


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

**Monthly EM&A Report**

(November 2017)

**Verified by** : Mr. Adi Lee 

**Position** : Independent Environmental Checker

**Date** : 12 July 2018




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

**Monthly EM&A Report**

(November 2017)

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



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

**Date** : 6 July 2018

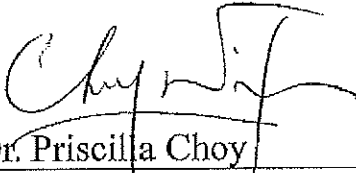




**Drainage Services Department**  
**Advance Works for Shek Wu Hui Sewage  
Treatment Works – Further Expansion Phase 1A**

Monthly EM&A Report

(November 2017)

**Certified by** :   
Dr. Priscilla Choy

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

**Date** : 10 July 2018



## Table of Contents

1.	EXECUTIVE SUMMARY .....	1
1.1	Summary of Major Construction Works taken in the Reporting Period.....	1
1.2	Environmental Monitoring and Audit Activities .....	2
1.3	Environmental Complaint .....	2
1.4	Site Inspection .....	2
1.5	Reporting Changes .....	2
1.6	Future Key Issues .....	3
2.	INTRODUCTION .....	4
2.1	Background .....	4
2.2	Project Programme .....	5
2.3	Purpose of the Report .....	5
2.4	Project Organization.....	6
3.	ENVIRONMENTAL MONITORING AND AUDIT .....	7
4.	WASTE MANAGEMENT .....	9
5.	IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS...	10
6.	CONCLUSION AND RECOMMENDATION .....	11
6.1	Conclusion.....	11
6.2	Recommendation.....	11

### List of Tables

Table 2.1	Summary of Awarded Works Contracts
Table 2.2	Key Project Contacts
Table 3.1	Summary of Major Construction Activities in the Reporting Period
Table 3.2	Summary of 1-Hour TSP Monitoring Results in the Reporting Period
Table 3.3	Summary of 24-Hour TSP Monitoring Results in the Reporting Period
Table 3.4	Summary of Construction Noise Monitoring Results in the Reporting Period
Table 3.5	Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month
Table 4.1	Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract No. DC/2013/09
Table 4.2	Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract No. DE/2014/01
Table 5.1	Summary of Environmental Licenses and Permits for Contract No. DC/2013/09
Table 5.2	Summary of Environmental Licenses and Permits for Contract No. DE/2014/01

### List of Appendices

Appendix A	Monthly EM&A Report for Contract No. DC/2013/09
Appendix B	Monthly EM&A Report for Contract No. DE/2014/01



## **1. EXECUTIVE SUMMARY**

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-01/474/2013 from 1 to 30 November 2017 (the reporting period).

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

- 1.1.1 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>• Dismantle and removal of formwork and temporary metal falsework (At membrane facility building)</li> <li>• Excavation, pipe laying of CLP and E&amp;M cable duct</li> <li>• Construction of plinth and excavation for support of DN900 air main</li> <li>• Remedial Work of Bio-Reactor No.1</li> <li>• Water Tightness Test of pretreatment screen chamber</li> <li>• Installation of pipe support, FRP Baffle Wall and Walkway (At Bioreactor No.1)</li> <li>• Excavation, Installation of sheet pile, Pipelaying for DN1400 RAS Pipe (Near Bioreactor No1)</li> <li>• Plastering, painting and laying tiles for the internal finishing for membrane facilities building</li> <li>• Construction of DN600 air main.</li> <li>• Internal finish for membrane facilities building</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>• Provision of Building Services &amp; Extra Low Voltage Installation for CLP</li> <li>• Transformer Room 'D' &amp; 'Room C'</li> <li>• Provision of Lighting and Small Power Installation for 11kV Switch room</li> <li>• Defect rectification for CLP Transformer Room 'C' &amp; 'Room D'</li> </ul>

## 1.2 Environmental Monitoring and Audit Activities

- 1.2.1 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	10	0	0
Construction Noise	L <sub>Aeq</sub> (30min) Daytime	8	0	0

## 1.3 Environmental Complaint

- 1.3.1 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

## 1.4 Site Inspection

- 1.4.1 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: 9, 16, 23 and 28 November 2017

Contract No. DE/2014/01: 9, 16, 23 and 28 November 2017

- 1.4.2 IEC conducted site audit on 28 November 2017. No environmental non-compliance was identified in the reporting period.

## 1.5 Reporting Changes

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

## 1.6 Future Key Issues

1.6.1 Key issues to be considered in the next reporting period for the Project are as follow:

<b>Works Contract</b>	<b>Major Construction Works</b>	<b>Potential Pollution Issues</b>	<b>Mitigation Measures</b>
DC/2013/09	<ul style="list-style-type: none"> <li>• Dismantle and removal of formwork and temporary metal falsework (At membrane facility building)</li> <li>• Excavation, pipe laying of CLP and E&amp;M cable duct</li> <li>• Installation of Structural gantry at BR1</li> <li>• Remedial Work of Bio-Reactor No.1</li> <li>• Painting of pretreatment screen chamber</li> <li>• Installation of FRP walkway and skimmer at Bioreactor No.1</li> <li>• Excavation, Installation of sheet pile, Pipelaying for DN1400 RAS Pipe (Near Bioreactor No1)</li> <li>• Plastering, painting and laying tiles for the internal finishing for membrane facilities building</li> <li>• Construction of DN900 air main.</li> <li>• Internal and external finishing for membrane facilities building</li> <li>• Installation of falsework and scaffolding at membrane tank.</li> </ul>	<ul style="list-style-type: none"> <li>• Dust impact from excavation work, dusty material handling and during concrete production</li> <li>• Muddy runoff water generated from the dusty material stockpile during rainy days</li> </ul>	<ul style="list-style-type: none"> <li>• Implement dust suppression measures at all times</li> <li>• Implement construction site runoff control practices and measures at all times</li> </ul>
DE/2014/01	<ul style="list-style-type: none"> <li>• Provision of switchboards in LV switch room.</li> <li>• Provision of switchboards in 11kV HV switch room.</li> <li>• Mechanical Installation in MBR Pre-treatment Screen Chamber.</li> <li>• Mechanical Installation in Bioreactor No.1 (BR1).</li> </ul>	<ul style="list-style-type: none"> <li>• Storage of chemicals containers</li> <li>• Waste accumulation</li> <li>• Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Drip tray should be provided to chemical containers</li> <li>• Waste should be disposed properly and avoid accumulation</li> <li>• Accumulated materials to be recycled onsite</li> <li>• Wheel washing should be provided to vehicles before leaving the site area</li> </ul>

## **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.
- 2.1.5 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).
- 2.1.6 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 on 21 November 2013. On 23 January 2014, Further Environmental Permit (FEP) No. FEP-01/474/2013 was issued by EPD to DSD for the further expansion of SWHSTW Phase 1A works.



## 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**

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
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 30 November 2017 (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**

Works Contract	Organization	Role	Name	Tel No.
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. Mo Fong	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-01/474/2013. As per the EP Conditions, EM&A Reports for Works Contract No. DC/2013/09 and No. 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**

Works Contract	Contract Title	Major Construction Works
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>• Dismantle and removal of formwork and temporary metal falsework (At membrane facility building)</li> <li>• Excavation, pipe laying of CLP and E&amp;M cable duct</li> <li>• Construction of plinth and excavation for support of DN900 air main</li> <li>• Remedial Work of Bio-Reactor No.1</li> <li>• Water Tightness Test of pretreatment screen chamber</li> <li>• Installation of pipe support, FRP Baffle Wall and Walkway (At Bioreactor No.1)</li> <li>• Excavation, Installation of sheet pile, Pipelaying for DN1400 RAS Pipe (Near Bioreactor No1)</li> <li>• Plastering, painting and laying tiles for the internal finishing for membrane facilities building</li> <li>• Construction of DN600 air main.</li> <li>• Internal finish for membrane facilities building</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>• Provision of Building Services &amp; Extra Low Voltage Installation for CLP</li> <li>• Transformer Room 'D' &amp; 'Room C'</li> <li>• Provision of Lighting and Small Power Installation for 11kV Switch room</li> <li>• Defect rectification for CLP Transformer Room 'C' &amp; 'Room D'</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 for Contract No. DC/2013/09 were carried out on 9, 16, 23 and 28 November 2017 and for Contract No. DE/2014/01 were carried out on 9, 16, 23 and 28 November 2017 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	40-65	286	500	No
AM2	Fu Tei Au	47-72	276	500	No

Note:

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. 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	12-98	147	260	No
AM2a	RE's Site Office	50-92	155	260	No

Note:

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. DC/2013/09 in accordance with the Updated EM&A Manual.

