


**Drainage Services Department**  
**Advance Works for Shek Wu Hui Sewage  
Treatment Works – Further Expansion Phase 1A**

**Monthly EM&A Report**

(March 2018)

**Verified by** : Mr. Adi Lee 


**Position** : Independent Environmental Checker

**Date** : 13 Apr 2018

**Drainage Services Department**  
**Advance Works for Shek Wu Hui Sewage  
Treatment Works – Further Expansion Phase 1A**

**Monthly EM&A Report**

(March 2018)

**Certified by** : Mr. T. W. Tam 

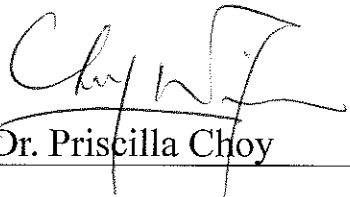
**Position** : Environmental Team Leader of  
Contract No. DC/2013/09

**Date** : 13 April 2018

**Drainage Services Department**  
**Advance Works for Shek Wu Hui Sewage**  
**Treatment Works – Further Expansion Phase 1A**

Monthly EM&A Report

(March 2018)

**Certified by** :   
Dr. Priscilla Choy

**Position** : Environmental Team Leader of  
Contract No. DE/2014/01

**Date** : 13 Apr 2018

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**1. EXECUTIVE SUMMARY**

- 1.1** This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the ETs of the respective Contractors of Contract No. DC/2013/09 and No. DE/2014/01 under FEP No. FEP-02/474/2013 from 1 to 31 March 2018 (the reporting period).

**Summary of Major Construction Works taken in the Reporting Period**

- 1.2** In the reporting period, the major construction works being undertaken by the respective Contractors are summarized in the below table.

<b>Works Contract</b>	<b>Contract Title</b>	<b>Major Construction Works</b>
DC/2013/09	Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road	<ul style="list-style-type: none"><li>● Excavation of base slab of LV switch room</li><li>● Excavation, pipe laying of CLP and E&amp;M cable duct</li><li>● Construction of plinth for support of DN900 air main</li><li>● Remedial Work of Bio-Reactor No.1</li><li>● Painting of epoxy lining for membrane tank</li><li>● Installation of steel gantry at bioreactor</li><li>● Construction of underground drainage pipe</li></ul>
DE/2014/01	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	<ul style="list-style-type: none"><li>● Mechanical installation of lifting appliance at 1/F, MBR Facilities Building</li><li>● Mechanical Installation of lifting appliance in MBR Pre-treatment Screen Chamber</li><li>● Provision of switchboards in 11kV HV Switch room</li></ul>

### Environmental Monitoring and Audit Activities

- 1.3 The environmental monitoring activities under the EM&A programme are summarized in the below table. No Action and Limit Level exceedance of air quality and construction noise monitoring was recorded during the reporting period.

Environmental Issue	Environmental Monitoring Parameters / Inspection	Occasions	Action Level Exceedance	Limit Level Exceedance
Air Quality	1-hour TSP	30	0	0
	24-hour TSP	12	0	0
Construction Noise	L <sub>Aeq</sub> (30min) Daytime	8	0	0

### Environmental Complaint

- 1.4 No environmental complaint, notification of summons or successful prosecutions were received during the reporting period. It is summarized in the below table.

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions	Status / Follow-up Actions
DC/2013/09	0	0	0	N/A
DE/2014/01	0	0	0	N/A

### Site Inspection

- 1.5 Joint site inspections to evaluate the site environmental performance by the RE, the respective ETs and the Contractors were carried out on the following dates during the reporting period.

Contract No. DC/2013/09: 8, 15, 22 and 27 March 2018

Contract No. DE/2014/01: 8, 15, 20 and 27 March 2018

- 1.6 IEC conducted site audit on 27 March 2018. No environmental non-compliance was identified in the reporting period.

### Reporting Changes

- 1.7 There were no reporting changes during the reporting period.

### Future Key Issues

- 1.8 Key issues to be considered in the next reporting period for the Contract No. DC/2013/09 are as follow:

- Implementation of dust suppression measures at all times
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material
- Ensure dust suppression measures are implemented properly
- Implementation of construction noise preventative control measures
- Management of chemical wastes
- Follow-up of improvement on general waste management issues

- 1.9** Key issues to be considered in the next reporting period for the Contract No. DE/2014/01 are as follow:
- Chemicals storage
  - Efficiency and maintenance of drainage system
  - Noise from the operation of construction machinery on-site
  - Waste management and the maintenance of equipment to prevent oil leakage within the construction work areas

## **2. INTRODUCTION**

### **2.1 Background**

- 2.1.1 The existing Shek Wu Hui Sewage Treatment Works (SWHSTW) is operated and maintained by the Drainage Services Department (DSD). It provides secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas, with design capacity of 93,000m<sup>3</sup>/day at ADWF.
- 2.1.2 To cope with the latest population growth and new developments in the catchment, further expansion of SWHSTW is planned to be carried out in three phases, namely Phases 1A, 1B and 2. Further Expansion Phase 1A is to cope with the forecast increase in sewage flow from local developments and extension of village sewerage in Sheung Shui, Fanling and adjacent areas. The scope of the Phase 1A Project comprises the followings:
- (a) the construction of proposed treatment facilities to increase the treatment capacity of SWHSTW by at least 40,000m<sup>3</sup>/day with tertiary treatment level, with suitable allowance to cater for a further increase of treatment capacity by 20,000m<sup>3</sup>/day in Phase 1B; and
  - (b) modification/upgrading of the existing facilities of SWHSTW.
- 2.1.3 To cope with the projected sewage flow buildup and meet the tight implementation programme, Advance Works for SWHSTW Further Expansion Phase 1A (hereinafter referred as “the Project”) are proposed to be carried out between 2015 and 2018. The Phase 1A Advance Works comprise a civil works contract and an Electrical & Mechanical (E&M) works contract. The civil works Contract No. DC/2013/09 “Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road” is supervised by the Sewerage Projects Division (SPD) of DSD. The E&M works Contract No. DE/2014/01 “Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station” is supervised by the Electrical & Mechanical Projects Division (E&MPD) of DSD.
- 2.1.4 The scope of Phase 1A Advance Works comprises the followings:
- (a) the conversion of one existing bioreactor (BR1) and two existing final sedimentation tanks (FST1 and FST2) into one membrane bioreactor; and
  - (b) the ancillary works.

This Project is a part of designated project under item F.2 of Part 1, Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance. The EIA for the further expansion of SWHSTW Phases 1A, 1B and 2 is covered under the EIA Report of NENT NDAs (Register No. AEIAR-175-2013).

An Environment Permit (EP) No. EP-474/2013 for the further expansion of SWHSTW Phases 1A, 1B and 2 was issued by EPD to CEDD in November 2013. The Further Environmental Permit (FEP) No. FEP-02/474/2013 covering the Phase 1A works only was issued by EPD to DSD in February 2018 and it superseded FEP No. FEP-01/474/2013 which issued by EPD to DSD in January 2014.

### **2.2 Project Programme**

Two construction works contracts of the Project, i.e. civil works and E&M works, were awarded in 2015 and 2016 respectively. The construction of the Project commenced in October 2015 and is expected to complete in 2018 tentatively. **Table 2.1** summarises the information of the awarded Works Contracts.

**Table 2.1 Summary of Awarded Works Contracts**

<b>Works Contract</b>	<b>Description</b>	<b>Construction Start Date</b>	<b>Contractor</b>	<b>Environmental Team</b>
DC/2013/09	Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road	October 2015	Tsun Yip Waterworks Construction Co Ltd (Tsun Yip)	Action-United Environmental Services & Consulting (AUES)
DE/2014/01	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	October 2017	Jardine Engineering Corporation Limited (JEC)	Cinotech Consultants Limited (Cinotech)

## **2.3 Purpose of the Report**

- 2.3.1 The Environmental Monitoring and Audit (EM&A) programme for DC/2013/09 and DE/2014/01 commenced in October 2015 and October 2017 respectively. This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs from 1 to 31 March 2018 (the reporting period).

## **2.4 Project Organization**

Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in *Table 2.2* below.

**Table 2.2 Key Project Contacts**

<b>Works Contract</b>	<b>Organization</b>	<b>Role</b>	<b>Name</b>	<b>Tel No.</b>
DC/2013/09	DSD	Resident Engineer	Mr. Michael Leung	2594 7463
	ANewR Consulting Limited	Independent Environmental Checker	Mr. Adi Lee	2618 2836
	Tsun Yip	Site Agent	Mr. Ken Wong	9161 9627
		Environmental Officer	Mr. M. T. Ho	9507 9634
	AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059
DE/2014/01	DSD	Resident Engineer	Mr. Fong Mo	2594 7329
	ANewR Consulting Limited	Independent Environmental Checker	Mr. Adi Lee	2618 2836
	JEC	Project Manager	Mr. Kim Hung Lau	2947 1125
		Environmental Officer	Mr. George Ng	2947 1125
	Cinotech	Environmental Team Leader	Dr. Priscilla Choy	2151 2089

### **3. ENVIRONMENTAL MONITORING AND AUDIT**

- 3.1** The Project has been divided into two construction works contracts which are covered by EP No. EP-474/2013 and FEP No. FEP-02/474/2013. As per the EP Conditions, EM&A Reports for Works Contracts DC/2013/09 and DE/2014/01 prepared by the respective Contractor's ETs are provided in *Appendices A* and *B* respectively.
- 3.2** The EM&A Reports provide details of the project information, EM&A requirements, impact monitoring and audit results for the corresponding Contracts.
- 3.3** A summary of the major construction activities undertaken by the respective Contractors of various Works Contracts during the reporting period are presented in *Table 3.1*.

**Table 3.1 Summary of Major Construction Activities in the Reporting Period**

<b>Works Contract</b>	<b>Contract Title</b>	<b>Major Construction Works</b>
DC/2013/09	Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road	<ul style="list-style-type: none"> <li>• Excavation of base slab of LV switch room</li> <li>• Excavation, pipe laying of CLP and E&amp;M cable duct</li> <li>• Construction of plinth for support of DN900 air main</li> <li>• Remedial Work of Bio-Reactor No.1</li> <li>• Painting of epoxy lining for membrane tank</li> <li>• Installation of steel gantry at bioreactor</li> <li>• Construction of underground drainage pipe</li> </ul>
DE/2014/01	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	<ul style="list-style-type: none"> <li>• Mechanical installation of lifting appliance at 1/F, MBR Facilities Building</li> <li>• Mechanical Installation of lifting appliance in MBR Pre-treatment Screen Chamber</li> <li>• Provision of switchboards in 11kV HV Switch room</li> </ul>

- 3.4** Impact monitoring for air quality and construction noise were conducted in accordance with the Updated EM&A Manual in the reporting period. The air quality and construction noise for this reporting month are summarised in **Tables 3.2** to **3.4**. Details of the monitoring requirements, locations, equipment, methodology and QA/QC procedures are presented in the EM&A Reports as provided in **Appendices A** and **B**.
- 3.5** No Action and Limit Level exceedance of air quality and construction noise monitoring was recorded during the reporting period.
- 3.6** No environmental complaint, notification of summons or successful prosecutions were received during the reporting period. Log for environmental complaints, notification of summons and successful prosecutions are provided in **Table 3.5**.
- 3.7** Regular site inspections were conducted by the respective Contractor's ETs on a weekly basis to check the implementation of environmental pollution control and mitigation measures for the Project. No non-compliance was identified in the reporting period. Joint site inspections were carried out on 8, 15, 22 and 27 March 2018 during the reporting period. No environmental non-compliance was identified in the reporting period.

**Table 3.2 Summary of 1-Hour TSP Monitoring Results in the Reporting Period**

Monitoring Station ID	Location	TSP Concentration (mg/m <sup>3</sup> )	Action Level (mg/m <sup>3</sup> )	Limit Level (mg/m <sup>3</sup> )	Exceedance due to the Project Construction (Yes/No)
AM1	No. 31 Wai Loi Tsuen	17-59	286	500	No
AM2	Fu Tei Au	22-60	276	500	No

**Note:**

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract DC/2013/09 in accordance with the Updated EM&A Manual.

**Table 3.3 Summary of 24-Hour TSP Monitoring Results in the Reporting Period**

Monitoring Station ID	Location	TSP Concentration (mg/m <sup>3</sup> )	Action Level (mg/m <sup>3</sup> )	Limit Level (mg/m <sup>3</sup> )	Exceedance due to the Project Construction (Yes/No)
AM1	No. 31 Wai Loi Tsuen	14-80	147	260	No
AM2a	RE's Site Office	44-90	155	260	No

**Note:**

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract DC/2013/09 in accordance with the Updated EM&A Manual.



**Table 3.4 Summary of Construction Noise Monitoring Results in the Reporting Period**

<b>Monitoring Station ID</b>	<b>Location</b>	<b>Noise Level (LAeq,30mins, dB(A))</b>	<b>Action Level (dB(A))</b>	<b>Limit Level (dB(A))</b>	<b>Exceedance due to the Project Construction (Yes/No)</b>
NM1	No. 31 Wai Loi Tsuen	51-53	When one documented complaint is received	>75	No
NM2	Fu Tei Au	49-50		>75	No

**Note:**

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract DC/2013/09 in accordance with the Updated EM&A Manual.

**Table 3.5 Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month**

<b>Works Contract</b>	<b>Environmental Complaints</b>	<b>Notification of Summons</b>	<b>Successful Prosecutions</b>
DC/2013/09	0	0	0
DE/2014/01	0	0	0

#### 4. WASTE MANAGEMENT

- 4.1** Waste management was carried out by on-site Environmental Officer or an Environmental Supervisor of respective Contractors from time to time.
- 4.2** The quantities of waste for disposal in this Reporting Period are summarized in *Tables 4.1* and *4.2* and the Monthly Summary Waste Flow Tables of respective Contracts are presented in the EM&A Reports as provided in *Appendices A* and *B*. Whenever possible, materials were reused on-site as far as practicable.

**Table 4.1 Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract DC/2013/09**

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Total C&D Materials (Inert) (in '000m <sup>3</sup> )	20.61	0.19	20.80	--
Hard Rock and Large Broken Concrete (Inert) (in '000m <sup>3</sup> )	1.79	0.01	1.79	Tuen Mun 38
Reused in this Project (Inert) (in '000m <sup>3</sup> )	3.27	0	3.27	--
Reused in other Projects (Inert) (in '000m <sup>3</sup> )	2.23	0	2.23	--
Disposal as Public Fill (Inert) (in '000m <sup>3</sup> )	13.42	0.19	13.61	Tuen Mun 38
Metals (in '000kg)	142.00	0	142.00	--
Paper / Cardboard Packing (in '000kg)	0.07	0	0.07	--
Plastics (in '000kg)	0	0	0	--
Chemical Wastes (in '000kg)	0	0	0	--
General Refuses (in '000m <sup>3</sup> )	0.94	0.03	0.97	NENT

**Table 4.2 Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract DE/2014/01**

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Total C&D Materials (Inert) (in '000m <sup>3</sup> )	0	0	0	--
Hard Rock and Large Broken Concrete (Inert) (in '000m <sup>3</sup> )	0	0	0	--
Reused in this Project (Inert) (in '000m <sup>3</sup> )	0	0	0	--
Reused in other Projects (Inert) (in '000m <sup>3</sup> )	0	0	0	--
Disposal as Public Fill (Inert) (in '000m <sup>3</sup> )	0	0	0	--
Metals (in '000kg)	0	0	0	--
Paper / Cardboard Packing (in '000kg)	0	0	0	--
Plastics (in '000kg)	0	0	0	--
Chemical Wastes (in '000kg)	0	0	0	--
General Refuses (in tonne)	1	0	1	--

## 5. IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

- 5.1 The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Reports, EM&A Manuals, EP No. EP-474/2013 and FEP No. FEP-02/474/2013. Summary of the relevant permits, licenses, and/or notifications on environmental protection for this Project in this reporting period are summarised in *Tables 5.1* and *5.2*.

**Table 5.1 Summary of Environmental Licenses and Permits for Contract DC/2013/09**

Item	Valid License/Permit	License/Permit Number
1	Further Environmental Permit	FEP-02/474/2013
2	Air Pollution Control (Construction Dust) Regulation	N/A
3	Chemical Waste Producer Registration	WPN5213-624-T3148-04
4	Water Pollution Control Ordinance	WT00022503-2015
5	Billing Account for Disposal of Construction Waste	Account Number: 7022898

**Table 5.2 Summary of Environmental Licenses and Permits for Contract DE/2014/01**

Item	Valid License/Permit	License/Permit Number
1	Further Environmental Permit	FEP-02/474/2013
2	Chemical Waste Producer Registration	WPN5213-624-T3685-01
3	Billing Account for Disposal of Construction Waste	Account Number: 7024165

## **6. CONCLUSION AND RECOMMENDATION**

### **Conclusion**

- 6.1** This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs from 1 to 31 March 2018 (the reporting period).
- 6.2** No Action and Limit Level exceedance of 1-hour and 24-hour TSP monitoring was recorded during the reporting period.
- 6.3** No Action and Limit Level exceedance of construction noise monitoring was recorded during the reporting period.
- 6.4** Joint site inspections to evaluate the site environmental performance by the RE, the respective ETs and the Contractors were carried out on the following dates during the reporting period.
- Contract No. DC/2013/09: 8, 15, 22 and 27 March 2018  
Contract No. DE/2014/01: 8, 15, 20 and 27 March 2018
- 6.5** IEC conducted site audit on 27 March 2018. No environmental non-compliance was identified in the reporting period.
- 6.6** No documented complaint, notification of summons or successful prosecution was received during the reporting period.

### **Recommendation**

- 6.7** The following recommendations were made for future reporting periods:

#### *Air Quality*

- Maintain wet surface on access road
- All vehicles must be used wheel washing facility before off site
- Spray water during breaking works
- A cleaning truck was regularly performed on the public road to prevent fugitive dust emission

#### *Noise*

- Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday.
- Keep good maintenance of plants
- Shut down the plants when not in used.

*Water Quality*

- Identify any discharge of wastewater from the construction site
- Avoid blockage of U channel and drainage system by sediment
- Avoid water accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed
- Avoid spoilage of run-off from construction site to public area
- The discharge quality must meet the requirements specified in the discharge license

*Waste/Chemical Management*

- On-site sorting prior to disposal
- Follow requirements and procedures of the “Trip-ticket System”
- Predict required quantity of concrete accurately
- Collect the unused fresh concrete at designated locations in the sites for subsequent disposal

## **APPENDIX A**

### **MONTHLY EM&A REPORT FOR CONTRACT DC/2013/09**



**JOB No.: TCS00757/15**

**DSD CONTRACT NO. DC/2013/09 –  
ADVANCE WORKS FOR SHEK WU HUI SEWAGE  
TREATMENT WORKS – FURTHER EXPANSION PHASE 1A  
AND SEWERAGE WORKS AT PING CHE ROAD**

**30<sup>TH</sup> MONTHLY ENVIRONMENTAL MONITORING AND  
AUDIT (EM&A) REPORT – MARCH 2018**

**PREPARED FOR**

**TSUN YIP WATERWORKS CONSTRUCTION CO LTD**

Date	Reference No.	Prepared By	Certified By
11 April 2018	TCS00757/15/600/R0121v3	 Martin Li (Assistant Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	9 April 2018	First Submission
2	11 April 2018	Amended against IEC's comments
3	11 April 2018	Amended against IEC's comments



**EXECUTIVE SUMMARY**

ES.01 This is the **30<sup>th</sup>** Monthly Environmental Monitoring and Audit Report covering the period from **1** to **31 March 2018** (the Reporting Period).

**ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES**

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

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	<b>30</b>
	24-hour TSP	<b>12</b>
Construction Noise	L <sub>Aeq</sub> (30min) Daytime	<b>8</b>
Inspection / Audit	ET Regular Environmental Site Inspection	<b>4</b>
	IEC Monthly Environmental Site Audit	<b>1</b>

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

ES.03 No exceedance of air quality and construction noise monitoring were recorded in this Reporting Period. No Notification of Exceedance (NOE) was therefore issued. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

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

Note: NOE – Notification of Exceedance

**ENVIRONMENTAL COMPLAINT**

ES.04 No environmental complaint was recorded or received in this Reporting Period. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 March 2018	0	0	NA

**NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS**

ES.05 No environmental summons or successful prosecutions were recorded in this Reporting Period. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 March 2018	0	0	NA

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 March 2018	0	0	NA

**REPORTING CHANGE**

ES.06 There were no reporting changes in the Reporting Period.

**SITE INSPECTION BY EXTERNAL PARTIES**

ES.07 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor was carried out on **8, 15, 22 and 27 March 2018**. Furthermore, IEC attend site inspection was on **27 March 2018**. No non-compliance was noted.

**FUTURE KEY ISSUES**

- ES.08 As wet season is approaching, special attention should be paid to avoid ingress of surface runoff into nearby water bodies from the construction site. Water quality mitigation measures should be fully implemented.
- ES.09 Air quality mitigation measures including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc. should be properly maintained. Moreover, the contractor should be to prevent mosquito breeding on site.

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## **1 INTRODUCTION**

### **1.1 PROJECT BACKGROUND**

1.1.1 The existing Shek Wu Hui Sewage Treatment Works (hereafter referred as “SWHSTW”) with secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas is operated and maintained by Drainage Services Department (hereafter referred as “DSD”). Based on the preliminary design of the Project, the scope of works for the Project comprises the following major components:

- (a) Demolition of the existing Inlet Works and construction of the new Inlet Works, including inlet pumping station, screening and gritting facilities;
- (b) Demolition of 4 existing circular Primary Sedimentation Tanks (PSTs) and construction of new rectangular PSTs;
- (c) Construction of new pre-membrane screens;
- (d) Modification of existing Bioreactor (BR) 1 and 2 to suit the proposed membrane bioreactor (MBR) process;
- (e) Construction of a new standby Bioreactor;
- (f) Demolition of 4 existing circular Final Sedimentation Tanks (FSTs) and construction of new Membrane Tanks and Membrane Facility Building;
- (g) Reconstruction of sludge treatment facilities, including thickening, anaerobic digestion, biogas handling, sludge holding and dewatering facilities; and
- (h) Other ancillary works.

1.1.2 According to the Project implementation programme, the construction of most of the above proposed works (hereinafter referred to as “Main Works”) will be commencement in 2016 and completion in 2022. Furthermore, Advance Works as part of the above proposed works will carry out before Main Works commencement. The Advance Works will be commencement in third quarter of 2015 and comprise the following major components:

- (a) Modification of BR1, through upgrading of electrical and mechanical (E&M) equipment and minor civil works, to suit the proposed MBR process;
- (b) Demolition of FSTs 1 and 2 and construction of Membrane Tanks and the first phase of Membrane Facility Building; and
- (c) Tree felling and transplanting, to facilitate timely construction of the new Inlet Works during the implementation of Main Works (under review).

1.1.3 The general layout of Advance Works and Main Works of SWHSTW Further Expansion Phase 1A show in [Appendix A](#). Subsequent to Further Expansion Phase 1A, the SWHSTW will be further expanded under separate projects (namely Further Expansion Phase 1B and Phase 2).

1.1.4 In July 2015, Tsun Yip Waterworks Construction Co Ltd (hereinafter referred as “Tsun Yip” or “the Contractor”) has awarded the DSD Contract No. DC/2013/09 – **Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road** (hereinafter referred as “the Contract”). The Contract is the Advance Works for Shek Wu Hui Sewage Treatment Works as part of SWHSTW Further Expansion which is a Designated Project under Environmental Permit number FEP-02/474/2013 (hereinafter referred as “the FEP-02/474/2013” or “the EP”).

1.1.5 The works under the Contract at Shek Wu Hui Sewage Treatment Works will be included the conversion of one existing bioreactor and two existing final sedimentation tanks into one membrane bioreactor. Moreover, construction of about 1.5 kilometres length of sewers at Ping Che Road and other ancillary works will be undertaken. The works of Contract are scheduled to be conduct about 25 months. Layout plan of the Contract is shown in [Appendix B](#).

- 1.1.6 Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) was appointed by the Contractor as an Environmental Team (hereinafter referred as “the ET”) to implement the relevant EM&A program in accordance with the Updated EM&A Manual, as well as the associated duties.
- 1.1.7 As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions. Hence baseline monitoring including air quality and noise were carried out between **28 August 2015** and **12 September 2015** at the proposed locations before construction work commencement. The “Baseline Monitoring Report (TCS00757/15/600/R0014 Version 2)” had submitted to EPD by the DSD before commencement of major construction works and approved by the IEC on 24 September 2015. Further to Tsun Yip’s instructions, the EM&A program was commenced on 1 October 2015 and the monitoring schedule had been issued to relevant parties on 29 September 2015.
- 1.1.8 This is the **30<sup>th</sup>** Monthly EM&A Report presenting the monitoring results and inspection findings for the reporting period from **1** to **31 March 2018**.

## **1.2 REPORT STRUCTURE**

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

<b>SECTION 1</b>	<b>INTRODUCTION</b>
<b>SECTION 2</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS</b>
<b>SECTION 3</b>	<b>SUMMARY OF MONITORING REQUIREMENTS</b>
<b>SECTION 4</b>	<b>MONITORING METHODOLOGY</b>
<b>SECTION 5</b>	<b>IMPACT MONITORING RESULTS</b>
<b>SECTION 6</b>	<b>WASTE MANAGEMENT</b>
<b>SECTION 7</b>	<b>SITE INSPECTIONS</b>
<b>SECTION 8</b>	<b>ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE</b>
<b>SECTION 9</b>	<b>IMPLEMENTATION STATUES OF MITIGATION MEASURES</b>
<b>SECTION 10</b>	<b>CONCLUSIONS AND RECOMMENDATION</b>

**2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS****2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE**

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

**2.2 CONSTRUCTION PROGRESS**

2.1.2 3-Month Rolling Programme of the Project is enclosed in [Appendix D](#) and the major construction activities undertaken in this Reporting Month are illustrated in [Appendix B](#) and listed below:-

- Excavation of base slab of LV switch room
- Excavation, pipe laying of CLP and E&M cable duct
- Construction of plinth for support of DN900 air main
- Remedial Work of Bio-Reactor No.1
- Painting of epoxy lining for membrane tank
- Installation of steel gantry at bioreactor
- Construction of underground drainage pipe

**2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS**

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

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

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust) Regulation	Notified EPD on 30 July 2015
2	Chemical waste Producer Registration (WPN: 5213-624-T3148-04)	Application date: 19/08/2015 Date approved: 18/9/2015
3	Water Pollution Control Ordinance (Discharge License: WT00022503-2015)	Application date: 19/08/2015 Date approved: 18/9/2015
4	Billing Account for Disposal of Construction Waste (Account Number: 7022898)	Granted on 02/09/2015
5	Further Environmental Permit No. FEP-02/474/2013 (Superseded FEP-01/474/2013)	Granted on 15/02/2018

2.1.4 In accordance with the Further EP No. FEP-02/474/2013 Condition 2.3, an Updated Environmental Monitoring and Audit (EM&A) Manual (TCS00757/15/600/R0012v3) which certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC), has submitted to DSD and EPD endorsement.

2.1.5 Baseline Monitoring Report (TCS00757/15/600/R0014v2) as certified by the ETL and verified by the IEC was submitted to the EPD on 24 September 2015 for endorsement.



### 3 SUMMARY OF IMPACT MONITORING REQUIREMENT

#### 3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Updated EM&A manual. Environmental issues such as air quality and construction noise were identified as the key issues during the construction phase of Advance Works of the Project.

3.1.2 A summary of EM&A programme of construction phase are presented in the sub-sections below.

#### 3.2 MONITORING PARAMETERS

3.2.1 The EM&A programme of construction phase shall cover the following environmental issues:

- Air quality; and
- Construction noise

3.2.2 A summary of the monitoring parameters is presented in *Table 3-1* below

**Table 3-1 Summary of EM&A Requirements**

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> <li>• 1-hour TSP by Real-Time Portable Dust Meter; and</li> <li>• 24-hour TSP by High Volume Air Sampler.</li> </ul>
Construction Noise	<ul style="list-style-type: none"> <li>• <math>L_{eq(30min)}</math> during normal working hours; and</li> <li>• <math>L_{eq(15min)}</math> for the construction works undertaken in Restricted Hours, if necessary.</li> </ul>

#### 3.3 MONITORING LOCATIONS

3.3.1 According to the *Updated EM&A Manual of Advance Works* which submitted to EPD on **25 August 2015**, three air quality sensitive receivers and two construction noise sensitive receivers are proposed to monitor the environmental performance of the Contract. The proposed monitoring locations are summarized in *Table 3-2* and shown in *Appendix E*.

**Table 3-2 Proposed Air Quality and Construction Noise Monitoring Locations**

Aspect	Station ID	Location	Parameter
Air Quality	AM1	No. 31 Wai Loi Tsuen	1- hour and 24- hour TSP
	AM2	Fu Tei Au	1- hour
	AM2a	RE's Site Office	24- hour TSP
Noise	NM1	No. 31 Wai Loi Tsuen	$L_{eq(30min)}$
	NM2	Fu Tei Au	$L_{eq(30min)}$

#### 3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The requirements of baseline monitoring are stipulated in *Sections 2.1.7 and 3.2.5* of the Updated EM&A Manual and presented as follows.

##### Air Quality Monitoring

3.4.2 Monitoring frequency for air quality baseline monitoring is as follows:

- 1-Hour TSP      3 sets of 1-hour TSP monitoring shall be carried out once in every six days.
- 24-Hour TSP      24-hour shall be carried out once in every six days.

##### Noise Monitoring

3.4.3 Construction noise monitoring should be carried out at the designated monitoring station when there are Project-related construction activities being undertaken within a radius of 300m from the monitoring stations. The monitoring frequency should depend on the scale of the construction activities. An initial guide on the monitoring is to obtain one set of 30-minute



measurement at each station between 0700 and 1900 hours on normal weekdays at a frequency of once a week when construction activities are underway.

- 3.4.4 If construction works are extended to include works during the hours of 1900 - 0700, additional weekly impact monitoring shall be carried out during evening and night-time works. Applicable permits under NCO shall be obtained by the Contractor.

### 3.5 MONITORING EQUIPMENT

#### Air Quality Monitoring

- 3.5.1 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.
- 3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.
- 3.5.3 All equipment as used air quality monitoring is listed in **Table 3-3**.

**Table 3-3 Air Quality Monitoring Equipment**

Equipment	Model
<b>24-Hr TSP</b>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
<b>1-Hour TSP</b>	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter

#### Wind Data Monitoring Equipment

- 3.5.4 According to the Updated EM&A Manual Sections 2.1.3.8, alternative methods to obtain representative wind data was proposed by the ET. Meteorological information as extracted from “the Hong Kong Observatory Ta Kwu Ling Station” is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is situated the sea level above 15mPD. The station’s wind data monitoring equipment is set above the existing ground ten meters in compliance with the general setting up requirement. Furthermore, this station can also provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In a lot of Hong Kong development projects, weather information extracted from Hong Kong Observatory is a common alternative method if installation of weather station is not allowed.

#### Noise Monitoring

- 3.5.5 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  $\text{m s}^{-1}$ .
- 3.5.6 Noise monitoring equipment to be used for impact monitoring is listed in **Table 3-4**.

**Table 3-4 Construction Noise Monitoring Equipment**

Equipment	Model
Integrating Sound Level Meter	Rion NL - 52
Calibrator	Rion NC – 74
Portable Wind Speed Indicator	Testo Anemometer

- 3.5.7 Sound level meters listed above comply with the *International Electrotechnical Commission*

Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the baseline monitoring will be calibrated yearly.

### 3.6 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.6.1 According to the baseline monitoring results and the Updated EM&A Manual, the air quality and construction noise criteria were set up, namely Action and Limit levels are listed in **Tables 3-5 & 3-6** as below.

**Table 3-5 Action and Limit Levels for 24-Hr TSP and 1-Hr TSP Air Quality,  $\mu\text{g m}^{-3}$**

Monitoring Stations	Action Level ( $\mu\text{g/m}^3$ )		Limit Level ( $\mu\text{g/m}^3$ )	
	1-hour	24-hour	1-hour	24-hour
AM1	286	147	500	260
AM2	276	NA	500	NA
AM2a	NA	155	NA	260

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

Monitoring Stations	Action Level	Limit Level in dB(A)
Time Period: 0700-1900 hours on normal weekdays		
NM1 and NM2	When one documented complaint is received	> 75* dB(A)

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

### 3.7 EVENT ACTION PLAN

3.7.1 If non-compliance or exceedance of the Action/Limit Levels is occurred, actions shall be taken in accordance with the Event Action Plan in **Appendix F**.

## **4 MONITORING METHDOLOGY**

### **4.1 AIR QUALITY MONITORING**

#### **Monitoring Location**

- 4.1.1 The detailed information of air quality monitoring stations referred to *Table 3-2* and the graphical plot of monitoring locations shown in *Appendix E* in this report.

#### **Monitoring Equipment**

- 4.1.2 All the monitoring equipment to be used in the EM&A program as listed in *Table 3-3* has been agreed with the IEC.

#### **Monitoring Procedures**

##### 1-hour TSP

- 4.1.3 The 1-hour TSP monitor, a Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter was used for baseline monitoring, which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90° light scattering. The 1-hour TSP monitor consisted of the following:

- a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
- b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
- c. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

- 4.1.4 The 1-hour TSP meter used is within the valid period, calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event. Operation of the 1-hour TSP meter was follow manufacturer's Operation and Service Manual. A valid calibration certificate is attached in *Appendix G*.

##### 24-hour TSP

- 4.1.5 The equipment used for 24-hour TSP measurement is a Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The High Volume Air Sampler (HVS) consists of the following:

- a. An anodized aluminum shelter;
- b. A 8"x10" stainless steel filter holder;
- c. A blower motor assembly;
- d. A continuous flow/pressure recorder;
- e. A motor speed-voltage control/elapsed time indicator;
- f. A 7-day mechanical timer, and
- g. A power supply of 220v/50 hz

- 4.1.6 Prior to 24-hour TSP monitoring, the HVS was calibrated in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The 24-hour TSP Monitoring using the HVS was also processed in accordance with the manufacturer's Operations Manual. A valid calibration certificate of the calibration kit with the certificate of HVS calibrated is attached in *Appendix G*.

- 4.1.7 24-hour TSP was collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keeps all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C, for six months prior to disposal.

## **4.2 CONSTRUCTION NOISE MONITORING**

### **Monitoring Location**

- 4.2.1 The detailed information of construction noise monitoring stations referred to **Table 3-2** and the graphical plot of monitoring locations shown in **Appendix E** in this report.

### **Monitoring Equipment**

- 4.2.2 All the monitoring equipment to be used in the EM&A program as listed in **Table 3-3** has been agreed with the IEC.
- 4.2.3 Sound level meter listed in **Table 3-4** is complied with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO). A valid of calibration certificates including sound level meter and an acoustic were shown in **Appendix G**.

### **Monitoring Procedures**

- 4.2.4 The noise measurement was performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30min) in six consecutive Leq(5 min) measurements were used as the monitoring parameter throughout the baseline monitoring period.
- 4.2.5 During the monitoring, the sound level meter was mounted on a tripod at a height of about 1.2 m and placed at the monitoring locations and oriented such that the microphone was pointed to the site with the microphone facing perpendicular to the line of sight. The windshield was fitted for the measurement. For construction noise monitoring, all monitoring stations were conducted 1 m from the exterior of the building façade.
- 4.2.6 Prior to noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The calibration level from before and after the noise measurement agrees to within 1.0dB.
- 4.2.7 During the noise measurement, a portable wind speed meter was used to check wind speed (m/s). For impact noise monitoring, no wind speed was exceeding 5m/s or gusts exceeding 10m/s. Also, noise measurement in time was no fog and rain.

## **4.3 DATA MANAGEMENT AND DATA QA/QC CONTROL**

- 4.3.1 The monitoring data were handled by the ET's in-house data recording and management system.
- 4.3.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were input into a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.
- 4.3.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

## 5 IMPACT MONITORING RESULTS

### 5.1 GENERAL

5.1.1 Air quality and construction noise monitoring scheduled in the Reporting Period is enclosed in *Appendix H* and the monitoring results are shown in the following sub-sections.

### 5.2 RESULTS OF AIR QUALITY MONITORING

5.2.1 The results for 24-hour and 1-hour TSP are summarized in *Tables 5-1 to 5-2*. The 24-hour TSP data are shown in *Appendix I* and graph plots including 1-hour TSP and 24-hour TSP are shown in *Appendix J*.

