																	
SKW 05943	Buttress & surface Protection (SI No. 31)	60	100 03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A														
SKW 05944	Slope Treatment (SI. No. 36)	60	100 03/07/12 A												1					
SKW05945	Rock Slope Treatment (SI. No. 68)	60	100 01/08/12 A							·	·			!			   			
SKW 05946	Rock Slope Treatment (SI. No. 98)	60	100 10/09/12 A					<u>_</u> '												
SKW05947	Rock Slope Treatment (SI. No. 115)	60	100 01/11/12 A																	
SKW 05948	Soil Nailing Works (VO. No. 52)	300				28/02/13 A														
SKW 0595	Rock Meshing	60	80 01/07/14 A	12/11/14	01/07/14 A		327d		1 1	Rock Mesh	ng				1					
SKW 05963	Determine Alignment & Foundation Design of RFB	120	100 10/02/12 A			08/06/12 A			1	·										
SKW059631	GEO Approval of Foundation Design	70	100 09/06/12 A			31/07/12 A														
SKW 05964	Fabrication & Shipping of RFB Material           Site clearance & Formation of access	180				30/11/12 A									1 		1			
SKW 05965 SKW 05967	Plant mobilization	62	100 09/06/12 A 100 02/01/13 A			31/07/12 A 15/01/13 A														
SKW 05967 SKW 05968	Construction of anchors & pull out test	14	100 02/01/13 A 100 16/01/13 A			15/01/13 A 17/08/13 A									i.					
SKW 05969	Construction of Foundation	180	100 16/01/13 A 100 11/07/13 A		10/01/13 A											- - -	· 			
SKW 05969 SKW 05970	Proof Load Test	60				23/08/13 A 28/09/13 A														
SKW05970 SKW05971	Transportation of Material (To the slope crest)	30				28/09/13 A 29/08/13 A														
SKW05971	Installation of Flexible barrier	90	100 31/07/13 A				-													
		90	100 31/07/13 A	20/10/13 A	51/01/13 A	20/10/13 A									'					
	S. No. 1 in Portion D																			
Civil & Geotec				00/05/10 1	47/05/10	00/05/100									j. L					
SKW0651	Site Clearance	7	100 17/05/10 A	_																
SKW 0652	Initial Survey	7	100 24/05/10 A	30/05/10 A	24/05/10 A	30/05/10 A					1					1	<u> </u>	<u> </u>		
Start date	05/05/10 Early bar											Г	ate			Revis	sion		Checker	Approve
Finish date	31/01/17 Progress bar			1	eader Ci	vil Engine	orina	Corp. Ltd.				31/10/14			Revisio				RH	VC
Data date	01/11/14 Critical bar Summary bar			L		tract No.						51/10/14	r		01010	<u></u>			1111	
Run date	10/11/14 Progress point		Cor	structio				Works at YSW & SKW						-				-+		
Page number								ov 2014 - Jan 2015						-+						
c Primavera	Systems, Inc. Start milestone point Finish milestone point				3	3								+						
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Start date	05/05/10		Early bar
Finish date	31/01/17		Progress bar Critical bar
Data date	01/11/14		Summary ba
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Activity ID	Description	Original Duration	Percent Early Complete Start	Early Lat Finish Sta		Total Float <sub>28 05</sub>	ост		NOV		DEC		JAN 04 11 18		EB
SKW 0661	Transplantation for uncommon vegatation	30		29/06/10 A 31/05/1			12 19 26	02 09	16 2	23 30 07	/ 14 21	28	04 11 18	25 01 08	15 22
SKW0681	Excavate to lower the working platform to +3mPD	49	100 30/06/10 A	17/08/10 A 30/06/1											
SKW 0691	ELS to +2.2mPD	40	100 18/08/10 A	26/09/10 A 18/08/1	0 A 26/09/10 A										
SKW0721	Excavate to formation	270	100 17/09/10 A	13/06/11 A 17/09/1	0 A 13/06/11 A						++-				
SKW0722	Construction of Manholes (VO. No. 21A)	107	100 28/10/13 A	31/10/14 A 28/10/1	3 A 31/10/14 A				n of Manholes	s (VO. No. 21A)					
Structural Wo	rks														
SKW0741	RC Works for Structure	240		08/02/12 A 14/06/1											
SKW0841	ABWF works	60	100 09/02/12 A	08/04/12 A 09/02/1	2 A 08/04/12 A										
SKW0861	300mm U-channel & 675mm Step Channel	30	100 26/01/14 A	29/10/14 A 26/01/1	4 A 29/10/14 A			-300mm U-cha	annel & 675m	m Step Channel					
E&M Works (F	,														
Submission		100	100 17/05/10 1		0.4/00/44.4										
E&M1001 E&M1002	Submission of Pumps Submission of Gen-Set	198 198		24/02/11 A 17/05/1 24/02/11 A 17/05/1											
E&M1002	Submission of DeO System	198		16/07/13 A 17/05/1				1111 I.							
E&M1003	Submission of LV SB & MCC	130		09/01/12 A 17/05/1											
E&M1004	Submission of Instrumentation	243	100 17/05/10 A	12/03/12 A 17/05/1											
E&M1006	Submission of FS System	243		30/09/12 A 17/05/1				HH	$ \frac{1}{1} \frac{1}{1} \frac{1}{1}$	$      \frac{1}{1}$ $     \frac{1}{1}$ $    \frac{1}{1}$ $    \frac{1}{1}$ $    \frac{1}{1}$ $     \frac{1}{1}$ $      \frac{1}{1}$ $         -$	$ \frac{1}{1} \frac{1}{1} - \frac{1}{1$				
E&M1007	Submission of BS System	243		07/01/14 A 17/05/1				1111 I 1111 I 1111 I 1111 I 1111 I 1111 I 1 I							
E&M1011	Delivery of Pumps	150		21/07/11 A 24/02/1											
E&M1012	Delivery of Gen-Set	150		23/09/11 A 24/02/1											
E&M1013	Delivery of DeO System	150	100 11/07/11 A	28/10/11 A 11/07/1	1 A 28/10/11 A										
E&M1014	Delivery of LV SB & MCC	150	100 01/06/12 A	31/07/12 A 01/06/1	2 A 31/07/12 A	•		HHH		+-					
E&M1015	Delivery of Instrumentation	90	100 01/11/11 A	03/11/11 A 01/11/1	1 A 03/11/11 A										
E&M1016	Delivery of FS Equipment	107	100 01/12/11 A	21/01/14 A 01/12/1	1 A 21/01/14 A			1111 I 1111 I 1111 I 1111 I 1111 I 1111 I							