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

Monitoring Station ID	Location	Noise Level (LAeq,30mins, dB(A))	Action Level (dB(A))	Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
NM1	No. 31 Wai Loi Tsuen	53-55	When one documented complaint is received	>75	No
NM2	Fu Tei Au	48-57		>75	No

Note:

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. 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**

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions
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 No. DC/2013/09**

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Total C&D Materials (Inert) (in '000m <sup>3</sup> )	19.98	0.33	20.31	Tuen Mun 38
Hard Rock and Large Broken Concrete (Inert) (in '000m <sup>3</sup> )	1.61	0.06	1.67	Tuen Mun 38
Reused in this Project (Inert) (in '000m <sup>3</sup> )	3.17	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> )	12.97	0.27	13.23	Tuen Mun 38
Metals (in '000kg)	141.63	0	141.63	--
Paper / Cardboard Packing (in '000kg)	0.02	0	0.02	--
Plastics (in '000kg)	0	0	0	--
Chemical Wastes (in '000kg)	0	0	0	--
General Refuses (in '000m <sup>3</sup> )	0.64	0.13	0.77	NENT

**Table 4.2 Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract No. 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)	0	0	0	--



## 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-01/474/2013. 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 No. DC/2013/09**

Item	Valid License/Permit	License/Permit Number
1	Further Environmental Permit	FEP-01/474/2013
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 No. DE/2014/01**

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

## **6. CONCLUSION AND RECOMMENDATION**

### **6.1 Conclusion**

- 6.1.1 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 30 November 2017 (the reporting period).
- 6.1.2 No Action and Limit Level exceedance of 1-hour and 24-hour TSP monitoring was recorded during the reporting period.
- 6.1.3 No Action and Limit Level exceedance of construction noise monitoring was recorded during the reporting period.
- 6.1.4 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: 9, 16, 23 and 28 November 2017

Contract No. DE/2014/01: 9, 16, 23 and 28 November 2017

- 6.1.5 IEC conducted site audit on 28 November 2017. No environmental non-compliance was identified in the reporting period.
- 6.1.6 No documented complaint, notification of summons or successful prosecution was received during the reporting period.

### **6.2 Recommendation**

- 6.2.1 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 NO. DC/2013/09**



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

26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November 2017

**AUES**

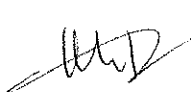

**JOB No.: TCS00757/15**

**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**

**26<sup>TH</sup> MONTHLY ENVIRONMENTAL MONITORING AND  
AUDIT (EM&A) REPORT – NOVEMBER 2017**

**PREPARED FOR**

**TSUN YIP WATERWORKS CONSTRUCTION CO LTD**

Date	Reference No.	Prepared By	Certified By
11 December 2017	TCS00757/15/600/R0108v4	 Martin Li (Assistant Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	8 December 2017	First Submission
2	11 December 2017	Amended against IEC's comments
3	11 December 2017	Amended against IEC's comments
4	11 December 2017	Amended against IEC's comments

**EXECUTIVE SUMMARY**

ES.01 This is the 26<sup>th</sup> Monthly Environmental Monitoring and Audit Report covering the period from 1 to 30 November 2017 (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	30
	24-hour TSP	10
Construction Noise	L <sub>Aeq</sub> (30min) Daytime	8
Inspection / Audit	ET Regular Environmental Site Inspection	4
	IEC Monthly Environmental Site Audit	1

**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 30 November 2017	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 30 November 2017	0	0	NA

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 30 November 2017	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 9, 16, 23 and 28 November 2017. Furthermore, IEC attend site inspection was on 28 November 2017. No non-compliance was noted.

**FUTURE KEY ISSUES**

- ES.08 As dry season is approached, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures properly.
- 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.

**Table of Contents**

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	PROJECT BACKGROUND	1
1.2	REPORT STRUCTURE	2
<b>2</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS</b>	<b>3</b>
2.1	PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE	3
2.2	CONSTRUCTION PROGRESS	3
2.3	SUMMARY OF ENVIRONMENTAL SUBMISSIONS	3
<b>3</b>	<b>SUMMARY OF IMPACT MONITORING REQUIREMENT</b>	<b>4</b>
3.1	GENERAL	4
3.2	MONITORING PARAMETERS	4
3.3	MONITORING LOCATIONS	4
3.4	MONITORING FREQUENCY AND PERIOD	4
3.5	MONITORING EQUIPMENT	5
3.6	DETERMINATION OF ACTION/LIMIT (A/L) LEVELS	6
3.7	EVENT ACTION PLAN	6
<b>4</b>	<b>MONITORING METHDOLOGY</b>	<b>7</b>
4.1	AIR QUALITY MONITORING	7
4.2	CONSTRUCTION NOISE MONITORING	8
4.3	DATA MANAGEMENT AND DATA QA/QC CONTROL	8
<b>5</b>	<b>IMPACT MONITORING RESULTS</b>	<b>9</b>
5.1	GENERAL	9
5.2	RESULTS OF AIR QUALITY MONITORING	9
5.3	RESULTS OF CONSTRUCTION NOISE MONITORING	10
<b>6</b>	<b>WASTE MANAGEMENT</b>	<b>11</b>
6.1	GENERAL WASTE MANAGEMENT	11
6.2	RECORDS OF WASTE QUANTITIES	11
<b>7</b>	<b>SITE INSPECTION</b>	<b>12</b>
7.1	REQUIREMENTS	12
7.2	FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH	12
<b>8</b>	<b>ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE</b>	<b>14</b>
8.1	ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION	14
<b>9</b>	<b>IMPLEMENTATION STATUS OF MITIGATION MEASURES</b>	<b>15</b>
9.1	GENERAL REQUIREMENTS	15
9.2	TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH	15
9.3	KEY ISSUES FOR THE COMING MONTH	16
<b>10</b>	<b>CONCLUSIONS AND RECOMMENTATIONS</b>	<b>17</b>
10.1	CONCLUSIONS	17
10.2	RECOMMENDATIONS	17

**LIST OF TABLES**

TABLE 2-1	STATUS OF ENVIRONMENTAL LICENSES AND PERMITS
TABLE 3-1	SUMMARY OF EM&A REQUIREMENTS
TABLE 3-2	PROPOSED AIR QUALITY AND CONSTRUCTION NOISE MONITORING LOCATIONS
TABLE 3-3	AIR QUALITY MONITORING EQUIPMENT
TABLE 3-4	CONSTRUCTION NOISE MONITORING EQUIPMENT
TABLE 3-5	ACTION AND LIMIT LEVELS FOR 24-HR TSP AND 1-HR TSP AIR QUALITY, $\mu\text{g}/\text{m}^3$
TABLE 3-6	ACTION AND LIMIT LEVELS FOR CONSTRUCTION NOISE
TABLE 5-1	SUMMARY OF 1-HOUR TSP MONITORING RESULTS, $\mu\text{g}/\text{m}^3$
TABLE 5-2	SUMMARY OF 24-HOUR TSP MONITORING RESULTS, $\mu\text{g}/\text{m}^3$
TABLE 5-3	SUMMARY OF CONSTRUCTION NOISE MONITORING RESULTS, dB(A)
TABLE 6-1	SUMMARY OF QUANTITIES OF INERT C&D MATERIALS FOR THE PROJECT
TABLE 6-2	SUMMARY OF QUANTITIES OF C&D WASTES FOR THE PROJECT
TABLE 7-1	SITE OBSERVATIONS
TABLE 8-1	STATISTICAL SUMMARY OF ENVIRONMENTAL COMPLAINTS
TABLE 8-2	STATISTICAL SUMMARY OF ENVIRONMENTAL SUMMONS
TABLE 8-3	STATISTICAL SUMMARY OF ENVIRONMENTAL PROSECUTION
TABLE 9-1	ENVIRONMENTAL MITIGATION MEASURES

**LIST OF APPENDICES**

APPENDIX A	GENERAL LAYOUT OF ADVANCE WORKS AND MAIN WORKS OF SWHSTW FURTHER EXPANSION PHASE 1A
APPENDIX B	LAYOUT PLAN OF THE CONTRACT
APPENDIX C	ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES
APPENDIX D	3-MONTH ROLLING PROGRAM OF THE PROJECT
APPENDIX E	PROPOSED MONITORING LOCATIONS
APPENDIX F	EVENT ACTION PLAN
APPENDIX G	VALID CALIBRATION CERTIFICATES
APPENDIX H	IMPACT MONITORING SCHEDULE
APPENDIX I	24-HOUR TSP AND CONSTRUCTION NOISE MONITORING DATA
APPENDIX J	GRAPHICAL PLOTS
APPENDIX K	METEOROLOGICAL DATA DURING THE REPORTING MONTH
APPENDIX L	MONTHLY SUMMARY WASTE FLOW TABLE
APPENDIX M	IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)



## **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 degritting 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-01/474/2013 (hereinafter referred as “the FEP-01/474/2013” 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 **26<sup>th</sup> Monthly EM&A Report** presenting the monitoring results and inspection findings for the reporting period from **1 to 30 November 2017**.