**Table 5-1 Summary of 1-Hour TSP Monitoring Results,  $\mu\text{g}/\text{m}^3$**

DATE	AM1				AM2			
	Start Time	1 <sup>st</sup> Meas.	2 <sup>nd</sup> Meas.	3 <sup>rd</sup> Meas.	Start Time	1 <sup>st</sup> Meas.	2 <sup>nd</sup> Meas.	3 <sup>rd</sup> Meas.
5-Mar-18	9:19	48	46	47	13:13	41	39	41
10-Mar-18	9:21	29	41	36	13:28	39	22	25
16-Mar-18	9:31	45	46	50	13:22	36	40	41
22-Mar-18	13:14	54	58	59	9:46	57	59	60
28-Mar-18	13:14	34	17	21	9:21	42	54	50
Average (Range)	42 (17 - 59)				43 (22 - 60)			

**Table 5-2 Summary of 24-hour TSP Monitoring Results,  $\mu\text{g}/\text{m}^3$**

DATE	AM1	AM2a
3-Mar-18	51	44
9-Mar-18	44	59
14-Mar-18	37	47
20-Mar-18	44	51
26-Mar-18	80	90
29-Mar-18	14	60
Average (Range)	45 (14 – 80)	58 (44 – 90)

5.2.2 As shown in *Tables 5-1* and *5-2*, the 24-hour and 1-hour TSP monitoring results were below the Action/ Limit Level. No Notification of Exceedances (NOE) of air quality criteria or corrective action was therefore required.

5.2.3 The meteorological data during the Reporting Month is summarized in *Appendix K*.

5.2.4 Construction dust assessment for short term impact was undertaken in the EIA study. In view of the current contract, monitoring locations AM1 and AM2a are not an ASR during the EIA study and therefore no prediction was made. For 1-hour TSP monitoring location AM2, it is very near the assessment point FLN-E13 in the EIA. According to the EIA prediction, the predicted result for Tier 2 in assessment year 2018 is  $91.0\mu\text{g}/\text{m}^3$  for 1-hour TSP and the cumulative 1-hour concentrations would comply with the respective criteria and adverse short-term construction dust impact is not anticipated. It is concluded that the overall 1-hour TSP monitoring result in the Reporting Period is comparable to the EIA prediction.

### 5.3 RESULTS OF CONSTRUCTION NOISE MONITORING

- 5.3.1 In the Reporting Period, a total of **8** event noise measurements were carried out at the two designated locations. During construction noise monitoring, the sound level meter was set in 1m from the exterior of the building façade. Therefore, no façade correction (+3dB(A)) is added according to acoustical principles and EPD guidelines. The construction noise monitoring results at the designated locations are summarized in **Table 5-3**. The detailed noise monitoring data are presented in **Appendix I** and the relevant graphical plots are shown in **Appendix J**.

**Table 5-3 Summary of Construction Noise Monitoring Results, dB(A)**

Date	NM1		NM2	
	Time of Measurement	( $L_{eq30min}$ )	Time of Measurement	( $L_{eq30min}$ )
5-Mar-18	9:23	51	13:21	50
16-Mar-18	9:34	53	13:24	50
22-Mar-18	13:23	52	9:56	50
28-Mar-18	13:29	52	10:17	49
<b>Limit Level</b>	<b>75 dB(A)</b>			

- 5.3.2 As shown in **Table 5-3**, the noise level measured at the designated monitoring locations are well below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, Contractors or DSD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was required.

**6 WASTE MANAGEMENT****6.1 GENERAL WASTE MANAGEMENT**

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

**6.2 RECORDS OF WASTE QUANTITIES**

- 6.2.1 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.

- 6.2.2 The quantities of waste for disposal in this Reporting Period are summarized in **Tables 6-1** and **6-2** and the Monthly Summary Waste Flow Table is shown in **Appendix L**. Whenever possible, materials were reused on-site as far as practicable.

**Table 6-1 Summary of Quantities of Inert C&D Materials for the Project**

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Total C&D Materials (Inert) (in '000m <sup>3</sup> )	20.61	0.19	20.80	--
Hard Rock and Large Broken Concrete (Inert) (in '000 m <sup>3</sup> )	1.79	0.01	1.79	Tuen Mun 38
Reused in this Project (Inert) (in '000 m <sup>3</sup> )	3.27	0.00	3.27	--
Reused in other Projects (Inert) (in '000 m <sup>3</sup> )	2.23	0.00	2.23	--
Disposal as Public Fill (Inert) (in '000 m <sup>3</sup> )	13.42	0.19	13.61	Tuen Mun 38

Remark: The figures were rounded off to two decimal places.

**Table 6-2 Summary of Quantities of C&D Wastes for the Project**

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Metals ('000kg)	142.00	0.00	142.00	--
Paper / Cardboard Packing ('000kg)	0.07	0.00	0.07	--
Plastics ('000kg)	0.00	0.00	0.00	--
Chemical Wastes ('000kg)	0.00	0.00	0.00	--
General Refuses ('000m <sup>3</sup> )	0.94	0.03	0.97	NENT

Remark: The figures were rounded off to two decimal places.



**7 SITE INSPECTION****7.1 REQUIREMENTS**

- 7.1.1 According to the Updated EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

**7.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH**

- 7.2.1 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor has been carried out on **8, 15, 22 and 27 March 2018**. Furthermore, IEC attend site inspection was on **27 March 2018**. No non-compliance was noted.
- 7.2.2 Observations for the site inspections and monthly audit within this Reporting Period are summarized in **Table 7-1**.

**Table 7-1 Site Observations**

<b>Date</b>	<b>Findings / Deficiencies</b>	<b>Follow-Up Status</b>
8 March 2018	<ul style="list-style-type: none"> <li>The Contractor was reminded to clean stagnant water after raining.</li> </ul>	<ul style="list-style-type: none"> <li>Not required for reminder.</li> </ul>
15 March 2018	<ul style="list-style-type: none"> <li>Chemical containers were observed on the ground near BR1. The Contractor was advised to place chemicals containers inside drip tray.</li> </ul>	<ul style="list-style-type: none"> <li>Chemical containers were removed. Last observation closed.</li> </ul>
22 March 2018	<ul style="list-style-type: none"> <li>The Contractor was reminded to spray water on dry unpaved haul road.</li> </ul>	<ul style="list-style-type: none"> <li>Not required for reminder.</li> </ul>
27 March 2018	<ul style="list-style-type: none"> <li>Dry unpaved haul road was observed near main building. The Contractor should spray water regularly for dust suppression.</li> </ul>	<ul style="list-style-type: none"> <li>To be follow up in next reporting period.</li> </ul>

- 7.2.3 In the Reporting Period, the overall environmental performance was considered satisfactory.



**8 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE****8.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

- 8.1.1 No environmental complaint, summons and prosecution was received in this reporting period. The statistical summary table of environmental complaint is presented in [Tables 8-1, 8-2](#) and [8-3](#).

**Table 8-1 Statistical Summary of Environmental Complaints**

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 March 2018	0	0	NA

**Table 8-2 Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 March 2018	0	0	NA

**Table 8-3 Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 March 2018	0	0	NA

**9 IMPLEMENTATION STATUS OF MITIGATION MEASURES****9.1 GENERAL REQUIREMENTS**

9.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the Updated EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in **Appendix M**.

9.1.2 The Contract under the Project shall be implementing the required environmental mitigation measures according to the Updated EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by the Contract in this Reporting Period are summarized in **Table 9-1**.

**Table 9-1 Environmental Mitigation Measures**

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> <li>Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>Maintain wet surface on access road</li> <li>All vehicles must be used wheel washing facility before off site</li> <li>Spray water during breaking works</li> <li>A cleaning truck was regularly performed on the public road to prevent fugitive dust emission</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday.</li> <li>Keep good maintenance of plants</li> <li>Shut down the plants when not in used.</li> </ul>
Waste and Chemical Management	<ul style="list-style-type: none"> <li>On-site sorting prior to disposal</li> <li>Follow requirements and procedures of the “Trip-ticket System”</li> <li>Predict required quantity of concrete accurately</li> <li>Collect the unused fresh concrete at designated locations in the sites for subsequent disposal</li> </ul>
General	<ul style="list-style-type: none"> <li>The site was generally kept tidy and clean.</li> </ul>

9.1.3 Based on monitoring results including air quality and construction noise, it is considered that the environmental mitigation measures implemented by the Contractor in this Reporting Period are effective.

**9.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH**

9.2.1 Construction activities listed below will be undertaken in the coming month for the Contract of the Project.

- Excavation, pipe laying of CLP and E&M cable duct
- Casting formwork and reinforcement and concrete for base slab of LV switch room
- Remedial Work of Bio-Reactor No.1
- Construction of steel platform at basement of membrane facilities building
- Excavation of DN80, DN100 and DN300 pumping pipe outside MFB
- Construction of chemical storage room
- Painting of epoxy lining for membrane tank
- Installation of steel gantry at bioreactor

**9.3 KEY ISSUES FOR THE COMING MONTH**

9.3.1 Key issues to be considered in the coming month for the Contract include:

- Implementation of dust suppression measures at all times;
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material;
- Ensure dust suppression measures are implemented properly;
- Implementation of construction noise preventative control measures;
- Management of chemical wastes;
- Follow-up of improvement on general waste management issues

**10 CONCLUSIONS AND RECOMMENDATIONS**

**10.1 CONCLUSIONS**

10.1.1 This is the 30<sup>th</sup> Monthly EM&A report, covering the construction period from **1 to 31 March 2018**.

10.1.2 No 24-hour or 1-hour TSP monitoring results that triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.

10.1.3 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 NOEs or the associated corrective actions were therefore issued.

10.1.4 No documented complaint, notification of summons or successful prosecution was received.

10.1.5 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor was carried out on **8, 15, 22 and 27 March 2018**. Furthermore, IEC attend site inspection was on **27 March 2018**. No non-compliance was noted.

**10.2 RECOMMENDATIONS**

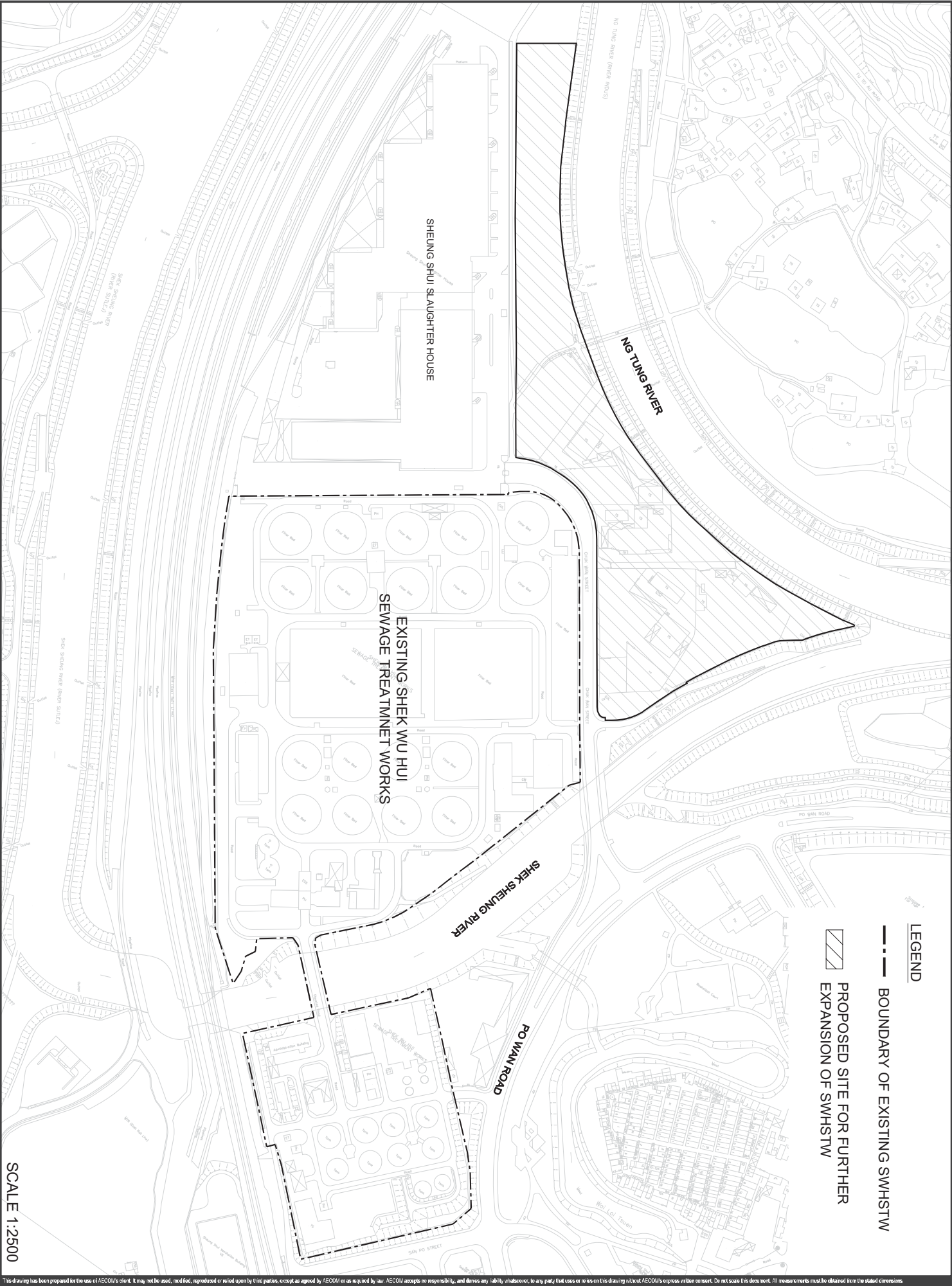
10.2.1 As wet season is approaching, special attention should be paid to avoid ingress of surface runoff into nearby water bodies from the construction site. Water quality mitigation measures should be fully implemented.

10.2.2 Moreover, air quality mitigation measures including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc. should be properly maintained.

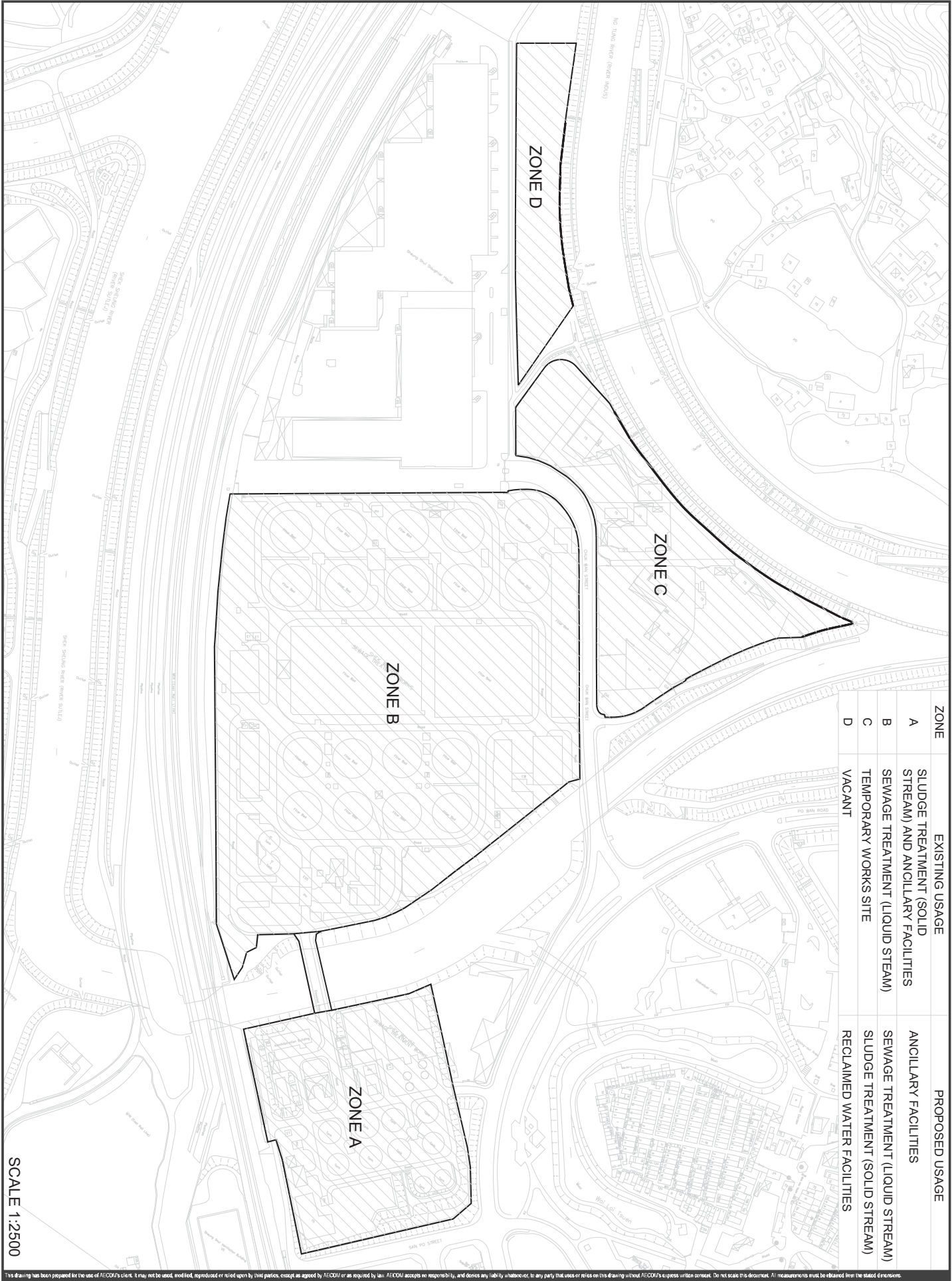
10.2.3 To control the site performance on waste management, Tsun Yip shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. Tsun Yip is also reminded to implement the recommended environmental mitigation measures according to the Updating Environmental Monitoring and Audit Manual.

## **Appendix A**

### **GENERAL LAYOUT OF ADVANCE WORKS AND MAIN WORKS OF SWHSTW FURTHER EXPANSION PHASE 1A**





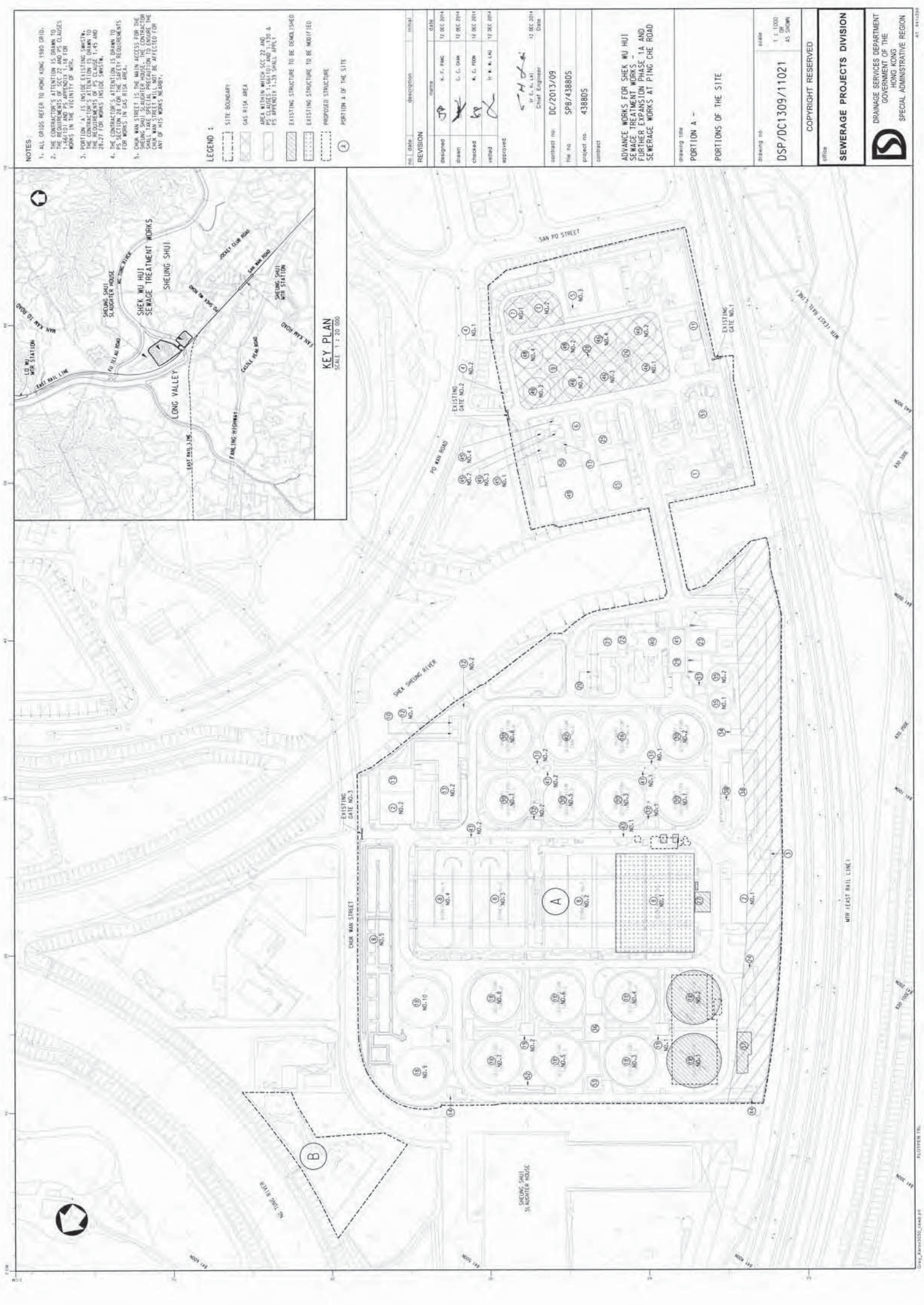


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## **Appendix B**

### **LAYOUT PLAN OF ADVANCE WORKS**





**NOTES:**

1. ALL GRIDS REFER TO HONG KONG 1980 GRID.
2. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE FOLLOWING: (a) THE WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS AND PS APPENDIX 1, 2, 3 AND 4 FOR WORKS IN THE VICINITY OF MTR.
3. PORTION 'A' IS INSIDE EXISTING SWGTW. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE FOLLOWING: (a) THE WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS AND PS APPENDIX 1, 2, 3 AND 4 FOR WORKS IN THE VICINITY OF MTR.
4. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE FOLLOWING: (a) THE WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS AND PS APPENDIX 1, 2, 3 AND 4 FOR WORKS IN THE VICINITY OF MTR.
5. CHOW WAN STREET IS THE MAIN ACCESS FOR THE WORKS. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE FOLLOWING: (a) THE WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS AND PS APPENDIX 1, 2, 3 AND 4 FOR WORKS IN THE VICINITY OF MTR.

**LEGEND:**

- SITE BOUNDARY
- GAS RISER AREA
- AREA WITHIN WHICH SCC 22 AND PS CLAUSES 1, 4, 10, 11 AND 11.33, 11.35, 11.36, 11.37, 11.38, 11.39, 11.40 AND 11.41 APPLY
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE MODIFIED
- PROPOSED STRUCTURE
- PORTION A OF THE SITE

REV.	DATE	DESCRIPTION	INITIAL
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1	12 DEC 2014	DESIGN	
2	12 DEC 2014	DESIGN	
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**REVISION**

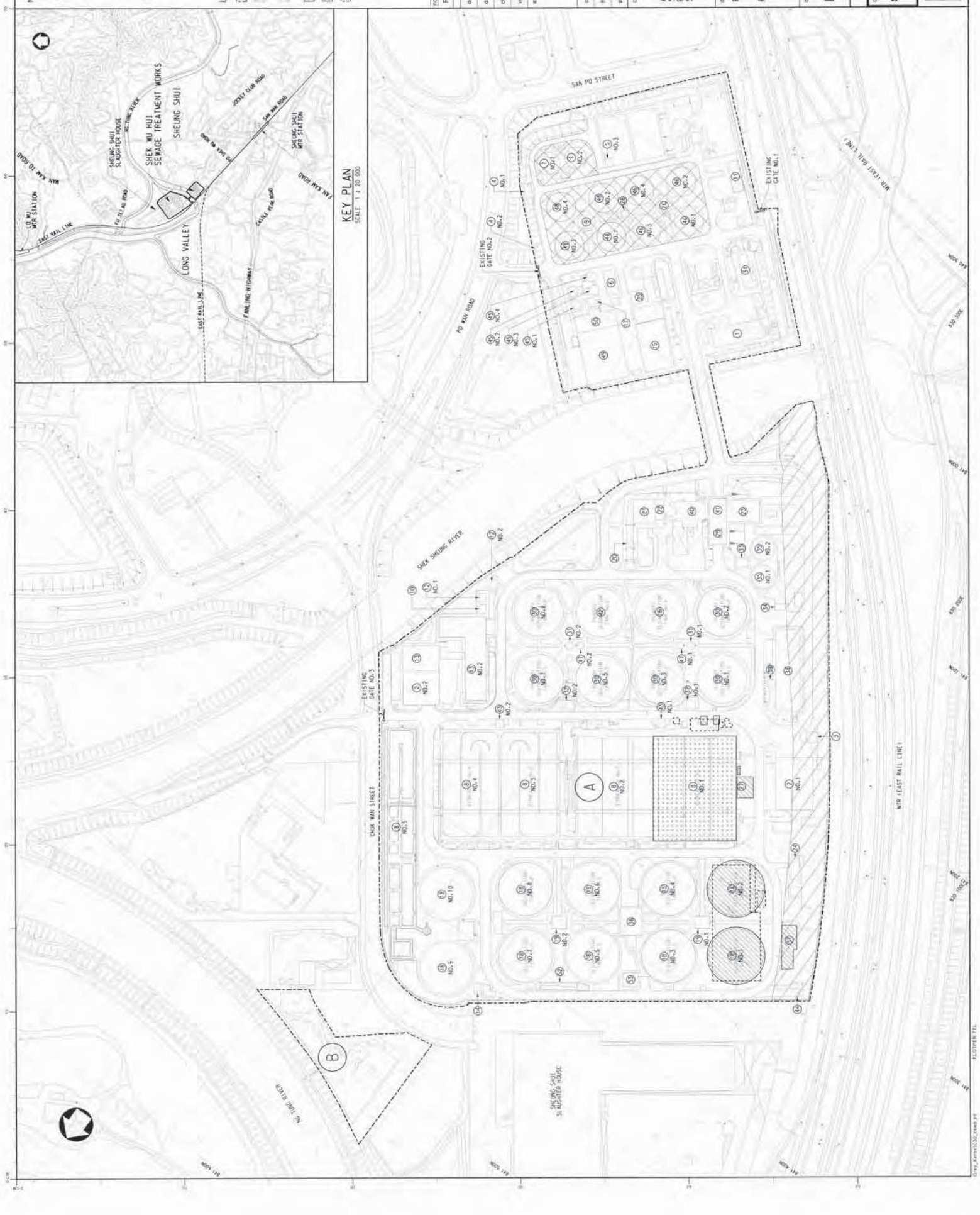
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**ADVANCE WORKS FOR SHEK WU HUI SEWAGE TREATMENT WORKS 1A AND SEWERAGE WORKS AT PING CHE ROAD**

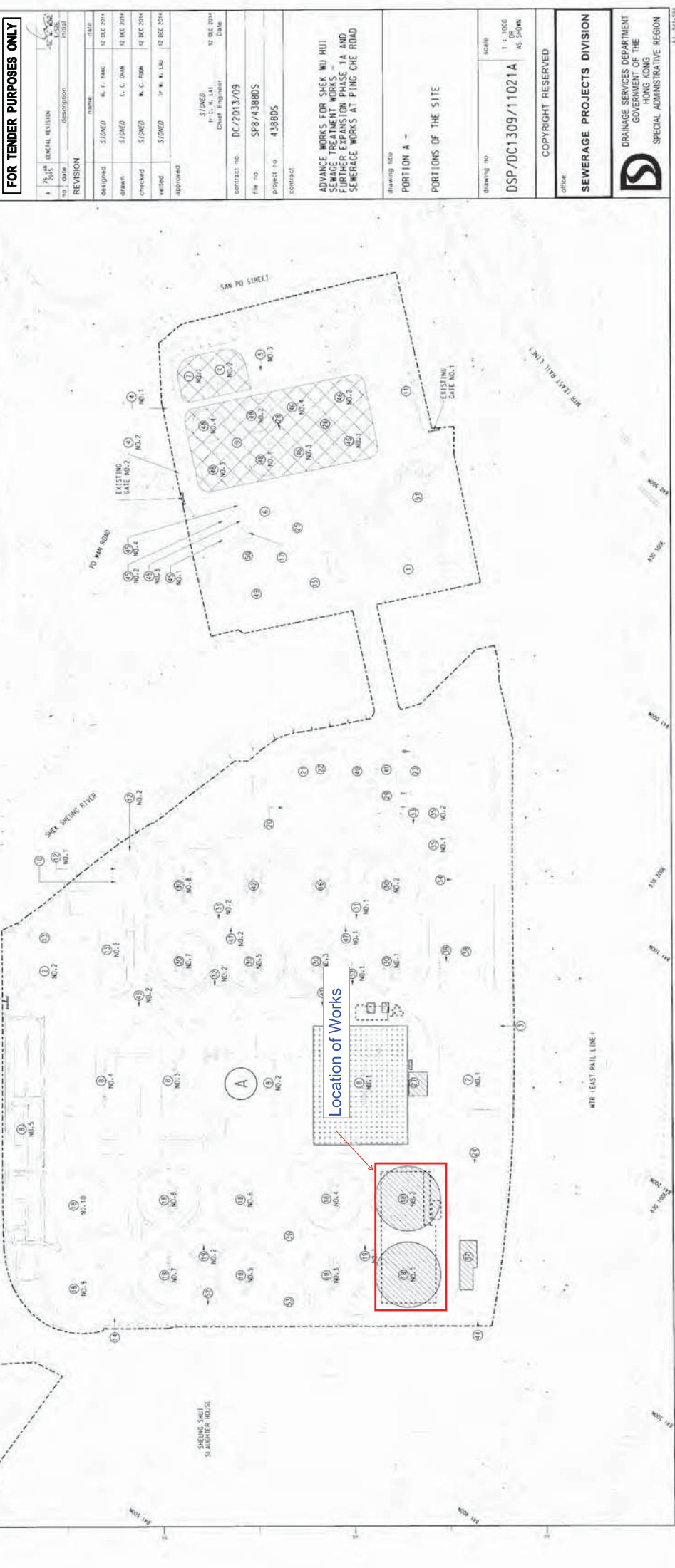
**PORTION A - PORTIONS OF THE SITE**

**DSP/DC1309/11021**

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NOTES:

1. ALL GRIDS REFER TO HONG KONG 1980 GRID.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITIES.
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5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITIES.

GENERAL REVISION		REVISION	DATE
1	DESIGNED	DESIGNED	12 DEC 2014
2	DRAWN	DRAWN	12 DEC 2014
3	CHECKED	CHECKED	12 DEC 2014
4	VERIFIED	VERIFIED	12 DEC 2014
5	APPROVED	APPROVED	12 DEC 2014

STATION	12 DEC 2014
Chief Engineer	
Contract no.	DC/2013/09
File no.	SPB/438805
Project no.	438805
Contact	

ADVANCE WORKS FOR SHEK WU HUI SEWAGE TREATMENT WORKS - FURTHER EXPANSION PHASE 1A AND SEWERAGE WORKS AT PING CHE ROAD

PORTION A - PORTIONS OF THE SITE

Drawing no. DSP/DC/1309/11021A

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SEWERAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT  
GOVERNMENT OF THE HONG KONG  
SPECIAL ADMINISTRATIVE REGION

## **Appendix C**

### **ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES**

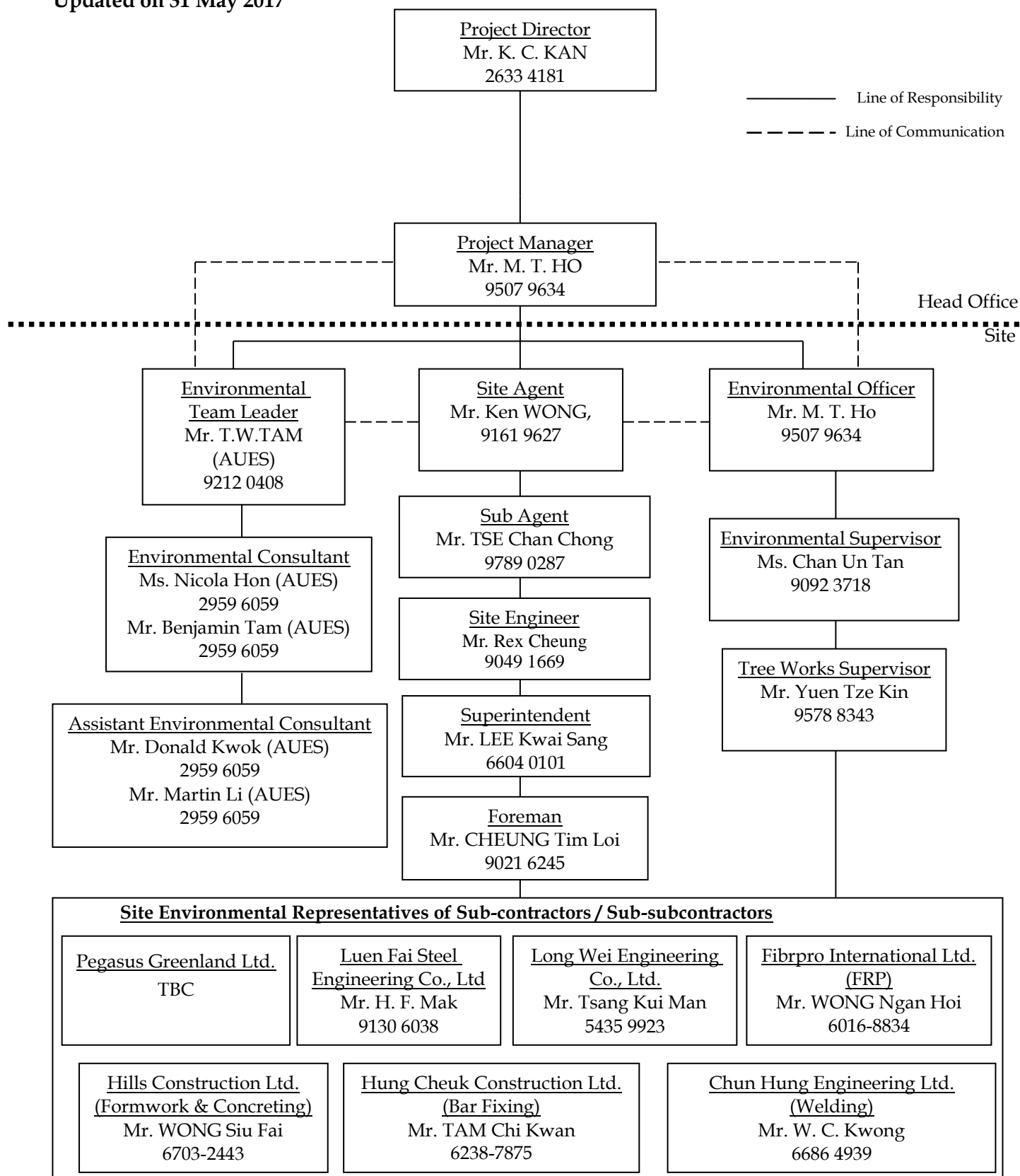
Contract No. DC/2013/09

*Advance Works for Shek Wu Hui Sewage Treatment Works*

*- Further Expansion Phase 1A and Sewerage Works at Ping Che Road*

### **SITE ENVIRONMENTAL TEAM ORGANIZATION CHART**

Updated on 31 May 2017



**Contact Details of Relevant Parties**

<b>Organization</b>	<b>Project Role</b>	<b>Name of Key Staff</b>	<b>Tel No.</b>	<b>Fax No.</b>
DSD	Resident Site Engineer	Mr. Michael Leung	2594 7463	2827 8700
ANewR	Independent Environmental Checker	Mr. Adi Lee	2618 2836	3007 8648
Tsun Yip	Project Director	Mr. K. C. KAN	2633 4181	2633 4691
Tsun Yip	Project Manager	Mr. M. T. HO	9507 9634	2633 4691
Tsun Yip	Site Agent	Mr. Ken WONG	9161 9627	2633 4691
Tsun Yip	Environmental Officer	Mr. M.T.HO	9507 9634	2633 4691
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
AUES	Assistant Environmental Consultant	Mr. Martin Li	2959 6059	2959 6079