E&M1017	Delivery of BS Equipment	107	100 15/11/11 A	28/01/14 A 15/11/1	1 A 28/01/14 A										
Installation, T	Г&C														
E&M1101	Install Pumps	55		05/01/14 A 02/10/1											
E&M1102	Install Gen Set	55		05/05/13 A 02/10/1											
E&M1103	Install DeO System	55		02/01/14 A 03/12/1											
E&M1104	Install LV SB & MCC	55		26/03/13 A 02/01/1											
E&M1105	Install Instrumentation	55		28/01/14 A 01/11/1			· · · · · · · · · · · · · · · · · · ·				+-		·		
E&M1106	Install FS Equipment Install BS Equipment	55		30/01/14 A 02/10/1 08/01/14 A 02/10/1											
E&M1107 E&M1110	Install Valves, Pipes & Fittings	46		27/03/13 A 02/01/1											
E&M1130	Form 501 Submission to FSD	28		28/11/14 * 01/11/1		0			i i	Form 501	Submission to I	SD			
E&M1140	Cabling Works	43	-	07/02/14 A 21/05/1				UTI UU				0D			
E&M1150	Insulation Tests of Cables and Cable Termination	7		09/02/14 A 25/06/1				HH							
E&M1160	Engergization	3		02/08/13 A 01/07/1											
E&M1170	Functional and Performance Tests of Equipment	30	95 02/01/13 A	02/11/14 * 02/01/1	3 A 02/11/14 *	0		Functiona	al and Perforn	nance Tests of E	quipment				
E&M11800	Commissioning Test	60	5 01/10/14 A	27/12/14 * 01/10/1	4 A 27/12/14 *	0						Comm	issioning Test		
	ewer and PS No.2 in Portions E&H														
Civil & Geotec															
SKW0881	Site Clearance	7		23/05/10 A 17/05/1											
SKW0891	Plant mobilization	7		23/05/10 A 17/05/1											
SKW 0892	Initial Survey	30		22/06/10 A 24/05/1											
SKW 0901 SKW 0921	Tree Transplantation Cut Slope & U-Channel	90		20/09/10 A 23/06/1 04/10/10 A 21/09/1											
SKW0921 SKW0931	Hoarding & Fencing	14		18/10/10 A 05/10/1				1111   1210 - J J 1111   1111							
SKW 0950	Removal of Rock Boulders before ELS	66		23/12/10 A 19/10/1											
SKW 0951	ELS & Excavate to formation	169	100 24/12/10 A	10/06/11 A 24/12/1											
SKW0961	Mass Conc. Retaining Wall	90		06/01/14 A 16/01/1											
SKW1491	LCS (ChA0+45 to 1+75) VO.7	90		21/06/12 A 24/03/1											
SKW15111	Twin DN150 DI Rising Main (ChA1+75 - ChA5+79)	180		30/11/12 A 22/06/1				HH- IIII 1 1 IIII 1 IIII 1		+-	+-	+			
SKW15112	Twin DN150 DI Rising Main (ChA0+00 - ChA0+45)	30	100 01/02/13 A	03/01/14 A 01/02/1	3 A 03/01/14 A										
SKW 1531	Extent village sewers S163.1 & S164.1	34	100 30/11/12 A	10/01/13 A 30/11/1	2 A 10/01/13 A	· · ·									
Start date	05/05/10 Early bar										Date		Revision	Checked	Approved
Finish date	31/01/17 Progress bar			Leader	Civil Engi	eering Corp	. Ltd.			_	31/10/14		Revision 0	RH	VC
Data date	01/11/14 Critical bar					DC/2009/13				_	51,10,17	I			
Run date	10/11/14 Progress point		Con				s at YSW & SKW			_					
Page number	8A Summary point			3-month Rollin						_					
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Start date	05/05/10		Early bar
Finish date	31/01/17		Progress ba Critical bar
Data date	01/11/14		- Summary ba
Run date	10/11/14		Progress po
Page number	8A		Critical poin Summary p
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Activity		Original	Percent Early	Early	Late	Late To						2014	ļ							2015		
ID	Description		Complete Start	Finish	Start	Finish Flo	at 28 0	5 12	DCT 19	26	02	NOV 09 16		30	D 07 14	EC 21	28 0	04 11	JAN 18	25 01	FE 08	B 15 22
SKW 1581	Construct Manhole no. S163 & S164	34	100 11/01/13 A	28/02/13 A 11	/01/13 A	28/02/13 A																
Structural Wo	rks																					
SKW 0971	Structural Works (Phase 1)	245	100 11/06/11 A	10/02/12 A 11																		
SKW1021	Structural Works (Phase 2)	42	100 11/02/12 A	23/03/12 A 11		23/03/12 A																
SKW 1061	ABWF Works	90	100 24/03/12 A	21/06/12 A 24		21/06/12 A																
SKW1081	375mm U-channel/catchpits/outfall	30	100 22/06/12 A	31/01/13 A 22	2/06/12 A	31/01/13 A																
E&M Works (I Submission																						
E&M2001	Submission of Pumps	198	100 17/05/10 A	24/02/11 A 17	7/05/10 A	24/02/11 A																
E&M2002	Submission of Gen-Set	198	100 17/05/10 A	24/02/11 A 17		24/02/11 A																
E&M2003	Submission of DeO System	198	100 17/05/10 A		7/05/10 A	11/07/11 A																
E&M2004	Submission of LV SB & MCC	271	100 17/05/10 A	30/06/12 A 17	7/05/10 A	30/06/12 A																
E&M2005	Submission of Instrumentation	243	100 17/05/10 A	30/06/12 A 17	7/05/10 A	30/06/12 A																
E&M2006	Submission of FS System	243	100 17/05/10 A	07/01/14 A 17	7/05/10 A	07/01/14 A					1								   			
E&M2007	Submission of BS System	243	100 17/05/10 A	07/01/14 A 17		07/01/14 A																
E&M2011	Delivery of Pumps	150	100 24/02/11 A	21/07/11 A 24		21/07/11 A																
E&M2012	Delivery of Gen-Set	150	100 24/02/11 A	23/09/11 A 24		23/09/11 A																
E&M2013	Delivery of DeO System	150	100 11/07/11 A	28/10/11 A 11		28/10/11 A						·			· · · · · · · · · · · · · · · · · · ·							
E&M2014	Delivery of LV SB & MCC	150	100 29/02/12 A	31/07/12 A 29		31/07/12 A																