## **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 STATUSES 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:-

- Dismantle and removal of formwork and temporary metal falsework (At membrane facility building)
- Excavation, pipe laying of CLP and E&M cable duct
- Construction of plinth and excavation for support of DN900 air main
- Remedial Work of Bio-Reactor No.1
- Water Tightness Test of pretreatment screen chamber
- Installation of pipe support, FRP Baffle Wall and Walkway (At Bioreactor No.1)
- Excavation, Installation of sheet pile , Pipelaying for DN1400 RAS Pipe (Near Bioreactor No1)
- Plastering, painting and laying tiles for the internal finishing for membrane facilities building
- Construction of DN600 air main.
- Internal finish for membrane facilities building

### 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

2.1.4 In accordance with the Further EP No. FEP-01/474/2013 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-3 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 m s<sup>-1</sup>.
- 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- 31&52
Calibrator	Rion NC – 74 / B&k 4231
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-3 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.
4-Nov-17	9:33	54	61	65	9:46	56	62	68
10-Nov-17	9:48	43	48	50	13:28	51	57	59
16-Nov-17	9:26	52	47	49	13:21	55	50	51
22-Nov-17	9:45	46	59	54	13:09	60	72	68
28-Nov-17	9:34	41	40	43	13:11	47	49	53
Average (Range)	50 (40 - 65)				57 (47 - 72)			

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

Date	AM1	AM2a
2-Nov-17	98	92
8-Nov-17	50	67
14-Nov-17	58	87
20-Nov-17	12	50
25-Nov-17	69	70
Average (Range)	57 (12 - 98)	74 (50 - 92)

- 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	( $L_{eq30min}$ )
10-Nov-17	9:56	55	13:34	48
16-Nov-17	9:37	54	13:27	48
22-Nov-17	9:59	55	13:10	50
28-Nov-17	9:39	53	13:20	57
<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> )	19.98	0.33	20.31	--
Hard Rock and Large Broken Concrete (Inert) (in '000 m <sup>3</sup> )	1.61	0.06	1.67	Tuen Mun 38
Reused in this Project (Inert) (in '000 m <sup>3</sup> )	3.17	0	3.17	--
Reused in other Projects (Inert) (in '000 m <sup>3</sup> )	2.23	0	2.23	CV/2015/03*
Disposal as Public Fill (Inert) (in '000 m <sup>3</sup> )	12.97	0.27	13.23	Tuen Mun 38

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

\* Contract No. CV/2015/03 Site Formation and Infrastructural Works near Tong Hang Road and Tsz Tin Road in Area 54, Tuen Mun

**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)	141.63	0	141.63	Licensed Collector
Paper / Cardboard Packing ('000kg)	0.02	0	0.02	Paper Recyclers
Plastics ('000kg)	0	0	0	--
Chemical Wastes ('000kg)	0	0	0	--
General Refuses ('000m <sup>3</sup> )	0.64	0.13	0.77	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 **9, 16, 23 and 28 November 2017**. Furthermore, IEC attend site inspection was on **28 November 2017**. 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**

Date	Findings / Deficiencies	Follow-Up Status
31 October 2017	<ul style="list-style-type: none"> <li>Dry unpaved haul road near main building was observed. The Contractor was advised to spray water regularly to avoid dust emission.</li> <li>General waste was observed near BR1. The Contractor was advised to dispose the waste regularly.</li> </ul>	<ul style="list-style-type: none"> <li>Water spraying was implemented within site area. Last observation closed.</li> <li>General waste was disposed. Last observation closed.</li> </ul>
9 November 2017	<ul style="list-style-type: none"> <li>Empty cement bags was observed on the ground floor of mainbuilding. The Contractor was advised to place empty cement bags inside garbage bags.</li> </ul>	<ul style="list-style-type: none"> <li>Empty cement bags was disposed regularly. Last observation closed.</li> </ul>
16 November 2017	<ul style="list-style-type: none"> <li>Broken concrete was observed on the ground near main building. The Contractor was advised to dispose of it regularly.</li> <li>The Contractor was reminded to clean the stagnant water on the roof of main building after raining.</li> </ul>	<ul style="list-style-type: none"> <li>Broken concrete was disposed. Last observation closed.</li> <li>Not required for reminder.</li> </ul>
23 November 2017	<ul style="list-style-type: none"> <li>Empty cement bags was observed on the ground floor of mainbuilding. The Contractor was advised to place it inside garbage bags to avoid dust emission.</li> <li>The Contractor was reminded to spray larvicidal oil on main building.</li> </ul>	<ul style="list-style-type: none"> <li>Empty cement bags at mainbuilding was disposed. Last observation closed.</li> <li>Not required for reminder.</li> </ul>
28 November 2017	<ul style="list-style-type: none"> <li>Chemical containers were observed on the ground near BR 1. The Contractor was advised to place chemical containers inside drip tray.</li> <li>Empty cement bags were observed at BR 1. The Contractor was advised to dispose of it regularly</li> </ul>	<ul style="list-style-type: none"> <li>To be followed.</li> <li>To be followed.</li> </ul>

Date	Findings / Deficiencies	Follow-Up Status
	and place inside garbage bags. <ul style="list-style-type: none"><li>The Contractor was reminded to dispose accumulation of construction waste near main building regularly.</li></ul>	<ul style="list-style-type: none"><li>To be followed.</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 30 November 2017	0	0	NA

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

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 30 November 2017	0	0	NA

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

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 30 November 2017	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 Contractor 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.

- Dismantle and removal of formwork and temporary metal falsework (At membrane facility building)
- Excavation, pipe laying of CLP and E&M cable duct
- Installation of Structural gantry at BR1
- Remedial Work of Bio-Reactor No.1
- Painting of pretreatment screen chamber
- Installation of FRP walkway and skimmer at Bioreactor No.1
- Excavation, Installation of sheet pile , Pipelaying for DN1400 RAS Pipe (Near Bioreactor No1)
- Plastering, painting and laying tiles for the internal finishing for membrane facilities building
- Construction of DN900 air main.
- Internal and external finishing for membrane facilities building
- Installation of falsework and scaffolding at membrane tank.



**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; and

## **10 CONCLUSIONS AND RECOMMENDATIONS**

### **10.1 CONCLUSIONS**

- 10.1.1 This is the 26<sup>th</sup> Monthly EM&A report, covering the construction period from **1 to 30 November 2017**.
- 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 **9, 16, 23 and 28 November 2017**. Furthermore, IEC attend site inspection was on **28 November 2017**. No non-compliance was noted.

### **10.2 RECOMMENDATIONS**

- 10.2.1 As dry season has approached, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures properly.
- 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.

*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*

*26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November  
2017*

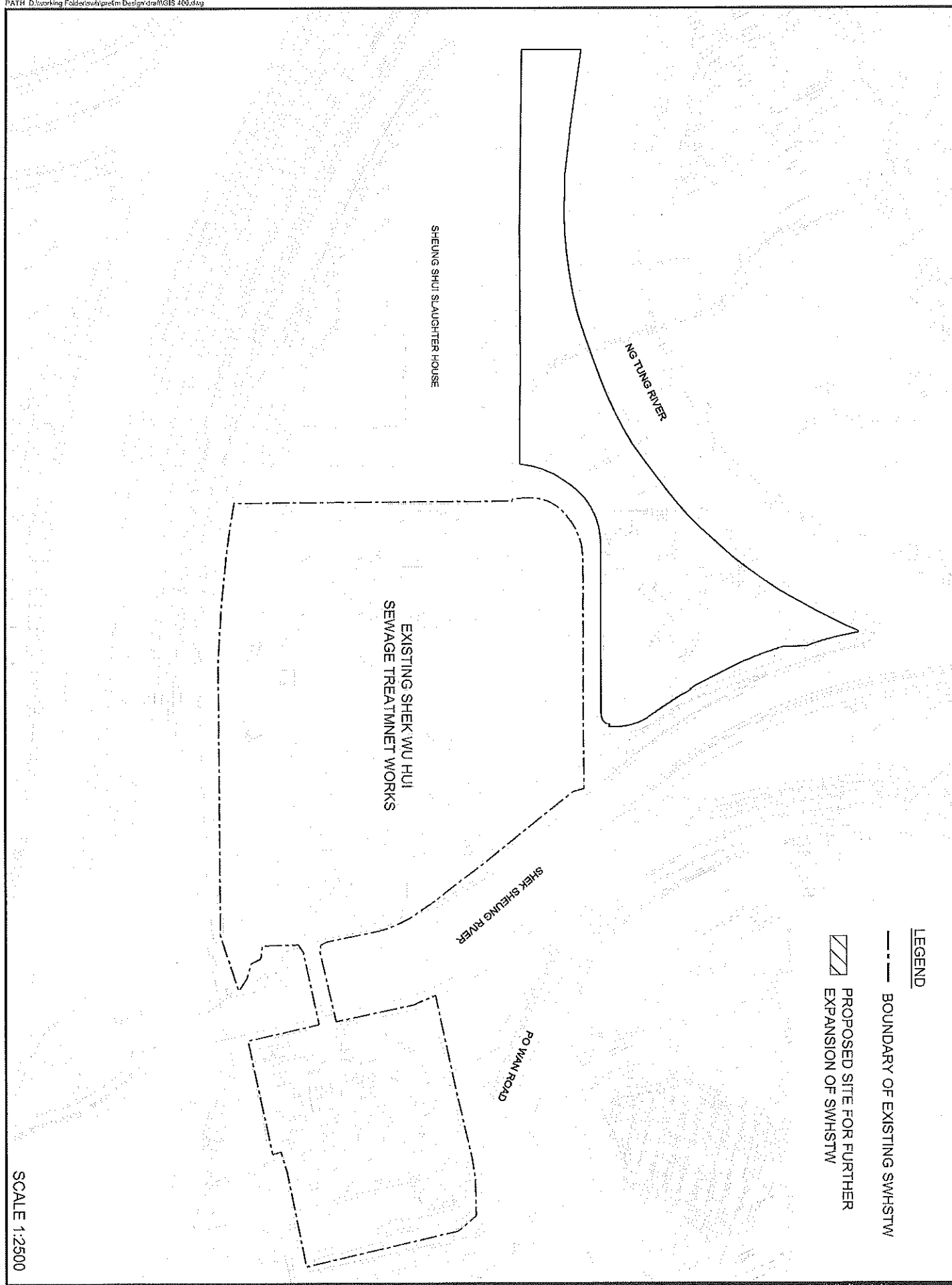
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## **Appendix A**