**Legend:**

*DSD (Employer & Resident Site Engineer) – Drainage Service Department*

*Tsun Yip (Main Contractor) – Tsun Yip Waterworks Construction Co Ltd*

*ANewR (IEC) – ANewR Consulting Limited*

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

## **Appendix D**

### **3-MONTH ROLLING PROGRAM**

Contract No. DC/2013/09

**Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road**

### 3-Month Rolling Programme (Shek Wu Hui Sewage Treatment Works - Section 2) in March 2018

Item	Description	Duration (Days)	% of Completion	Start	Finished	Mar -2018																															Apr -2018																															May -2018																															Jun -2018																														
						01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30																																																															
Shek Wu Hui Sewage Treatment Works - Section II																																																																																																																																	
1	Modification of Bioreactor No.1	427		31/10/16	31/12/17																																																																																																																												
1.1	Design and Material Delivery of FRP Baffle Wall and Walkway	136	100%	31/10/16	15/03/17																																																																																																																												
1.2	Installation of FRP Baffle Wall	110	100%	04/02/17	24/05/17																																																																																																																												
1.3	Installation of FRP Walkway (for Pipe CHE 0-69)	70	100%	01/05/17	09/07/17																																																																																																																												
1.4	Installation of FRP Walkway (for Pipe CHD 96-165)	70	100%	01/05/17	09/07/17																																																																																																																												
1.5	Installation of Structual Gantry	30	100%	11/12/17	09/01/18																																																																																																																												
1.6	Cutting of Existing partition wall of BR1	10	100%	25/07/17	03/08/17																																																																																																																												
1.7	Installation of DN800 Puddle Flange Pipe	36	100%	04/08/17	08/09/17																																																																																																																												
1.8	Installation of FRP Pipe support of DN600 air main	70	100%	10/07/17	17/09/17																																																																																																																												
1.9	Construction of Concrete Pump Pit	40	100%	17/08/17	25/09/17																																																																																																																												
1.10	Repairing of Existing Joint and Concrete or Screeding (Including Curing)	60	100%	07/08/17	05/10/17																																																																																																																												
1.11	Painting Waterproofing lining of Wall and Floor of BR1	87	80%	06/10/17	31/12/17																																																																																																																												
2	Portion B - Construction of Membrane Facilities Building (+1.3mPD - +10.00mPD)	92		25/09/17	25/12/17																																																																																																																												
2.1	Rebar Fixing for the concrete plinths	14	100%	01/11/17	14/11/17																																																																																																																												
2.2	Erection of Formwork for the concrete plinths	14	100%	15/11/17	28/11/17																																																																																																																												
2.3	Concreting for the concrete plinths	3	100%	29/11/17	01/12/17																																																																																																																												
2.4	Water Tightness Test for the Permeate Storage Tank	14	100%	02/12/17	15/12/17																																																																																																																												
2.5	Painting Waterproofing lining of Wall and Floor of Permeate Storage Tank & De-oxygen Tank	7	100%	29/01/18	04/02/18																																																																																																																												
2.6	G/F Internal Finishing	39	100%	25/09/17	02/11/17																																																																																																																												
2.6.1	Installation of Trench Support and Cover	14	90%	25/09/17	08/10/17																																																																																																																												
2.6.2	Plastering	14	100%	25/09/17	08/10/17																																																																																																																												
2.6.3	Tiling	7	100%	09/10/17	15/10/17																																																																																																																												
2.6.4	Painting	14	100%	16/10/17	29/10/17																																																																																																																												
2.6.5	Floor Screeding	4	50%	30/10/17	02/11/17																																																																																																																												
2.7	Basement Internal Finishing	25	100%	06/11/17	30/11/17																																																																																																																												
2.7.1	Plastering	7	100%	06/11/17	12/11/17																																																																																																																												
2.7.2	Tiling	7	100%	13/11/17	19/11/17																																																																																																																												
2.7.3	Painting	7	100%	20/11/17	26/11/17																																																																																																																												
2.7.4	Floor Screeding	4	0%	27/11/17	30/11/17																																																																																																																												

**Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road  
3-Month Rolling Programme (Shek Wu Hui Sewage Treatment Works - Section 2) in March 2018**

Item	Description	Duration (Days)	% of Completion	Start	Finished	Mar -2018																															Apr -2018																															May -2018																															Jun -2018																														
						01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31																															
Shek Wu Hui Sewage Treatment Works - Section II																																																																																																																																	
2.8	First Floor Internal Finishing	25	100%	01/12/17	25/12/17																																																																																																																												
2.8.1	Plastering	7	100%	01/12/17	07/12/17																																																																																																																												
2.8.2	Tiling	7	100%	08/12/17	14/12/17																																																																																																																												
2.8.3	Painting	7	100%	15/12/17	21/12/17																																																																																																																												
2.8.4	Floor Screeding	4	100%	22/12/17	25/12/17																																																																																																																												
2.9	Roof Finishes	32	0%	01/01/18	01/02/18																																																																																																																												
2.9.1	Installation of Rubber Waterproof Membrane	7	100%	01/01/18	08/01/18																																																																																																																												
2.9.2	Installation of Insulation Board	7	100%	09/01/18	16/01/18																																																																																																																												
2.9.3	Laying Cement Sand Screeding with 1:200 fall	7	100%	17/01/18	24/01/18																																																																																																																												
2.9.4	All Deck Coating	7	0%	25/01/18	01/02/18																																																																																																																												
3	Membrane Tank	46		04/12/17	18/01/18																																																																																																																												
3.1	Erection of falsework and working platform for column and maintenance platform construction	7	100%	04/12/17	10/12/17																																																																																																																												
3.2	Rebar Fixing for the column & slab (level up to +11.00mPD)	7	100%	11/12/17	17/12/17																																																																																																																												
3.3	Erection of formwork for the column & slab	7	100%	18/12/17	24/12/17																																																																																																																												
3.4	Concreting for the column & slab	1	100%	25/12/17	25/12/17																																																																																																																												
3.5	Curing of Concrete and Dismentle of Formwork	14	100%	26/12/17	08/01/18																																																																																																																												
3.6	Installation of FRP handrailing & construction of maintenance platform	10	0%	09/01/18	18/01/18																																																																																																																												
3.7	Painting Waterproofing lining of Wall and Floor of MT	21	95%	20/12/17	09/01/18																																																																																																																												
4	(V.O.) LV Switch Room No.3	74		05/03/18	18/05/18																																																																																																																												
4.1	Laying subase material for the base	2	100%	05/03/18	06/03/18																																																																																																																												
4.2	Rebar Fixing for the base slab	7	100%	07/03/18	13/03/18																																																																																																																												
4.3	Erection of formwork for the base slab	7	100%	14/03/18	20/03/18																																																																																																																												
4.4	Concreting for the base slab	1	0%	21/03/18	21/03/18																																																																																																																												
4.5	Curing of Concrete and Dismentle of Formwork	7	0%	22/03/18	28/03/18																																																																																																																												
4.6	Rebar Fixing for the wall & column	7	0%	29/03/18	04/04/18																																																																																																																												
4.7	Erection of formwork for the wall & column	7	0%	05/04/18	11/04/18																																																																																																																												
4.8	Concreting for the wall & column	1	0%	12/04/18	12/04/18																																																																																																																												
4.9	Curing of Concrete and Dismentle of Formwork	7	0%	13/04/18	19/04/18																																																																																																																												
4.10	Erection of working platform and falsework for the roof construction	7	0%	20/04/18	26/04/18																																																																																																																												
4.11	Rebar Fixing for the roof slab and beam	7	0%	27/04/18	03/05/18																																																																																																																												
4.12	Erection of formwork for the roof slab and beam	7	0%	04/05/18	10/05/18																																																																																																																												
4.13	Concreting for the roof slab and beam	1	0%	11/05/18	11/05/18																																																																																																																												
4.14	Curing of Concrete and Dismentle of Formwork	7	0%	12/05/18	18/05/18																																																																																																																												



**Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road  
3-Month Rolling Programme (Shek Wu Hui Sewage Treatment Works - Section 2) in March 2018**

**Legend** Anticipated Programme In Progress Critical Path

Contract No. DC/2013/09

Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road

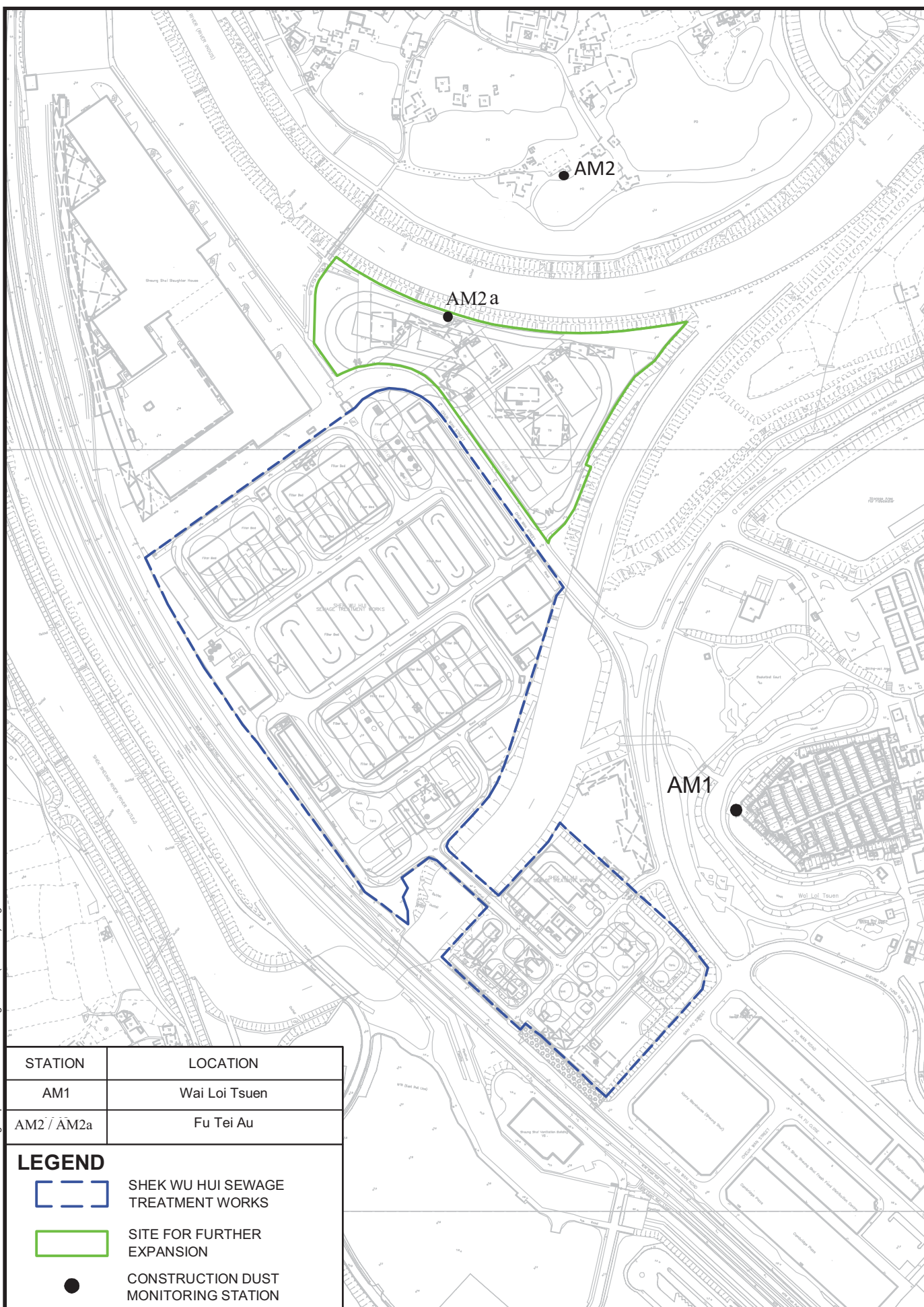
3-Month Rolling Programme (Shek Wu Hui Sewage Treatment Works - Section 3) in March 2018

Item	Description	Duration (Days)	% of Completion	Start	Finished	Mar -2018	Apr -2018	May -2018	Jun -2018
						01020304050607080910111213141516171819202122232425262728293031	010203040506070809101112131415161718192021222324252627282930	010203040506070809101112131415161718192021222324252627282930	010203040506070809101112131415161718192021222324252627282930
	<b>Shek Wu Hui Sewage Treatment Works - Section 3</b>								
1	<b>6x 150mm</b> Cable Ducts Installation and Draw Pit Construction	557	28%	22/06/16	30/12/17				
1.1	<b>V.O.9</b> - Duct Laying (FST8 to FST6 - 69m)	58	100.0%	22/06/16	18/08/16				
1.2	<b>V.O.10</b> - Remaining CLP cable duct laying (MFB to Compressor Room)	90	100.0%	20/09/17	18/12/17				
1.3	<b>V.O.12</b> - Remaining cable duct laying (MFB to Compressor Room)	90	90.0%	24/06/17	21/09/17				
1.4	<b>V.O.12</b> - Remaining Duct Laying (MFB to FST No.3)	50	45.0%	11/11/17	30/12/17				
1.5	<b>V.O.12</b> - Remaining Duct Laying (outside BR1 to MT)	90	30.0%	22/09/17	20/12/17				
2	<b>Road Works</b> <i>(Footway reinstatement between MFB, MT and FST No.3 &amp;4)</i>	29	0%	01/03/18	29/03/18				
2.1	Laying Sub-Base Material	7	100.0%	01/03/18	08/03/18				
2.2	Laying Road Surface Concrete	7	100.0%	09/03/18	15/03/18				
2.3	Construction of Road Kerb	7	100.0%	16/03/18	22/03/18				
2.4	Reinstatement of U-Channel with cover	7	0.0%	23/03/18	29/03/18				
3	<b>Road Drainage Work</b> <i>(Carriageway and footway from FST NO.7 to MFB)</i>	29	0%	03/04/18	01/05/18				
3.1	Installation of 225 Precast Concrete Drain Pipe	14	0.0%	03/04/18	17/04/18				
3.2	Construction of Road Gullies and Drainage Manhole	14	0.0%	18/04/18	01/05/18				
4	<b>Road Works</b> <i>(Carriageway and footway from FST NO.7 to MFB)</i>	39	0%	01/05/18	08/06/18				
4.1	Construction of Road Kerb	14	0.0%	01/05/18	15/05/18				
4.2	Laying Sub-Base Material	14	0.0%	16/05/18	29/05/18				
4.3	Laying Road Surface Concrete	10	0.0%	30/05/18	08/06/18				
5	<b>Road Drainage Work</b> <i>(Carriageway and footway from Pre-Treatment Chamber to MFB)</i>	29	0%	01/05/18	29/05/18				
5.1	Installation of 225 Precast Concrete Drain Pipe	14	0.0%	01/05/18	15/05/18				
5.2	Construction of Road Gullies and Drainage Manhole	14	0.0%	16/05/18	29/05/18				
6	<b>Road Works</b> <i>(Carriageway and footway from Pre-Treatment Chamber to MFB)</i>	39	0%	29/05/18	06/07/18				
6.1	Construction of Road Kerb	14	0.0%	29/05/18	12/06/18				
6.2	Laying Sub-Base Material	14	0.0%	13/06/18	26/06/18				
6.3	Laying Road Surface Concrete	10	0.0%	27/06/18	06/07/18				

Legend Anticipated Programme In Progress Critical Path

## **Appendix E**

### **PROPOSED MONITORING LOCATIONS**



AGREEMENT NO. CE 40/2012 (DS)  
 SHEK WU HUI SEWAGE TREATMENT WORKS  
 - FURTHER EXPANSION PHASE 1A  
 - INVESTIGATION

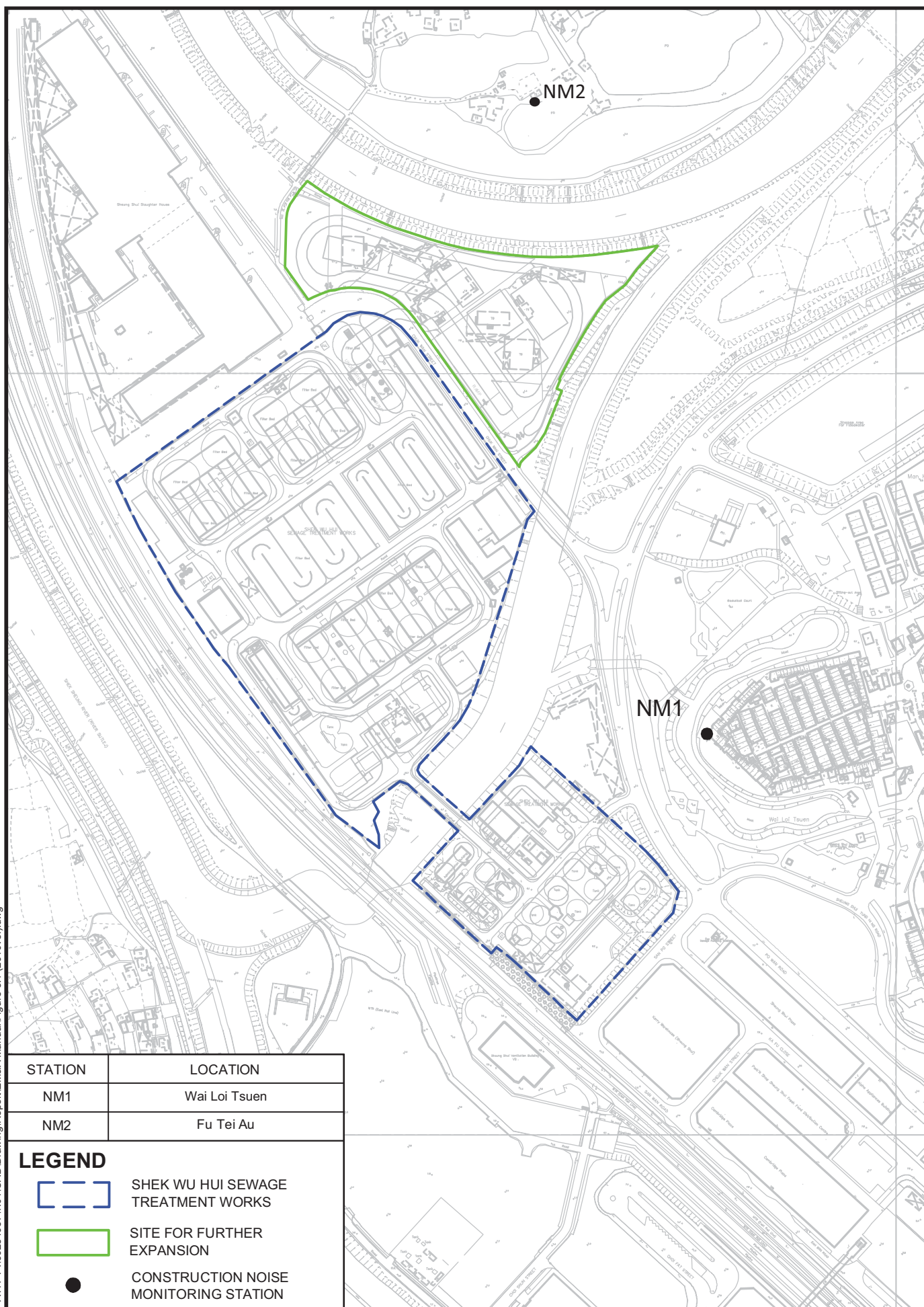
PROPOSED CONSTRUCTION DUST MONITORING  
 STATIONS FOR CONSTRUCTION PHASE AND  
 OPERATION PHASE

**AECOM**

Project No.: 60284037 Date: FEB. 2014

Drawing No.  
 60284037/EM&AM/405





AGREEMENT NO. CE 40/2012 (DS)  
 SHEK WU HUI SEWAGE TREATMENT WORKS  
 - FURTHER EXPANSION PHASE 1A  
 - INVESTIGATION

# LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS

**AECOM**

Project No.: 60284037 Date: FEB. 2014

Drawing No.  
 60284037/EM&AM/407

## **Appendix F**

### **EVENT ACTION PLAN**

**Event and Action Plan for Construction Dust**

Event	Action			
	ET	IEC	ER	Contractor
Action level being exceeded by one sampling	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of complaint and propose remedial measures;</li> <li>2. Inform IEC and ER;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice;</li> <li>2. Amend working methods if appropriate.</li> </ol>
Action level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IEC and ER;</li> <li>3. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>4. Repeat measurements to confirm findings;</li> <li>5. Increase monitoring frequency to daily;</li> <li>6. Discuss with IEC and Contractor on remedial actions required;</li> <li>7. If exceedance continues, arrange meeting with IEC and ER;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ET on the effectiveness of the proposed remedial measures;</li> <li>5. Supervise Implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial actions to IEC within three working days of notification;</li> <li>2. Implement the agreed proposals;</li> <li>3. Amend proposal if appropriate.</li> </ol>
Limit level being exceeded by one sampling	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Inform Contractor, IEC, ER, and EPD;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>5. Supervise implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within three working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Amend proposal if appropriate.</li> </ol>
Limit level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, Contractor and EPD;</li> <li>2. Identify source;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within three working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>

**Event and Action Plan for Construction Noise**

Event	Action			
	ET	IEC	ER	Contractor
<b>Action Level</b>	<ol style="list-style-type: none"> <li>1. Notify IEC and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IEC, ER and Contractor;</li> <li>4. Discuss with the Contractor and formulate remedial measures;</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC;</li> <li>2. Implement noise mitigation proposals.</li> </ol>
<b>Limit Level</b>	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IEC, ER, EPD and Contractor;</li> <li>3. Repeat measurements to confirm findings;</li> <li>4. Increase monitoring frequency;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>3. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem;</li> <li>4. Ensure remedial measures properly implemented;</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Resubmit proposals if problem still not under control;</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>



## **Appendix G**

### **VALID CALIBRATION CERTIFICATES**

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : No. 31 Wai Loi Tsuen  
Location ID : AM1

Date of Calibration: 1-Mar-18  
Next Calibration Date: 1-May-18  
Technician: Fai So

### CONDITIONS

Sea Level Pressure (hPa)  
Temperature (°C)

1012.5  
21.3

Corrected Pressure (mm Hg)  
Temperature (K)

759.375  
294

### CALIBRATION ORIFICE

Make-> TISCH  
Model-> 5025A  
Serial # -> 1612

Qstd Slope ->  
Qstd Intercept ->

2.02017  
-0.03691

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.757	52	52.63	Slope = 25.7790 Intercept = 6.7618 Corr. coeff. = 0.9981
13	5.30	5.30	10.6	1.639	48	48.58	
10	4.00	4.00	8.0	1.427	43	43.52	
7	2.20	2.20	4.4	1.063	33	33.40	
5	1.40	1.40	2.8	0.851	29	29.35	

#### Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

#### For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

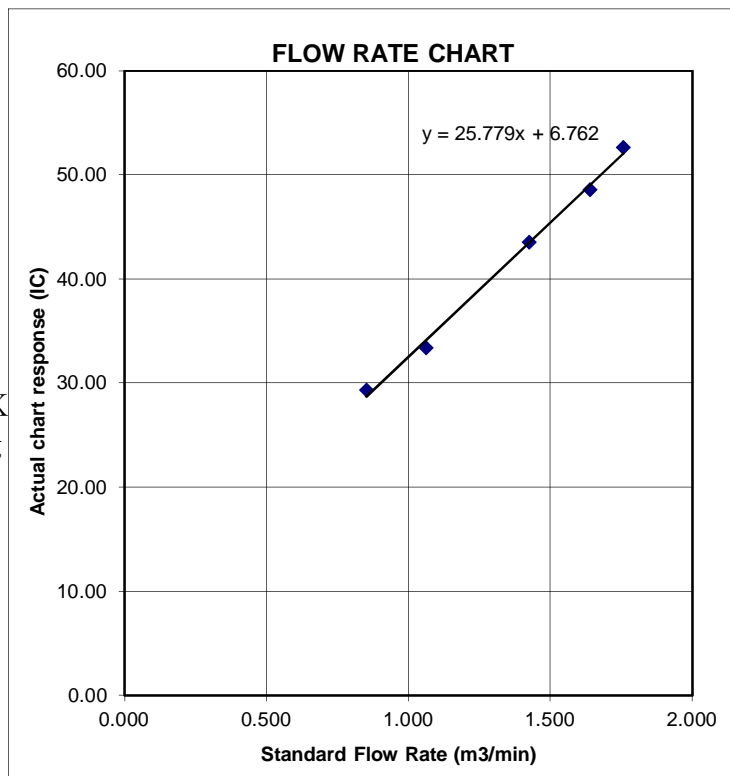
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : RE's Site Office  
Location ID : AM2a

Date of Calibration: 1-Mar-18  
Next Calibration Date: 1-May-18  
Technician: Fai So

### CONDITIONS

Sea Level Pressure (hPa)	1020.5	Corrected Pressure (mm Hg)	765.375
Temperature (°C)	17.3	Temperature (K)	290

### CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.02017
Model->	5025A	Qstd Intercept ->	-0.03691
Serial # ->	1612		

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.20	6.20	12.4	1.791	53	54.60	Slope = 25.9854 Intercept = 7.5509 Corr. coeff. = 0.9993
13	5.40	5.40	10.8	1.672	49	50.48	
10	4.10	4.10	8.2	1.460	44	45.33	
7	2.10	2.10	4.2	1.050	34	35.03	
5	1.40	1.40	2.8	0.860	29	29.87	

#### Calculations :

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

#### For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope

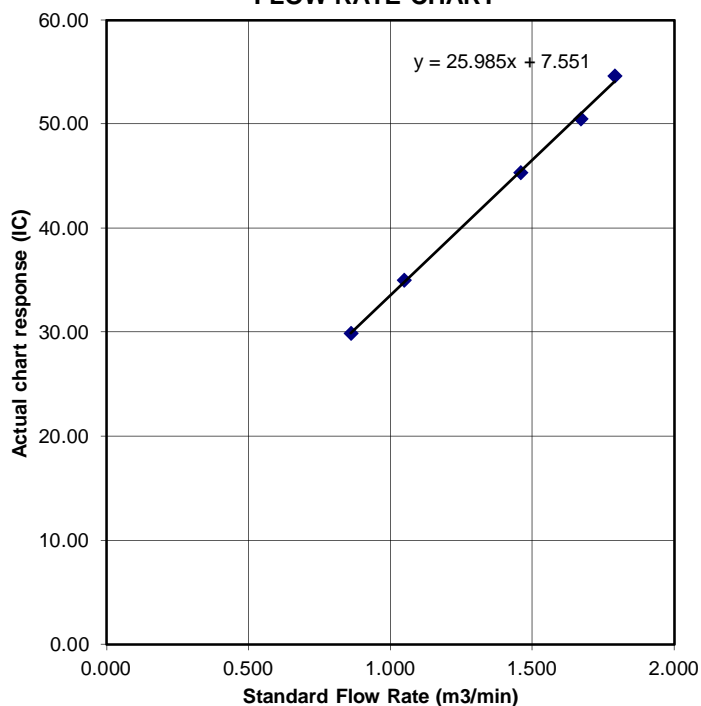
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

**FLOW RATE CHART**



# Certificate of Calibration

## Calibration Certification Information

Cal. Date: February 13, 2018

Rootsmeter S/N: 438320

Ta: 293

°K

Operator: Jim Tisch

Pa: 763.3

mm Hg

Calibration Model #: TE-5025A

Calibrator S/N: 1612

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8900	7.9	5.00
4	7	8	1	0.8440	8.7	5.50
5	9	10	1	0.7010	12.6	8.00

## Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
1.0172	0.7281	1.4293	0.9958	0.7128	0.8762
1.0130	1.0130	2.0213	0.9917	0.9917	1.2392
1.0109	1.1358	2.2599	0.9896	1.1120	1.3854
1.0098	1.1964	2.3702	0.9886	1.1713	1.4530
1.0046	1.4331	2.8586	0.9835	1.4030	1.7524
<b>QSTD</b>	m=	<b>2.02017</b>	<b>QA</b>	m=	<b>1.26500</b>
	b=	<b>-0.03691</b>		b=	<b>-0.02263</b>
	r=	<b>0.99988</b>		r=	<b>0.99988</b>

## Calculations

$$Vstd = \Delta Vol / ((Pa - \Delta P) / Pstd) (Tstd / Ta)$$

$$Va = \Delta Vol / ((Pa - \Delta P) / Pa)$$

$$Qstd = Vstd / \Delta Time$$

$$Qa = Va / \Delta Time$$

For subsequent flow rate calculations:

$$Qstd = 1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b \right)$$

$$Qa = 1/m \left( \left( \sqrt{\Delta H \left( \frac{Ta}{Pa} \right)} \right) - b \right)$$

## Standard Conditions

Tstd: 298.15 °K

Pstd: 760 mm Hg

## Key

ΔH: calibrator manometer reading (in H2O)

ΔP: rootsmeter manometer reading (mm Hg)

Ta: actual absolute temperature (°K)

Pa: actual barometric pressure (mm Hg)

b: intercept

m: slope

## RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



### SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1815078
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 5-JAN-2018
		DATE OF ISSUE	: 5-FEB-2018
PROJECT	: ----	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ----

### General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.

### Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung  General Manager

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd  
Part of the ALS Laboratory Group

11/F., Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N.T. Hong Kong  
Tel. +852 2610 1044 Fax. +852 2610 2021 [www.alsglobal.com](http://www.alsglobal.com)

WORK ORDER : HK1815078  
SUB-BATCH : 1  
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING  
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1815078-001	S/N: 366409	AIR	05-Jan-2018	S/N: 366409



## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 366409  
Equipment Ref: EQ109  
Job Order HK1815078

### Standard Equipment:

Standard Equipment: Higher Volume Sampler  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 1 December 2017

### Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m <sup>3</sup> (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	474	3.7
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	577	4.8
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2097	16.4

Sensitivity Adjustment Scale Setting (Before Calibration) 520 (CPM)

Sensitivity Adjustment Scale Setting (After Calibration) 521 (CPM)

### Linear Regression of Y or X

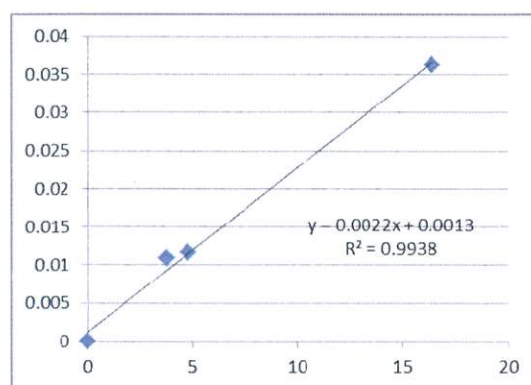
Slope (K-factor): 0.0022

Correlation Coefficient 0.9967

Date of Issue 9 January 2018

### Remarks:

1. **Strong** Correlation ( $R > 0.8$ )
  2. Factor 0.0022 should be apply for TSP monitoring
- \*If  $R < 0.5$ , repair or re-verification is required for the equipment



Operator: Martin Li Signature:  Date: 9 January 2018

QC Reviewer: Ben Tam Signature:  Date: 9 January 2018

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 1-Dec-17
Location ID :	Calibration Room	Next Calibration Date: 1-Mar-18

### CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

### CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239
13	5	5	10.0	1.518	48	48.44	Intercept = 0.7901
10	3.9	3.9	7.8	1.342	42	42.38	Corr. coeff. = 0.9971
8	2.4	2.4	4.8	1.056	32	32.29	
5	1.0	1.0	2.0	0.686	23	23.21	

#### Calculations :

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K )

Pstd = actual pressure during calibration ( mm Hg )

#### For subsequent calculation of sampler flow:

$$1/m((I) [\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

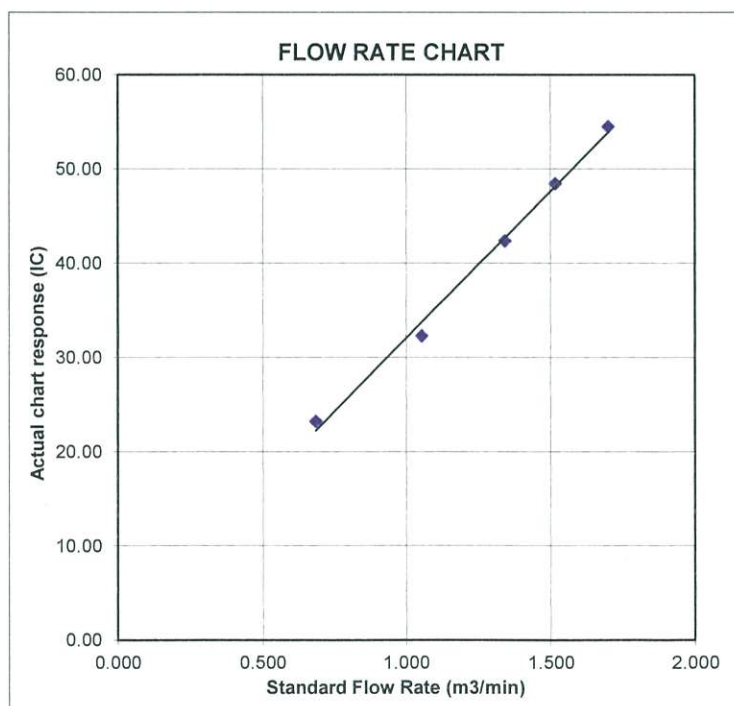
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure







輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

# Certificate of Calibration 校正證書

Certificate No. : C173480

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924)

Date of Receipt / 收件日期 : 20 June 2017

Description / 儀器名稱 : Sound Calibrator (EQ083)  
Manufacturer / 製造商 : Rion  
Model No. / 型號 : NC-74  
Serial No. / 編號 : 34246492  
Supplied By / 委託者 : Action-United Environmental Services and Consulting  
Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

## TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$   
Line Voltage / 電壓 : ---

Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$

## TEST SPECIFICATIONS / 測試規範

Calibration check


DATE OF TEST / 測試日期 : 28 June 2017

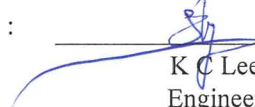
## TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
The results do not exceed manufacturer's specification.  
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By :   
測試 H T Wong  
Technical Officer

Certified By :   
核證 K C Lee  
Engineer

Date of Issue : 30 June 2017  
簽發日期

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

# Certificate of Calibration

## 校正證書

Certificate No. : C173480

證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
2. The results presented are the mean of 3 measurements at each calibration point.
3. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C163709
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

4. Test procedure : MA100N.

5. Results :

- 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	$\pm 0.3$	$\pm 0.2$

- 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.002	1 kHz $\pm 1\%$	$\pm 1$

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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Sun Creation Engineering Limited – Calibration & Testing Laboratory

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輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C172287  
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924)

Date of Receipt / 收件日期 : 24 April 2017

Description / 儀器名稱 : Sound Level Meter (EQ015)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-52

Serial No. / 編號 : 00142581

Supplied By / 委託者 : Action-United Environmental Services and Consulting  
Unit A, 20/F., Gold King Industrial Building,  
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

### TEST CONDITIONS / 測試條件

Temperature / 溫度 :  $(23 \pm 2)^{\circ}\text{C}$

Relative Humidity / 相對濕度 :  $(55 \pm 20)\%$

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 April 2017

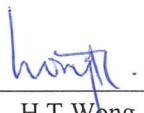
### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.  
The results do not exceed manufacturer's specification.  
The results are detailed in the subsequent page(s).

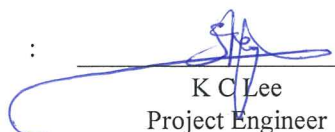
The test equipment used for calibration are traceable to National Standards via :

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By  
測試

  
H T Wong  
Technical Officer

Certified By  
核證

  
K C Lee  
Project Engineer

Date of Issue  
簽發日期

2 May 2017

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗室書面批准。

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# Certificate of Calibration

## 校正證書

Certificate No. : C172287

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- Self-calibration was performed before the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C170048
CL281	Multifunction Acoustic Calibrator	PA160023

- Test procedure : MA101N.