E&M2015 E&M2016	Delivery of Instrumentation Delivery of FS Equipment	90	100 21/06/11 A 100 01/12/11 A	03/11/11 A 21 28/01/14 A 01		03/11/11 A 28/01/14 A																
E&M2018	Delivery of BS Equipment	107																				
Installation,		101	100 10/01/11/1	20/01/11/1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	20/01/11/1	1		l l l		1	1 I I I I I			1 I I I I I	1	<u> </u>			       	1	1
E&M2101	Install Pumps	55	100 02/10/12 A	10/01/14 A 02	2/10/12 A	10/01/14 A																
E&M2102	Install Gen Set	55	100 01/09/12 A	05/05/13 A 01	/09/12 A	05/05/13 A																
E&M2103	Install DeO System	55	100 03/12/12 A	05/01/14 A 03	8/12/12 A	05/01/14 A																
E&M2104	Install LV SB & MCC	55	100 02/01/13 A	31/01/13 A 02	2/01/13 A	31/01/13 A																
E&M2105	Install Instrumentation	55	100 31/05/13 A	01/02/14 A 31	/05/13 A	01/02/14 A									i i i i							
E&M2106	Install FS Equipment	55	100 02/10/12 A	27/02/14 A 02	2/10/12 A	27/02/14 A																
E&M2107	Install BS Equipment	55	100 01/09/12 A	05/02/14 A 01		05/02/14 A																
E&M2110	Install Valves, Pipes & Fittings	46	100 02/01/13 A	31/01/13 A 02		31/01/13 A																
E&M2120	Hydraulic Test of Pipeworks	7	100 02/01/13 A	-	2/01/13 A	31/01/13 A				<u>-</u>	· · · · · · · · · · · · · · · · · · ·	·			01 Submiss	ion to ESD						
E&M2130 E&M2140	Form 501 Submission to FSD Cabling Works	28	0 01/11/14 100 01/02/13 A	28/11/14 * 01 08/03/14 A 01	/11/14 /02/13 A	28/11/14 *	0					·						·		, 		
E&M2150	Insulation Tests of Cables and Cable Termination		100 01/02/13 A																			
E&M2160	Engergization	3		-																		
E&M2170	Functional and Performance Tests of Equipment	30		-	5/01/13 A	03/11/14 *	0	1 111	I		Fur	ctional and	l Performar	ce Tests	of Equipme	nt						
E&M2180	Commissioning Test	60	5 01/10/14 A	27/12/14 * 01	/10/14 A	27/12/14 *	0										Commis	ssioning Te	est			
Section W7 - S	KW STW,Sewer and Submarine Outfall								l L		1										1	
Submarine Ou						1 1																
SKW1130	Approval of IHS Consultant	180		27/08/10 A 17																· · · · · · · · · · · · · · · · · · ·		
SKW1131	Hydrographical Survey (SKW)	300		28/02/11 A 01		28/02/11 A																
SKW1141	Baseline Monitoring (Water)	213 90		31/12/10 A 27 30/09/11 A 15		31/12/10 A 30/09/11 A																
SKW1151 SKW1171	Set up Temporary Working Platform           ELS for HDD Set-up (SKW)	90	100 15/06/11 A 100 01/09/11 A	30/09/11 A 15 30/09/11 A 01		30/09/11 A 30/09/11 A																
SKW1171	Mobilization of HDD plant & equipment to SKW	90 8	100 06/01/12 A	07/01/12 A 06		07/01/12 A						·		<u>+</u>	· +	   		·	   			
SKW1191	Setting up at drillhole location	7	100 09/01/12 A	14/01/12 A 09		14/01/12 A																
SKW 1201	Drill pilot hole and reaming hole - NS280 - 750m	33	100 16/01/12 A	16/02/12 A 16		16/02/12 A																
SKW1211	Receiving Pit for HDD (SKW)	13	100 16/01/12 A	29/02/12 A 16		29/02/12 A																
SKW1221	Installaiton of NS280 HDPE 450mm dia. pipe	61	100 31/03/12 A	30/04/12 A 31	/03/12 A	30/04/12 A					1 1 1			   		   						
SKW1231	Removal of Receiving Platform	50	100 01/05/12 A	19/06/12 A 01		19/06/12 A					1		1	1		1				,		
SKW1241	Dredging of MD for Diffuser (PS CL 1.122(3))	16	100 20/06/12 A	05/07/12 A 20		05/07/12 A					1			   		1						
SKW 1251	Diffuser Construction	77	100 01/09/12 A	16/11/12 A 01		16/11/12 A														· · · · · · · · · · · · · · · · · · ·		
SKW1431	Removal of silt curtain	1	100 17/11/12 A	17/11/12 A 17		17/11/12 A																
SKW1440	Sewer of Outfall Chamber to connection pit VO37A	90	100 31/12/12 A	04/01/14 A 31		04/01/14 A			====;=======			: = = = = = = = = = =	= = = = = = = = = = = = = = = = = = = =			$=====\frac{1}{\frac{1}{\frac{1}{1}}}======$	= = = = = = = = = = = = = = = =				== ============	
SKW1441	Sewer of Connection Pit to Outfall VO45	177	100 05/06/13 A	30/01/14 A 05	13 A	30/01/14 A	1	1 111	i.	Ì	i		i	i	i	Det	<u>i i</u>	-		<u> </u>	i	<u> </u>
Start date Finish date	05/05/10 Early bar 31/01/17 Progress bar			1.00	der Ci-	il Engineeri		اسد ا م							31/10/	Date		Revision (	evision	Ch RF		Approved VC
Data date	01/11/14 Critical bar Summary bar			Lea		vil Engineerin ract No. DC/2									31/10/	14	R		,		I	vu
Run date	10/11/14 Progress point		Con	struction o		age Treatmer			W & SM	w												
Page number	9A Summary point					Programme (																
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Activity	Description		Percent Early	Early	Late	Late	Total	ост	2014 NOV	DE	EC	JÆ	2 AN	2015	FEB
ID		Duration	Complete Start	Finish	Start	Finish	Float 28	05 12 19 26 02	09 16 23	30 07 14		8 04 11	18 25	01 08	15 22
SKW STW															
	Delivery (E&M)	450	100 24/02/11 A	47/40/44 4	04/00/44	47/40/44 4									
E&M3010	Delivery of MBR M.M 1st shipment for Temp STP	150													
E&M3030	Delivery of Grit Removal Equipment	180	100 10/10/11 A												
E&M3060 E&M3070	Delivery of Fine Screens	136	100 12/09/11 A 100 23/06/11 A												
E&M3070	Delivery of Pumps Delivery of Submersible Mixers	136	100 23/06/11 A 100 26/07/11 A												