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



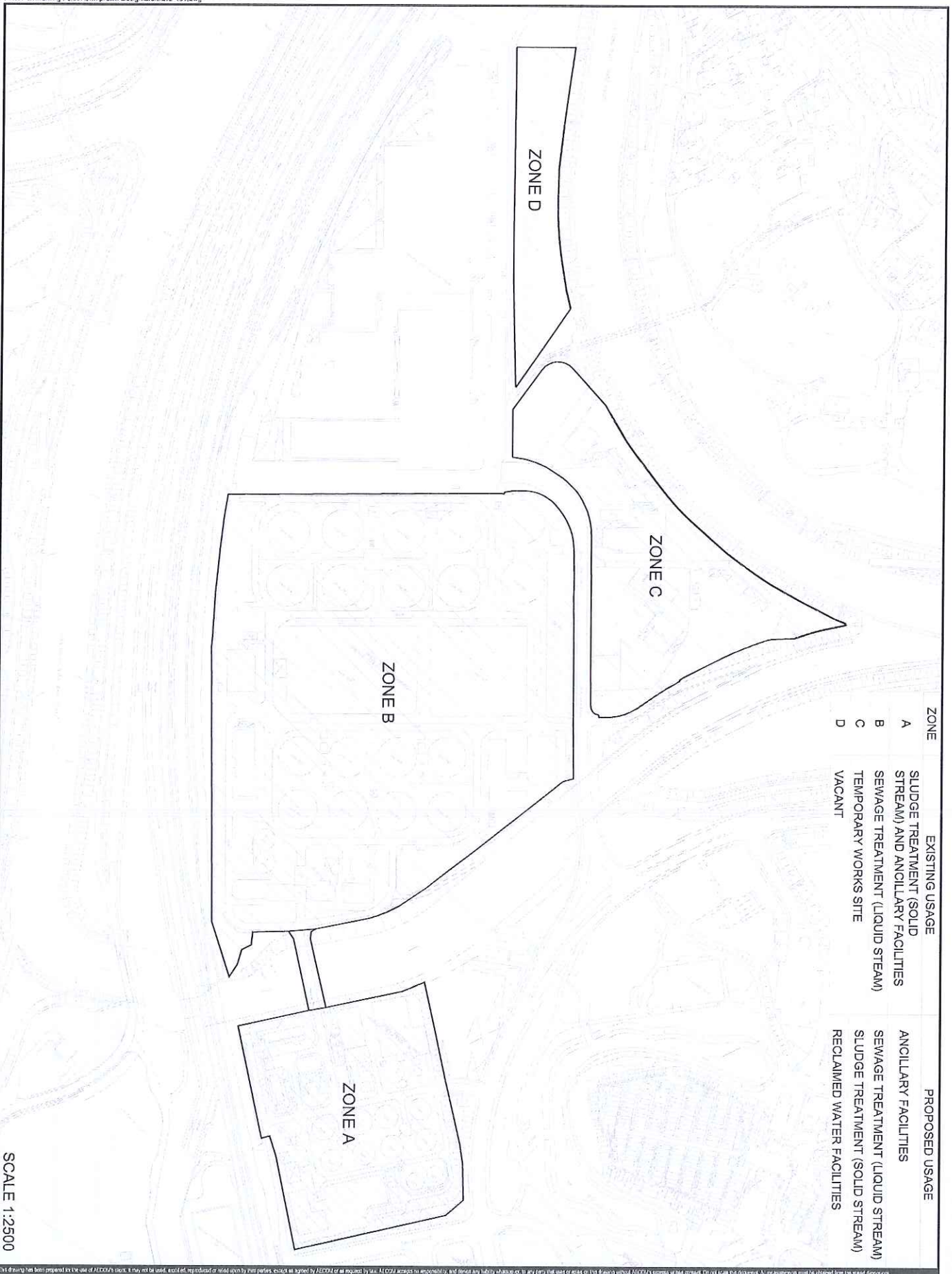


**LEGEND**

--- BOUNDARY OF EXISTING SWHSTW

▨ PROPOSED SITE FOR FURTHER  
 EXPANSION OF SWHSTW

SCALE 1:2500



SCALE 1:2500

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

PREFERRED SITE UTILIZATION  
 ACCORDING TO BRIEF

**AECOM**

Project No.: 60284037 Date: FEB. 2014

Drawing 60284037/EM&AM/401



*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*

*26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November  
2017*

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## **Appendix B**

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





[illegible]

 SITE BOUNDARY  
 GAS HIGH AREA  
 EXISTING STRUC  
 EXISTING STRUC  
 PROPOSED STRUC  
 PORTION A OF

REVISION			
DATE	DESCRIPTION	REVISION	DATE
	DESIGNED	W. J. HAY	12 DEC 2011
	DRAWN	L. L. DICK	12 DEC 2011
	REWORKED	W. J. HAY	12 DEC 2011
	TESTED	W. J. HAY	12 DEC 2011