- Results :

- Sound Pressure Level

- Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading	IEC 61672 Class 1 Spec.
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.3	± 1.1

- Linearity

UUT Setting				Applied Value		UUT Reading
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.3 (Ref.)
				104.00		104.3
				114.00		114.3

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

- Time Weighting

UUT Setting				Applied Value		UUT Reading	IEC 61672 Class 1 Spec.
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 130	L <sub>A</sub>	A	Fast	94.00	1	94.3	Ref.
			Slow			94.3	± 0.3

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# Certificate of Calibration

## 校正證書

Certificate No. : C172287

證書編號

### 6.3 Frequency Weighting

#### 6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>A</sub>	A	Fast	94.00	63 Hz	68.1	-26.2 ± 1.5
					125 Hz	78.1	-16.1 ± 1.5
					250 Hz	85.6	-8.6 ± 1.4
					500 Hz	91.0	-3.2 ± 1.4
					1 kHz	94.3	Ref.
					2 kHz	95.5	+1.2 ± 1.6
					4 kHz	95.3	+1.0 ± 1.6
					8 kHz	93.3	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

#### 6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L <sub>C</sub>	C	Fast	94.00	63 Hz	93.4	-0.8 ± 1.5
					125 Hz	94.1	-0.2 ± 1.5
					250 Hz	94.3	0.0 ± 1.4
					500 Hz	94.3	0.0 ± 1.4
					1 kHz	94.3	Ref.
					2 kHz	94.1	-0.2 ± 1.6
					4 kHz	93.5	-0.8 ± 1.6
					8 kHz	91.4	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

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# Certificate of Calibration

## 校正證書

Certificate No. : C172287

證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 06015

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB : 63 Hz - 125 Hz	: ± 0.35 dB
250 Hz - 500 Hz	: ± 0.30 dB
1 kHz	: ± 0.20 dB
2 kHz - 4 kHz	: ± 0.35 dB
8 kHz	: ± 0.45 dB
12.5 kHz	: ± 0.70 dB
104 dB : 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB : 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

## **Appendix H**

### **IMPACT MONITORING SCHEDULE**

**Impact Monitoring Schedule for Reporting Month – March 2018**

Date		Dust Monitoring		Noise Monitoring
		1-hour TSP	24-hour TSP	
THU	1-MAR-18			
FRI	2-MAR-18			
SAT	3-MAR-18		✓	
SUN	4-MAR-18			
MON	5-MAR-18	✓		✓
TUE	6-MAR-18			
WED	7-MAR-18			
THU	8-MAR-18			
FRI	9-MAR-18		✓	
SAT	10-MAR-18	✓		
SUN	11-MAR-18			
MON	12-MAR-18			
TUE	13-MAR-18			
WED	14-MAR-18		✓	
THU	15-MAR-18			
FRI	16-MAR-18	✓		✓
SAT	17-MAR-18			
SUN	18-MAR-18			
MON	19-MAR-18			
TUE	20-MAR-18		✓	
WED	21-MAR-18			
THU	22-MAR-18	✓		✓
FRI	23-MAR-18			
SAT	24-MAR-18			
SUN	25-MAR-18			
MON	26-MAR-18		✓	
TUE	27-MAR-18			
WED	28-MAR-18	✓		✓
THU	29-MAR-18		✓	
FRI	30-MAR-18			
SAT	31-MAR-18			

✓	Monitoring Day
	Sunday or Public Holiday

## Monitoring Location

Air Quality	1-hour TSP	AM1 and AM2
	24-hour TSP	AM1 and AM2a
Construction Noise		NM1 and NM2



**Impact Monitoring Schedule for next Reporting Period – April 2018**

Date		Dust Monitoring		Noise Monitoring
		1-hour TSP	24-hour TSP	
Sun	1-Apr-18			
Mon	2-Apr-18			
Tue	3-Apr-18	✓		✓
Wed	4-Apr-18		✓	
Thu	5-Apr-18			
Fri	6-Apr-18			
Sat	7-Apr-18			
Sun	8-Apr-18			
Mon	9-Apr-18	✓		✓
Tue	10-Apr-18		✓	
Wed	11-Apr-18			
Thu	12-Apr-18			
Fri	13-Apr-18	✓		
Sat	14-Apr-18			
Sun	15-Apr-18			
Mon	16-Apr-18		✓	
Tue	17-Apr-18			
Wed	18-Apr-18			
Thu	19-Apr-18	✓		✓
Fri	20-Apr-18			
Sat	21-Apr-18		✓	
Sun	22-Apr-18			
Mon	23-Apr-18			
Tue	24-Apr-18			
Wed	25-Apr-18	✓		✓
Thu	26-Apr-18			
Fri	27-Apr-18		✓	
Sat	28-Apr-18			
Sun	29-Apr-18			
Mon	30-Apr-18	✓		✓

✓	Monitoring Day
	Sunday or Public Holiday

## Monitoring Location

Air Quality	1-hour TSP	AM1 and AM2
	24-hour TSP	AM1 and AM2a
Construction Noise		NM1 and NM2

## **Appendix I**

### **24-HOUR TSP AND CONSTRUCTION NOISE MONITORING DATA**

**24-Hr TSP Monitoring Data for AM1**

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (µg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(°C)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
3-Mar-18	22325	16904.88	16928.89	1440.60	21	22	21.5	17.3	1018.1	0.58	842	2.6841	2.7270	0.0429	51
9-Mar-18	22312	16928.89	16952.89	1440.00	21	22	21.5	18	1017.8	0.58	840	2.6812	2.7179	0.0367	44
14-Mar-18	22367	16952.89	16976.34	1407.00	22	23	22.5	19.4	1015.6	0.62	872	2.6726	2.7052	0.0326	37
20-Mar-18	22392	16976.34	17000.35	1440.60	21	22	21.5	19.7	1014.7	0.58	835	2.6638	2.7009	0.0371	44
26-Mar-18	22431	17000.35	17024.35	1440.00	22	23	22.5	20.1	1014.8	0.62	891	2.6752	2.7468	0.0716	80
29-Mar-18	22285	17024.35	17048.35	1440.00	21	22	21.5	20.3	1014.7	0.58	834	2.6839	2.6954	0.0115	14

**24-Hr TSP Monitoring Data for AM2a**

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (µg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(°C)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
3-Mar-18	22326	13559.66	13583.67	1440.60	38	41	39.5	17.3	1018.1	1.25	1805	2.6619	2.7405	0.0786	44
9-Mar-18	22310	13583.67	13607.67	1440.00	39	40	39.5	18	1017.8	1.25	1802	2.6925	2.7986	0.1061	59
14-Mar-18	22366	13607.67	13631.67	1440.00	38	41	39.5	19.4	1015.6	1.25	1794	2.6685	2.7520	0.0835	47
20-Mar-18	22393	13631.67	13655.68	1440.60	39	42	40.5	19.7	1014.7	1.28	1848	2.6772	2.7722	0.0950	51
26-Mar-18	22430	13655.68	13679.68	1440.00	38	41	39.5	20.1	1014.8	1.24	1790	2.6675	2.8284	0.1609	90
29-Mar-18	22286	13679.68	13703.68	1440.00	37	41	39.0	20.3	1014.7	1.22	1761	2.6711	2.7770	0.1059	60

**Noise Measurement Results (dB) of NM1**

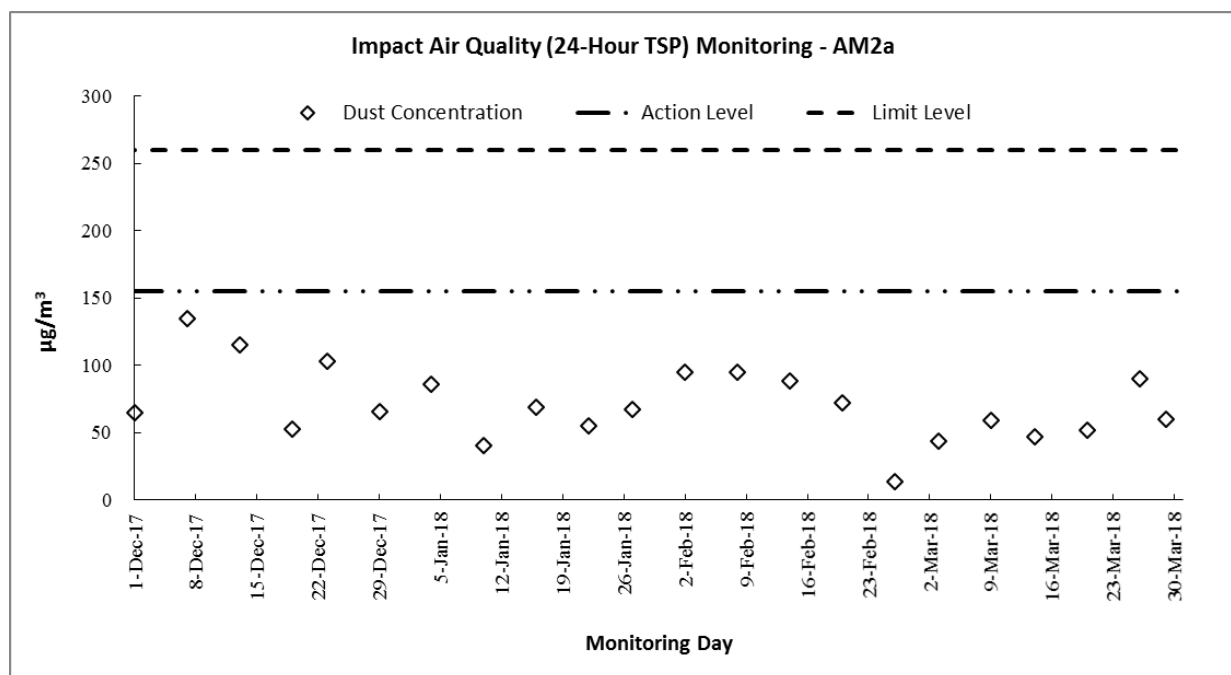
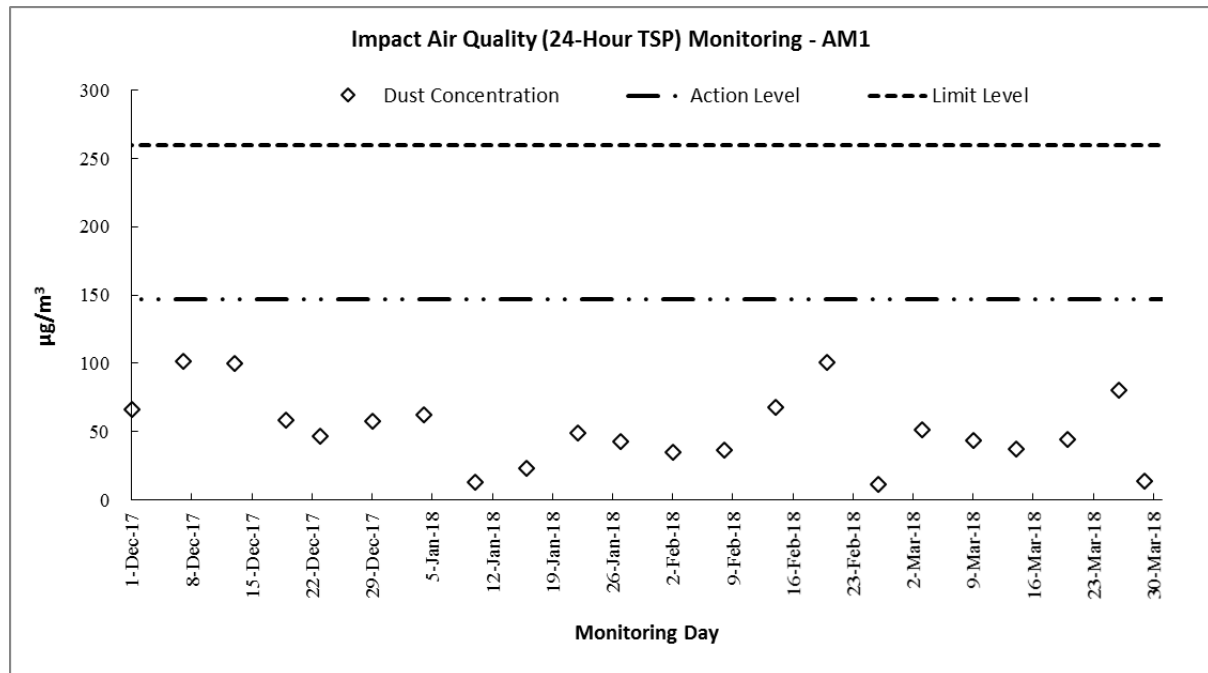
Date	Start Time	1 <sup>st</sup> Leq <sub>5min</sub>	L10	L90	2 <sup>nd</sup> Leq <sub>5min</sub>	L10	L90	3 <sup>rd</sup> Leq <sub>5min</sub>	L10	L90	4 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	5 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	6 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	Leq <sub>30min</sub>
5-Mar-18	9:23	52.4	58.8	49.4	51.3	59.6	50.1	52.7	60.3	48.4	51.6	59.3	50.2	50.6	58.1	49.4	49.6	57.3	48.1	51
16-Mar-18	9:34	53.6	60.7	50.1	54.9	60.9	51.7	52.5	57.3	49.2	50.8	58.4	49.6	51.3	57.8	49.2	51.1	57.6	50.4	53
22-Mar-18	13:23	51.7	60.3	48.7	52.6	60.7	50.3	54.8	59.7	49.2	53.8	60.7	50.3	49.4	57.6	48.2	49.9	58.8	47.5	52
28-Mar-18	13:29	52.8	59.4	49.2	52.5	60.7	49.9	53.5	60.5	50.1	51.8	59.6	49.3	50.7	58.1	48.8	49.6	57.3	47.2	52

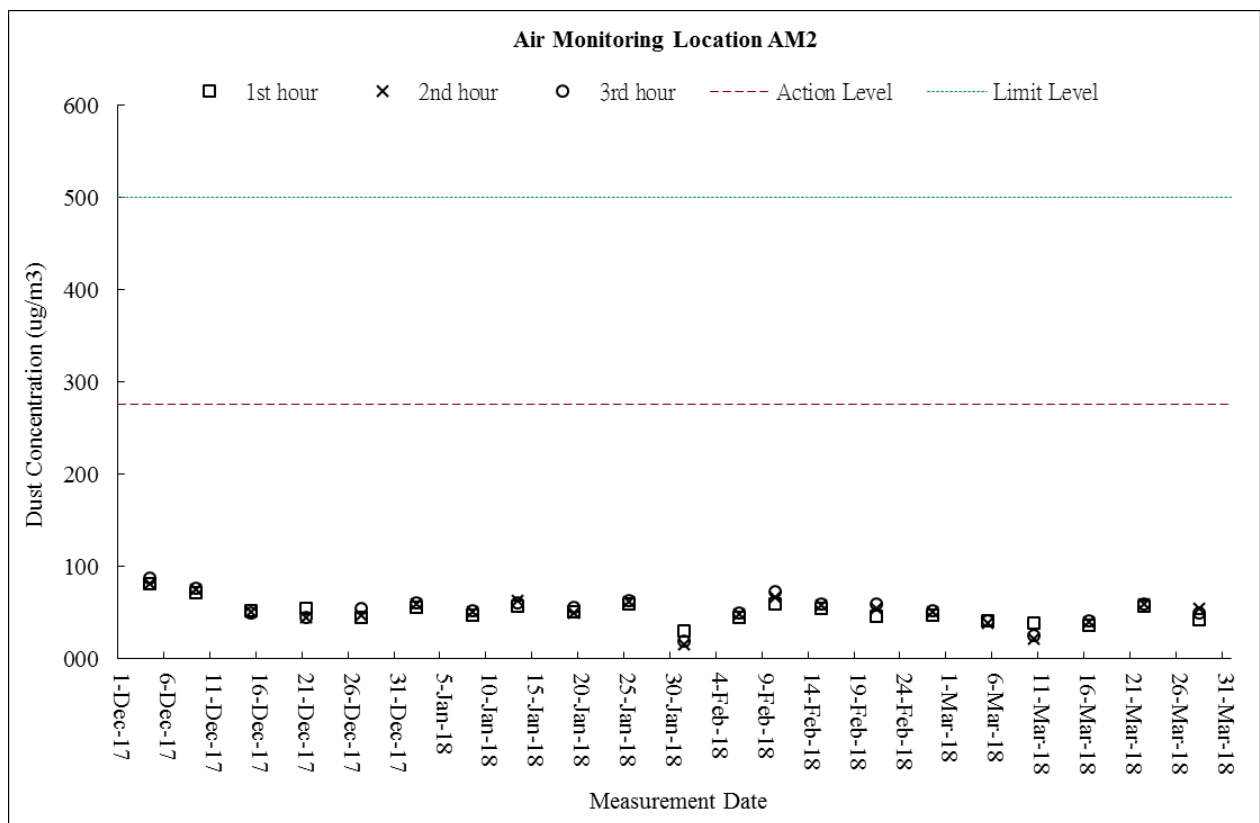
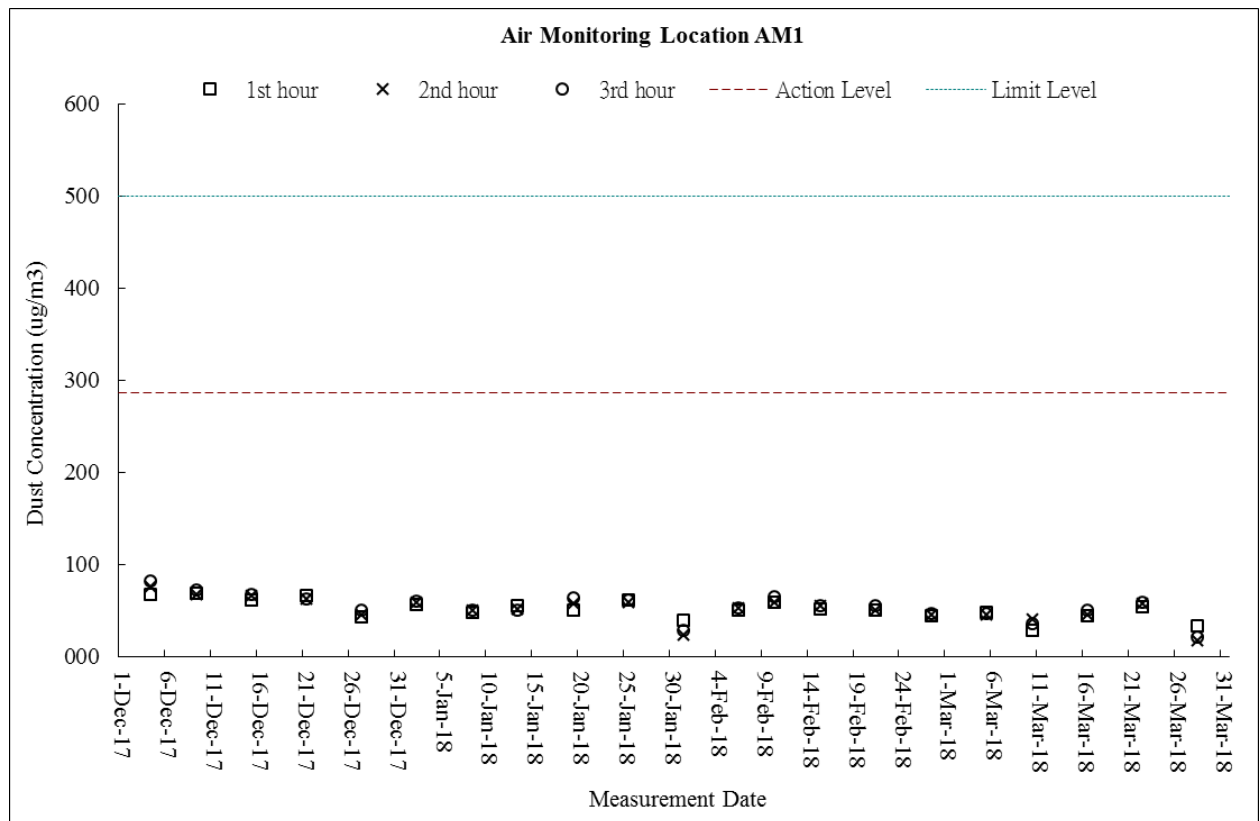
**Noise Measurement Results (dB) of NM2**

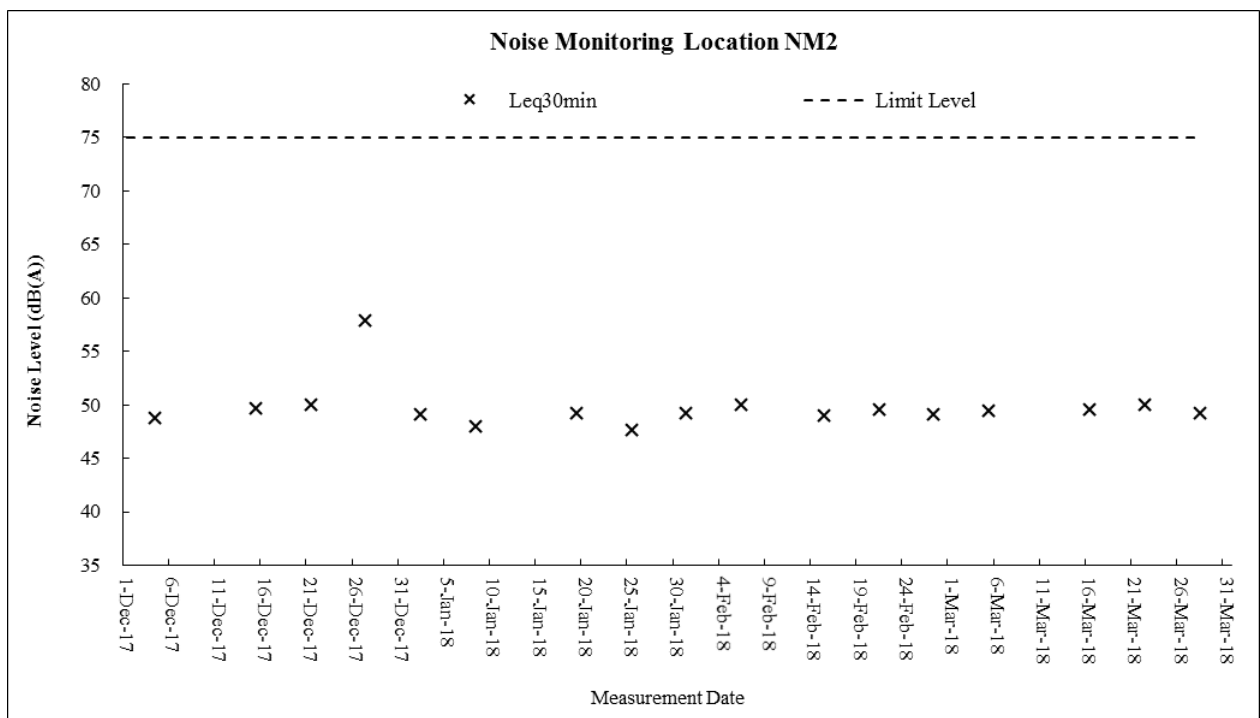
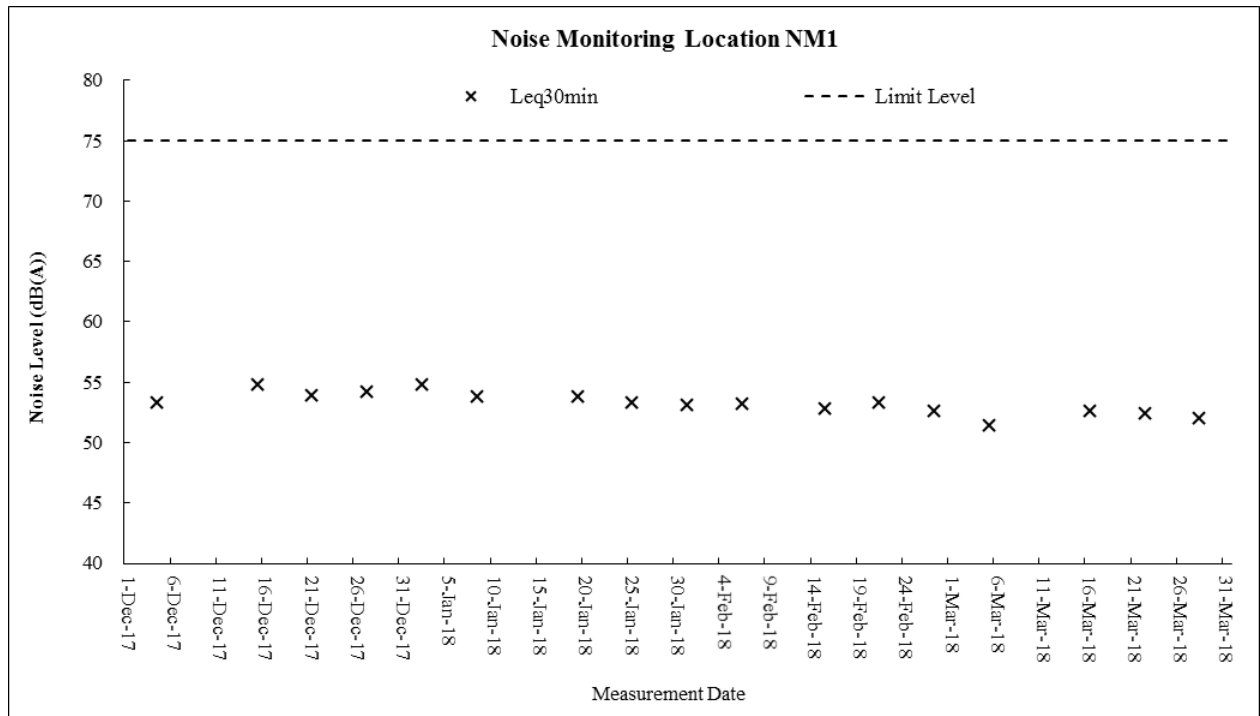
Date	Start Time	1 <sup>st</sup> Leq <sub>5min</sub>	L10	L90	2 <sup>nd</sup> Leq <sub>5min</sub>	L10	L90	3 <sup>rd</sup> Leq <sub>5min</sub>	L10	L90	4 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	5 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	6 <sup>th</sup> Leq <sub>5min</sub>	L10	L90	Leq <sub>30min</sub>
5-Mar-18	13:21	48.4	56.2	47.6	49.6	55.3	48.2	50.6	54.7	49.2	50.3	54.8	49.6	49.4	53.1	45.9	48.2	52.6	45.3	50
16-Mar-18	13:24	49.7	54.8	45.2	51.3	56.7	48.6	50.1	55.3	47.5	49.2	53.6	47.5	48.9	52.4	48.1	47.5	51.3	45.5	50
22-Mar-18	9:56	49.9	55.6	48.8	50.3	56.2	50.1	51.9	56.8	49.6	49.2	54.8	47.6	50.3	54.2	46.8	47.4	53.2	45.6	50
28-Mar-18	10:17	49.2	54.8	47.5	50.6	55.1	48.4	50.3	54.4	49.6	48.3	53.1	45.2	48.6	53.6	45.3	47.2	53.9	45.6	49

## **Appendix J**

### **GRAPHICAL PLOTS**

**Air Quality – 24-Hour TSP**

**Air Quality – 1-Hour TSP**

**Construction Noise**

## **Appendix K**

### **METEOROLOGICAL DATA DURING THE REPORTING MONTH (TA KWU LING STATION)**



Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Mar-18	Thu	Fresh to strong easterly winds.	0	21	9	81.5	SE
2-Mar-18	Fri	Fresh to strong easterly winds.	Trace	23.6	9.7	72.5	E/NE
3-Mar-18	Sat	Fine. Dry in the afternoon. Moderate easterly winds.	0	23.2	7.9	81	E
4-Mar-18	Sun	Fine. Dry in the afternoon. Moderate easterly winds.	Trace	23.7	6.6	88	E
5-Mar-18	Mon	Fresh to strong easterly winds.	0	25.7	6.5	77.7	E/SE
6-Mar-18	Tue	Cloudy with one or two rain patches.	Trace	19.8	10.1	79.2	NE
7-Mar-18	Wed	Becoming cold progressively.	Trace	19.8	12	72.5	E/NE
8-Mar-18	Thu	Cloudy with a few rain patches.	20.3	15.3	9.7	79.5	N/NW
9-Mar-18	Fri	Fine and dry. Moderate to fresh north to northeasterly winds.	0	14.3	11.6	46.2	N/NW
10-Mar-18	Sat	Fine and dry. Moderate easterly winds.	0	14.6	8.1	52.3	E/NE
11-Mar-18	Sun	Fine and dry. Moderate easterly winds.	0	17.6	7.5	56.7	E/NE
12-Mar-18	Mon	Fine. Dry in the afternoon. Moderate easterly winds.	0	19.6	6.9	69.7	E/NE
13-Mar-18	Tue	Fine. Dry in the afternoon. Moderate easterly winds.	0	20.7	6.4	73	E/NE
14-Mar-18	Wed	Mainly cloudy with a few showers. Moderate easterly winds.	2.4	19.5	8.2	82.5	E/NE
15-Mar-18	Thu	Fine and dry. Moderate to fresh northerly winds.	Trace	21.8	4.4	81.2	N/NW
16-Mar-18	Fri	Fine and dry. Moderate easterly winds.	0	23	5	74.5	E
17-Mar-18	Sat	Fine and dry. Moderate easterly winds.	Trace	20.2	6.9	79.6	E/NE
18-Mar-18	Sun	Fine. Dry in the afternoon. Moderate easterly winds.	Trace	21.9	8.6	82.5	E/NE
19-Mar-18	Mon	Fine. Dry in the afternoon. Moderate easterly winds.	Trace	22.8	6.9	83	E/NE
20-Mar-18	Tue	Fine and dry. Moderate to fresh northerly winds.	Trace	19	8.2	76.7	N/NW
21-Mar-18	Wed	Fine and dry. Moderate to fresh northerly winds.	0	17.8	10.7	46	N/NW
22-Mar-18	Thu	Moderate easterly winds, fresh at times.	0	16.9	5.3	62.5	E/NE
23-Mar-18	Fri	Fine at first	0	19.3	7.1	59.7	E/NE
24-Mar-18	Sat	Fine and dry. Moderate to fresh northerly winds.	Trace	21.1	7.5	61.3	E/NE
25-Mar-18	Sun	Mainly cloudy with sunny periods. Moderate east to northeasterly winds.	Trace	21.8	8	60.7	E/NE
26-Mar-18	Mon	Sunny periods in the afternoon. Light winds.	0	22.5	5.5	65.7	E/SE
27-Mar-18	Tue	Mainly fine. Warm in the afternoon.	0	22	6	73.5	SW
28-Mar-18	Wed	Mainly fine. Warm in the afternoon.	0	23.2	7	73	E/NE
29-Mar-18	Thu	Hot and dry in the afternoon. Light winds.	0	22.3	6.5	70.1	E/NE
30-Mar-18	Fri	Mainly fine.	0	24.3	6.9	72.1	E/NE
31-Mar-18	Sat	Mainly fine.	0	24.4	6.8	72.3	E/NE

## **Appendix L**

### **MONTHLY SUMMARY WASTE FLOW TABLE**

## Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09  
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road  
 Commencement Date: 21-Jul-15 Estimated completion Date: 19-Aug-16 Estimated Contract Sum: 1.56M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Feb 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Mar 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Apr 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
May 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
June 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
<b>Sub-total</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
July 15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug 15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep 15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011
Oct 15	0.035	0.028	0.000	0.000	0.007	0.000	43.790	0.000	0.000	0.000	0.014
Nov 15	1.119	0.263	0.001	0.000	0.855	0.273	44.170	0.000	0.000	0.000	0.000
Dec 15	1.300	0.744	0.001	0.000	0.555	6.123	25.550	0.000	0.000	0.000	0.026
<b>Total</b>	<b>2.454</b>	<b>1.035</b>	<b>0.002</b>	<b>0.000</b>	<b>1.417</b>	<b>6.396</b>	<b>113.510</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.051</b>

- Notes: (1) The waste flow table should cover the whole construction period of the Contract.
- (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
- (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
- (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
- (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
- (6) Broken concrete for recycling into aggregates.

## Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09  
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road  
 Commencement Date: 21-Jul-2015 Estimated completion Date: 19-Aug-2017 Estimated Contract Sum: 1.56M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan-16	0.335	0.111	0.060	0.000	0.164	0.000	0.000	0.000	0.000	0.000	0.000
Feb-16	2.377	0.089	0.050	2.228	0.010	0.000	0.000	0.000	0.000	0.000	0.008
Mar-16	0.141	0.015	0.050	0.000	0.076	0.000	0.000	0.000	0.000	0.000	0.007
Apr-16	0.160	0.010	0.050	0.000	0.100	0.000	0.000	0.000	0.000	0.000	0.023
May-16	0.334	0.000	0.010	0.000	0.324	0.000	0.000	0.000	0.000	0.000	0.026
Jun-16	2.517	0.024	0.300	0.000	2.193	0.000	0.000	0.000	0.000	0.000	0.013
<b>Sub-total</b>	<b>5.863</b>	<b>0.249</b>	<b>0.520</b>	<b>2.228</b>	<b>2.866</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.076</b>
Jul-16	3.284	0.000	0.150	0.000	3.134	0.000	0.000	0.000	0.000	0.000	0.002
Aug-16	0.396	0.005	0.100	0.000	0.291	0.000	4.720	0.000	0.000	0.000	0.012
Sep-16	0.529	0.000	0.100	0.000	0.429	0.000	0.000	0.000	0.000	0.000	0.008
Oct-16	1.151	0.000	0.300	0.000	0.851	0.000	0.000	0.000	0.000	0.000	0.013
Nov-16	0.266	0.000	0.100	0.000	0.166	0.000	14.700	0.000	0.000	0.000	0.028
Dec-16	0.520	0.022	0.100	0.000	0.398	0.000	0.000	0.000	0.000	0.000	0.019
<b>Total</b>	<b>12.008</b>	<b>0.275</b>	<b>1.370</b>	<b>2.228</b>	<b>8.135</b>	<b>0.000</b>	<b>19.420</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.158</b>

- Notes:
- (1) The waste flow table should cover the whole construction period of the Contract.
  - (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
  - (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
  - (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
  - (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

## Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09  
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road  
 Commencement Date: 21-Jul-2015 Estimated completion Date: 19-Aug-2017 Estimated Contract Sum: 1.56M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan-17	0.304	0.089	0.100	0.000	0.115	0.000	0.000	0.000	0.000	0.000	0.023
Feb-17	0.660	0.000	0.400	0.000	0.260	0.000	1.830	0.000	0.000	0.000	0.051
Mar-17	0.326	0.076	0.200	0.000	0.050	0.000	1.190	0.015	0.000	0.000	0.029
Apr-17	1.100	0.000	0.200	0.000	0.900	0.000	0.620	0.000	0.000	0.000	0.029
May-17	0.600	0.000	0.100	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.019
Jun-17	0.600	0.000	0.200	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.031
<b>Sub-total</b>	<b>3.590</b>	<b>0.165</b>	<b>1.200</b>	<b>0.000</b>	<b>2.225</b>	<b>0.000</b>	<b>3.640</b>	<b>0.015</b>	<b>0.000</b>	<b>0.000</b>	<b>0.182</b>
Jul-17	0.344	0.000	0.100	0.000	0.244	0.000	0.000	0.000	0.000	0.000	0.041
Aug-17	0.461	0.011	0.400	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.067
Sep-17	0.602	0.016	0.000	0.000	0.586	0.000	0.000	0.000	0.000	0.000	0.082
Oct-17	0.515	0.106	0.100	0.000	0.309	0.000	5.060	0.000	0.000	0.000	0.063
Nov-17	0.331	0.062	0.000	0.000	0.268	0.000	0.000	0.000	0.000	0.000	0.126
Dec-17	0.234	0.068	0.000	0.000	0.166	0.000	0.370	0.059	0.001	0.000	0.100
<b>Total</b>	<b>6.077</b>	<b>0.428</b>	<b>1.800</b>	<b>0.000</b>	<b>3.848</b>	<b>0.000</b>	<b>9.070</b>	<b>0.074</b>	<b>0.001</b>	<b>0.000</b>	<b>0.662</b>

- Notes:
- (1) The waste flow table should cover the whole construction period of the Contract.
  - (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
  - (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
  - (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
  - (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

## Monthly Summary Waste Flow Table

Department: Drainage Services Department      Contract No.: DC/2013/09  
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road  
 Commencement Date: 2015-7-21      Estimated completion Date: 2017-8-19      Estimated Contract Sum: 1.56M

Month-Year	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Jan-2018	0.072	0.049	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.046
Feb-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022
Mar-2018	0.191	0.006	0.000	0.000	0.185	0.000	0.000	0.000	0.000	0.000	0.030
Apr-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
May-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
June-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Sub-total</b>	<b>0.263</b>	<b>0.055</b>	<b>0.000</b>	<b>0.000</b>	<b>0.208</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.098</b>
July-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oct-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nov-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dec-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Total</b>	<b>0.263</b>	<b>0.055</b>	<b>0.000</b>	<b>0.000</b>	<b>0.208</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.098</b>

- Notes: (1) The waste flow table should cover the whole construction period of the Contract.
- (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
- (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
- (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
- (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

## **Appendix M**

### **IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)**

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Air Quality Impact</b>						
S2.4.1.3	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> <li>Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;</li> <li>Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;</li> <li>A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones;</li> <li>The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;</li> <li>Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;</li> <li>When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period.</li> <li>The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials;</li> <li>Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously;</li> <li>Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet;</li> </ul>	To minimize the dust impact	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Air Pollution Control Ordinance (APCO) and Air Pollution Control (Construction Dust) Regulation



EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Air Quality Impact</b>						
	<ul style="list-style-type: none"> <li>Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</li> <li>Any skip hoist for material transport should be totally enclosed by impervious sheeting;</li> <li>Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;</li> <li>Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed;</li> <li>Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and</li> <li>Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabilizer within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.</li> </ul>					

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Noise Impact</b>						
S3.4.1.1	Use of movable barrier, enclosure, acoustic mat and quiet plant. Use of wooden frames barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m <sup>2</sup> on a skid footing with 25mm thick internal sound absorptive lining.	To minimize construction noise impact arising from the Project at the affected noise sensitive receivers (NSRs)	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, Noise Control Ordinance (NCO)
S3.4.1.2	<p>Good Site Practice:</p> <ul style="list-style-type: none"> <li>Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> <li>Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.</li> <li>Mobile plant, if any, should be sited as far away from NSRs as possible.</li> <li>Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.</li> <li>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.</li> <li>Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction period of Advance Works and Main Works of Phase 1A	EIAO-TM, NCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Ecological Impact</b>						
S4.2.1.1	Solid dull green noise/visual barriers of at least 2m high shall be erected and maintained between active works area and all areas of ecological importance.	Minimize noise and human disturbances during construction phase.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.2	Avoid unnecessary lighting.	Minimize mortality impacts on birds.	Design Contractor / Plant Operator	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.3	Good construction site practice to minimise dust generation should be followed on all construction sites. Measures to avoid, minimise and mitigate impacts on air quality are detailed in this schedule	Minimize dust generation from construction sites.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.4	<p>The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented</p> <ul style="list-style-type: none"> <li>• Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies;</li> <li>• Proper locations well away from nearby water bodies should be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpiles of construction debris and spoil, and these should be identified before commencement of works;</li> <li>• To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies should be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective measures should also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work sites;</li> <li>• Construction debris and spoil should be covered and/or properly disposed of as soon as possible to avoid these being washed into nearby water bodies;</li> <li>• Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be identified;</li> </ul>	Avoid, minimise and mitigate impact on water quality	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Ecological Impact</b>						
	<ul style="list-style-type: none"> <li>• Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies;</li> <li>• Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited;</li> <li>• Regular water monitoring and site audit should be carried out at adequate points along any watercourses where construction works are underway upstream within their catchments and also on the Ng Tung, Sheung Yue and Shek Sheung Rivers. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works should be considered;</li> <li>• Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety;</li> <li>• Where soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means;</li> <li>• Stockpiling sites should be lined with impermeable sheeting and bunded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimize contaminated runoff and construction materials should be properly covered and located away from nearby water bodies; and</li> <li>• Supply of suitable clean backfill material after excavation, if required.</li> <li>• Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent discharge during transport or during wet season;</li> <li>• Speed control for the trucks carrying contaminated materials should be enforced;</li> <li>• Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and</li> <li>• Other measures as detailed in this schedule.</li> </ul>					

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Water Quality Impact</b>						
S5.2.2.1	Construction Site Runoff Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PN1/94) should be followed where applicable.	Control construction runoff	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO
S5.2.2.2 – S5.2.2.3	<p>Sewage from Workforce</p> <ul style="list-style-type: none"> <li>• Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed Contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.</li> <li>• Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures</li> </ul>	Handling of site sewage	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Waste Management</b>						
S6.2.2.1	<p>Good Site Practices and Waste Reduction Measures:</p> <ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;</li> <li>Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;</li> <li>Provision of sufficient waste disposal points and regular collection for disposal;</li> <li>Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;</li> <li>Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;</li> <li>An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval.</li> </ul>	Minimize waste generation during construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal Ordinance (WDO)
S6.2.3.1	<p>Waste Reduction Measures:</p> <ul style="list-style-type: none"> <li>Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;</li> <li>Proper storage and site practices to minimize the potential for damage and contamination of construction materials;</li> <li>Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste;</li> <li>Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and</li> <li>Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.</li> </ul>	Reduce waste generation	Contractor	Work Sites	Prior to the commencement of construction of Advance Works and Main Works of Phase 1A	WDO
S6.2.4.1 - S6.2.4.2	<p>Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> <li>Waste, such as soil, should be handled and stored well to ensure secure</li> </ul>	Minimize waste impacts arising from waste storage	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	WDO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Waste Management</b>						
	<ul style="list-style-type: none"> <li>containment, thus minimizing the potential of pollution;</li> <li>Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and</li> <li>Different locations should be designated to stockpile each material to enhance reuse.</li> <li>Remove waste in timely manner;</li> <li>Employ the trucks with cover or enclosed containers for waste transportation;</li> <li>Obtain relevant waste disposal permits from the appropriate authorities; and</li> <li>Disposal of waste should be done at licensed waste disposal facilities.</li> </ul>					
S6.2.5.2	C&D Materials from Site Formation <ul style="list-style-type: none"> <li>Maintain temporary stockpiles and reuse excavated fill material for backfilling;</li> <li>Carry out on-site sorting;</li> <li>Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate;</li> <li>Adopt “selective demolition” technique to demolish the existing structure and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; and</li> <li>Implement a trip-ticket system for each works contract to ensure that the disposal of C&amp;D materials are properly documented and verified.</li> </ul>	Minimize waste impacts from excavated and C&D materials	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005
S6.2.5.3	C&D Material from Buildings Demolition and New Building Construction <ul style="list-style-type: none"> <li>The Contractor should recycle as much as possible of the C&amp;DM on-site. Public fill and C&amp;DM waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage.</li> <li>The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminium or alloy etc, could be used.</li> <li>Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow</li> </ul>	Minimize waste impacts from building demolition and new building construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Waste Management</b>						
	<p>reuse of the inert material on site when implemented.</p> <ul style="list-style-type: none"> <li>In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and non-inert C&amp;D material arising from demolition works, selective demolition method should be adopted.</li> </ul>					
S6.2.5.4	<p>Chemical Waste</p> <ul style="list-style-type: none"> <li>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers.</li> <li>Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</li> </ul>	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S6.2.5.5	<p>General Refuse</p> <ul style="list-style-type: none"> <li>General refuse should be stored in enclosed bins separately from construction and chemical wastes.</li> <li>Recycling bins should also be placed to encourage recycling.</li> <li>Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean.</li> <li>A reputable waste collector should be employed to remove general refuse on a daily basis.</li> </ul>	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste



EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Landscape and Visual</b>						
S7.3.1.1	<b>Good Site Practices</b> <ul style="list-style-type: none"> <li>For areas unavoidably disturbed by the Project on a short term basis e.g. works areas, the general principle to try and restore these to their former state to suit future land use, should be adhered to.</li> <li>With regard to topsoil, where identified, it should be stripped, treated appropriately, and where suitable and practical stored for re-use in the construction of the soft landscape works such as roadside amenity strips, and open space sites.</li> </ul>	Minimize the impact to the landscape and visual	Contractor	Work Sites	Prior to construction and construction phase	
S7.3.2.1	<b>MM4 - Tree Protection &amp; Preservation</b> <ul style="list-style-type: none"> <li>Existing trees to be retained within the Project Site should be carefully protected during construction. In particular Old and Valuable Trees (OVTs) will be preserved according to ETWB TC (Works) No. 29/2004. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in Contractor's works areas. A detailed tree survey will be carried out for the Tree Removal Application (TRA) process which will be carried out at the later detailed design stage of the Project. The detailed tree survey will propose which trees should be retained, transplanted or felled and will include details of tree protection measures for those trees to be retained.</li> </ul>	Protect and Preserve Trees	Designer / Contractor	Work Sites	Prior to construction and construction phase	ETWB TCW No. 10/2013, 29/2004 and 3/2006
S7.3.2.1	<b>MM5 - Tree Transplantation</b> <ul style="list-style-type: none"> <li>Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor site and not held in a temporary nursery as far as possible. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, where applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWBTC 2/2004 and 3/2006 and final</li> </ul>	Transplant Trees where suitable for transplantation	Designer / Contractor	Work Sites where possible. Otherwise consider offsite locations	Prior to construction, construction phase and operation phase	WB TCW No. 10/2013, 3/2006 and 2/2004

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<b>Landscape and Visual</b>						
	locations of transplanted trees should be agreed prior to commencement of the work.					
S7.3.2.1	MM17 - Light Control <ul style="list-style-type: none"> <li>Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the Construction phase. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase.</li> </ul>	To minimize glare impact to adjacent VSRs.	Designer / Contractor	Work Sites and/or the Plant	Construction phase and operation phase	

## **APPENDIX B**

### **MONTHLY EM&A REPORT FOR CONTRACT DE/2014/01**

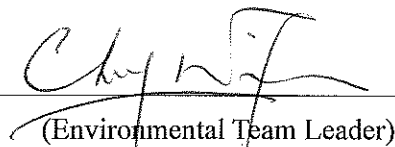
**Jardine Engineering Corporation Ltd.**

**Contract No. DE/2014/01  
Provision of Electrical and Mechanical Facilities  
for Shek Wu Hui Sewage Treatment Works –  
Further Expansion Phase 1A –  
Advance Works and Ng Chow South Road  
Sewage Pumping Station**

**Monthly Environmental  
Monitoring and Audit Report  
March 2018**

**(Version 1.0)**

Certified By



(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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## **ABBREVIATION AND ACRONYM**

AL Levels	Action and Limit Levels
DSD	Drainage Services Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan
SCISTW	Shek Wu Hui Sewage Treatment Works

## EXECUTIVE SUMMARY

### Introduction

1. This is the 6<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract No. DE/2014/01 “Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station” (The Project) which documents the key information of EM&A and environmental monitoring works undertaken by other Contract at the Shek Wu Hui Sewage Treatment Works under Phase 1A with Environmental Permit (Permit No. FEP-02/474/2013).
2. The site activities undertaken in the reporting month included:
  - Mechanical installation of lifting appliance at 1/F, MBR Facilities Building.
  - Mechanical Installation of lifting appliance in MBR Pre-treatment Screen Chamber.
  - Provision of switchboards in 11kV HV Switch room.

### Environmental Monitoring Works

3. The environmental monitoring works of the Project were conducted by the ET of Contract DC/2013/09 at the SWHSTW under Phase 1A with same Environmental Permit in accordance with the Updated EM&A Manual for Contract DE/2014/01 which has been submitted and verified by IEC. The current impact monitoring methodology conducted by DC/2013/09 under the requirements of the Updated EM&A Manual for Shek Wu Hui Sewage Treatment Works, are also applicable for the installation works of DE/2014/01 since the two Contracts have shared the same site areas and will execute their works under the same EP.
4. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.
5. Summary of the non-compliance of the reporting month is tabulated in **Table I**.

**Table I Summary Table for Non-compliance Recorded in the Reporting Month**

Monitored By	Monitoring Station	Parameter	No. of Exceedance		No. of Exceedance Due to the Project		Action Taken
			Action Level	Limit Level	Action Level	Limit Level	
DC/2013/09	AM1	1-hr TSP	0	0	0	0	N/A
		24-hr TSP	0	0	0	0	N/A
	AM2a	1-hr TSP	0	0	0	0	N/A
		24-hr TSP	0	0	0	0	N/A
	NM1	Noise	0	0	0	0	N/A
	NM2		0	0	0	0	N/A

#### 1-hour TSP Monitoring

6. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.



*24-hour TSP Monitoring*

7. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

*Construction Noise*

8. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

**Environmental Licenses and Permits**

9. Licenses/Permits granted to Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A include the Environmental Permit (EP no. FEP-02/474/2013); Registered as a Chemical Waste Producer and Billing account for Disposal of Construction Waste for the Project.

**Environmental Mitigation Implementation Schedule**

10. According to the Updated EM&A Manual, air quality, noise and waste management would be the key environmental issues and mitigation measures shall be implemented during the construction phase. Details of the implementation of mitigation measures are provided in the **Appendix F**.

**Key Information in the Reporting Month**

11. Summary of key information in the reporting month is tabulated in **Table II**

**Table II Summary Table for Key Information in the Reporting Month**

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0	---	N/A	N/A	---
Status of submissions under EP	---	---	---	---	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

**Site Inspection Conducted by Government Department**

12. No site inspection for Contract DE/2014/01 was conducted by Government Department in the reporting month.

**Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons**

13. No environmental complaint, prosecution, reporting changes and notification of summons were received or reported for the Project in the reporting month.
14. There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix G**.

15. No notification of summons and prosecution was received by the Contractor in the reporting

month.

**Future Key Issues:**

16. Major site activities for the coming two months include:

- Electrical Installation of switchboards in LV Switchroom at G/F, MBR Facilities Building.
- Mechanical Installation of Lifting Appliance and Air Blowers at 1/F, MBR Facilities Building.
- Electrical Installation in Transformer Room No.2 at 1/F, MBR Facilities Building.
- Mechanical Installation of MBR Pre-treatment Screen Facilities.
- Mechanical Installation in Bioreactor No.1 (BR1).

17. The environmental concerns in the coming months are mainly on chemicals storage, the efficiency and maintenance of drainage system, noise from the operation of construction machinery on-site, waste management and the maintenance of equipment to prevent oil leakage within the construction work areas.

## 1. INTRODUCTION

### Background

- 1.1 The Project ‘Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station’ under Contract No: DE/2014/01 mainly comprises the Design, manufacture, supply, delivery, installation, inspection, testing and commissioning of E&M installations for the Advance Works in the SWHSTW. The general location plan of the Project is shown in **Figure 1**.
- 1.2 The Project is under North East New Territories New Development Areas and is part of the designated project with Register No. : AEIAR-175/2013. The current works under the Project and other Contracts at SWHSTW are covered by the Environmental Permit (Permit No. FEP-02/474/2013), which was issued on 15<sup>th</sup> February 2018 by the Environmental Protection Department (hereinafter called EPD) to the Drainage Services Department (hereinafter called the DSD) as the Permit Holder.
- 1.3 The environmental monitoring works on air quality and noise were covered by the ET of Contract DC/2013/09 for the Project.
- 1.4 The Jardine Engineering Corporation, Limited was commissioned by the DSD to undertake the construction of the Contract No. DE/2014/01 “Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station”.
- 1.5 The site activities undertaken in the reporting month included:
- Mechanical installation of lifting appliance at 1/F, MBR Facilities Building.
  - Mechanical Installation of lifting appliance in MBR Pre-treatment Screen Chamber.
  - Provision of switchboards in 11kV HV Switch room.
- 1.6 Cinotech Consultants Limited was commissioned and appointed by The Jardine Engineering Corporation Limited as the Environmental Team (ET) of Contract No. DE/2014/01 under Condition 2.1 of the FEP. The Environmental Monitoring and Audit (EM&A) works were conducted and reported during the reporting month according to the Updated EM&A Manual of this designated project.
- 1.7 This is the 6<sup>th</sup> monthly EM&A report summarizing the EM&A works conducted for the Project in March 2018.

### Project Organizations

- 1.8 The contacts of the Project are shown in **Table 1.1** and the Project Organization Chart is shown in **Figure 4**.

**Table 1.1 Key Project Contacts**

<b>Party</b>	<b>Role</b>	<b>Name</b>	<b>Position</b>	<b>Phone No.</b>
Drainage Service Department	Resident Site Engineer	Mr. Fong Mo	Resident Engineer	2594 7329
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089
ANewR	Independent Environmental Checker	Mr. Adi Lee	Independent Environmental Checker	2618 2836
The Jardine Engineering Corporation, Limited	Contractor	Mr. Kim Hung Lau	Project Manager	2947 1125
		Mr. George Ng	Environmental Officer	2947 1125

**Summary of EM&A Requirements**

- 1.9 The EM&A programme requires construction phase monitoring for air quality and construction noise, landscape and visual and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:
- All monitoring parameters;
  - Action and Limit levels for all environmental parameters;
  - Event Action Plans;
  - Environmental mitigation measures, as recommended in the project EIA study final report; and
  - Environmental requirements in contract documents.
- 1.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in **Section 4** of this report.
- 1.11 This report presents the monitoring results, observations, locations, equipment, period, for required monitoring parameter namely air quality, noise and audit works conducted for the Project during this reporting month. For the methodology and QA/QC procedures of the monitoring parameters, please refer to the respective monthly reports for the other contract at SWHSTW.

## 2. AIR QUALITY

### Monitoring Requirements

- 2.1 1-hour and 24-hour TSP monitoring were conducted to monitor the air quality. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

### Monitoring Locations

- 2.2 Three designated monitoring stations, AM1, AM2 and AM2a were selected for impact dust monitoring for the Project. **Table 2.1** describes the air quality monitoring locations and **Figure 2** indicated their positions in relation to the site boundary.

**Table 2.1 Locations for Air Quality Monitoring**

Monitoring Station	Monitored by	Location of Measurement
AM1	DC/2013/09	No. 31 Wai Loi Tsuen
AM2		Fu Tei Au
AM2a		RE's Site Office

### Monitoring Equipment

- 2.3 The details of the monitoring equipment and copies of the calibration certificates used during the reporting month could be referred to the monthly EM&A reports of Contract DC/2013/09.

### Monitoring Parameters, Frequency and Duration

- 2.4 **Table 2.2** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period could refer to the respective monthly reports.

**Table 2.2 Impact Dust Monitoring Parameters, Frequency and Duration**

Monitoring Station	Parameter	Period	Frequency
AM1	1-hour TSP	0700-1900 hrs	At least three times every 6 days
AM2			
AM1	24-hour TSP	0000-2400 hrs	At least once every 6 days
AM2a			

### Monitoring Methodology and QA/QC Procedure

- 2.5 The monitoring methodology and QA/QC procedure could be referred to the monthly report of Contract DC/2013/09.

### Results and Observations

- 2.6 The monitoring results at AM1, AM2 and AM2a in reporting month could be referred to the monthly report of Contract DC/2013/09. The monitoring results has been checked by the ET of Contract DC/2013/09 and verified by the IEC.

- 2.7 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix B.**
- 2.8 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix B.**
- 2.9 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results could be referred to Appendix I and Appendix J of the monthly report of Contract DC/2013/09.
- 2.10 According to field observations during site inspection, identifiable dust sources near the monitoring stations were mainly from construction works and vehicles movement operating for the Project.

### 3. NOISE

#### Monitoring Requirements

- 3.1 Two noise monitoring station, namely NM1 and NM2 were designated in the Updated EM&A Manual for impact monitoring. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

#### Monitoring Locations

- 3.2 Noise monitoring was conducted at the designated monitoring stations as listed in **Table 3.1** and **Figure 3** indicated their positions in relation to the site boundary

**Table 3.1 Location of Noise Monitoring Stations**

Monitoring Station	Monitored By	Location of Measurement
NM1	DC/2013/09	No. 31 Wai Loi Tsuen
NM2		Fu Tei Au

#### Monitoring Equipment

- 3.3 The details of the monitoring equipment and copies of the calibration certificates used during the reporting month could be referred to the monthly EM&A reports of Contract DC/2013/09.

#### Monitoring Parameters, Frequency and Duration

- 3.4 **Table 3.2** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule for the reporting period could refer to the respective monthly reports.

**Table 3.2 Noise Monitoring Parameters, Frequency and Duration**

Monitoring Stations	Parameter	Period	Frequency
NM1	L <sub>10</sub> (30 min.) dB(A) L <sub>90</sub> (30 min.) dB(A) L <sub>eq</sub> (30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week
NM2			

#### Monitoring Methodology and QA/QC Procedures

- 3.5 The monitoring methodology and QA/QC procedure could be referred to the monthly report of Contract DC/2013/09.

#### Results and Observations

- 3.6 The monitoring results at NM1 and NM2 in the reporting month could be referred to the monthly report of Contract DC/2013/09. The monitoring results has been checked by the ET of Contract DC/2013/09 and verified by the IEC.

- 3.7 The monitoring results and graphical presentations could be referred to Appendix I and Appendix J of the monthly report of Contract DC/2013/09.
- 3.8 No Action/Limit Level exceedance was recorded in the reporting month. Summary of exceedance is presented in **Appendix B**.
- 3.9 The major noise sources identified at the designated noise monitoring stations were mainly from construction works and vehicles movement operating for the Project.



#### 4. ENVIRONMENTAL AUDIT

##### Site Audits

- 4.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix C**.
- 4.2 Site audits were conducted on 8, 15, 20 and 27 March 2018 by ET after the commencement of construction works for the Contract. A joint site audit with the representative of IEC was carried out on 27 March 2018. The details of observations during site audit can refer to **Table 4.1**.

##### Implementation Status of Environmental Mitigation Measures

- 4.3 Details of the implementation of mitigation measures are provided in the **Appendix F**.
- 4.4 During the weekly environmental site inspections in the reporting period, no non-conformance was identified. The observations of the site audit for the Projects are summarized in **Table 4.1**.

**Table 4.1 Observations of Site Audit**

Parameters	Date	Ref. Number	Observations	Follow Up Action
Water Quality	N/A	N/A	--	--
Air Quality	N/A	N/A	--	--
Noise	N/A	N/A	--	--
Waste/ Chemical Management	N/A	N/A	--	--
Permit/ Licenses	N/A	N/A	--	--

##### Review of Environmental Monitoring Procedures

- 4.5 The monitoring works was conducted by the monitoring teams of Contracts DC/2013/09. The monitoring procedures were reviewed by its respective ET.

##### Status of Environmental Licensing and Permitting

- 4.6 All permits/licenses obtained for the Contract DE/2014/01 are summarized in **Table 4.2**.

**Table 4.2 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit				
FEP-02/474/2013	15/2/2018	N/A	The FEP was approved on 15/2/2018	Valid
FEP-01/474/2013	23/1/2014	14/2/2018	The FEP was approved on 23/1/2014	Expired
Registered Chemical Waste Producer				
WPN5213-624-T3685-01	3/7/2017	N/A	The application was approved on 3/7/2017	Valid
Billing Account for Disposal of Construction Waste				
A/C No.7024165	4/2/2016	N/A	The application was approved on 4/2/2016	Valid

**Status of Waste Management**

- 4.7 The amount of wastes generated by the activities of the Project in the reporting month is shown in **Appendix D**.

**Implementation Status of Event Action Plans**

- 4.8 The Event Action Plans for air quality and noise are presented in **Appendix E**.

1-hr TSP

- 4.9 No Action/Limit Level exceedance was recorded.

24-hr TSP

- 4.10 No Action/Limit Level exceedance was recorded.

Construction Noise

- 4.11 No Action/Limit Level exceedance was recorded.

Landscape and Visual

- 4.12 No non-compliance was recorded.

**Site Inspection Conducted by Government Department**

- 4.13 No site inspection for Contract DE/2014/01 was conducted by Government Department in the reporting month.

**Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons**

- 4.14 No environmental complaint, prosecution, reporting changes and notification of summons were received or reported for the Project in the reporting month.

- 4.15 There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix G**.

## **5. FUTURE KEY ISSUES**

### **Key Issues for the Coming Month**

5.1 Key environmental issues in the coming month include:

- Accumulated materials to be recycled on-site;
- Noise from operation of equipment and machinery on-site;
- Storage of chemicals/fuel and chemical waste/waste oil on-site;
- Silty surface runoff generated from the site area during raining; and
- Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities.

### **Monitoring Schedule for the Next Month**

5.2 The tentative environmental monitoring schedules for the next reporting month are shown in the monthly reports of Contract DC/2013/09 (Appendix H).

### **Construction Program for the Next Month**

5.3 The tentative construction program is provided in **Appendix H**.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

- 6.1 Environmental monitoring and audit works were performed in the reporting month for the Project. The results were checked and reviewed by the ET of Contract DC/2013/09.

#### 1-hour TSP Monitoring

- 6.2 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### 24-hour TSP Monitoring

- 6.3 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### Construction Noise Monitoring

- 6.4 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All Construction Noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

#### Environmental Audit

- 6.5 Weekly environmental site audits were conducted by the ET of Contract No. DE/2014/01 at the site area of Contract No. DE/2014/01 during the reporting month. No non-compliance was recorded.

#### Complaint, notification of summons and Prosecution

- 6.6 No environmental complaint, notification of summons and prosecution was received in the reporting month.

### **Recommendations for Future Reporting Months:**

- 6.7 The following recommendations were made for future reporting months:

#### *Air Quality*

- To regularly maintain the machinery and vehicles on site;
- To follow up any exceedance caused by the construction works;
- Non-Road Mobile Machinery (NRMM) labels must be demonstrated on the registered equipment for inspection.

#### *Noise*

- To inspect the noise source inside the site;

- To follow up any exceedance caused by the construction works;
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers;
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location.
- To provide adequate lubricant on mechanical equipment to reduce frictional noise; and
- To well maintain the mechanical equipment/ machineries to avoid abnormal noise nuisance.

#### *Water Quality*

- To identify any discharge of wastewater from the construction site;
- To avoid blockage of U channel and drainage system by sediment;
- To avoid water accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed; and
- To avoid spoilage of run-off from construction site to public area.
- The discharge quality must meet the requirements specified in the discharge licence.

#### *Waste/Chemical Management*

- To provide proper rubbish bins / skips for waste collection;
- To check for any accumulation of wasted materials or rubbish on site;
- To provide proper storage area or drip trays for oil and chemical containers on site;
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment;
- To avoid improper handling or storage of oil drum on site.

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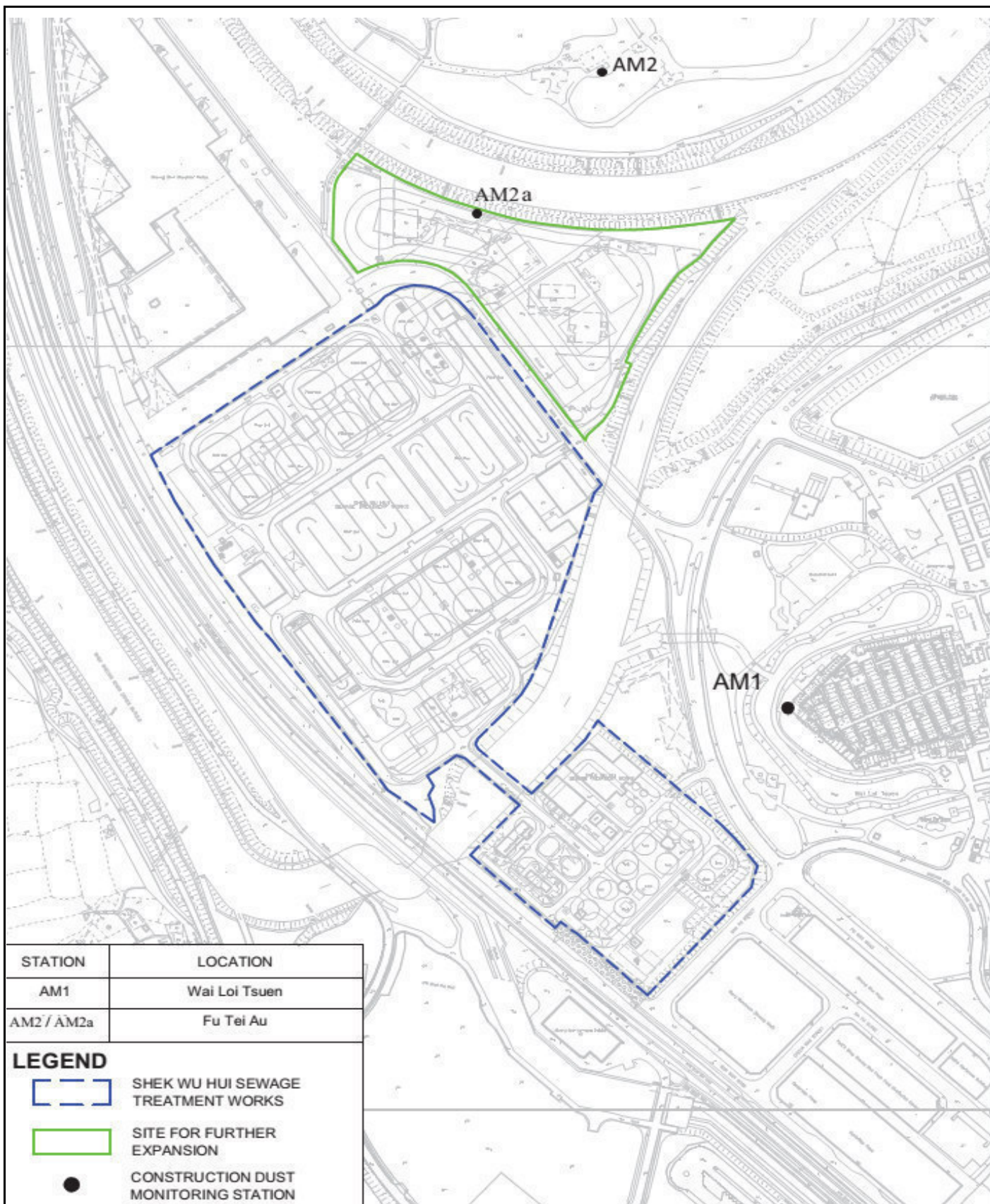
## FIGURES

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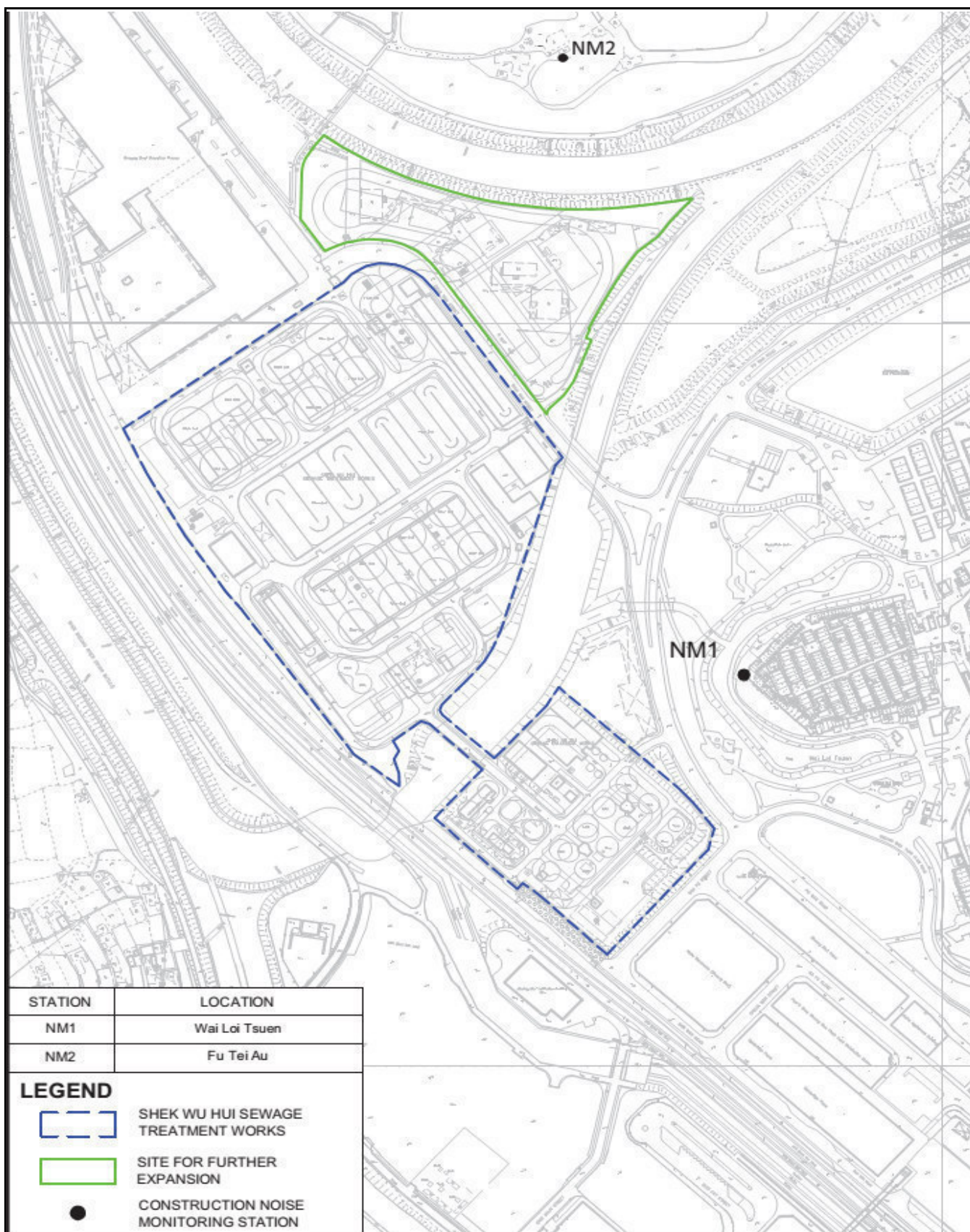




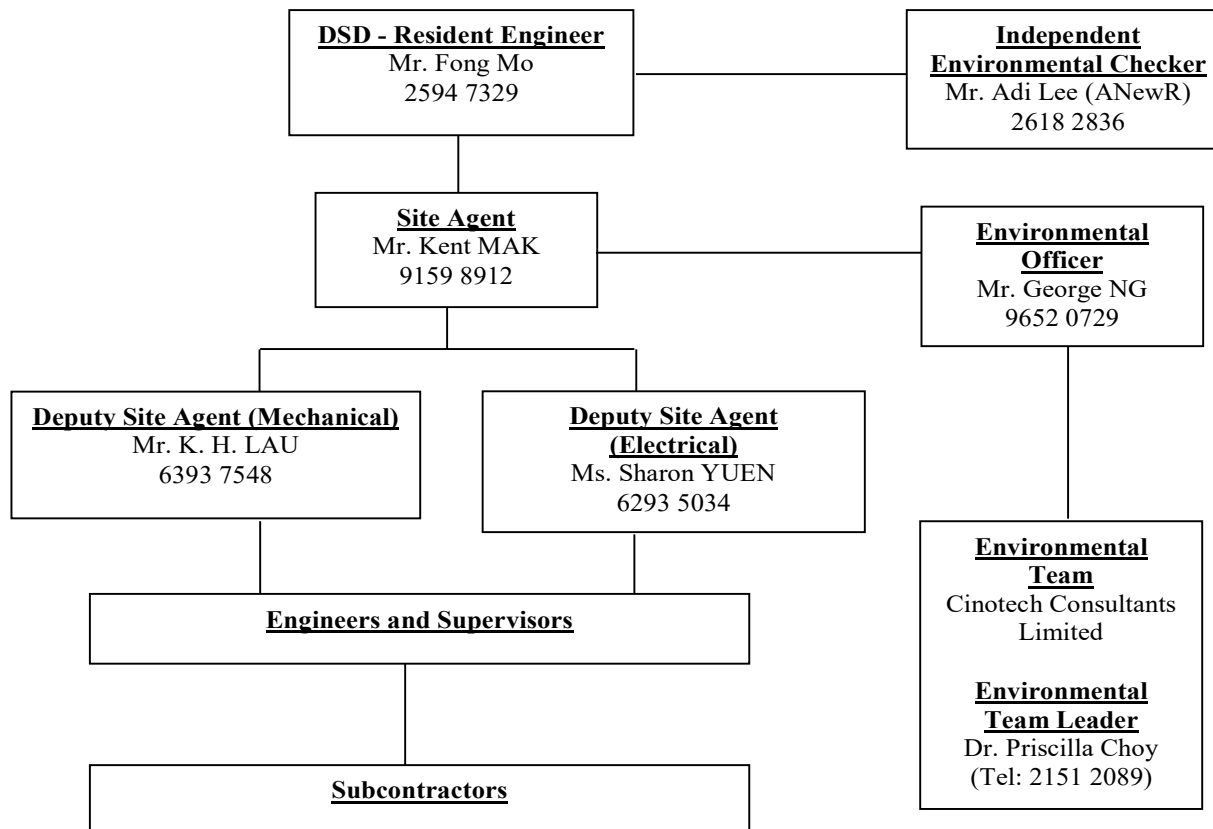


Title	Contract No. DE/2014/01 Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	Scale  N.T.S	Project No.  MA16002	CINOTECH
	Locations of Impact Air Quality Monitoring Stations	Date  Oct-17	Figures  2	





Title	Contract No. DE/2014/01		Scale	Project	CINOTECH
	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station		N.T.S	No. MA16002	
	Locations of Impact Noise Monitoring Stations		Date Oct-17	Figures 3	



Title	Contract No. DE/2014/01 Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station Project Organization Chart	Scale	Project	CINOTECH
		N.T.S	No. MA16002	
		Version	Figure	
		v.1	4	

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**APPENDIX A  
ACTION AND LIMIT LEVELS FOR AIR  
QUALITY AND NOISE**

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## Appendix A Action and Limit Levels

**Table A-1 Action and Limit Levels for 1-Hour TSP and 24-Hour TSP**

Monitoring Stations	Action Level ( $\mu\text{g}/\text{m}^3$ )		Limit Level ( $\mu\text{g}/\text{m}^3$ )	
	1-hour	24-hour	1-hour	24-hour
AM1	286	147	500	260
AM2	276	N/A	500	N/A
AM2a	N/A	155	N/A	260

**Table A-2 Action and Limit Level for Construction Noise**

Monitoring Stations	Time Period	Action Level	Limit Level in dB(A)
NM1	0700-1900 hours on normal weekdays	When one documented complaint is received	>75*
NM2			

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

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**APPENDIX B**  
**SUMMARY OF EXCEEDANCE**

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## **APPENDIX B – SUMMARY OF EXCEEDANCE**

**Reporting Month:** March 2018

- a) Exceedance Report for 1-hr TSP (NIL)**
- b) Exceedance Report for 24-hr TSP (NIL)**
- c) Exceedance Report for Construction Noise (NIL)**

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**APPENDIX C**  
**SITE AUDIT SUMMARY**

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**Contract No: DE/2014/01**

**Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**



**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	180308
Date	8 March 2018 (Thursday)
Time	09:30-10:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others / Remarks</b></p> <ul style="list-style-type: none"><li>-</li></ul>	

	Name	Signature	Date
Recorded by	Victor Wong		8 March 2018
Checked by	Dr. Priscilla Choy		8 March 2018



**Contract No: DE/2014/01**

**Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**

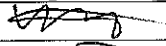

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	180315
Date	15 March 2018 (Thursday)
Time	09:30-10:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others / Remarks</b></p> <ul style="list-style-type: none"><li>-</li></ul>	

	Name	Signature	Date
Recorded by	Victor Wong		15 March 2018
Checked by	Dr. Priscilla Choy		15 March 2018

**Contract No: DE/2014/01**

**Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**

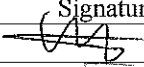

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	180320
Date	20 March 2018 (Wednesday)
Time	09:30-10:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others / Remarks</b></p> <ul style="list-style-type: none"><li>• -</li></ul>	

	Name	Signature	Date
Recorded by	Victor Wong		20 March 2018
Checked by	Dr. Priscilla Choy		20 March 2018

**Contract No: DE/2014/01**

**Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station**

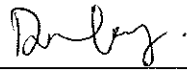

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	180327
Date	27 March 2018 (Tuesday)
Time	09:30-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p><b>Part C - Water Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part D - Air Quality</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part E - Construction Noise Impact</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part F - Waste / Chemical Management</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Part G - Permit / Licenses</b></p> <ul style="list-style-type: none"><li>• No environmental deficiency was identified during the site inspection.</li></ul> <p><b>Others / Remarks</b></p> <ul style="list-style-type: none"><li>• -</li></ul>	

	Name	Signature	Date
Recorded by	Donley Fung		27 March 2018
Checked by	Dr. Priscilla Choy		27 March 2018

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**APPENDIX D  
SUMMARY OF THE AMOUNT OF  
WASTE GENERATED**

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Name of Department: Drainage Services Department

Contract No. : DE/2014/01

**Monthly Summary Waste Flow Table for 2018**

Month	Annual Quantities of Inert C&D Materials Generated Monthly						Annual Quantities of C&D Materials Generated Monthly				
	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in tonne)
Jan	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0	1
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr											
May											
June											
Sub-total	0	0	0	0	0	0	0	0	0	0	1
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0	0	0	0	0	0	0	0	0	0	1

Forecast of Total Quantities of C&D Materials to be Generated from the Contractor										
Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 m <sup>3</sup> )	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m <sup>3</sup> )
0	0	0	0	0	0	0	1	1	0.5	1

- Notes: (1) The performance targets are given in PS Clause 6.21.8(14).  
 (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.  
 (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m<sup>3</sup>. (PS Clause 6.21.7(4)(b) refers).