E&M3090	Delivery of Sludge Dewatering Equipment	210		-							- $        -$	· · · · · · · · · · · · · · · · · · ·			
	, , , , , , , , , , , , , , , , , , , ,														
E&M3100	Delivery of Valves, Pipes & Fittings	180	100 30/08/11 A	06/07/14 A											
E&M3110 E&M3130	Delivery of Penstocks	180	100 12/08/11 A 100 21/06/11 A	24/12/11 A											
E&M3140	Delivery of instruments Delivery of MCC LVSB	180	100 21/08/11 A												
E&M3140	Delivery of BS Equipment	180	100 03/07/12 A	1								· · · · · · · · · · · · · · · · · · ·			
E&M3160	Delivery of FS Equipment	180	100 30/06/12 A												
Construction		100	100 30/00/12 A	00/00/14 A	30/00/12 A	00/00/14 A									
SKW 1261	Excavate for SKW STW Structure (Grid A -G)	164	100 28/03/12 A	31/08/12 A	28/03/12 A	31/08/12 A									
SKW1271	55 M3 Fire Sprinkle Water Tank (FL +0.9 mPD)	36	100 03/07/12 A												
SKW1281	Ground Floor Slab (Grid A-G)	46	100 03/07/12 A												
SKW 1291	Columns & Walls to 1/F & 1/F Slab (Grid A-G)	50	100 03/07/12 A									· · · · · · · · · · · · · · · · · · ·			
SKW1301	Columns & Walls to R/F & R/F Slab (Grid A-G)	50	100 01/09/12 A												
SKW1411	ABWF Works	105	97 01/02/13 A				0		ABWF Works	====	1				
Construction			01 0.00								-				
SKW1311	Excavate for SKW STW Structure (Grid G-N)	90	100 28/03/12 A	25/06/12 A	28/03/12 A	25/06/12 A									
SKW1321	Equalization Tank no.1 & 2 with base slabs (-2.1	42	100 26/06/12 A	30/09/12 A											
SKW1331	Columns & Walls from B/S to G/F Slab (Grid G-N)	35	100 01/09/12 A	30/09/12 A											
SKW1341	Ground Floor Slab (Grid G-N)	35	100 01/09/12 A	17/12/12 A											
SKW1351	Columns & Walls to 1/F & 1/F Slab (Grid G-N)	28	100 01/11/12 A												
SKW1361	Columns & Walls to R/F & R/F Slab (Grid G-N)	35								+++		·			
SKW 1451	ABWF Works	54					0		ABWF Works						
Construction															
SKW1371	Excavate for SKW STW Structure (Grid N-T)	97	100 03/07/12 A	25/01/13 A	03/07/12 A	25/01/13 A									
SKW1381	Ground Floor Slabs include MBR Tank (Grid N-T)	58	100 02/10/12 A	31/01/13 A	02/10/12 A	31/01/13 A									
SKW1391	Columns & Walls to 1/F & 1/F Slab (Grid N-T)	35	100 31/05/13 A	05/07/13 A		05/07/13 A									
SKW1401	Columns & Walls to R/F & R/F Slab (Grid N-T)	35	100 03/07/13 A	15/09/13 A											
SKW1421	ABWF Works	60	97 06/08/13 A				0		ABWF Works						
Road and Dra	inage at Internal EVA	I		1 1		<u> </u>									
SKW1551	Drainage (SSMH1-Outfall)	35	100 15/07/14 A	27/10/14 A	15/07/14 A	27/10/14 A		Drainag	ge (SSMH1-Outfall)						
SKW 15611	Sewer (SMFH10-11, SMFH9-4)	22	100 27/03/14 A	10/10/14 A	27/03/14 A	10/10/14 A		Sewer (SMFH10-11, SMF	H9-4)						
SKW156111	Underground FS pipes	20	50 11/11/14 A	20/11/14	11/11/14 A	10/11/14	-10d		Under	rground FS pipes					
SKW15612	Sewer (SFMH9-10, SFMH11-12, SFMH4-6)	17	30 21/11/14 A	02/12/14	21/11/14 A	22/11/14	-10d			Sewer (SFMH	9-10, SFMH11	-12, SFMH4-6)			
SKW15613	300UC at EVA (GL K to T)	20	0 03/11/14 *	22/11/14	03/11/14	22/11/14	0		300	OUC at EVA (GL K to T	)				
SKW15614	300UC at EVA (GL A to K)	20	0 23/11/14	12/12/14	13/12/14	01/01/15	20d			300	UC at EVA (G				
SKW15615	EVA pavement and road kerb (GL K to T)	20	0 03/12/14	22/12/14	23/11/14	12/12/14	-10d			<b>-</b>	EVA p	avement and road ke			
SKW15616	EVA pavement and road kerb (GL A to K)	20	0 23/12/14	11/01/15	02/01/15	21/01/15	10d					EVA	pavement and	d road kerb (GL	
SKW15617	Slope toe UC at 1.2m high (GL K to T)	40	0 23/12/14	31/01/15	13/12/14	21/01/15	-10d							Slope toe U	C at 1.2m high (Gl
SKW15618	Slope toe UC at 1.2m high (GL A to K)	40	0 01/02/15	12/03/15	22/01/15	02/03/15	-10d								
SKW STW - E															
E&M3170	Install Membrane Modules in MBR Tank No. 1 to 2	100	100 14/01/14 A			08/10/14 A		Install Membrane Modules in							
E&M3190	Install Grit Removal Equipment	60	100 15/03/14 A			15/10/14 A		Install Grit Removal	Equipment		חר ווו ווו				
E&M3210	Install Fine Screens	60	100 14/01/14 A	09/10/14 A	14/01/14 A	09/10/14 A		Install Fine Screens							
E&M3220	Install Pumps	75	60 15/03/14 A	03/12/14	15/03/14 A	29/06/14	-157d			Install Pumps					
E&M3230	Install Submersible Mixers	45				17/07/14	-157d		·		<u></u>	Submersible Mixers			
E&M3240	Install Sludge Dewatering Equipment	74	60 04/03/14 A			18/09/14	-83d			Instal	I Sludge Dewa	tering Equipment	_		
E&M3250	Install Valves, Pipes & Fittings	75	65 13/07/14 A			12/08/14	-157d						Install Valves	s, Pipes & Fitting	S
E&M3260	Install Penstocks	135	100 05/03/14 A	15/10/14 A	05/03/14 A	15/10/14 A		Install Penstocks							
Start date	05/05/10 Early bar										Date	Day	ision	Checked	Approved
	31/01/17 Progress bar			1.0	ader Civ	il Engine	orina Co	orn Itd		31/10/		Revision 0	5011	RH	Approved VC
	01/11/14 Critical bar Summary bar			Le		ract No. E				31/10/	14				vC
Run date	10/11/14 Progress point		Con	struction				orks at YSW & SKW							
	10A Critical point Summary point							2014 - Jan 2015							
c Primavera S	Systems, Inc.  Start milestone point Finish milestone point														
												I			