Contract No	DC/2013/05
Lot No	SP8/4388DS
Order No	4388DS
Contract	


DVANCE WORKS FOR SHEK WU HUI  
EWAGE TREATMENT WORKS -  
URTHER EXPANSION PHASE 1A AND  
EWERAGE WORKS AT PING CHE ROAD

### IMPLICATIONS OF THE SITE

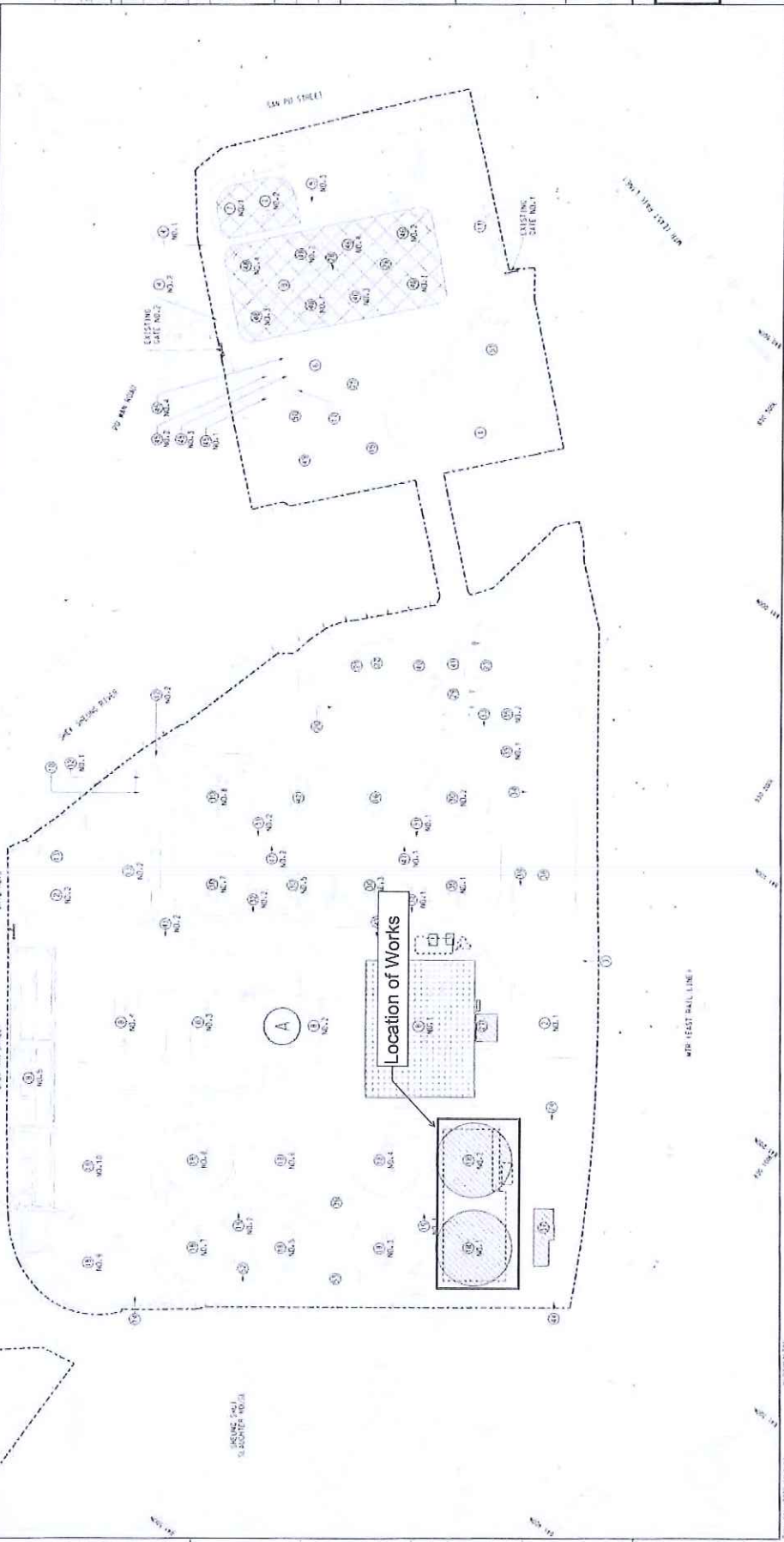
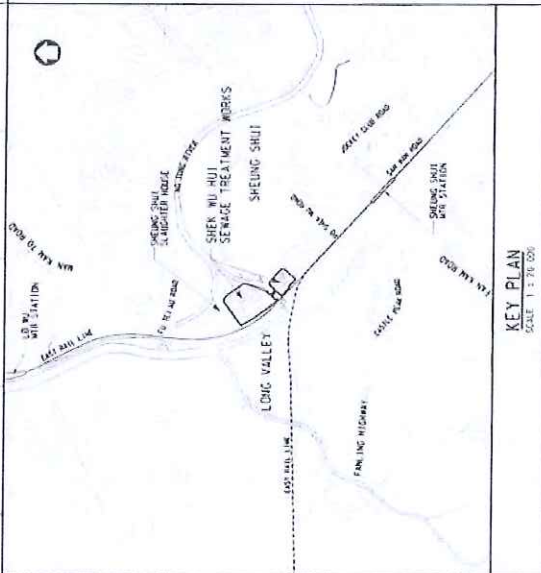
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SEWERAGE PROJECTS DIVISION



DRAINAGE SERVICES DEPARTMENT  
GOVERNMENT OF THE  
HONG KONG  
SPECIAL ADMINISTRATIVE REGION



*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*

*26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November  
2017*

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## **Appendix C**

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







WATERWORKS CONSTRUCTION COMPANY LIMITED

# Tsun Yip Waterworks Construction Company Limited 進業水務建築有限公司

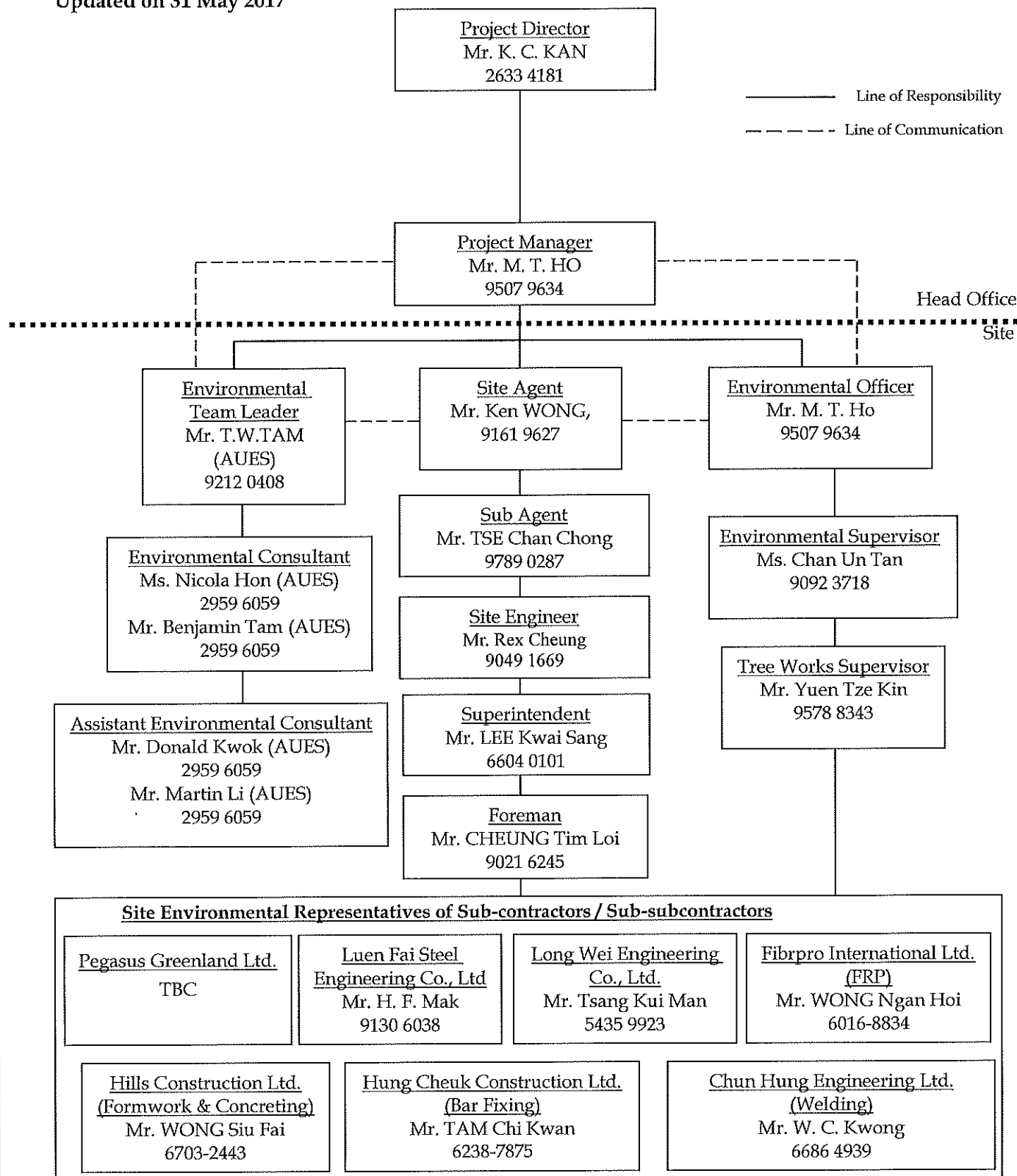
Contract No. DC/2013/09

*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**

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
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

*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*

*26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November  
2017*

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## **Appendix D**

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



Item	Description	Duration (Days)	% of Completion	Start	Finished
<b>Shek Wu Hui Sewage Treatment Works - Section II</b>					
1	Modification of Borecoster 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 Structural Gantry	30	0%	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	70%	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	90%	01/11/17	14/11/17
2.2	Erection of Formwork for the concrete plinths	14	90%	15/11/17	28/11/17
2.3	Concreting for the concrete plinths	3	90%	29/11/17	01/12/17
2.4	Water Tightness Test for the Permeate Storage Tank	14	0%	02/12/17	15/12/17
2.5	G/F Internal Finishing	39	100%	25/09/17	02/11/17
2.5.1	Installation of Trench Support and Cover	14	80%	25/09/17	08/10/17
2.5.2	Plastering	14	100%	25/09/17	08/10/17
2.5.3	Tiling	7	90%	09/10/17	15/10/17
2.5.4	Painting	14	90%	16/10/17	29/10/17
2.5.5	Floor Screeding	4	50%	30/10/17	02/11/17
2.6	Basement Internal Finishing	25	100%	06/11/17	30/11/17
2.6.1	Plastering	7	50%	06/11/17	12/11/17
2.6.2	Tiling	7	60%	13/11/17	19/11/17
2.6.3	Painting	7	0%	20/11/17	26/11/17
2.6.4	Floor Screeding	4	0%	27/11/17	30/11/17
2.7	First Floor Internal Finishing	25	100%	01/12/17	25/12/17
2.7.1	Plastering	7	20%	01/12/17	07/12/17
2.7.2	Tiling	7	0%	08/12/17	14/12/17
2.7.3	Painting	7	20%	15/12/17	21/12/17
2.7.4	Floor Screeding	4	0%	22/12/17	25/12/17