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**APPENDIX E**  
**EVENT ACTION PLANS**

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## APPENDIX E – Event / Action Plans

**Table E-1 Event / Action Plan For Air Quality**

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of exceedance writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial actions to IEC within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor ,IEC, ER, and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate
2. Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues,	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by



EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	<p>taken;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring</p>		<p>consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</p>	<p>the ER until the exceedance is abated</p>

**Table E-2 Event / Action Plan For Construction Noise**

<b>EVENT</b>	<b>ACTION</b>			
	<b>ET</b>	<b>IEC</b>	<b>ER</b>	<b>CONTRACTOR</b>
Action Level being exceeded	1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level being exceeded	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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**APPENDIX F  
ENVIRONMENTAL MITIGATION  
IMPLEMENTATION SCHEDULE (EMIS)**

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## APPENDIX F IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
A	<b>Air Quality</b>					
S2.4.1.3	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> <li>Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;</li> <li>Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;</li> <li>A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones;</li> <li>The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;</li> <li>Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;</li> <li>The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials;</li> <li>Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously;</li> </ul>	To minimize the dust impact	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Air Pollution Control Ordinance (APCO) and Air Pollution Control (Construction Dust) Regulation

	<ul style="list-style-type: none"> <li>Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet;</li> <li>Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</li> <li>Any skip hoist for material transport should be totally enclosed by impervious sheeting;</li> <li>Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;</li> <li>Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed;</li> <li>Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system.</li> </ul>					
<b>B</b>	<b>Noise</b>					
S3.4.1.1	Use of movable barrier, enclosure, acoustic mat and quiet plant. Use of wooden frames barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m <sup>2</sup> on a skid footing with 25mm thick internal sound absorptive lining.	To minimize construction noise impact arising from the Project at the affected noise sensitive receivers (NSRs)	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM,
S3.4.1.2	Good Site Practice: <ul style="list-style-type: none"> <li>Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.</li> <li>Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the</li> </ul>	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction period of Advance Works and Main Works of Phase 1A	EIAO-TM, NCO

	<p>construction program.</p> <ul style="list-style-type: none"> <li>• Mobile plant, if any, should be sited as far away from NSRs as possible.</li> <li>• Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.</li> <li>• 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.</li> <li>• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.</li> </ul>					
<b>C</b>	<b>Ecological Impact</b>					
S4.2.1.2	Avoid unnecessary lighting.	Minimize mortality impacts on birds.	Design/ Contractor/ Plant Operator	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.3	Good construction site practice to minimise dust generation should be followed on all construction sites. Measures to avoid, minimise and mitigate impacts on air quality are detailed in this schedule	Minimize dust generation from construction sites.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.4	<p>The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented</p> <ul style="list-style-type: none"> <li>• Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies;</li> <li>• Proper locations well away from nearby water bodies should be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpiles of construction debris and spoil, and these should be identified before commencement of works;</li> <li>• To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies should be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective</li> </ul>	Avoid, minimise and mitigate impact on water quality	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM

	<p>measures should also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work sites;</p> <ul style="list-style-type: none"> <li>• Construction debris and spoil should be covered and/or properly disposed of as soon as possible to avoid these being washed into nearby water bodies;</li> <li>• Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be identified;</li> <li>• Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies;</li> <li>• Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited;</li> <li>• Regular water monitoring and site audit should be carried out at adequate points along any watercourses where construction works are underway upstream within their catchments and also on the Ng Tung, Sheung Yue and Shek Sheung Rivers. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works should be considered;</li> <li>• Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety;</li> <li>• Where soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means;</li> <li>• Stockpiling sites should be lined with impermeable sheeting and bunded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimize contaminated runoff and construction materials should be properly covered and located away from nearby water bodies; and</li> <li>• Supply of suitable clean backfill material after excavation, if required.</li> <li>• Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent discharge during transport or during wet</li> </ul>					
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	season; <ul style="list-style-type: none"> <li>Speed control for the trucks carrying contaminated materials should be enforced;</li> <li>Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and</li> <li>Other measures as detailed in this schedule.</li> </ul>					
<b>D</b>	<b>Water Quality Impact</b>					
S5.2.2.1	Construction Site Runoff Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PN1/94) should be followed where applicable.	Control construction runoff	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO
S5.2.2.2– S5.2.2.3	Sewage from Workforce <ul style="list-style-type: none"> <li>Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed Contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.</li> <li>Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures</li> </ul>	Handling of site sewage	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO
<b>E</b>	<b>Waste Management</b>					
S6.2.2.1	Good Site Practices and Waste Reduction Measures: <ul style="list-style-type: none"> <li>Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;</li> <li>Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;</li> <li>Provision of sufficient waste disposal points and regular</li> </ul>	Minimize waste Generation during construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal Ordinance (WDO)



	<p>collection for disposal;</p> <ul style="list-style-type: none"> <li>• Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;</li> <li>• Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;</li> <li>• An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval.</li> </ul>					
S6.2.3.1	<p>Waste Reduction Measures:</p> <ul style="list-style-type: none"> <li>• Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;</li> <li>• Proper storage and site practices to minimize the potential for damage and contamination of construction materials;</li> <li>• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste;</li> <li>• Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and</li> <li>• Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.</li> </ul>	Reduce waste generation	Contractor	Work Sites	Prior to the commencement of construction of Advance Works and Main Works of Phase 1A	WDO
S6.2.4.1 - S6.2.4.2	<p>Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> <li>• Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution;</li> <li>• Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and</li> <li>• Different locations should be designated to stockpile each material to enhance reuse.</li> <li>• Remove waste in timely manner;</li> <li>• Employ the trucks with cover or enclosed containers for waste transportation;</li> <li>• Obtain relevant waste disposal permits from the appropriate authorities; and</li> <li>• Disposal of waste should be done at licensed waste disposal</li> </ul>	Minimize waste impacts arising from waste storage	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	WDO

	facilities.					
S6.2.5.3	<p>C&amp;D Material from Buildings Demolition and New Building Construction</p> <ul style="list-style-type: none"> <li>• The Contractor should recycle as much as possible of the C&amp;DM on-site. Public fill and C&amp;DM waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage.</li> <li>• The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminium or alloy etc, could be used.</li> <li>• Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow reuse of the inert material on site when implemented.</li> <li>• In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and non-inert C&amp;D material arising from demolition works, selective demolition method should be adopted.</li> </ul>	Minimize waste impacts from building demolition and new building construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005
S6.2.5.4	<p>Chemical Waste</p> <ul style="list-style-type: none"> <li>• If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers.</li> <li>• Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation</li> </ul>	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S6.2.5.5	<p>General Refuse</p> <ul style="list-style-type: none"> <li>• General refuse should be stored in enclosed bins separately from construction and chemical wastes.</li> </ul>	Minimize production of the general refuse and avoid odour, pest	Contractor	Work Sites	Construction phase of Advance Works	Waste Disposal (Chemical Waste General) Regulation,

	<ul style="list-style-type: none"><li>• Recycling bins should also be placed to encourage recycling.</li><li>• Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean.</li><li>• A reputable waste collector should be employed to remove general refuse on a daily basis.</li></ul>	and litter impacts			and Main Works of Phase 1A	Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
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**APPENDIX G  
COMPLAINT LOG**

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**APPENDIX G – COMPLAINT LOG****Reporting Month:** March 2018

<b>Log Ref.</b>	<b>Location</b>	<b>Received Date</b>	<b>Details of Complaint</b>	<b>Investigation/Mitigation Action</b>	<b>Status</b>
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

**Remarks:** No environmental complaint was received in the reporting month.

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**APPENDIX H**  
**CONSTRUCTION PROGRAMME**

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Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21
Shek Wu Hui STW - Master Programme DE/2014/01																												
Contract Data																												
Starting Date & Completion Date																												
AS000010	Contract Date (LOA)	0	28-Dec-15 A																									
AS000020	Contract Starting Date	0	30-Dec-15 A																									
AS000110	Original Contract Period	297	30-Dec-15 A	23-Oct-18	182	23-Oct-18, Original Contract Period																						
AS000220	Contract Completion Date for the whole of the Works	0		23-Apr-19	0	◆ 23-Apr-19, Contract Completion Date for the whole of the Works																						
Access Date																												
AS001010	PM's Site Office and Contractor's Site Office and Storage Area, (within 120 days)	0	30-Dec-15 A	27-Apr-16 A																								
AS001012	Planned Access Date for PM's Site Office and Contractor's Site Office and Storage Area	0	27-Apr-16 A	27-Apr-16 A																								
AS001020	Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity, (within 560 days)	0	30-Dec-15 A	06-Nov-17 A																								
AS001022	Planned Access Date for Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity	0	06-Nov-17 A	06-Nov-17 A																								
AS001030	Bioreactor no.1 (BR1) and its vicinity, (within 560 days)	0	30-Dec-15 A	01-Dec-17 A																								
AS001032	Planned Access Date for Bioreactor no.1 (BR1) and its vicinity	0	01-Dec-17 A	01-Dec-17 A																								
AS001040	MBR Facilities Building, Membrane Filtration System No.1 (MFS1) and its vicinity, (within 566 days)	0	30-Dec-15 A	19-Nov-17 A																								
AS001042	Planned Access Date for MBR Facilities Building, Membrane Filtration System No.1 (MFS1) and its vicinity	0	19-Nov-17 A	19-Nov-17 A																								
AS001050	Ng Chow South Road Sewage Pumping Station - (within 158 days)	0	30-Dec-15 A	04-Jun-16 A																								
AS001052	Planned Access Date for Ng Chow South Road Sewage Pumping Station	0	04-Jun-16 A	04-Jun-16 A																								
AS001100	New Access Date for MFB -B/F	1	30-Mar-18	30-Mar-18*	0							30-Mar-18	30-Mar-18*, New Access Date for MFB -B/F															
AS001120	New Access Date for MFB -G/F	0	06-Dec-17 A	06-Dec-17 A																								
AS001150	New Access Date for MFB -CLP Rm C	0	29-Sep-17 A	29-Sep-17 A																								
AS001160	New Access Date for MFB -CLP Rm D	0	26-Sep-17 A	26-Sep-17 A																								
AS001170g	New Access Date for MFB -11kV Switchroom	0	03-Nov-17 A	03-Nov-17 A																								
AS001175g	New Access Date for MFB -LV Switchroom 1 at G/F	1	30-Mar-18	30-Mar-18*	17							30-Mar-18	30-Mar-18*, New Access Date for MFB -LV Switchroom 1 at G/F															
AS001180	New Access Date for MFB -1/F (Air Blowers Area)	1	20-Feb-18	20-Feb-18*	17							20-Feb-18	20-Feb-18*, New Access Date for MFB -1/F (Air Blowers Area)															
AS001180g	New Access Date for MFB -1/F (Other Areas)	1	30-Mar-18	30-Mar-18*	22							30-Mar-18	30-Mar-18*, New Access Date for MFB -1/F (Other Areas)															
AS001200	New Access Date for MFB -LR/F	1	30-Mar-18	30-Mar-18*	237							30-Mar-18	30-Mar-18*, New Access Date for MFB -LR/F															
AS001220	New Access Date for MFB -UR/F	1	30-Mar-18	30-Mar-18*	237							30-Mar-18	30-Mar-18*, New Access Date for MFB -UR/F															
AS001240	New Access Date for MFB -Parapet & Roof	1	30-Mar-18	30-Mar-18*	237							30-Mar-18	30-Mar-18*, New Access Date for MFB -Parapet & Roof															
AS001300	New Access Date for Pre-treatment Screen Chamber	1	03-Jan-18	03-Jan-18*	4							03-Jan-18	03-Jan-18*, New Access Date for Pre-treatment Screen Chamber															
AS001320	New Access Date for Flowmeter Chamber	1	30-Mar-18	30-Mar-18*	87							30-Mar-18	30-Mar-18*, New Access Date for Flowmeter Chamber															
AS001340	New Access Date for Bioreactor No. 1 - 2nd Lane	0	06-Dec-17 A	06-Dec-17 A																								
AS001342	New Access Date for Bioreactor No. 1 - 1st Lane (2nd Half)	1	25-Jan-18	25-Jan-18*	77							25-Jan-18	25-Jan-18*, New Access Date for Bioreactor No. 1 - 1st Lane (2nd Half)															
AS001342g	New Access Date for Bioreactor No. 1 - 1st Lane (1st Half)	1	30-Mar-18	30-Mar-18*	10							30-Mar-18	30-Mar-18*, New Access Date for Bioreactor No. 1 - 1st Lane (1st Half)															
AS001344	New Access Date for Bioreactor No. 1 - Post Anoxic Zone	1	30-Mar-18	30-Mar-18*	13							30-Mar-18	30-Mar-18*, New Access Date for Bioreactor No. 1 - Post Anoxic Zone															
AS001360	New Access Date for Membrane Tanks	1	30-Mar-18	30-Mar-18*	17							30-Mar-18	30-Mar-18*, New Access Date for Membrane Tanks															
AS001380	Availability of CLP Cable Ducts	0	03-Nov-17 A	03-Nov-17 A																								
AS001400	New Access Date for Other Cable Ducts	1	30-Mar-18	30-Mar-18*	8							30-Mar-18	30-Mar-18*, New Access Date for Other Cable Ducts															
AS001420	New Access Date for Chemical Room	1	30-Apr-18	30-Apr-18*	72							30-Apr-18	30-Apr-18*, New Access Date for Chemical Room															
AS001440	New Access Date for LV Switchroom No.3	1	30-Apr-18	30-Apr-18*	37							30-Apr-18	30-Apr-18*, New Access Date for LV Switchroom No.3															
Key Dates																												
AS002010	Completion of NCSRSPSP E&M Works including testing and commissioning	0	30-Dec-15 A	28-Jul-17 A																								

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019															
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21					
AS002020	Completion of SWHSTW - Further Expansion Phase 1A - Advance Works E&M Works including T&C, process commissioning	380	30-Dec-15 A	23-Apr-19	0	23-Apr-19, Completion of SWHSTW - Further Expansion Phase 1A - Advance Works E&M Works including T&C, process commissioning																											
Section I																																	
AS200010	Contract Completion of the works - Section I	0	30-Dec-15 A	23-Sep-16 A																													
AS200020	Completion date - Section I (272 days from starting date)	0		23-Sep-16 A																													
Time Risk Allowance and Planned Completion																																	
AS200040	Planned Completion date - Section I	0		23-Sep-16 A																													
Section II																																	
AS300010	Contract Completion of the works - Section II	0	30-Dec-15 A	18-Mar-16 A																													
AS300020	Completion date - Section II (80 days from starting date)	0		18-Mar-16 A																													
Time Risk Allowance and Planned Completion																																	
AS300040	Planned Completion date - Section II	0		18-Mar-16 A																													
Section III																																	
AS400010	Contract Completion of the works - Section III	440	30-Dec-15 A	15-Mar-19	39	15-Mar-19, Contract Completion of the works - Section III																											
AS400020	Completion date - Section III (1029 days from starting date)	0		23-Apr-19	0	23-Apr-19, Completion date - Section III																											
Time Risk Allowance and Planned Completion																																	
AS400030	Time Risk Allowance for Completion of Function Test of Section III (4% of installation duration, 463-469 days)	18	06-Apr-19	23-Apr-19	0	06-Apr-19, 23-Apr-19, Time Risk Allowance for Completion of Function Test of Section III (4% of installation duration, 463-469 days)																											
AS400040	Planned Completion date - Section III	0		23-Apr-19	0	23-Apr-19, Planned Completion date - Section III																											
Section IV																																	
AS500010	Contract Completion of the works - Section IV	0	30-Dec-15 A	28-Jul-17 A																													
AS500020	Completion date - Section IV (278 days from starting date)	0		28-Jul-17 A		28-Jul-17 A, Completion date - Section IV (278 days from starting date)																											
Time Risk Allowance and Planned Completion																																	
AS500030	Time Risk Allowance for Section IV (4% of installation duration, 120 days)	0	22-Jun-17 A	28-Jul-17 A																													
AS500040	Planned Completion Date	0		28-Jul-17 A		28-Jul-17 A, Planned Completion Date																											
Activity Schedule No.1 - Preliminaries																																	
1.01 - Preliminaries																																	
Contractor's Site Office Construction																																	
AS101010	Construction of Contractor's Site Office & Store	0	22-Jul-16 A	23-Sep-16 A																													
AS101012	Maintain Contractor's Site Office & Store	450	27-Oct-16 A	25-Mar-19	8	25-Mar-19, Maintain Contractor's Site Office & Store																											
AS101014	Removal of Site Office, Store & Relevant Facilities	21	26-Mar-19	15-Apr-19	8	26-Mar-19, 15-Apr-19, Removal of Site Office, Store & Relevant Facilities																											
Site Facilities																																	
AS101030	Set up Temp. Electricity Supply, Water Supply	0	18-Aug-16 A	23-Sep-16 A																													
AS101032	Provision of Temp. Electricity & Water Supply for execution for the Contract	471	27-Oct-16 A	15-Apr-19	8	15-Apr-19, Provision of Temp. Electricity & Water Supply for execution for the Contract																											
Permanent Utilities Services																																	
AS101040	Applications to the Public Utilities for Provision of Services	0	29-Jan-16 A	23-Sep-16 A																													
AS101041	Completion of CLP 11kV Switchroom No. 1 & No.2 (by Other Contractor)	0		29-Sep-17 A		29-Sep-17 A, Completion of CLP 11kV Switchroom No. 1 & No.2 (by Other Contractor)																											
AS101042	BS Works for CLP 11 kV Switchroom No.1 & No. 2	0	30-Sep-17 A	02-Nov-17 A																													
AS101042g	H/O Inspection of 11 kV Switchroom with CLP	13	03-Nov-17 A	12-Jan-18	75	12-Jan-18, H/O Inspection of 11 kV Switchroom with CLP																											
AS101043	Handover of 11 kV Switchroom to CLP	0		12-Jan-18	75	12-Jan-18, Handover of 11 kV Switchroom to CLP																											
AS101045	Provision of Permanent Electricity Supply (by CLP)	120	13-Jan-18	12-May-18	75	12-May-18, Provision of Permanent Electricity Supply (by CLP)																											
AS101045a	CLP Meters Installed	0		22-May-18	94	22-May-18, CLP Meters Installed																											
AS101046	Provision of Telemetry & Telephone Lines	30	19-Aug-18	17-Sep-18	36	17-Sep-18, Provision of Telemetry & Telephone Lines																											
Provide all necessary labour, tools, materials, equipment and supervision																																	
AS101050	Environmental Auditing and fulfilling the Environmental Permit	471	29-Jan-16 A	15-Apr-19	8	15-Apr-19, Environmental Auditing and fulfilling the Environmental Permit																											
O&M Manuals and As-Built Drawings																																	
AS101061	Prepare & Submit the first draft O&M Manuals	90	19-May-18	16-Aug-18	87	16-Aug-18, Prepare & Submit the first draft O&M Manuals																											
AS101062	Acceptance the first draft O&M Manuals	28	17-Aug-18	13-Sep-18	87	13-Sep-18, Acceptance the first draft O&M Manuals																											
AS101071	Prepare & Submit the final draft O&M Manuals & all Drawings	90	23-Nov-18	20-Feb-19	17	20-Feb-19, Prepare & Submit the final draft O&M Manuals & all Drawings																											





File Name: DE/2014/01G3


Layout: DE1401 (Rev. G) - WBS


TASK filter: All Activities

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 Remaining Work

 Critical Activity

 Milestone

 Actual Progress

**Contract No. DE/2014/01**

**Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works**

**Further Expansion Phase 1A - Advance Works and**

**Ng Chow South Road Sewage Pumping Station**

**Master Programme**

Date	Revision	Checked	Approved
08-Jan-16	Rev. 0	KH Lau	KM
22-Jun-17	Rev. D	KH Lau	KM
12-Jul-17	Rev. E	KH Lau	KM
17-Oct-17	Rev. F	KH Lau	KM
27-Mar-18	Rev. G	KH Lau	KM



Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21	
AS101072	Acceptance the final draft O&M Manuals & all Drawings	28	21-Feb-19	20-Mar-19	34																21-Feb-19			20-Mar-19	Acceptance the final draft O&M Manuals & all Drawings				
Training to Employer's Staff on the O&M of the Plant																													
AS101080	Provide Training for the Employer's Staff	45	21-Feb-19	06-Apr-19	17																21-Feb-19			06-Apr-19	Provide Training for the Employer's Staff				
PM's Site Office																													
AS101090	Provide E&M equipment & Office Stationary for the use of Project Manager and Supervisors	471	29-Mar-16 A	15-Apr-19	8																			15-Apr-19	Provide E&M equipment & Office Stationary				
AS101160	Provide clerical support to the Project Manager's site office	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Provide clerical support to the Project Manager's site office				
Site Progress																													
AS101100	Provide all necessary photographs, video clips and accessories	471	07-Jun-16 A	15-Apr-19	8																			15-Apr-19	Provide all necessary photographs, video clips and accessories				
Contract Vehicle																													
AS101110	Provision of one contract vehicle service (Electric Vehicle) during the normal working hours	0	30-Dec-15 A	28-Jan-16 A																									
AS101120	Provide Contract Vehicle Service; one (Petrol-Electricity) & one (Electric) during the normal working hours	0	30-Dec-15 A	28-Jan-16 A																									
AS101130	Provide O&M of the Contract Cars; Driving Services; Mobile Phone Services (normal working hours)	471	29-Jan-16 A	15-Apr-19	8																			15-Apr-19	Provide O&M of the Contract Cars; Driving Services; Mobile Phone Services (normal working hours)				
AS101140	Provide O&M of the Electric Contract Cars; Driving Services (outside normal working hours)	471	29-Jan-16 A	15-Apr-19	8																			15-Apr-19	Provide O&M of the Electric Contract Cars; Driving Services (outside normal working hours)				
AS101150	Provide O&M of the Petrol-Electricity Contract Cars; Driving Services (outside normal working hours)	471	29-Jan-16 A	15-Apr-19	8																			15-Apr-19	Provide O&M of the Petrol-Electricity Contract Cars; Driving Services (outside normal working hours)				
Uniform																													
AS101170	Uniform for Site Personnel and self-employed workers	471	29-Jan-16 A	15-Apr-19	8																			15-Apr-19	Uniform for Site Personnel and self-employed workers				
Independent Checking Engineer																													
AS101180	Provision of Independent Certified Engineer in accordance with the Specification	471	29-Jan-16 A	15-Apr-19	8																			15-Apr-19	Provision of Independent Certified Engineer in accordance with the Specification				
Automated External Defibrillator (AED)																													
AS101190	Provide Automated External Defibrillator (AED) and associated accessories	0	18-Nov-16 A	12-Dec-16 A																									
AS101192	Provide Training for Qualified on-site personnels for the use of AED	0	13-Dec-16 A	22-Dec-16 A																									
Site Management Plan for Trip Ticket System																													
AS102010	Complete site management plan for trip ticket system	0	30-Dec-15 A	13-Mar-16 A																									
AS102020	Implementation of site management plan for trip ticket system	471	14-Mar-16 A	15-Apr-19	8																			15-Apr-19	Implementation of site management plan for trip ticket system				
Site Cleaning and Tidiness																													
AS103010	(i) Site and works area in Shek Wu Hui Sewage Treatment Works - Daily	471	26-Sep-17 A	19-Apr-19	4																			19-Apr-19	(i) Site and works area in Shek Wu Hui Sewage Treatment Works - Daily				
AS103020	(ii) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Daily	0	05-Jun-16 A	27-Sep-16 A																									
AS103030	(i) Site and works area in Shek Wu Hui Sewage Treatment Works - Weekly	471	26-Sep-17 A	19-Apr-19	4																			19-Apr-19	(i) Site and works area in Shek Wu Hui Sewage Treatment Works - Weekly				
AS103040	(ii) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Weekly	0	05-Jun-16 A	27-Sep-16 A																									
Subcontractor Management Plan																													
AS104010	Complete sub-contractor management plan	0	30-Dec-15 A	27-Feb-16 A																									
AS104020	Quarterly updating of sub-contractor management plan	471	29-May-16 A	15-Apr-19	8																			15-Apr-19	Quarterly updating of sub-contractor management plan				
Waste Management Plan																													
AS105010	Complete waste management plan	0	30-Dec-15 A	28-Mar-16 A																									
AS105020	Review and updating of waste management plan	471	29-Mar-16 A	15-Apr-19	8																			15-Apr-19	Review and updating of waste management plan				
Safety Scheme																													
AS106010	Complete Safety Plan	0	30-Dec-15 A	27-Feb-16 A																									
AS106030	Update Safety Plan	471	29-Feb-16 A	19-Apr-19	4																			19-Apr-19	Update Safety Plan				
AS106050	Provide Safety Officer	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Provide Safety Officer				
AS106070	Attend Site Safety and Environment Management Committee	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Attend Site Safety and Environment Management Committee				
AS106080	Attend Site Safety and Environment Committee	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Attend Site Safety and Environment Committee				
AS106090	Arrange and attend weekly safety walk	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Arrange and attend weekly safety walk				
AS106100	Arrange and attend weekly environmental walk	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Arrange and attend weekly environmental walk				
AS106110	Provide safety and environment training - (i) 1 day course ( for first attendance)	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Provide safety and environment training - (i) 1 day course ( for first attendance)				
AS106120	Provide safety and environment training - (ii) 0.5 day revalidation course	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Provide safety and environment training - (ii) 0.5 day revalidation course				
AS106130	Provide safety and environment training - site specific induction training	471	28-Apr-16 A	15-Apr-19	8																			15-Apr-19	Provide safety and environment training - site specific induction training				

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21	
AS106140	Provide safety and environment training - toolbox talks	471	28-Apr-16 A	15-Apr-19	8																								
AS106150	Provide safety and environment training:Participate in safety promotional campaign as instructed by the Engineer	471	28-Apr-16 A	15-Apr-19	8																								
AS107010	Arrange and hold Pre-workActivities of Site Safety Cycle	471	28-Apr-16 A	15-Apr-19	8																								
AS107020	Provide safety bulletin board	471	28-Apr-16 A	15-Apr-19	8																								
AS107030	Use of quality powered mechanical equipment	471	28-Apr-16 A	15-Apr-19	8																								
AS109010	Confined Space Training for Competent Persons to competent persons	471	28-Apr-16 A	15-Apr-19	8																								
AS109020	Confined Space Training for Certified Workers to certified workers	471	28-Apr-16 A	15-Apr-19	8																								
Environmental Scheme																													
AS106020	Complete Environmental Management Plan	0	30-Dec-15 A	27-Feb-16 A																									
AS106040	Update Environmental Management Plan	471	29-Feb-16 A	19-Apr-19	4																								
AS106060	Provide Environmental Officer	471	29-Jan-16 A	15-Apr-19	8																								
AS108010	Use of mechanical dump truck covers	471	29-Feb-16 A	19-Apr-19	4																								
AS111010	Update the EM&A Manual	471	28-Feb-16 A	15-Apr-19	8																								
AS111020	Implement all necessary environmental impact mitigation measures	471	28-Feb-16 A	15-Apr-19	8																								
AS111030	Employ Environmental Team	0	30-Dec-15 A	27-Apr-16 A																									
AS111032	Provide Environmental Team Services	471	28-Apr-16 A	15-Apr-19	8																								
1.12 - Process Commissioning																													
AS112000	Process Commissioning (Refer to Section III)	0		05-Apr-19	0																								
Procurement Procurement Programme																													
AS003000	Prepare & Submit Procurement Programme	0	30-Dec-15 A	27-Feb-16 A																									
Section I of Works																													
Activity Schedule No.2																													
1 - Design Calculation of Plant and Materials																													
AS201100	Complete Design Calculation of Plant & Material (Refer to P&M Submission Schedule for details)	0	30-Dec-15 A	23-Sep-16 A																									
2 - Civil Requirement Drawings for the Plant																													
AS202100	Complete Civil Requirement Drawings for Flowmeter Chamber, Pre-treatment Screen, MF Tanks & MFB (B/L)	0	30-Dec-15 A	28-Mar-16 A																									
AS202200	Complete Other Civil Requirement Drawings (Refer to Dwgs Submission Schedule for details)	0	30-Dec-15 A	23-Sep-16 A																									
3 - Detailed Design and Plant Layout Drawings																													
AS203100	Complete Detailed Design and Plant Layout Drawings (Refer to Dwgs Submission Schedule for details)	0	29-Mar-16 A	23-Sep-16 A																									
Section II of Works																													
Activity Schedule No. 3																													
1 - Design Calculation of Plant and Material																													
AS301100	Complete Design Calculation of Plant & Material (Refer to P&M Submission Schedule for details)	0	30-Dec-15 A	18-Mar-16 A																									
2 - Civil Requirement Drawings for the Plant																													
AS302100	Complete Civil Requirement Drawings (Refer to Dwgs Submission Schedule for details)	0	30-Dec-15 A	18-Mar-16 A																									
3 - Detailed Design and Plant Layout Drawings																													
AS303100	Complete Detailed Design and Plant Layout Drawings (Refer to Dwgs Submission Schedule for details)	0	30-Dec-15 A	18-Mar-16 A																									
Section III of Works																													
Plant & Material Procurement																													
Tender and Award of Suppliers - Mechanical - MBR1																													
AS400100	Procurement of BR Feedpumps & Associated Equipment	0	28-May-16 A	23-Sep-16 A																									
AS400110	Procurement of MBR Pre-treatment Screen	0	29-Mar-16 A	21-Jun-16 A																									
AS400120	Procurement of Wash compactors, bagging system	0	28-May-16 A	25-Aug-16 A																									
AS400120a	Procurement of screenings skips	0	30-Sep-16 A	19-Oct-17 A																									
AS400130	Procurement of Associated ductworks, pipeworks and valves	0	30-Sep-16 A	20-Sep-17 A																									
AS400140	Procurement of Mist system, FRP kiosk and drain pumping system	0	30-Sep-16 A	05-Sep-17 A																									
AS400150	Procurement of Ancillary areation system	0	27-Jun-16 A	22-Sep-16 A																									