Activity		Original	Percent Early	Early	Late	Late	Total							2014									2	015		
ID	Description		Complete Start	Finish	Start	Finish	Float	28 05	OCT 12		26	02	09	NOV 16	23	30	07	DEC 14	21	28	04	JAN 11 18	25	01 (	FEB 08 15	22
E&M3261	Install SAT of MCC & LVSB	174	100 30/06/14 A	21/12/14 A	30/06/14 A	21/12/14 A													Ins	tall SAT	of MCC	& LVSB				
E&M3270	Install instruments	60	50 26/09/14 A	15/02/15	26/09/14 A	17/10/14	-1210	ł																	Insta	all instrum
E&M3291	Install BS Equipment	180	70 28/07/14 A	13/02/15	28/07/14 A	10/11/14	-950	1											+ -+						Install	BS Equip
E&M3300	Install FS Equipment	161	60 06/08/14 A	23/02/15	06/08/14 A	10/11/14	-1050													1						Insta
E&M3310	Hydraulic Tests of Pipeworks	90	0 17/01/15	16/04/15	13/08/14	10/11/14	-1570	1											+i+ + 							
E&M3311	Cabling Works	47	50 21/12/14 A	11/03/15	21/12/14 A	10/11/14	-1210	ł										н	· <b></b>							
E&M3320	Cabling Works for Dewatering Equipment	47	10 20/11/14 A	01/02/15	20/11/14 A	30/10/14	-940	ł				1		1H 📂	Ì		i.							Cablin	g Works for D	Dewaterin
E&M3321	Insulation Tests of Cables and Cable Termination	21	50 06/02/14 A	12/02/15	06/02/14 A	10/11/14	-940																			ion Tests
E&M3331	Energization	1	100 03/02/14 A	04/02/14 A	03/02/14 A	04/02/14 A																				
E&M3359	Functional and Performance Tests of Equipment	35	30 16/03/15 A	11/05/15	16/03/15 A	05/12/14	-1570	1																		
E&M3360	T&C Period	91	5 16/10/14 A	06/08/15	16/10/14 A	02/03/15	-1570	ł	-																	
E&M3370	Trial Operation Period	456	0 07/08/15	31/01/17	07/08/15	31/01/17	0	)				1								1						
Rising Main																										
SKW 1481	Subm, Approval & Delivery of DI pipes	120	100 17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A																				
SKW 1501	LCS (ChB0+00 - ChB1+20)	300	100 14/09/10 A	10/07/11 A	14/09/10 A	10/07/11 A																				
SKW 1521	Twin DN150 DI Rising Main (ChB0+00 - ChA4+55)	250	100 11/07/11 A	13/10/14 A	11/07/11 A	13/10/14 A			Twir	DN150	DI Risi	ing Mai	n (ChB	0+00 -	ChA4+5	55)			1	1			1			
Section W8 -	Landscape Softworks in All Portions		· · · · · · · · · · · · · · · · · · ·		-1	-1																				
SKW1591	Tree Survey	21	100 17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A																				
SKW1611	Preservation & Protection of Trees	1053	99 17/05/10 A	11/11/14	17/05/10 A	11/11/14	(	)					P	reserva	tion & P	rotectio	on of Tre	es								
SKW1621	Transplantation at SKW	90	100 07/06/10 A	04/09/10 A	07/06/10 A	04/09/10 A																				
Section W9 -	Establishment Works in All Portions																									
SKW1631	Section W9 - Establishment Works	194	0 12/11/14	24/05/15	12/11/14	24/05/15	0	)																		