Item	Description	Duration (Days)	% of Completion	Start	Finished
3	Membrane Tank	46		04/12/17	18/01/18
3.1	Water Tightness Test	7	0%	04/12/17	10/12/17
3.2	Erection of falsework and working platform for column and maintenance platform construction	7	0%	04/12/17	10/12/17
3.3	Rebar Fixing for the column & slab (level up to +1.00mPD)	7	0%	11/12/17	17/12/17
3.4	Erection of formwork for the column & slab	7	0%	18/12/17	24/12/17
3.5	Concreting for the column & slab	1	0%	25/12/17	25/12/17
3.6	Curing of Concrete and Dismantle of Formwork	14	0%	26/12/17	08/01/18
3.7	Dismantle of Falsework & Working Platform	7	0%	09/01/18	15/01/18
3.8	Installation of FRP handrailing & construction of maintenance platform	10	0%	09/01/18	18/01/18
3.9	Painting Waterproofing lining of Wall and Floor of BR1	21	0%	20/12/17	09/01/18
4	Flow Meter Chamber	59		15/10/17	13/12/17
4.1	Excavation and ELS Installation	20	100%	15/10/17	03/11/17
4.2	Concreting the blinding layer	3	100%	04/11/17	06/11/17
4.3	Rebar Fixing for the base slab	7	100%	07/11/17	13/11/17
4.4	Concreting for the base slab	1	100%	14/11/17	14/11/17
4.5	Installation of the dummy pipe	2	100%	15/11/17	16/11/17
4.6	Installation of formwork	5	100%	17/11/17	21/11/17
4.7	Rebar Fixing for the wall	7	80%	22/11/17	28/11/17
4.8	Installation of internal formwork	4	0%	29/11/17	02/12/17
4.9	Concreting for the wall	1	0%	03/12/17	03/12/17
4.10	Removal of sump pile and backfilling	10	100%	04/12/17	13/12/17
5	VO (10 - Construction of CLP Cable Duct and Draw Pit (Membrane Building to CLP connection point) 170m	#REF!		20/04/17	#REF!
5.1	Excavation and Installation of sump pile	90	100%	20/04/17	18/07/17
5.2	HDPE Cable Duct Pipelaying	65	100%	19/07/17	21/09/17
5.3	Construction of Cable Draw Pit	70	100%	22/09/17	30/11/17



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Legend

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 November 2017

Item	Description	Duration (Days)	% of Completion	Start	Finished	Nov-2017	Dec-2017	Jan-2018	Feb-2018
1	Act 150mm Cable Duct Installation and Draw Pit Construction	557	24%	22/05/16	30/12/17				
1.1	V.O.2 - Duct Laying (FST6 to FST6 - 69m)	58	100.0%	22/05/16	18/08/16				
1.2	V.O.12 - Remaining CLP cable duct laying (MFB to Compressor Room)	90	0.0%	20/09/17	19/12/17				
1.3	V.O.12 - Remaining cable duct laying (MFB to Compressor Room)	90	25.0%	24/06/17	21/09/17				
1.4	V.O.12 - Remaining Duct Laying (MFB to FST No.3)	50	0.0%	11/11/17	30/12/17				
1.5	V.O.12 - Remaining Duct Laying (outside BRT to MT)	90	20.0%	22/09/17	20/12/17				

*Legend*

In Progress
Completed

*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*

*26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November  
2017*

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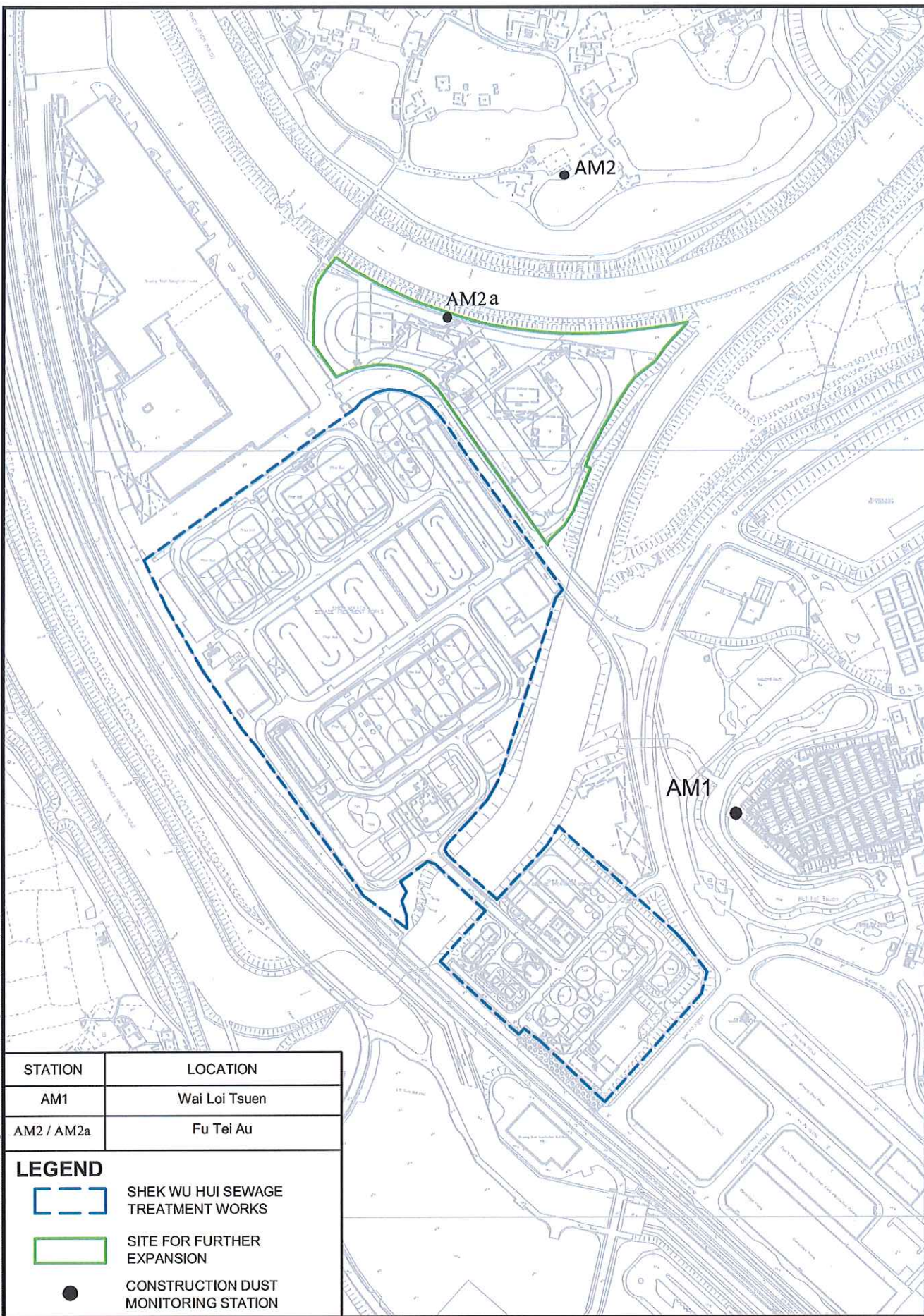
**AUES**