 Actual Progress

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019								
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19
AS400160	Procurement of Other Associated Equip't for MBR Pre-treatment Screen Facilities	23	20-Nov-17 A	22-Jan-18	91	20-Nov-17 A																				
Tender and Award of Suppliers - Mechanical - BR1																										
AS400200	Procurement of Aeration Blowers	0	27-Jun-16 A	24-Aug-16 A																						
AS400210	Procurement of Submersible Mixers	0	28-May-16 A	22-Sep-16 A																						
AS400220	Procurement of Mixed Liquor Return pumps	0	28-May-16 A	22-Sep-16 A																						
AS400230	Procurement of Surplus Activated Sludge Pumps	0	28-May-16 A	22-Sep-16 A																						
AS400240	Procurement of Air Diffusion System	0	29-Mar-16 A	01-Jun-16 A																						
AS400250	Procurement of Associated pipework, ductwork & valves BR1	23	30-Sep-16 A	22-Jan-18	62																					
AS400260	Procurement of Foam control system and wash water spraying system	0	27-Jun-16 A	22-Sep-16 A																						
AS400270	Procurement of Other associated equipment for BR1	23	30-Sep-16 A	22-Jan-18	64																					
Tender and Award of Suppliers - Mechanical - MFS1																										
AS400300	Procurement of Membrane Modules - MFS1	0	14-Mar-16 A	29-Apr-16 A																						
AS400310	Procurement of Permeate Pumps - MFS1	0	12-Jun-16 A	23-Sep-16 A																						
AS400320	Procurement of RAS / Backwash Pumps - MFS1	0	12-Jun-16 A	23-Sep-16 A																						
AS400330	Procurement of Air Scouring Blowers - MFS1	0	13-May-16 A	24-Aug-16 A																						
AS400340	Procurement of Air Compressor - MFS1	0	14-Mar-16 A	21-Dec-17 A																						
AS400350	Procurement of Chemical Dosing System	0	30-Sep-16 A	29-Jun-17 A																						
AS400360	Procurement of Permeate Drain Pumps, Drain Pumps for MFS1 & Cleaning drain pumps	0	30-Sep-16 A	05-Sep-17 A																						
AS400370	Procurement of Wash Water Pumping System	0	03-Jul-17 A	05-Sep-17 A																						
AS400380	Procurement of Associated Pipes, Valves & Fittings- MFS1	23	09-Jan-17 A	22-Jan-18	53																					
AS400390	Procurement of Other Associated Equipment - MFS1	23	09-Jan-17 A	22-Jan-18	23																					
Tender and Award of Suppliers - Mechanical - Flowmeter Chamber																										
AS400400	Procurement of Flowmeters	0	28-May-16 A	22-Sep-16 A																						
AS400410	Procurement of Flange Adaptors & Other Associated Equipment	0	27-Oct-16 A	20-Sep-17 A																						
Tender and Award of Suppliers - Penstocks, Lifting Appliance & Deorderisation System																										
AS400500	Procurement of Stoplogs	0	30-Sep-16 A	15-Feb-17 A																						
AS400510	Procurement of Penstocks	0	30-Sep-16 A	15-Feb-17 A																						
AS400520	Procurement of Deodorisers System	0	24-Feb-17 A	26-Jul-17 A																						
Tender and Award of Suppliers - Electrical Main & Sub-main																										
AS400600	Procurement of 11kV HV Switchboard	0	28-Apr-16 A	21-Sep-16 A																						
AS400610	Procurement of 3.3kV HV Switchboard	0	28-Apr-16 A	21-Sep-16 A																						
AS400620	Procurement of Transformer	0	28-Apr-16 A	21-Sep-16 A																						
AS400630	Procurement of L.V. Switchboard	0	28-Apr-16 A	22-Sep-16 A																						
AS400640	Procurement of Variable Speed Drive	0	30-Sep-16 A	02-Mar-17 A																						
AS400650	Procurement of Starter for Motor, Screen & Mixer etc.	0	22-Aug-16 A	22-Sep-16 A																						
AS400660	Procurement of Power Supply Cables	0	30-Sep-16 A	07-Dec-17 A																						
AS400670	Procurement of Earthing & Lightning Materials	11	26-Nov-16 A	10-Jan-18	55																					
AS400680	Procurement of Cable Tray & Trunking etc.	0	26-Nov-16 A	24-Nov-17 A																						
Tender and Award of Suppliers - Monitoring and Control System																										
AS400700	Procurement of Monitoring & Control System	0	26-Nov-16 A	18-Jul-17 A																						
Tender and Award of Suppliers - Building Services																										
AS400720	Procurement of B.S. Plant & Materials	90	26-Nov-16 A	30-Mar-18	21																					
Tender and Award of Suppliers - Fire Services																										
AS400740	Procurement of F.S. Plant & Materials	60	26-Nov-16 A	28-Feb-18	36																					
Subcontracting Process																										

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21
Subcontracting Prodedure and Acceptance																												
AS400800	Submit Details of the Tender, Tenderers & Procedures for Subcontractor Selection	60	30-Dec-15 A	28-Feb-18	10	28-Feb-18, Submit Details of the Tender, Tenderers & Procedures for Subcontractor Selection																						
AS400810	Comment on Details of the Tender, Tenderers & Procedures for Subcontractor Selection	0	31-Aug-16 A	31-Aug-16 A																								
AS400820	Resubmit Details of the Tender, Tenderers & Procedures for Subcontractor Selection	0	31-Aug-16 A	31-Aug-16 A																								
AS400830	Acceptance of Details of Tender, Tenderers & Procedures for Subcontractor Selection for the S/C by PM	83	20-Sep-16 A	23-Mar-18	7	23-Mar-18, Acceptance of Details of Tender, Tenderers & Procedures for Subcontractor Selection for the S/C by PM																						
Tender and Award of Subcontractors																												
AS300850	Procurement for Subcontracting - Mechanical Installation (BR1)	25	14-Mar-17 A	24-Jan-18	64	24-Jan-18, Procurement for Subcontracting - Mechanical Installation (BR1)																						
AS300860	Procurement for Subcontracting - Mechanical Installation (MFS1)	83	01-Aug-17 A	23-Mar-18	396	23-Mar-18, Procurement for Subcontracting - Mechanical Installation (MFS1)																						
AS300870	Procurement for Subcontracting - Mechanical Installation (Penstocks / Stoplogs)	83	14-Mar-17 A	23-Mar-18	64	23-Mar-18, Procurement for Subcontracting - Mechanical Installation (Penstocks / Stoplogs)																						
AS300880	Procurement for Subcontracting - Mechanical Installation (Flowmeter Chamber)	0	14-Mar-17 A	30-Nov-17 A																								
AS300890	Procurement for Subcontracting - Mechanical Installation (DO System - Supply & Install)	0	28-Feb-17 A	26-Jul-17 A																								
AS300900	Procurement for Subcontracting - Mechanical Installation (NCSRSPS)	0	25-May-16 A	12-Sep-16 A																								
AS400840	Procurement for Subcontracting - Mechanical Installation (MBR Pre-treatment Screen Chamber)	0	21-Mar-17 A	30-Nov-17 A																								
AS400910	Procurement for Subcontracting - FRP Cover (Supply & Install)	0	28-Feb-17 A	08-May-17 A																								
AS400920	Procurement for Subcontracting - FRP Platform & Kiosk (Supply & Install)	91	02-Nov-17 A	31-Mar-18	11	31-Mar-18, Procurement for Subcontracting - FRP Platform & Kiosk (Supply & Install)																						
AS400930	Procurement for Subcontracting - Lifting Appliances (Supply & Install)	0	25-Oct-16 A	19-Jan-17 A																								
AS400940	Procurement for Subcontracting - Electrical (HV) Installation	0	20-Oct-16 A	01-Sep-17 A																								
AS400950	Procurement for Subcontracting - Electrical (LV) Installation	41	19-Nov-16 A	09-Feb-18	117	09-Feb-18, Procurement for Subcontracting - Electrical (LV) Installation																						
AS400960	Procurement for Subcontracting - PQEM System (Supply & Install)	0	08-May-17 A	18-Jul-17 A																								
AS400970	Procurement for Subcontracting - SCADA/ PLC System (Supply & Install)	0	30-Sep-16 A	18-Jul-17 A																								
AS400980	Procurement for Subcontracting - Building Services (Supply & Install)	11	10-Feb-17 A	10-Jan-18	36	10-Jan-18, Procurement for Subcontracting - Building Services (Supply & Install)																						
AS400982	Procurement for Subcontracting - SS316 Air Duct (Supply & Install)	33	10-Feb-17 A	01-Feb-18	123	01-Feb-18, Procurement for Subcontracting - SS316 Air Duct (Supply & Install)																						
AS400990	Procurement for Subcontracting - Fire Services (Supply & Install)	60	10-Feb-17 A	28-Feb-18	36	28-Feb-18, Procurement for Subcontracting - Fire Services (Supply & Install)																						
AS400992	Procurement for Subcontracting - FS Water Tanks (Supply & Install)	60	10-Feb-17 A	28-Feb-18	36	28-Feb-18, Procurement for Subcontracting - FS Water Tanks (Supply & Install)																						
Activity Schedule No. 4																												
4.1 Works for MBR Pre-treatment Screen Chamber																												
Manufacturing, FAT and Delivery																												
AS401010	Purchase Order for BR Feedpumps & Associated Equipment	0	06-Sep-16 A	23-Sep-16 A																								
AS401012	Manufacturing, FAT & Delivery to Site - BR Feedpumps & Associated Equipment	0	14-Oct-16 A	18-Jul-17 A																								
AS401030	Purchase Order for MBR Pre-treatment Screen	0	01-Jun-16 A	21-Jun-16 A																								
AS401032	Manufacturing, FAT & Delivery to Site - MBR Pre-treatment Screen	53	06-Jul-16 A	21-Feb-18	16	21-Feb-18, Manufacturing, FAT & Delivery to Site - MBR Pre-treatment Screen																						
AS401050	Purchase Order for Wash Compactors, bagging system	0	23-May-16 A	21-Jun-16 A																								
AS401050a	Purchase Order for Screening skips & FRP Kiosk	0	16-Oct-17 A	19-Oct-17 A																								
AS401052	Manufacturing, FAT & Delivery to Site - Wash Compactors, bagging system	53	31-Aug-16 A	21-Feb-18	91	21-Feb-18, Manufacturing, FAT & Delivery to Site - Wash Compactors, bagging system																						
AS401052a	Manufacturing, FAT & Delivery to Site - Screening skips & FRP Kiosk	152	20-Oct-17 A	31-May-18	55	31-May-18, Manufacturing, FAT & Delivery to Site - Screening skips & FRP Kiosk																						
AS401070	Purchase Order for Mist system and drain pumping system	0	14-Aug-17 A	05-Sep-17 A																								
AS401072	Manufacturing, FAT & Delivery to Site - Mist system and drain pumping system	152	06-Sep-17 A	31-May-18	22	31-May-18, Manufacturing, FAT & Delivery to Site - Mist system and drain pumping system																						
AS401090	Purchase Order for Associated pipeworks and valves	0	18-Sep-17 A	20-Sep-17 A																								
AS401092	Manufacturing, FAT & Delivery to Site - Associated pipeworks and valves	47	21-Sep-17 A	15-Feb-18	7	15-Feb-18, Manufacturing, FAT & Delivery to Site - Associated pipeworks and valves																						
AS401110	Purchase Order for Ancillary areation system	0	13-Sep-16 A	22-Sep-16 A																								
AS401112	Manufacturing, FAT & Delivery to Site - Ancillary areation system	60	05-May-17 A	28-Feb-18	114	28-Feb-18, Manufacturing, FAT & Delivery to Site - Ancillary areation system																						
AS401130	Purchase Order for Other associated equipment for MBR Pre-treatment Screen Facilities	14	09-Jan-18	22-Jan-18	91	09-Jan-18, 22-Jan-18, Purchase Order for Other associated equipment for MBR Pre-treatment Screen Facilities																						
AS401132	Manufacturing & Delivery to Site / FAT - Other associated equipment for MBR Pre-treatment Screen Facilities	110	23-Jan-18	12-May-18	91	23-Jan-18, 12-May-18, Manufacturing & Delivery to Site / FAT - Other associated equipment for MBR Pre-treatment Screen Facilities																						
Install, T&C for Pre-treatment Screen Chamber (incl. Provision for Health & Safety Requirements)																												



Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20		
AS401002	Mobilisation of Works - MBR Pre-Treatment Screen Chamber	14	04-Jan-18	17-Jan-18	36			04-Jan-18	17-Jan-18, Mobilisation of Works - MBR Pre-Treatment Screen Chamber																				
AS401020	Install BR Feedpumps, Control, Site Test	30	08-Apr-18	07-May-18	16				08-Apr-18	07-May-18, Install BR Feedpumps, Control, Site Test																			
AS401040	Install MBR Pre-treatment Screens, Control, Site Test	45	22-Feb-18	07-Apr-18	16				22-Feb-18	07-Apr-18, Install MBR Pre-treatment Screens, Control, Site Test																			
AS401060	Install Wash Compactors & bagging system	30	08-May-18	06-Jun-18	16				08-May-18	06-Jun-18, Install Wash Compactors & bagging system																			
AS401060a	Install Screening skips & FRP Kiosk	30	07-Jun-18	06-Jul-18	49					07-Jun-18	06-Jul-18, Install Screening skips & FRP Kiosk																		
AS401080	Install Mist system and drain pumping system	30	07-Jun-18	06-Jul-18	16					07-Jun-18	06-Jul-18, Install Mist system and drain pumping system																		
AS401100	Install Associated pipeworks and valves	120	17-Feb-18*	16-Jun-18	6				17-Feb-18*	16-Jun-18, Install Associated pipeworks and valves																			
AS401120	Install Ancillary areation system	60	17-Jun-18	15-Aug-18	6					17-Jun-18	15-Aug-18, Install Ancillary areation system																		
AS401140	Install Other associated equipment for MBR Pre-treatment Screen Facilities	30	17-Jul-18	15-Aug-18	6					17-Jul-18	15-Aug-18, Install Other associated equipment for MBR Pre-treatment Screen Facilities																		
AS401800	Complete Power Cables Laying from Switchboard to Inlet Screen Chamber	0		02-Aug-18	22						02-Aug-18, Complete Power Cables Laying from Switchboard to Inlet Screen Chamber																		
AS401900	Site test and commission for MBR pre-treatment System	30	24-Aug-18	22-Sep-18	1						24-Aug-18	22-Sep-18, Site test and commission for MBR pre-treatment System																	
4.2 Works for Bioreactor No. 1 (BR1)																													
Manufacturing, FAT and Delivery																													
AS402010	Purchase Order for Aeration Blowers & master control for aeration system	0	18-Aug-16 A	24-Aug-16 A																									
AS402012	Manufacturing, FAT & Delivery to Site - Aeration Blowers & master control for aeration system	30	04-Jul-16 A	29-Jan-18	147	29-Jan-18, Manufacturing, FAT & Delivery to Site - Aeration Blowers & master control for aeration system																							
AS402030	Purchase Order for Submersible Mixers	0	06-Sep-16 A	22-Sep-16 A																									
AS402032	Manufacturing, FAT & Delivery to Site - Submersible Mixers	0	14-Oct-16 A	22-Sep-17 A																									
AS402050	Purchase Order for Mixed Liquor Return pumps	0	06-Sep-16 A	22-Sep-16 A																									
AS402052	Manufacturing, FAT & Delivery to Site - Mixed Liquor Return pumps	0	14-Oct-16 A	06-Jul-17 A																									
AS402070	Purchase Order for Surplus Activated Sludge Pumps	0	06-Sep-16 A	23-Sep-16 A																									
AS402072	Manufacturing, FAT & Delivery to Site - Surplus Activated Sludge Pumps	0	14-Oct-16 A	26-Sep-17 A																									
AS402090	Purchase Order for Air Diffusion System	0	02-May-16 A	01-Jun-16 A																									
AS402092	Manufacturing, FAT & Delivery to Site - Air Diffusion System	106	31-Mar-17 A	15-Apr-18	41	15-Apr-18, Manufacturing, FAT & Delivery to Site - Air Diffusion System																							
AS402110	Purchase Order for Associated ductworks, pipeworks and valves	0	13-Nov-17 A	17-Nov-17 A																									
AS402112	Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves	0	18-Nov-17 A	18-Dec-17 A																									
AS402130	Purchase Order for Foam control system & wash spraying system	0	13-Sep-16 A	22-Sep-16 A																									
AS402132	Manufacturing, FAT & Delivery to Site - Foam control system & wash spraying system	68	14-Oct-16 A	08-Mar-18	79	08-Mar-18, Manufacturing, FAT & Delivery to Site - Foam control system & wash spraying system																							
AS402150	Purchase Order for Other associated equipment for Other associated equipment for BR1	14	09-Jan-18	22-Jan-18	64	22-Jan-18, Purchase Order for Other associated equipment for Other associated equipment for BR1																							
AS402152	Manufacturing, FAT & Delivery to Site - Other associated equipment for BR1	60	23-Jan-18	23-Mar-18	64	23-Mar-18, Manufacturing, FAT & Delivery to Site - Other associated equipment for BR1																							
Install, T&C for BR1 (incl. Provision for Health & Safety Requirements)																													
AS402002	Mobilisation of Works - BR1	0	07-Dec-17 A	21-Dec-17 A																									
AS402020	Install Aeration blowers & master control system	60	28-Apr-18	26-Jun-18	59	26-Jun-18, Install Aeration blowers & master control system																							
AS402040	Install Submersible Mixers	30	03-Apr-18	02-May-18	10	02-May-18, Install Submersible Mixers																							
AS402060	Install Mixed Liquor Return pumps	14	03-May-18	16-May-18	10	16-May-18, Install Mixed Liquor Return pumps																							
AS402080	Install Surplus Activated Sludge Pumps	14	17-May-18	30-May-18	86	30-May-18, Install Surplus Activated Sludge Pumps																							
AS402100	Install Air Diffusion Aeration System	90	03-May-18	31-Jul-18	24	31-Jul-18, Install Air Diffusion Aeration System																							
AS402120	Install Associated ductworks, pipeworks and valves	111	22-Dec-17 A	20-Apr-18	36	20-Apr-18, Install Associated ductworks, pipeworks and valves																							
AS402140	Install Foam control system & wash spraying system	30	03-May-18	01-Jun-18	24	01-Jun-18, Install Foam control system & wash spraying system																							
AS402160	Install Other associated equipment for BR1	90	17-May-18	14-Aug-18	10	14-Aug-18, Install Other associated equipment for BR1																							
AS402800	Complete Power Cable Laying from Switchboard to Plants for BR1	0		19-Aug-18	6	19-Aug-18, Complete Power Cable Laying from Switchboard to Plants for BR1																							
AS402900	Site Testing & Commissioning for BR1	60	24-Aug-18	22-Oct-18	1	22-Oct-18, Site Testing & Commissioning for BR1																							
4.3 Works for Membrane Filtration System (MFS1)																													
Manufacturing, FAT and Delivery																													
AS403010	Purchase Order for Membrane Modules	0	18-Apr-16 A	29-Apr-16 A																									

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20		
AS403012	Manufacturing, FAT & Delivery to Site - Membrane Modules	151	28-Mar-16 A	30-May-18	56	30-May-18; Manufacturing, FAT & Delivery to Site - Membrane Modules																							
AS403030	Purchase Order for Permeate Pumps	0	13-Sep-16 A	23-Sep-16 A																									
AS403032	Manufacturing, FAT & Delivery to Site - Permeate Pumps	88	07-Oct-16 A	28-Mar-18	9	28-Mar-18; Manufacturing, FAT & Delivery to Site - Permeate Pumps																							
AS403050	Purchase Order for Return Activated Sludge Pumps	0	13-Sep-16 A	23-Sep-16 A																									
AS403052	Manufacturing, FAT & Delivery to Site - Return Activated Sludge Pumps	0	07-Oct-16 A	06-Sep-17 A																									
AS403070	Purchase Order for Backwash Pumps (Item Deleted)	0	31-Aug-16 A	31-Aug-16 A																									
AS403072	Manufacturing, FAT & Delivery to Site - Backwash Pumps (Item Deleted)	0	31-Aug-16 A	31-Aug-16 A																									
AS403090	Purchase Order for Air Scouring Blowers	0	15-Aug-16 A	24-Aug-16 A																									
AS403092	Manufacturing, FAT & Delivery to Site - Air Scouring Blowers	30	11-Apr-16 A	29-Jan-18	102	29-Jan-18; Manufacturing, FAT & Delivery to Site - Air Scouring Blowers																							
AS403110	Purchase Order for Air Compressor	0	18-Dec-17 A	21-Dec-17 A																									
AS403112	Manufacturing, FAT & Delivery to Site - Air Compressor	120	22-Dec-17 A	29-Apr-18	57	29-Apr-18; Manufacturing, FAT & Delivery to Site - Air Compressor																							
AS403130	Purchase Order for Chemical Dosing System (i) NaOCl dosing pumps	0	05-Jun-17 A	29-Jun-17 A																									
AS403132	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (i) NaOCl dosing pumps	121	30-Jun-17 A	30-Apr-18	86	30-Apr-18; Manufacturing, FAT & Delivery to Site - Chemical Dosing System (i) NaOCl dosing pumps																							
AS403150	Purchase Order for Chemical Dosing System (ii) Citric Acid dosing pumps	0	05-Jun-17 A	29-Jun-17 A																									
AS403152	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (ii) Citric Acid dosing pumps	121	30-Jun-17 A	30-Apr-18	116	30-Apr-18; Manufacturing, FAT & Delivery to Site - Chemical Dosing System (ii) Citric Acid dosing pumps																							
AS403170	Purchase Order for Chemical Dosing System (iii) Chemical storage tank	0	06-Feb-17 A	28-Feb-17 A																									
AS403172	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (iii) Chemical storage tank	121	01-Mar-17 A	30-Apr-18	116	30-Apr-18; Manufacturing, FAT & Delivery to Site - Chemical Dosing System (iii) Chemical storage tank																							
AS403190	Purchase Order for Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps	0	28-Aug-17 A	05-Sep-17 A																									
AS403192	Manufacturing, FAT & Delivery to Site - Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps	123	06-Sep-17 A	02-May-18	93	02-May-18; Manufacturing, FAT & Delivery to Site - Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps																							
AS403210	Purchase Order for Wash water pumping system	0	28-Aug-17 A	05-Sep-17 A																									
AS403212	Manufacturing, FAT & Delivery to Site - Wash water pumping system	121	06-Sep-17 A	30-Apr-18	125	30-Apr-18; Manufacturing, FAT & Delivery to Site - Wash water pumping system																							
AS403230	Purchase Order for Associated ductworks, pipeworks and valves	11	23-Jan-18	02-Feb-18	53	23-Jan-18 02-Feb-18; Purchase Order for Associated ductworks, pipeworks and valves																							
AS403232	Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves	90	03-Feb-18	03-May-18	53	03-Feb-18 03-May-18; Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves																							
AS403250	Purchase Order for Other associated equipment for MFS1	11	23-Jan-18	02-Feb-18	23	23-Jan-18 02-Feb-18; Purchase Order for Other associated equipment for MFS1																							
AS403252	Manufacturing, FAT & Delivery to Site - Other associated equipment for MFS1	60	03-Feb-18	03-Apr-18	23	03-Feb-18 03-Apr-18; Manufacturing, FAT & Delivery to Site - Other associated equipment for MFS1																							
Install, T&C for MFS1 (incl. Provision for Health & Safety Requirements)																													
AS403002	Mobilisation of Works - MBR Facilities Building G/F	0	07-Dec-17 A	20-Dec-17 A																									
AS403002a	Mobilisation of Works - MBR Facilities Building B/F	7	31-Mar-18	06-Apr-18	0	31-Mar-18 06-Apr-18; Mobilisation of Works - MBR Facilities Building B/F																							
AS403004	Mobilisation of Works - MFS1	7	03-Apr-18	09-Apr-18	17	03-Apr-18 09-Apr-18; Mobilisation of Works - MFS1																							
AS403020	Install Membrane Modules, MFS Tank	60	26-Jul-18	23-Sep-18	0	26-Jul-18 23-Sep-18; Install Membrane Modules, MFS Tank																							
AS403040	Install Permeate Pumps, No.1 - No.6, MBR Bldg	45	07-Apr-18	21-May-18	0	07-Apr-18 21-May-18; Install Permeate Pumps, No.1 - No.6, MBR Bldg																							
AS403060	Install Return Activated Sludge Pumps, No.1 - No.5, MBR Bldg	30	26-Jun-18	25-Jul-18	0	26-Jun-18 25-Jul-18; Install Return Activated Sludge Pumps, No.1 - No.5, MBR Bldg																							
AS403080	Install Backwash Pumps -MBR Bldg (Not required)	0	30-Dec-17 A	30-Dec-17 A																									
AS403100	Install Air Scouring Blowers, MBR Bldg	45	28-Apr-18	11-Jun-18	14	28-Apr-18 11-Jun-18; Install Air Scouring Blowers, MBR Bldg																							
AS403120	Install Air Compressor, MBR Bldg.	30	12-Jun-18	11-Jul-18	14	12-Jun-18 11-Jul-18; Install Air Compressor, MBR Bldg.																							
AS403140	Mobilisation of Works - Chemical Rooms	14	01-May-18	14-May-18	72	01-May-18 14-May-18; Mobilisation of Works - Chemical Rooms																							
AS403142	Install NaOCl Dosing Pumps & Storage Tank	30	15-May-18	13-Jun-18	72	15-May-18 13-Jun-18; Install NaOCl Dosing Pumps & Storage Tank																							
AS403160	Install Citric Acid Dosing Pumps & Storage Tank	30	14-Jun-18	13-Jul-18	72	14-Jun-18 13-Jul-18; Install Citric Acid Dosing Pumps & Storage Tank																							
AS403180	Install Acetic Acid Dosing Pumps & Storage Tank	30	14-Jul-18	12-Aug-18	81	14-Jul-18 12-Aug-18; Install Acetic Acid Dosing Pumps & Storage Tank																							
AS403200	Install Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps, MFS1 Drain Chamber	30	22-May-18	20-Jun-18	74	22-May-18 20-Jun-18; Install Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps, MFS1 Drain Chamber																							
AS403220	Install Wash water pumping system, MBR Bldg.	21	21-Jun-18	11-Jul-18	74	21-Jun-18 11-Jul-18; Install Wash water pumping system, MBR Bldg.																							
AS403240	Install Associated ductworks, pipeworks and valves	120	28-Apr-18	25-Aug-18	29	28-Apr-18 25-Aug-18; Install Associated ductworks, pipeworks and valves																							

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	AS403260	Install Power Supply / Other associated equipment for MFS1	150	27-Apr-18	23-Sep-18	0							27-Apr-18											23-Sep-18, Install Power Supply / Other associated equipment for MFS1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	AS403800	Complete Laying Power Cable from Switchboard to Plant for MFS1	0		23-Sep-18	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21	
AS406630	WSD Inspection (FS)	30	31-Jan-19	01-Mar-19	28																31-Jan-19		01-Mar-19	WSD Inspection (FS)					
Manufacturing, FAT and Delivery																													
AS406010	Purchase Order for Indoor Lighting	14	17-Mar-18	30-Mar-18	72						17-Mar-18		30-Mar-18	Purchase Order for Indoor Lighting															
AS406012	Manufacturing, FAT & Delivery to Site - Indoor Lighting	90	31-Mar-18	28-Jun-18	72						31-Mar-18				28-Jun-18	Manufacturing, FAT & Delivery to Site - Indoor Lighting													
AS406030	Purchase Order for Air-conditioning & ventilation System	14	17-Mar-18	30-Mar-18	34						17-Mar-18		30-Mar-18	Purchase Order for Air-conditioning & ventilation System															
AS406032	Manufacturing, FAT & Delivery to Site - Air-conditioning & ventilation System	120	31-Mar-18	28-Jul-18	34						31-Mar-18				28-Jul-18	Manufacturing, FAT & Delivery to Site - Air-conditioning & ventilation System													
AS406050	Purchase Order for Outdoor lighting installation for relevant area	14	17-Mar-18	30-Mar-18	147						17-Mar-18		30-Mar-18	Purchase Order for Outdoor lighting installation for relevant area															
AS406052	Manufacturing, FAT & Delivery to Site - Outdoor Lighting installation for relevant area	90	31-Mar-18	28-Jun-18	147						31-Mar-18				28-Jun-18	Manufacturing, FAT & Delivery to Site - Outdoor Lighting installation for relevant area													
AS406070	Purchase Order for Other B.S. installation for relevant area	14	17-Mar-18	30-Mar-18	21						17-Mar-18		30-Mar-18	Purchase Order for Other B.S. installation for relevant area															
AS406072	Manufacturing, FAT & Delivery to Site - Other B.S. installation for relevant area	90	31-Mar-18	28-Jun-18	21						31-Mar-18				28-Jun-18	Manufacturing, FAT & Delivery to Site - Other B.S. installation for relevant area													
AS406090	Purchase Order for F.S. Fittings & Equipment	14	01-Mar-18	14-Mar-18	36						01-Mar-18		14-Mar-18	Purchase Order for F.S. Fittings & Equipment															
AS406092	Manufacturing, FAT & Delivery to Site - F.S. Fittings & Equipment	90	15-Mar-18	12-Jun-18	36						15-Mar-18				12-Jun-18	Manufacturing, FAT & Delivery to Site - F.S. Fittings & Equipment													
Install, T&C for Building Services (incl. Provision for Health & Safety Requirements)																													
AS406020	Install Indoor Lighting - Trunking / Conduits, MBR Building	60	29-Jun-18	27-Aug-18	72									29-Jun-18			27-Aug-18	Install Indoor Lighting - Trunking / Conduits, MBR Building											
AS406022	Install Indoor Lighting Fittings, MBR Building	60	28-Aug-18	26-Oct-18	72										28-Aug-18			26-Oct-18	Install Indoor Lighting Fittings, MBR Building										
AS406024	Install Indoor Lighting - Trunking / Conduits, Chemical Rooms	7	28-Aug-18	03-Sep-18	104										28-Aug-18			03-Sep-18	Install Indoor Lighting - Trunking / Conduits, Chemical Rooms										
AS406026	Install Indoor Lighting Fittings, Chemical Rooms	7	04-Sep-18	10-Sep-18	125										04-Sep-18			10-Sep-18	Install Indoor Lighting Fittings, Chemical Rooms										
AS406040	Ductwork for Ventilation System, MBR Building	90	02-May-18	30-Jul-18	34								02-May-18			30-Jul-18	Ductwork for Ventilation System, MBR Building												
AS406041	Install Ventilation Fans & Control, MBR Building	21	31-Jul-18	20-Aug-18	57									31-Jul-18			20-Aug-18	Install Ventilation Fans & Control, MBR Building											
AS406042	Complete Ventilation System	0		20-Aug-18	57												20-Aug-18	Complete Ventilation System											
AS406043	Install Split Type Air-conditioning, MBR Building	35	28-Aug-18	01-Oct-18	97										28-Aug-18			01-Oct-18	Install Split Type Air-conditioning, MBR Building										
AS406044	MVAC Ready	0	02-Oct-18		97												02-Oct-18	MVAC Ready											
AS406045	Provision of Temp. A/C for H.V. Switchroom	21	31-Jul-18	20-Aug-18	34									31-Jul-18			20-Aug-18	Provision of Temp. A/C for H.V. Switchroom											
AS406046	Temporary MVAC Ready	0	21-Aug-18		34										21-Aug-18			Temporary MVAC Ready											
AS406060	Install Outdoor Lighting for Pre-treatment Screen & Flowmeter Chamber	30	29-Jun-18	28-Jul-18	162									29-Jun-18			28-Jul-18	Install Outdoor Lighting for Pre-treatment Screen & Flowmeter Chamber											
AS406061	Install Outdoor Lighting for BR1 & its Vicinity Areas	45	29-Jun-18	12-Aug-18	147									29-Jun-18			12-Aug-18	Install Outdoor Lighting for BR1 & its Vicinity Areas											
AS406062	Install Outdoor Lighting for MBR Building & its Vicinity Areas	45	29-Jun-18	12-Aug-18	147									29-Jun-18			12-Aug-18	Install Outdoor Lighting for MBR Building & its Vicinity Areas											
AS406063	Install Outdoor Lighting for MFS1 & its Vicinity area	30	29-Jun-18	28-Jul-18	162									29-Jun-18			28-Jul-18	Install Outdoor Lighting for MFS1 & its Vicinity area											
AS406064	Install Outdoor Lighting for Chemical Rooms	14	11-Sep-18	24-Sep-18	125										11-Sep-18			24-Sep-18	Install Outdoor Lighting for Chemical Rooms										
AS406080	Install Other B.S. (Switches for Power Supply to Equipment), Pre-treatment Screen & Flowmeter Chamber	30	29-Jun-18	28-Jul-18	21									29-Jun-18			28-Jul-18	Install Other B.S. (Switches for Power Supply to Equipment), Pre-treatment Screen & Flowmeter Chamber											
AS406081	Install Other B.S. (Switches for Power Supply to Equipment), BR1 & its Vicinity Areas	30	29-Jul-18	27-Aug-18	21									29-Jul-18			27-Aug-18	Install Other B.S. (Switches for Power Supply to Equipment), BR1 & its Vicinity Areas											
AS406082	Install Other B.S. (Switches for Power Supply to Equipment), MBR Facilities Building	45	28-Aug-18	11-Oct-18	21									28-Aug-18			11-Oct-18	Install Other B.S. (Switches for Power Supply to Equipment), MBR Facilities Building											
AS406083	Install Other B.S. (Switches for Power Supply to Equipment), MFS1 & its Vicinity area	45	12-Oct-18	25-Nov-18	21										12-Oct-18			25-Nov-18	Install Other B.S. (Switches for Power Supply to Equipment), MFS1 & its Vicinity area										
AS406084	Install Other B.S. (Switches for Power Supply to Equipment), Chemical Rooms	21	26-Nov-18	16-Dec-18	21											26-Nov-18		16-Dec-18	Install Other B.S. (Switches for Power Supply to Equipment), Chemical Rooms										
AS406800	Testing and Commission of B.S. Installation	21	17-Dec-18	06-Jan-19	21												17-Dec-18		06-Jan-19	Testing and Commission of B.S. Installation									
Install, T&C for Fire Services (incl. Provision for Health & Safety Requirements)																													
AS406101	Install Trunking & Conduits for AFA System - MBR Facilities Building	30	13-Jun-18	12-Jul-18	36									13-Jun-18			12-Jul-18	Install Trunking & Conduits for AFA System - MBR Facilities Building											
AS406102	Install AFA Fittings & Accessories, Wiring - MBR Facilities Building	60	13-Jul-18	10-Sep-18	36									13-Jul-18			10-Sep-18	Install AFA Fittings & Accessories, Wiring - MBR Facilities Building											
AS406104	Install Trunking & Conduits for AFA System - Chemical Rooms/D.G. Store	7	14-Jul-18	20-Jul-18	81									14-Jul-18			20-Jul-18	Install Trunking & Conduits for AFA System - Chemical Rooms/D.G. Store											
AS406106	Install AFA Fittings & Accessories, Wiring - Chemical Rooms/D.G. Store	7	21-Jul-18	27-Jul-18	81									21-Jul-18			27-Jul-18	Install AFA Fittings & Accessories, Wiring - Chemical Rooms/D.G. Store											
AS406108	Install F.S.Main Control System	7	11-Sep-18	17-Sep-18	36										11-Sep-18			17-Sep-18	Install F.S.Main Control System										
AS406180	Pipework for Sprinkler, HR/HR - MBR Facilities Building	14	29-Jul-18	11-Aug-18	158									29-Jul-18			11-Aug-18	Pipework for Sprinkler, HR/HR - MBR Facilities Building											
AS406182	Install Sprinkler Head, Hose Reel & Fire Hydrant - MBR Facilities Building	35	12-Aug-18	15-Sep-18	158									12-Aug-18			15-Sep-18	Install Sprinkler Head, Hose Reel & Fire Hydrant - MBR Facilities Building											



Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20		
AS406184	Install F.S. Pumps and Control - MBR Facilities Building	45	13-Jun-18	27-Jul-18	81									13-Jun-18		27-Jul-18, Install F.S. Pumps and Control - MBR Facilities Building													
AS406240	F.S. Direct Link Connection	7	07-Jan-19	13-Jan-19	21											07-Jan-19		13-Jan-19, F.S. Direct Link Connection											
AS406260	Install Fire Extinguisher for Relevant Areas	7	24-Jan-19	30-Jan-19	65											24-Jan-19		30-Jan-19, Install Fire Extinguisher for Relevant Areas											
AS406900	Testing of F.S. System	10	14-Jan-19	23-Jan-19	21											14-Jan-19		23-Jan-19, Testing of F.S. System											
4.7 HV Switchgear, Transformer, LV Switchgear, LV Control Gear etc..																													
Manufacturing, FAT and Delivery																													
AS407010	Purchase Order for 11kV HV Switchboard	0	12-Sep-16 A	21-Sep-16 A																									
AS407012	Manufacturing, FAT & Delivery to Site - 11kV HV Switchboard	12	07-Oct-16 A	11-Jan-18	30											11-Jan-18, Manufacturing, FAT & Delivery to Site - 11kV HV Switchboard													
AS407030	Purchase Order for 3.3kV HV Switchboard	0	12-Sep-16 A	21-Sep-16 A																									
AS407032	Manufacturing, FAT & Delivery to Site - 3.3kV HV Switchboard	89	07-Oct-16 A	29-Mar-18	85											29-Mar-18, Manufacturing, FAT & Delivery to Site - 3.3kV HV Switchboard													
AS407050	Purchase Order for Transformer	0	13-Sep-16 A	21-Sep-16 A																									
AS407052	Manufacturing, FAT & Delivery to Site - Transformer	75	07-Oct-16 A	15-Mar-18	53											15-Mar-18, Manufacturing, FAT & Delivery to Site - Transformer													
AS407070	Purchase Order for L.V. Switchboard	0	13-Sep-16 A	22-Sep-16 A																									
AS407072	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.1	106	30-Sep-16 A	15-Apr-18	1											15-Apr-18, Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.1													
AS407074	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.2	106	30-Sep-16 A	15-Apr-18	31											15-Apr-18, Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.2													
AS407076	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.3	121	30-Sep-16 A	14-May-18	37											14-May-18, Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.3													
AS407090	Purchase Order for (I) VSD for Permeate Pumps	0	03-Mar-17 A	16-Mar-17 A																									
AS407092	Manufacturing, FAT & Delivery to Site - (I) VSD for Permeate Pumps	75	17-Mar-17 A	15-Mar-18	32											15-Mar-18, Manufacturing, FAT & Delivery to Site - (I) VSD for Permeate Pumps													
AS407110	Purchase Order for (II) VSD for RAS Pumps	0	03-Mar-17 A	16-Mar-17 A																									
AS407112	Manufacturing, FAT & Delivery to Site - (II) VSD for RAS Pumps	75	17-Mar-17 A	15-Mar-18	32											15-Mar-18, Manufacturing, FAT & Delivery to Site - (II) VSD for RAS Pumps													
AS407130	Purchase Order for (III) VSD for SAS Pumps	0	03-Mar-17 A	16-Mar-17 A																									
AS407132	Manufacturing, FAT & Delivery to Site - (III) VSD for SAS Pumps	75	17-Mar-17 A	15-Mar-18	32											15-Mar-18, Manufacturing, FAT & Delivery to Site - (III) VSD for SAS Pumps													
AS407150	Purchase Order for (IV) VSD for BR Feedpumps	0	03-Mar-17 A	16-Mar-17 A																									
AS407152	Manufacturing, FAT & Delivery to Site - (IV) VSD for BR Feedpumps	75	17-Mar-17 A	15-Mar-18	32											15-Mar-18, Manufacturing, FAT & Delivery to Site - (IV) VSD for BR Feedpumps													
AS407170	Purchase Order for (V) VSD for Drain Pumps for MFS1	0	03-Mar-17 A	16-Mar-17 A																									
AS407172	Manufacturing, FAT & Delivery to Site - (V) VSD for Drain Pumps for MFS1	75	17-Mar-17 A	15-Mar-18	32											15-Mar-18, Manufacturing, FAT & Delivery to Site - (V) VSD for Drain Pumps for MFS1													
AS407190	Purchase Order for Starter for Motor, Screen & Mixer etc.	0	13-Sep-16 A	22-Sep-16 A																									
AS407192	Manufacturing, FAT & Delivery to Site - Starter for Motor, Screen & Mixer etc.	75	30-Sep-16 A	15-Mar-18	32											15-Mar-18, Manufacturing, FAT & Delivery to Site - Starter for Motor, Screen & Mixer etc.													
Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements)																													
AS407001	Mobilisation & Preparation Works - MBR Facilities Building CLP Rm C & D	0	30-Sep-17 A	02-Nov-17 A																									
AS407002	Mobilisation of Works - MBR Facilities Building	0	03-Nov-17 A	02-Dec-17 A																									
AS407020	Install 11kV HV Switchboard, SAT	65	12-Jan-18	17-Mar-18	30				12-Jan-18							17-Mar-18, Install 11kV HV Switchboard, SAT													
AS407022	Modify Existing 11kV HV Switchboard, SAT	21	18-Mar-18	07-Apr-18	30											18-Mar-18	07-Apr-18, Modify Existing 11kV HV Switchboard, SAT												
AS407024	CLP Inspection / Install Meters	10	13-May-18	22-May-18	75											13-May-18	22-May-18, CLP Inspection / Install Meters												
AS407026	11kV HV Switchboard Energization	0	23-May-18		75											23-May-18	11kV HV Switchboard Energization												
AS407040	Install 3.3kV HV Switchboard, SAT	30	14-May-18	12-Jun-18	40											14-May-18	12-Jun-18, Install 3.3kV HV Switchboard, SAT												
AS407042	Functional Test - 3.3kV HV Switchboard	14	27-Jun-18	10-Jul-18	40											27-Jun-18	10-Jul-18, Functional Test - 3.3kV HV Switchboard												
AS407060	Install Transformers (No. 3 & 4)	14	08-Apr-18	21-Apr-18	30											08-Apr-18	21-Apr-18, Install Transformers (No. 3 & 4)												
AS407062	Install Transformers (No. 1 & 2)	14	30-Apr-18	13-May-18	22											30-Apr-18	13-May-18, Install Transformers (No. 1 & 2)												
AS407080	Install L.V. Switchboard No.1 & MCB Distribution Board, SAT	45	16-Apr-18	30-May-18	1											16-Apr-18	30-May-18, Install L.V. Switchboard No.1 & MCB Distribution Board, SAT												
AS407081	Install VSD for BR Feedpumps, 2 nos.	3	31-May-18	02-Jun-18	48											31-May-18	02-Jun-18, Install VSD for BR Feedpumps, 2 nos.												
AS407082	Install L.V. Switchboard No.2 & MCB Distribution Board, SAT	45	16-May-18	29-Jun-18	1											16-May-18	29-Jun-18, Install L.V. Switchboard No.2 & MCB Distribution Board, SAT												
AS407083	Mobilisation of Works - Chemical Rooms	7	29-Jun-18	05-Jul-18	1											29-Jun-18	05-Jul-18, Mobilisation of Works - Chemical Rooms												

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20		
AS407084	Install MCB Distribution Board, DB-P6 (Chemical Room 2)	14	06-Jul-18	19-Jul-18	1									06-Jul-18	19-Jul-18, Install MCB Distribution Board, DB-P6 (Chemical Room 2)														
AS407085	Functional Test - L.V. Switchboard No. 1	30	20-Jul-18	18-Aug-18	1									20-Jul-18	18-Aug-18, Functional Test - L.V. Switchboard No. 1														
AS407086	L.V. Switchboard No. 1 Ready for Energisation	0	19-Aug-18		1										19-Aug-18 ♦ L.V. Switchboard No. 1 Ready for Energisation														
AS407087	Functional Test - L.V. Switchboard No. 2	30	30-Jun-18	29-Jul-18	21									30-Jun-18	29-Jul-18, Functional Test - L.V. Switchboard No. 2														
AS407088	L.V. Switchboard No. 2 Ready for Energisation	0	19-Aug-18		1										19-Aug-18 ♦ L.V. Switchboard No. 2 Ready for Energisation														
AS407500	Install , T&C of PQEMS	60	26-Aug-18	24-Oct-18	29										26-Aug-18	24-Oct-18, Install , T&C of PQEMS													
AS407600	Earthing System for MFS1 Completed	0	19-Aug-18		29										19-Aug-18 ♦ Earthing System for MFS1 Completed														
AS407620	Submit WR1 to EMSD for Electrical System, MFS1	7	19-Aug-18	25-Aug-18	29										19-Aug-18	25-Aug-18, Submit WR1 to EMSD for Electrical System, MFS1													
AS407640	Power On for MFS1 System	0	26-Aug-18		29										26-Aug-18 ♦ Power On for MFS1 System														
Install, T&C for BR1's Vicinity Area (incl. Provision for Health & Safety Requirements)																													
AS407003	Mobilisation of Works - BR1's Vicinity area	14	01-May-18	14-May-18	37								01-May-18	14-May-18, Mobilisation of Works - BR1's Vicinity area															
AS407004	Construction of Canopy for housing the L.V. Switchboard No.3	0	15-May-18	15-May-18	37								15-May-18	15-May-18, Construction of Canopy for housing the L.V. Switchboard No.3															
AS407089a	Install L.V. Switchboard No.3 (with Canopy)	30	15-May-18	13-Jun-18	37								15-May-18	13-Jun-18, Install L.V. Switchboard No.3 (with Canopy)															
AS407089b	Functional Test - L.V. Switchboard No. 3	30	14-Jun-18	13-Jul-18	37								14-Jun-18	13-Jul-18, Functional Test - L.V. Switchboard No. 3															
AS407089c	L.V. Switchboard No. 3 Ready for Energisation	0	14-Jul-18		37									14-Jul-18 ♦ L.V. Switchboard No. 3 Ready for Energisation															
AS407089d	Install MCB Distribution Board, DB-P8 (Power supply from Switchboard No.3)	7	14-Jul-18	20-Jul-18	170									14-Jul-18	20-Jul-18, Install MCB Distribution Board, DB-P8 (Power supply from Switchboard No.3)														
AS407700	Complete Earthing & Lightning System for BR1	0		19-Aug-18	1										19-Aug-18 ♦ Complete Earthing & Lightning System for BR1														
AS407720	Submit WR1 to EMSD for Electrical System, BR1	5	19-Aug-18	23-Aug-18	1										19-Aug-18	23-Aug-18, Submit WR1 to EMSD for Electrical System, BR1													
AS407740	Power On for BR1 System	0	24-Aug-18		1										24-Aug-18 ♦ Power On for BR1 System														
4.8 Lifting Appliance																													
Manufacturing, FAT and Delivery																													
AS408010	Purchase Order for 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber	0	08-Feb-17 A	14-Feb-17 A																									
AS408012	Manufacturing, FAT & Delivery to Site - 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber	0	15-Feb-17 A	06-Dec-17 A																									
AS408030	Purchase Order for 1 no. 500 kgs Lifting Appliance - (II) For BR1	0	08-Feb-17 A	14-Feb-17 A																									
AS408032	Manufacturing, FAT & Delivery to Site - 1 no. 500 kgs Lifting Appliance - (II) For BR1	39	15-Feb-17 A	07-Feb-18	66									07-Feb-18	Manufacturing, FAT & Delivery to Site - 1 no. 500 kgs Lifting Appliance - (II) For BR1														
AS408050	Purchase Order for 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In G/F of Membrane Facilities Building	0	08-Feb-17 A	14-Feb-17 A																									
AS408052	Manufacturing, FAT & Delivery to Site - 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In G/F of MF Bldg.	0	15-Feb-17 A	06-Dec-17 A																									
AS408070	Purchase Order for 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building	0	08-Feb-17 A	14-Feb-17 A																									
AS408072	Manufacturing, FAT & Delivery to Site - 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building	39	15-Feb-17 A	07-Feb-18	30									07-Feb-18	Manufacturing, FAT & Delivery to Site - 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building														
AS408090	Purchase Order for 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1	0	08-Feb-17 A	14-Feb-17 A																									
AS408092	Manufacturing, FAT & Delivery to Site - 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1	91	15-Feb-17 A	31-Mar-18	58									31-Mar-18	Manufacturing, FAT & Delivery to Site - 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1														
Install, T&C for Pre-Treatment Screen Chamber (incl. Provision for Health & Safety Requirements)																													
AS408020	Mobilisation of Works - MBR Pre-Treatment Screen Chamber	14	04-Jan-18	17-Jan-18	37			04-Jan-18							17-Jan-18	Mobilisation of Works - MBR Pre-Treatment Screen Chamber													
AS408022	Install Monorail A-shape support column. 1,500kgs S.W.L. Electric Chain Hoist	45	08-Feb-18*	24-Mar-18	16			08-Feb-18*							24-Mar-18	Install Monorail A-shape support column. 1,500kgs S.W.L. Electric Chain Hoist													
AS408024	SAT of Lifting Appliance	14	25-Mar-18	07-Apr-18	16								25-Mar-18		07-Apr-18	SAT of Lifting Appliance													
Install, T&C for Bioreactor No.1 (BR1) (incl. Provision for Health & Safety Requirements)																													
AS408040	Install Monorail 500kgs S.W.L. Manual Hoist c/w Trolley	14	03-Apr-18	16-Apr-18	12							03-Apr-18		16-Apr-18	Install Monorail 500kgs S.W.L. Manual Hoist c/w Trolley														
AS408042	SAT of Lifting Appliance	14	17-Apr-18	30-Apr-18	12							17-Apr-18		30-Apr-18	SAT of Lifting Appliance														
Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements)																													
AS408060	Install Electric Travelling Crane for 1 No. 3,000 kg S.W.L. & 1 No. 4,000 S.W.L. - G/F	65	07-Dec-17 A	05-Mar-18	7	07-Dec-17 A							05-Mar-18		Install Electric Travelling Crane for 1 No. 3,000 kg S.W.L. & 1 No. 4,000 S.W.L. - G/F														
AS408062	SAT of Lifting Appliance, G/F	25	06-Mar-18	30-Mar-18	7						06-Mar-18		30-Mar-18		SAT of Lifting Appliance, G/F														
AS408080	Install 2 Nos. Electric Travelling Crane for 8,500 kg S.W.L. - 1/F	35	24-Feb-18	30-Mar-18	14						24-Feb-18		30-Mar-18		Install 2 Nos. Electric Travelling Crane for 8,500 kg S.W.L. - 1/F														
AS408082	SAT of Lifting Appliance, 1/F	28	31-Mar-18	27-Apr-18	14						31-Mar-18		27-Apr-18		SAT of Lifting Appliance, 1/F														
Install, T&C for MFS1 (incl. Provision for Health & Safety Requirements)																													
AS408101	Install 2 Nos. Electric Travelling Crane for 5,000 kg S.W.L. - MFS1 Tanks	30	01-Apr-18	30-Apr-18	58						01-Apr-18		30-Apr-18		Install 2 Nos. Electric Travelling Crane for 5,000 kg S.W.L. - MFS1 Tanks														

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20		
AS408102	SAT of Lifting Appliance (MFS1 Tanks)	28	01-May-18	28-May-18	58							01-May-18																	
4.9 Cabling, Earthing and Lightning Protection System																													
Manufacturing, FAT and Delivery																													
AS409010	Purchase Order for Cables between HV Switchboard and TX	0	04-Dec-17 A	07-Dec-17 A																									
AS409012	Manufacturing & Delivery to Site - Cables between HV Switchboard and TX	97	08-Dec-17 A	06-Apr-18	107		08-Dec-17 A																						
AS409014	Purchase Order for Cables between TX/ 3.3kV SW. and Air Blower	0	04-Dec-17 A	07-Dec-17 A																									
AS409016	Manufacturing of Manufacturing & Delivery to Site - Cables between TX/ 3.3kV SW. and Air Blower	97	08-Dec-17 A	06-Apr-18	149		08-Dec-17 A																						
AS409030	Purchase Order for Cables between TX and LV Switchboard	0	04-Dec-17 A	07-Dec-17 A																									
AS409032	Manufacturing & Delivery to Site - Cables between TX and LV Switchboard	97	08-Dec-17 A	06-Apr-18	149		08-Dec-17 A																						
AS409050	Purchase Order for Cables between LV Switchboard and Plant	0	04-Dec-17 A	07-Dec-17 A																									
AS409052	Manufacturing & Delivery to Site - Cables between LV Switchboard and Plant	97	08-Dec-17 A	06-Apr-18	80		08-Dec-17 A																						
AS409070	Purchase Order for Earthing Sys. - Inlet Screen Chamber, BR1 & MFS1	7	04-Jan-18	10-Jan-18	55			04-Jan-18																					
AS409072	Manufacturing & Delivery to Site - Earthing Sys. - Inlet Screen Chamber, BR1 & MFS1	120	11-Jan-18	10-May-18	55			11-Jan-18																					
AS409090	Purchase Order for Lightning Sys. - Inlet Screen Chamber, BR1 & MFS1	7	04-Jan-18	10-Jan-18	77			04-Jan-18																					
AS409092	Manufacturing & Delivery to Site - Lightning Sys. - Inlet Screen Chamber, BR1 & MFS1	120	11-Jan-18	10-May-18	77			11-Jan-18																					
AS409110	Purchase Order for Cables Tray	0	20-Nov-17 A	24-Nov-17 A																									
AS409112	Manufacturing & Delivery to Site - Cables Tray	83	25-Nov-17 A	23-Mar-18	59		25-Nov-17 A																						
Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements)																													
AS409001	Complete Cable Pits & Ducting between New/Existing 11kV Switch Room	0		30-Mar-18	38																								
AS409002	Complete HV Switchboard and TX Installation	0		12-Jun-18	40																								
AS409003	Mobilisation of Works - MBR Facilities Building	14	31-Mar-18	13-Apr-18	38																								
AS409020	Laying Cables between HV Switchboard and TX	14	13-Jun-18	26-Jun-18	40																								
AS409022	Laying Cables between TX/ 3.3kV SW. and Air Blower	14	04-Jul-18	17-Jul-18	61																								
AS409039	Complete LV Switchboard and TX Installation	0		19-Aug-18	248																								
AS409040	Laying Cables between TX and LV Switchboard	14	27-Jun-18	10-Jul-18	68																								
AS409060	Laying Cables between LV Switchboard and Plant - MBR Facilities Building	60	04-Jun-18	02-Aug-18	22																								
AS409121	Install Cable Tray/Trunking between HV Switchboard and TX	7	30-Apr-18	06-May-18	22																								
AS409122	Install Cable Tray/Trunking between TX/3.3kV SW. and Air Blower	7	27-Jun-18	03-Jul-18	61																								
AS409123	Install Cable Tray/Trunking between LV Switchboard and TX	7	07-May-18	13-May-18	22																								
AS409124	Install Cable Tray/Trunking between LV Switchboard and Plant - MBR Facilities Building	21	14-May-18	03-Jun-18	22																								
AS409900	Complete Earthing & Lightning System for MFS1	0		19-Aug-18	29																								
Install, T&C for Plant's Vicinity Areas (incl. Provision for Health & Safety Requirements)																													
AS409006	Complete Cable Pits & Ducting between LV Switchboard and Plant - Relevant Areas	0		30-Mar-18	57																								
AS409007	Complete Lightning Pits & Ducting	0		30-Mar-18	118																								
AS409080	Complete Earth Pits & Ducting	0		30-Mar-18	96																								
AS409081	Install Earth Electrode & Earthing Conductor - Earthing System for HV & LV Equipment	14	11-May-18	24-May-18	55																								
AS409082	Install Earth Electrode & Earthing Conductor - Lightning System for HV & LV Equipment	10	25-May-18	03-Jun-18	63																								
AS409083	Install Earthing Conductor for Inlet Screen Chamber	14	05-Aug-18	19-Aug-18	29																								
AS409084	Install Earthing Conductor for BR1, Testing	30	20-Jul-18	19-Aug-18	1																								
AS409085	Install Earthing Conductor - Lightning System for HV & LV Equipment	55	25-Jun-18	19-Aug-18	1																								
AS409086	Install Earthing Conductor for MFS1, Testing	60	20-Jun-18	19-Aug-18	29																								
AS409125	Install Cable Tray/Trunking for Plant - Relevant Areas	90	31-Mar-18	28-Jun-18	57																								
4.10 Deodorising System																													
Manufacturing, FAT and Delivery																													

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20		
AS410010	Purchase Order for Deodorisers system with dehumidifier	0	10-Jul-17 A	26-Jul-17 A																									
AS410012	Manufacturing, FAT & Delivery to Site - Deodorisers system with dehumidifier	136	27-Jul-17 A	15-May-18	66	15-May-18, Manufacturing, FAT & Delivery to Site - Deodorisers system with dehumidifier																							
AS410030	Purchase Order for S.S. Ducting & Accessories	0	24-Jul-17 A	26-Jul-17 A																									
AS410032	Manufacturing & Delivery to Site - S.S. Ducting & Accessories	136	27-Jul-17 A	15-May-18	96	15-May-18, Manufacturing & Delivery to Site - S.S. Ducting & Accessories																							
Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements)																													
AS410020	Install Deodorising Plant	45	16-May-18	29-Jun-18	66							16-May-18					29-Jun-18, Install Deodorising Plant												
AS410040	Install S.S. Ducting, Accessories & Deodorising Control System	35	15-Jun-18	19-Jul-18	66							15-Jun-18					19-Jul-18, Install S.S. Ducting, Accessories & Deodorising Control System												
4.11 Maintenance Platform & Covers																													
Manufacturing, FAT and Delivery																													
AS411010	Purchase Order for maintenance platforms, stairways, hand railings and covers	7	01-Apr-18*	07-Apr-18	4						01-Apr-18*					07-Apr-18, Purchase Order for maintenance platforms, stairways, hand railings and covers													
AS411012	Manufacturing & Delivery to Site - maintenance platforms, stairways, hand railings and covers	60	08-Apr-18	06-Jun-18	4						08-Apr-18					06-Jun-18, Manufacturing & Delivery to Site - maintenance platforms, stairways, hand railings and covers													
AS411030	Purchase Order for Maintenance Platform in Basement of MBR Facilities Building	7	01-Apr-18	07-Apr-18	19						01-Apr-18					07-Apr-18, Purchase Order for Maintenance Platform in Basement of MBR Facilities Building													
AS411032	Manufacturing & Delivery to Site - Maintenance Platform in Basement of MBR Facilities Building	45	08-Apr-18	22-May-18	19						08-Apr-18					22-May-18, Manufacturing & Delivery to Site - Maintenance Platform in Basement of MBR Facilities Building													
AS411050	Purchase Order for FRP covers for Membrane Facilities Tanks	0	02-May-17 A	08-May-17 A																									
AS411052	Manufacturing & Delivery to Site - FRP covers for Membrane Facilities Tanks	91	09-May-17 A	31-Mar-18	26	31-Mar-18, Manufacturing & Delivery to Site - FRP covers for Membrane Facilities Tanks																							
AS411070	Purchase Order for Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required)	0	30-Dec-17 A	30-Dec-17 A																									
AS411072	Manufacturing & Delivery to Site - Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required)	0	30-Dec-17 A	30-Dec-17 A																									
Install, T&C for Maintenance Platform & Covers (incl. Provision for Health & Safety Requirements)																													
AS411020	Install maintenance platforms, stairways, hand railings and covers	75	07-Jun-18	20-Aug-18	4								07-Jun-18				20-Aug-18, Install maintenance platforms, stairways, hand railings and covers												
AS411040	Install Hand Rail & Maintenance Platform in Basement of MBR Facilities Building	45	23-May-18	06-Jul-18	19								23-May-18				06-Jul-18, Install Hand Rail & Maintenance Platform in Basement of MBR Facilities Building												
AS411060	Install FRP covers for Membrane Facilities Tanks	60	10-Apr-18	08-Jun-18	17							10-Apr-18				08-Jun-18, Install FRP covers for Membrane Facilities Tanks													
AS411080	Install Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required)	0	30-Dec-17 A	30-Dec-17 A																									
4.12 SCADA																													
Manufacturing, FAT and Delivery																													
AS412010	Purchase Order for Proposed SCADA	0	03-Jul-17 A	18-Jul-17 A																									
AS412012	Manufacturing & Delivery to Site - Proposed SCADA	90	19-Jul-17 A	30-Mar-18	48	30-Mar-18, Manufacturing & Delivery to Site - Proposed SCADA																							
AS412030	Purchase Order for PLC System	0	10-Jul-17 A	18-Jul-17 A																									
AS412032	Manufacturing & Delivery to Site - PLC System	90	19-Jul-17 A	30-Mar-18	48	30-Mar-18, Manufacturing & Delivery to Site - PLC System																							
AS412050	Purchase Order for Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers	91	31-Dec-17	31-Mar-18	23			31-Dec-17								31-Mar-18, Purchase Order for Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers													
AS412052	Manufacturing & Delivery to Site - Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers	90	01-Apr-18	29-Jun-18	23						01-Apr-18					29-Jun-18, Manufacturing & Delivery to Site - Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers													
AS412070	Purchase Order for Instrumentation in BR1	91	31-Dec-17	31-Mar-18	37			31-Dec-17								31-Mar-18, Purchase Order for Instrumentation in BR1													
AS412072	Manufacturing of Instrumentation in BR1	90	01-Apr-18	29-Jun-18	37						01-Apr-18					29-Jun-18, Manufacturing of Instrumentation in BR1													
AS412090	Purchase Order for Instrumentation in MFS1 & MFB	91	31-Dec-17	31-Mar-18	51			31-Dec-17								31-Mar-18, Purchase Order for Instrumentation in MFS1 & MFB													
AS412092	Manufacturing & Delivery to Site - Instrumentation in MFS1 & MFB	90	01-Apr-18	29-Jun-18	51						01-Apr-18					29-Jun-18, Manufacturing & Delivery to Site - Instrumentation in MFS1 & MFB													
AS412110	Purchase Order UPS for PLC Systems A	0	03-Jul-17 A	18-Jul-17 A																									
AS412112	Manufacturing & Delivery to Site - UPS for PLC Systems A	90	19-Jul-17 A	30-Mar-18	177	30-Mar-18, Manufacturing & Delivery to Site - UPS for PLC Systems A																							
AS412130	Purchase Order UPS for PLC Systems B	0	03-Jul-17 A	18-Jul-17 A																									
AS412132	Manufacturing & Delivery to Site - UPS for PLC Systems B	90	19-Jul-17 A	30-Mar-18	177	30-Mar-18, Manufacturing & Delivery to Site - UPS for PLC Systems B																							
Install, T&C for SCADA (incl. Provision for Health & Safety Requirements)																													
AS412001	Mobilisation of Works - Areas for laying works of optical fibres	7	03-Apr-18	09-Apr-18	8						03-Apr-18					09-Apr-18, Mobilisation of Works - Areas for laying works of optical fibres													
AS412020	Laying Fibre Optical Ethernet Ring	30	10-Apr-18	09-May-18	8						10-Apr-18					09-May-18, Laying Fibre Optical Ethernet Ring													
AS412021	Set Up and Demonstrate all the Functionality of the Proposed SCADA/PLC System A	45	10-May-18	23-Jun-18	8							10-May-18				23-Jun-18, Set Up and Demonstrate all the Functionality of the Proposed SCADA/PLC System A													
AS412022	Modify Existing Master Station at Control Room	45	24-Jun-18	07-Aug-18	12								24-Jun-18			07-Aug-18, Modify Existing Master Station at Control Room													
AS412023	Install SCADA Master Station	35	08-Aug-18	11-Sep-18	12									08-Aug-18		11-Sep-18, Install SCADA Master Station													
AS412024	Wiring for Control & Monitoring Circuits, Termination - SCADA	30	12-Sep-18	11-Oct-18	12										12-Sep-18		11-Oct-18, Wiring for Control & Monitoring Circuits, Termination - SCADA												



Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21	
AS412025	Testing - SCADA	30	18-Oct-18	16-Nov-18	6												18-Oct-18		16-Nov-18, Testing - SCADA										
AS412040	Install Trunking & Tray - PLC System	21	24-Jun-18	14-Jul-18	8									24-Jun-18		14-Jul-18, Install Trunking & Tray - PLC System													
AS412042	Install Controller & Associated Component - PLC System	14	15-Jul-18	28-Jul-18	57									15-Jul-18		28-Jul-18, Install Controller & Associated Component - PLC System													
AS412044	Wiring for Control & Monitoring Circuits, Termination - PLC System	21	28-Aug-18	17-Sep-18	6											28-Aug-18		17-Sep-18, Wiring for Control & Monitoring Circuits, Termination - PLC System											
AS412046	Testing - PLC System	30	18-Sep-18	17-Oct-18	6											18-Sep-18		17-Oct-18, Testing - PLC System											
AS412060	Install Instrumentation in Flowmeter, MBR Pre-treatment Screen Chamber	14	17-Jul-18	30-Jul-18	6									17-Jul-18		30-Jul-18, Install Instrumentation in Flowmeter, MBR Pre-treatment Screen Chamber													
AS412080	Install Instrumentation in BR1	14	31-Jul-18	13-Aug-18	6									31-Jul-18		13-Aug-18, Install Instrumentation in BR1													
AS412100	Install Instrumentation in MFS1	14	14-Aug-18	27-Aug-18	6									14-Aug-18		27-Aug-18, Install Instrumentation in MFS1													
AS412120	Install UPS for PLC system A	30	28-Aug-18	26-Sep-18	27											28-Aug-18		26-Sep-18, Install UPS for PLC system A											
AS412140	Install UPS for PLC system B	30	28-Aug-18	26-Sep-18	27											28-Aug-18		26-Sep-18, Install UPS for PLC system B											
4.13 Supply & Delivery of Miscellaneous Equipment																													
AS413010	Supply and Delivery of Telephone set, bell, line and accessories	60	22-Jan-19*	22-Mar-19	14														22-Jan-19*			22-Mar-19, Supply and Delivery of Telephone set, bell, line and accessories							
AS413020	Supply and Delivery of Aluminum scaffolding	60	22-Jan-19	22-Mar-19	14														22-Jan-19			22-Mar-19, Supply and Delivery of Aluminum scaffolding							
AS413030	Supply and Delivery of Maintenance trolley for Air Circuit Breaker	60	22-Jan-19	22-Mar-19	14														22-Jan-19			22-Mar-19, Supply and Delivery of Maintenance trolley for Air Circuit Breaker							
AS413040	Supply and Delivery of Portable Gas detector	60	22-Jan-19	22-Mar-19	14														22-Jan-19			22-Mar-19, Supply and Delivery of Portable Gas detector							
AS413050	Supply and Delivery of Portable ventilation fan	60	22-Jan-19	22-Mar-19	14														22-Jan-19			22-Mar-19, Supply and Delivery of Portable ventilation fan							
AS413060	Supply and Delivery of Forklift truck and battery charger	60	22-Jan-19	22-Mar-19	14														22-Jan-19			22-Mar-19, Supply and Delivery of Forklift truck and battery charger							
AS413070	Supply and Delivery of Access and working platforms	60	22-Jan-19	22-Mar-19	14														22-Jan-19			22-Mar-19, Supply and Delivery of Access and working platforms							
AS413080	Supply and Delivery of Portable drainage pump	60	22-Jan-19	22-Mar-19	14														22-Jan-19			22-Mar-19, Supply and Delivery of Portable drainage pump							
AS413090	Supply and Delivery of Sump Pump	60	02-Jul-18*	30-Aug-18	197									02-Jul-18*		30-Aug-18, Supply and Delivery of Sump Pump													
AS413100	Installation of Sump Pump	21	31-Aug-18	20-Sep-18	197											31-Aug-18		20-Sep-18, Installation of Sump Pump											
4.14 Supply & Delivery of Spares & Tools																													
AS414010	Delivery of (a) Automatic samplers' spare parts & (b) Sight glasses for MFS	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of (a) Automatic samplers' spare parts & (b) Sight glasses for MFS							
AS414020	Delivery of Spares & Tools for LV Switchboard, Control Panels and SCADA System	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for LV Switchboard, Control Panels and SCADA System							
AS414030	Delivery of Spares & Tools for HV Switchboard (including capacitor correction units)	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for HV Switchboard (including capacitor correction units)							
AS414040	Delivery of Spares & Tools for SCADA System, PLC system and Instrumentation	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for SCADA System, PLC system and Instrumentation							
AS414050	Delivery of Spares & Tools for Air Blower	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Air Blower							
AS414060	Delivery of Spares & Tools for Aeration Diffuser	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Aeration Diffuser							
AS414070	Delivery of Spares & Tools for Centrifugal Pump	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Centrifugal Pump							
AS414080	Delivery of Spares & Tools for Penstocks, Actuator and Valve	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Penstocks, Actuator and Valve							
AS414090	Delivery of Spares & Tools for Lifting Appliances	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Lifting Appliances							
AS414100	Delivery of Spares & Tools for Special Tool and measuring equipment	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Special Tool and measuring equipment							
AS414110	Delivery of Spares & Tools for Deodorization Unit	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Deodorization Unit							
AS414120	Delivery of Spares & Tools for Wash Compactor	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Wash Compactor							
AS414130	Delivery of Spares & Tools for MBR Pre-treatment Screens	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for MBR Pre-treatment Screens							
AS414140	Delivery of Spares & Tools for Submersible mixer	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for Submersible mixer							
AS414150	Delivery of Spares & Tools for MLR pump	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for MLR pump							
AS414160	Delivery of Spares & Tools for BR Feedpump	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Delivery of Spares & Tools for BR Feedpump							
AS414170	Lubricants for 1 year use of all equipment	30	21-Feb-19	22-Mar-19	32														21-Feb-19			22-Mar-19, Lubricants for 1 year use of all equipment							
Process Commissioning																													
Commissioning Plan & Procedure																													
AS112010	Prepare / ICE Certified / Submit a Process Commissioning Plan	90	26-May-18	24-Aug-18	21								26-May-18				24-Aug-18, Prepare / ICE Certified / Submit a Process Commissioning Plan												
AS112012	Comments on Process Commissioning Plan	28	24-Aug-18	20-Sep-18	21											24-Aug-18		20-Sep-18, Comments on Process Commissioning Plan											

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2018												2019											
						Oct -2	Nov -1	Dec 1	Jan 2	Feb 3	Mar 4	Apr 5	May 6	Jun 7	Jul 8	Aug 9	Sep 10	Oct 11	Nov 12	Dec 13	Jan 14	Feb 15	Mar 16	Apr 17	May 18	Jun 19	Jul 20	Aug 21	
AS112014	ICE Certified / Re-submit Process Commissioning Plan	28	21-Sep-18	18-Oct-18	21											21-Sep-18	<div></div>	18-Oct-18, ICE Certified / Re-submit Process Commissioning Plan											
	AS112016	Acceptance of Process Commissioning Plan	14	19-Oct-18	01-Nov-18	21											19-Oct-18	<div></div>	01-Nov-18, Acceptance of Process Commissioning Plan										
	Commissioning Process Period																												
	AS112020	Commencing of Process Commissioning	0	23-Nov-18		0													23-Nov-18	<div></div>	Commencing of Process Commissioning								
	AS112022	Preparation for the Process Commissioning	30	23-Nov-18	22-Dec-18	0													23-Nov-18	<div></div>	22-Dec-18, Preparation for the Process Commissioning								
	AS112024	Process Commissioning	90	23-Dec-18	22-Mar-19	0													23-Dec-18	<div></div>	22-Mar-19, Process Commissioning								
	AS112030	Sample analysis of the testing conducted for process commissioning by an Independent Lab. (HOKLAS)	70	26-Jan-19	05-Apr-19	0													26-Jan-19	<div></div>	05-Apr-19, Sample analysis of the testing conducted								
	AS112040	Completion of Process Commissioning	0		05-Apr-19	0																<div></div>	05-Apr-19, Completion of Process Commissioning						
Section IV of Works																													
Valve with Electric Actuators																													
Manufacturing, FAT and Delivery																													
AS501100	Procurement of Valves with electric actuators	0	13-Feb-16 A	28-Apr-16 A																									
AS501120	Manufacturing & Delivery / FAT of Valve with electric actuators	0	29-Mar-16 A	09-Sep-16 A																									
Install, T&C for Valve with Electric Actuators (incl. Provision for Health & Safety Requirements)																													
AS502100	Mobilisation and Enabling Works for NCSRSPS	0	31-Aug-16 A	09-Sep-16 A																									
AS502120	Install Valves with Electric Actuators	0	10-Sep-16 A	23-Sep-16 A																									
Modification of Control System																													
Manufacturing, FAT and Delivery																													
AS503100	Procurement of Control System	0	19-Mar-16 A	01-Jun-16 A																									
AS503120	Manufacturing, FAT & Delivery of Control System	0	02-Jun-16 A	22-Sep-16 A																									
Install, T&C for Control System (incl. Provision for Health & Safety Requirements)																													
AS504100	Modification of Existing Pump Control System	0	17-Mar-17 A	11-May-17 A																									
Associated Pipework and Fittings																													
Manufacturing, FAT and Delivery																													
AS505100	Procurement of Associated Pipework and Fittings	0	28-Feb-16 A	01-Jun-16 A																									
AS505120	Manufacturing, FAT & Delivery of Associated Pipework and Fittings	0	29-Mar-16 A	09-Sep-16 A																									
Install, T&C for Associated Pipework & Fittings (incl. Provision for Health & Safety Requirements)																													
AS506100	Install Associated Pipework and Fittings	0	10-Sep-16 A	23-Sep-16 A																									
AS506200a	Available of New Rising Main to Hung Leng SPS (By Others)	0		11-Apr-17 A																									
AS506220a	Pipe connection to New Rising Main to Hung Leng SPS	0	01-Mar-17 A	27-Mar-17 A																									
Commissioning of the Pumping System																													
AS513100	Site Tests / Functional Test for level control and sensing equipment	0	12-Apr-17 A	11-May-17 A																									
AS513110a	Further Coordination with DSD for Carrying Out Commissioning Test	0	12-May-17 A	05-Jun-17 A																									
AS513120	Commission of the Pumping System	0	06-Jun-17 A	09-Jun-17 A																									
AS513120a	Upload PLC Programme for Modified Pump Control System	0	28-Jul-17 A	28-Jul-17 A																									