Start date	05/05/10		Early bar
Finish date	31/01/17		Progress bar Critical bar
Data date	01/11/14		- Summary bar
Run date	10/11/14		Progress point
Page number	11A		Critical point Summary point
c Primavera	Systems, Inc.	-	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 (Nov 2014 - Jan 2015

Date
31/10/14

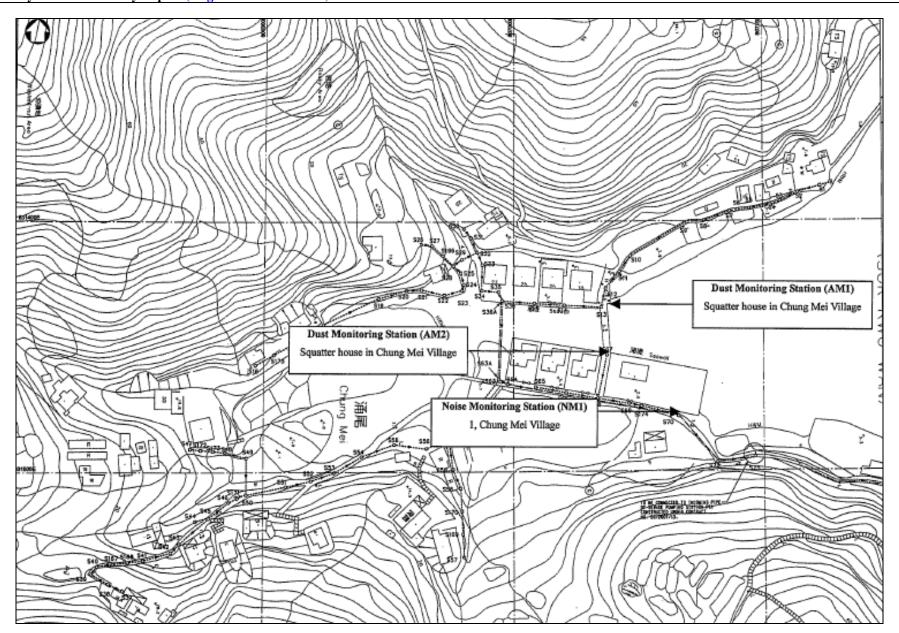
Revision	Checked	Approved
Revision 0	RH	VC