## **Appendix E**

### **PROPOSED MONITORING LOCATIONS**










STATION	LOCATION
AM1	Wai Loi Tsuen
AM2 / AM2a	Fu Tei Au

	SHEK WU HUI SEWAGE TREATMENT WORKS
	SITE FOR FURTHER EXPANSION
	CONSTRUCTION DUST MONITORING STATION



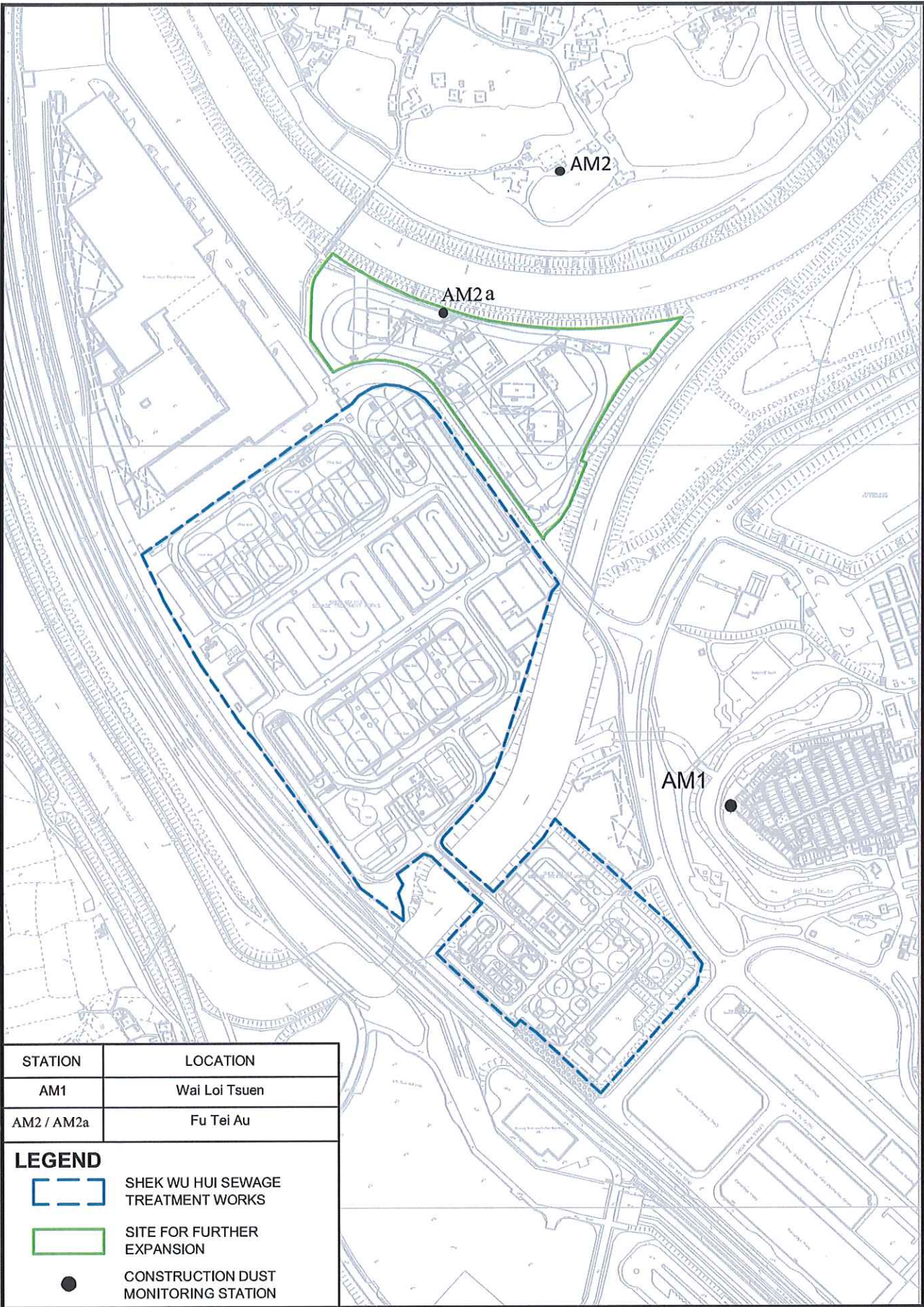


ISO A4 210mm x 297mm

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Project Management Initials:

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STATION	LOCATION
AM1	Wai Loi Tsuen
AM2 / AM2a	Fu Tei Au

	SHEK WU HUI SEWAGE TREATMENT WORKS
	SITE FOR FURTHER EXPANSION
	CONSTRUCTION DUST MONITORING STATION

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**

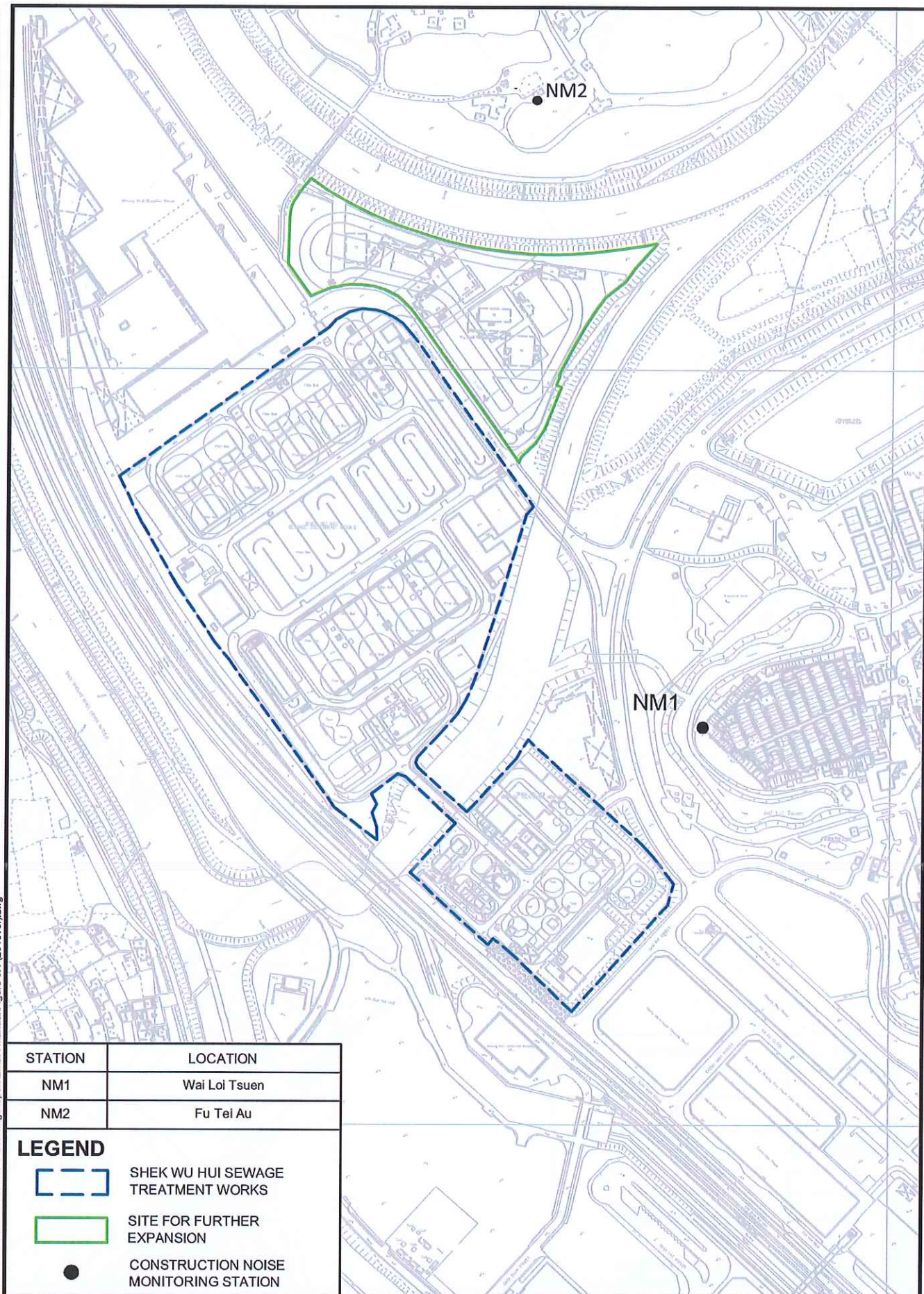


Plot File by: Shumyl  
PATH P:\60284037\1.0\ICAD\Drawing\Report\EM&A Manual\Figure 3.1 (2010ver).dwg  
25/02/2014

Project Management Initials:

Checked:

ISO A4 210mm x 297mm



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

**LOCATIONS OF CONSTRUCTION NOISE  
MONITORING STATIONS**

**AECOM**

Drawing No.

60284037/EM&AM/407

Project No.: 60284037 Date: FEB. 2014

*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*

*26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November 2017*

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**AUES**

## **Appendix F**

### **EVENT ACTION PLAN**



**Event and Action Plan for Construction Dust**

Event	Action				Contractor
	ET	IEC	ER		
Action level being exceeded by one sampling	1. Identify source, investigate the causes of complaint 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.	
Action level being exceeded by two or more consecutive sampling	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 in 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.	
Limit level being exceeded by one sampling	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 exceedance 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 three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.	
Limit level being exceeded by two or more consecutive sampling	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 taken; 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 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, 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 three 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.	