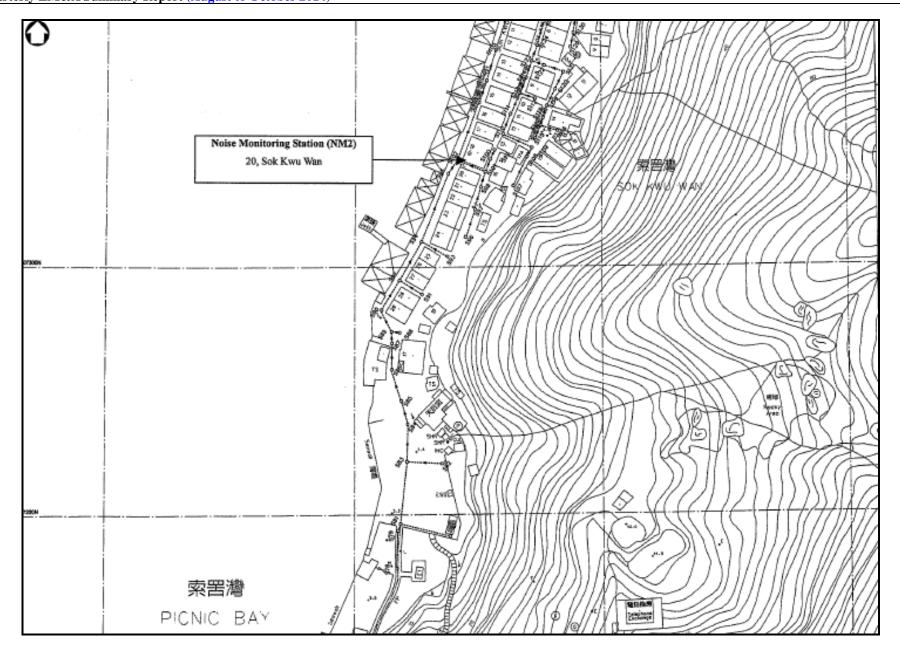
## Appendix D

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



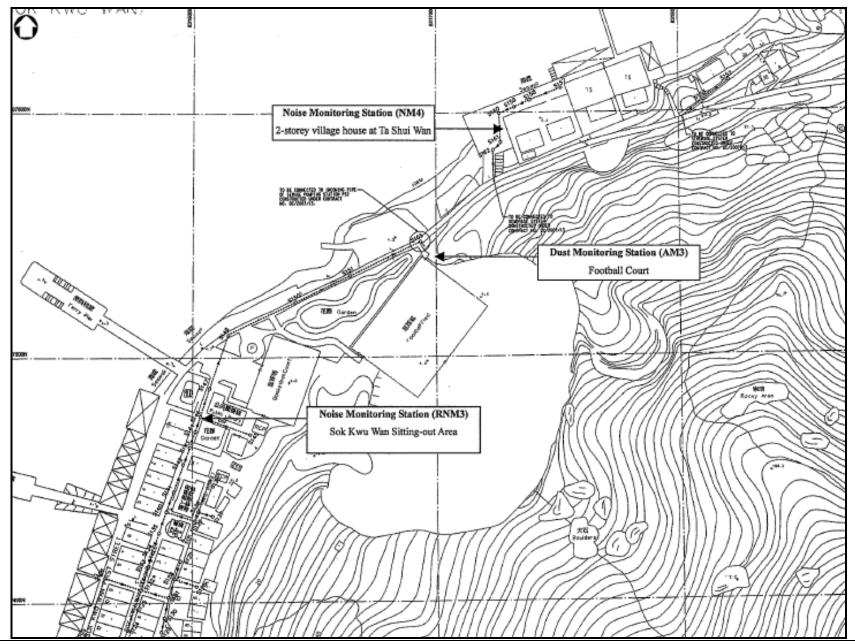






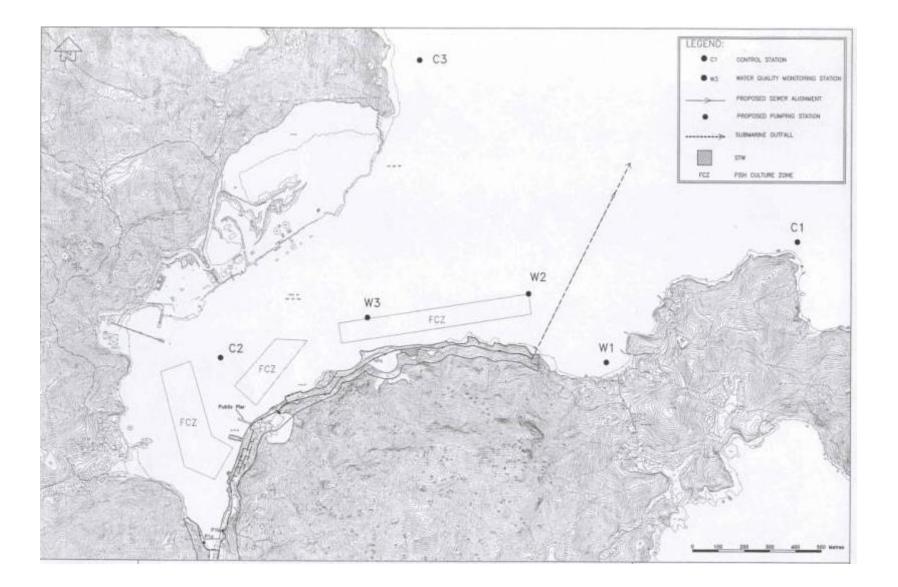
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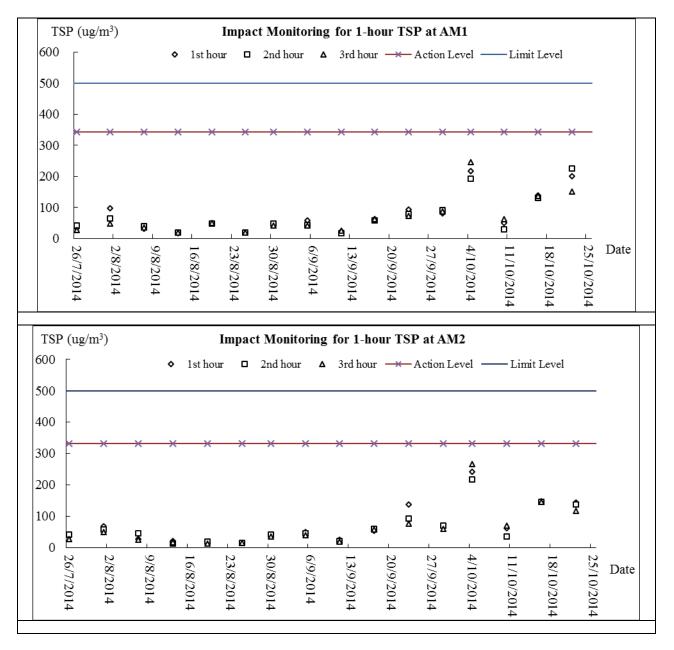
### Appendix E

### **Graphical Plots of Impact Monitoring**

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

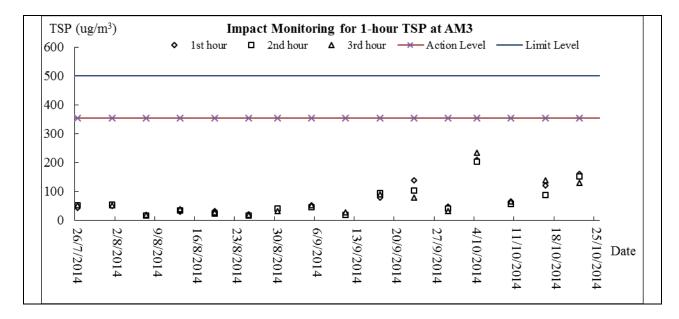


#### Air Quality Monitoring – 1 hour TSP Monitoring



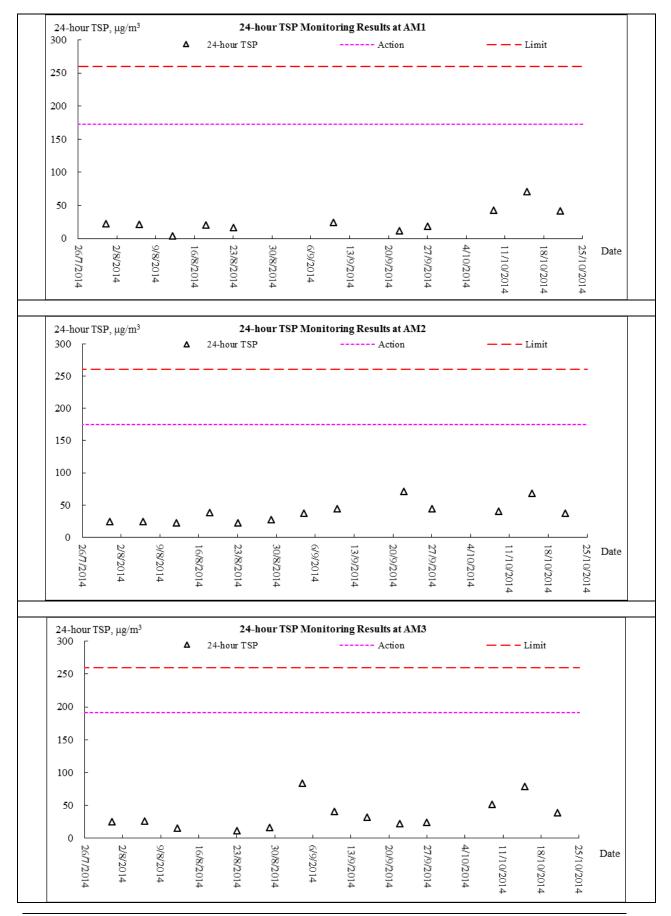
Contract No. DC/2009/13 – Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan Sok Kwu Wan Portion Area 17<sup>th</sup> Quarterly EM&A Summary Report (August to October 2014)







### Air Quality Monitoring – 24 hour TSP Monitoring

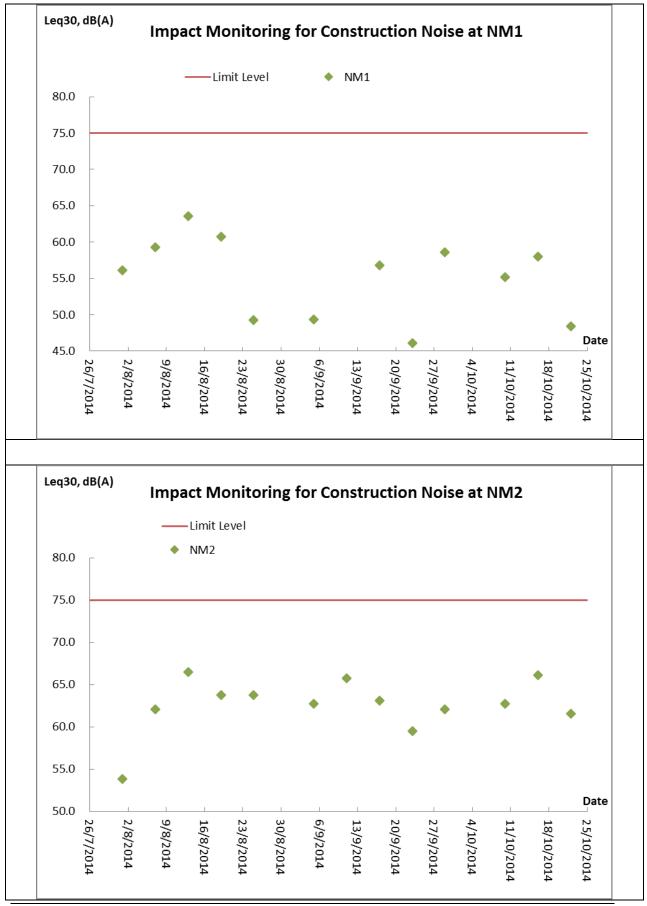


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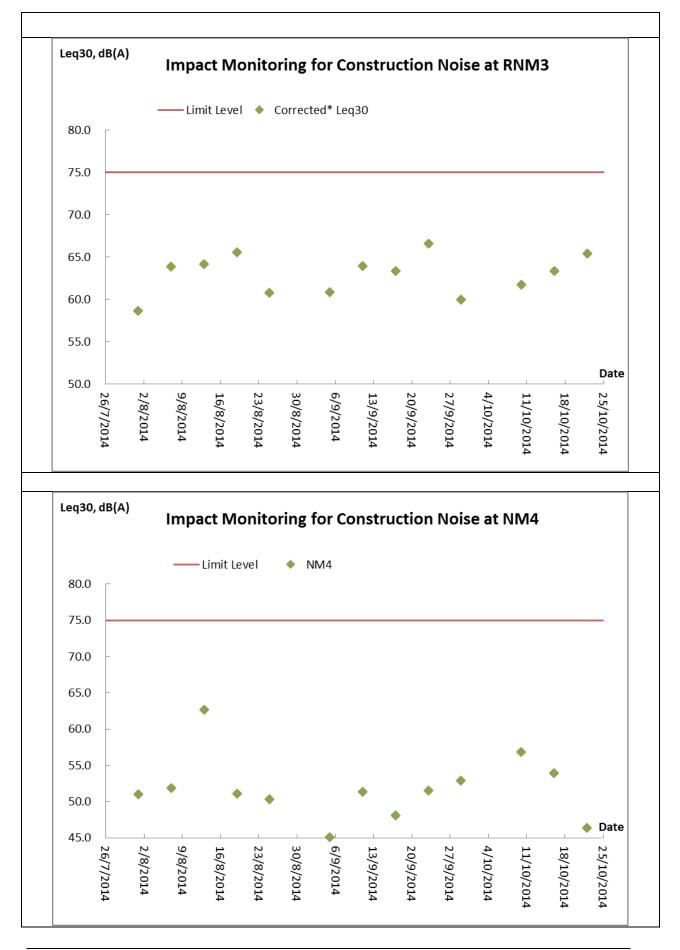
#### **Construction Noise Monitoring**



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# Appendix F

### **Meteorological Information**



#### Weather Condition – August 2014

The weather of August 2014 was hotter than usual due to prolonged spells of fine and sunny weather during the month. The monthly mean temperature of 29.0 degrees was 0.4 degree higher than the normal figure of 28.6 degrees, while the monthly duration of bright sunshine of 212.0 hours was about 12 percent above the normal figure of 188.9 hours. With two heavy rain episodes around mid-August, the month was also wetter than usual with a monthly rainfall amount of 548.2 millimetres, about 27 percent above the August normal of 432.2 millimetres. The accumulated rainfall since 1 January was 2312.1 millimetres, about 21 percent above the normal of 1905.5 millimetres for the same period.

#### Weather Condition – September 2014

Under the dominance of the subtropical ridge over southern China, September 2014 was the hottest September on record. The monthly mean minimum temperature of 27.0 degrees and mean temperature of 29.0 degrees were respectively the highest and one of the highest for September since record began in 1884. The month was also drier than usual with a monthly total rainfall amount of 140.6 millimetres, only about 43 percent of the September normal of 327.6 millimetres. The accumulated rainfall since 1 January was 2452.7 millimetres, about 10 percent above the normal of 2233.1 millimetres for the same period.

#### Weather Condition-October 2014

Under the dominance of a relatively dry northeast monsoon, October 2014 was much warmer and sunnier than usual. The mean temperature for the month was 26.2 degrees, 0.7 degrees above the normal figure of 25.5 degrees and also the one of the fifth highest for October since record began in 1884. The monthly total duration of sunshine was 222.9 hours, about 15 percent above the normal figure of 193.9 hours.

The details meteorological data for each successive day could be referred to the Monthly EM&A Report (August 2014, September 2014, and October 2014).



### Appendix G

### Monthly Summary Waste Flow Table

			Actu	al Quant	ities of Ir	nert C&D	Material	s Genera	ted Mont	hly				А	ctual Qu	uantities	of C&D	Wastes	Generat	ed Mont	hly	
Month	Total Q Gene (a) = (c)		Hard Ro Large I Cono (t	Broken crete	Reused Con	tract	Reused Proj (c	ects	Dispo Publi (6	c Fill	Import (1		Me	tals	card	per/ board aging	Plas	stics		mical aste		ners, ubbish
	(in '00	$00m^{3}$ )	(in '00	$00m^{3}$ )	(in '00	$00m^{3}$ )	(in '00	$00m^{3}$ )	(in '00	$00m^3$ )	(in '00	$00m^3$ )	(in '0	00kg)	(in '0	00kg)	(in '0	00kg)	(in '0	00kg)	(in t	onne)
	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW
2014	15.933	50.762	0.160	0.432	0.740	2.802	0.000	0.000	15.194	47.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<mark>487.580</mark>	290.030
Jan	0.342	0.325	0.000	0.005	0.000	0.000	0.000	0.000	0.342	0.325	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.480	4.820
Feb	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.110	4.300
Mar	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.150	4.340
Apr	0.000	0.000	0.000	0.005	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	0.000	0.000	0.000	4.030	3.900
May	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.810	4.180
Jun	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	33.060	5.880
<mark>Sub-total</mark>	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	588.220	317.450
Jul	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	21.980	11.520
Aug	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.250	3.540
Sep	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.610	3.270
Oct	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.860	5.490
Nov																						
Dec																						
Total	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	680.920	341.270
10141	67.6	668	0.6	02	3.5	42	0.0	00	<b>64</b> .1	126	0.0	00	0.0	00	0.0	000	0.0	00	0.0	000	1022	2.190

*Remark:* Assume 1.0  $m^3$  vehicle dump load = 1.6 tonnes C&D materials

YSW: Yung Shue Wan SKW: Sok Kwu Wan