## 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>



*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  
26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November  
2017*

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**AUES**

## **Appendix G**

### **VALID CALIBRATION CERTIFICATES**



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : No. 31 Wai Loi Tsuen

Date of Calibration: 1-Nov-17

Location ID : AM1

Next Calibration Date: 1-Jan-18

Technician: Fai So

### CONDITIONS

Sea Level Pressure (hPa)

1017.2

Corrected Pressure (mm Hg)

762.9

Temperature (°C)

23.0

Temperature (K)

296

### CALIBRATION ORIFICE

Make-> TISCH

Qstd Slope ->

2.11965

Model-> 5025A

Qstd Intercept ->

-0.02696

Serial # -> 1941

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.00	6.20	12.2	1.669	51	51.44	Slope = 23.7849 Intercept = 11.1108 Corr. coeff. = 0.9986
13	5.00	5.50	10.5	1.550	47	47.41	
10	3.90	4.20	8.1	1.363	43	43.37	
7	2.10	2.10	4.2	0.985	34	34.29	
5	1.70	1.00	2.7	0.792	30	30.26	

#### Calculations :

$$Q_{std} = 1/m[\text{Sqrt}(H2O(Pa/P_{std})(T_{std}/T_a))-b]$$

$$IC = I[\text{Sqrt}(Pa/P_{std})(T_{std}/T_a)]$$

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:

$$1/m((I) [\text{Sqrt}(298/T_{av})(P_{av}/760)]-b)$$

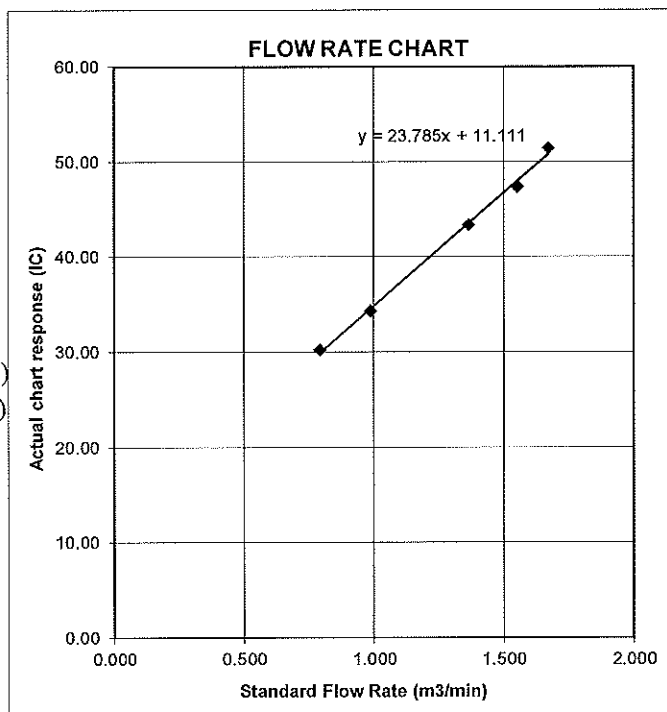
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : RE's Site Office		Date of Calibration: 1-Nov-17					
Location ID : AM2a		Next Calibration Date: 1-Jan-18					
Technician: Fai So							
<b>CONDITIONS</b>							
Sea Level Pressure (hPa)	1017.2	Corrected Pressure (mm Hg)	762.9				
Temperature (°C)	23.0	Temperature (K)	296				
<b>CALIBRATION ORIFICE</b>							
Make->	TISCH	Qstd Slope ->	2.11965				
Model->	5025A	Qstd Intercept ->	-0.02696				
Serial # ->	1941						
<b>CALIBRATION</b>							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.90	6.40	12.3	1.676	53	53.46	Slope = 27.0571 Intercept = 7.2389 Corr. coeff. = 0.9979
13	5.40	5.10	10.5	1.550	48	48.42	
10	4.00	4.00	8.0	1.354	43	43.37	
7	2.20	2.00	4.2	0.985	34	34.29	
5	1.30	1.30	2.6	0.777	28	28.24	
<b>Calculations :</b> $Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$ $IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$  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 )  <b>For subsequent calculation of sampler flow:</b> $1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)]-b)$  m = sampler slope b = sampler intercept I = chart response Tav = daily average temperature Pav = daily average pressure							

**FLOW RATE CHART**

Standard Flow Rate (m3/min)	Actual chart response (I)
0.8	28.24
1.0	34.29
1.3	43.37
1.5	48.42
1.7	53.46



TISCH ENVIRONMENTAL, INC.  
 145 SOUTH MIAMI AVE  
 VILLAGE OF CLEVELAND, OH  
 45002  
 513.467.9000  
 877.263.7610 TOLL FREE  
 513.467.9009 FAX

# ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Feb 28, 2017 Rootsmeter S/N 0438320 Ta (K) - 294  
 Operator Tisch Orifice I.D. - 1941 Pa (mm) - 750.57

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4600	3.2	2.00
2	NA	NA	1.00	1.0410	6.4	4.00
3	NA	NA	1.00	0.9280	7.9	5.00
4	NA	NA	1.00	0.8840	8.7	5.50
5	NA	NA	1.00	0.7290	12.7	8.00

## DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
0.9967	0.6827	1.4149	0.9957	0.6820	0.8851
0.9925	0.9534	2.0010	0.9915	0.9524	1.2517
0.9904	1.0672	2.2372	0.9894	1.0661	1.3995
0.9894	1.1192	2.3464	0.9884	1.1181	1.4678
0.9840	1.3499	2.8299	0.9830	1.3485	1.7702
Qstd slope (m) = 2.11965			Qa slope (m) = 1.32729		
intercept (b) = -0.02696			intercept (b) = -0.01686		
coefficient (r) = 0.99991			coefficient (r) = 0.99991		
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

## CALCULATIONS

$$Vstd = \text{Diff. Vol}[(Pa - \text{Diff. Hg})/760] (298/Ta)$$

$$Qstd = Vstd/\text{Time}$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg})/Pa]$$

$$Qa = Va/\text{Time}$$

For subsequent flow rate calculations:

$$Qstd = 1/m\{[\text{SQRT}(\text{H2O}(\text{Pa}/760) (298/\text{Ta}))] - b\}$$

$$Qa = 1/m\{[\text{SQRT} \text{H2O}(\text{Ta}/\text{Pa})] - b\}$$

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



### SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1725634
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	: 16-JUN-2017
		DATE OF ISSUE	: 20-JUN-2017
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.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

### Signatories

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

Signatories

Position

PP 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 : HK1725634  
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.
HK1725634-001	S/N: 456662	AIR	16-JUN-2017	S/N: 456662

## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 456662  
Equipment Ref: EQ118  
Job Order HK1725634

### Standard Equipment:

Standard Equipment: Higher Volume Sampler  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 23 February 2017

### Equipment Verification Results:

Calibration Date: 11 & 12 May 2017

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)
2hr16min	10:10 ~ 12:26	27.5	1013.8	0.034	2014	14.8
2hr19min	12:30 ~ 14:49	27.5	1013.8	0.036	2355	16.9
2hr13min	11:15 ~ 13:28	27.5	1010.9	0.029	1841	13.9

Sensitivity Adjustment Scale Setting (Before Calibration) 597 (CPM)

Sensitivity Adjustment Scale Setting (After Calibration) 597 (CPM)

### Linear Regression of Y or X

Slope (K-factor): 0.0022

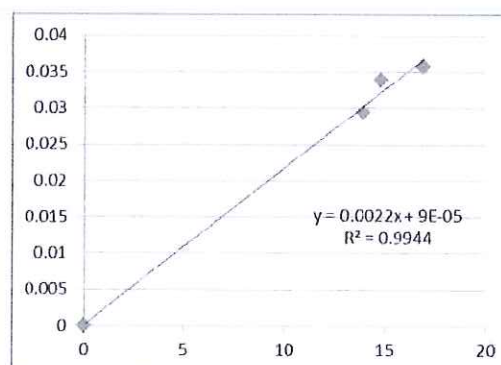
Correlation Coefficient (R) 0.9972

Date of Issue 15 May 2017

### 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: 15 May 2017

QC Reviewer: Ben Tam Signature:  Date: 15 May 2017

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung		Date of Calibration: 23-Feb-17	
Location ID : Calibration Room		Next Calibration Date: 23-May-17	

CONDITIONS			
Sea Level Pressure (hPa)	1017.4	Corrected Pressure (mm Hg)	763.05
Temperature (°C)	17.9	Temperature (K)	291

CALIBRATION ORIFICE			
Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.797	56	56.79	Slope = 36.1509 Intercept = -8.0555 Corr. coeff. = 0.9984
13	5	5	10.0	1.616	49	49.69	
10	3.8	3.8	7.6	1.410	43	43.61	
8	2.4	2.4	4.8	1.124	33	33.47	
5	1.4	1.4	2.8	0.862	22	22.31	

**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**

Standard Flow Rate (m3/min)	Actual chart response (I)
0.862	22.31
1.124	33.47
1.410	43.61
1.616	49.69
1.797	56.79

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



### SUB-CONTRACTING REPORT


CONTACT	: MR BEN TAM	WORK ORDER	: HK1716583
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	: 20-APR-2017
		DATE OF ISSUE	: 25-APR-2017
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.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

### 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

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Tel. +852 2610 1044 Fax. +852 2610 2021 [www.alsglobal.com](http://www.alsglobal.com)

WORK ORDER : HK1716583  
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.
HK1716583-001	S/N: 456660	AIR	20-APR-2017	S/N: 456660

## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 456660  
Equipment Ref: EQ117  
Job Order HK1716583

### Standard Equipment:

Standard Equipment: Higher Volume Sampler  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 23 February 2017

### Equipment Verification Results:

Calibration Date: 16 March 2017

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)
2hr02min	09:58 ~ 12:00	17.8	1016.4	0.037	2059	16.9
2hr07min	12:05 ~ 14:12	17.8	1016.4	0.031	1589	12.5
2hr02min	14:20 ~ 16:22	17.8	1016.4	0.026	1197	9.8

Sensitivity Adjustment Scale Setting (Before Calibration) 610 (CPM)

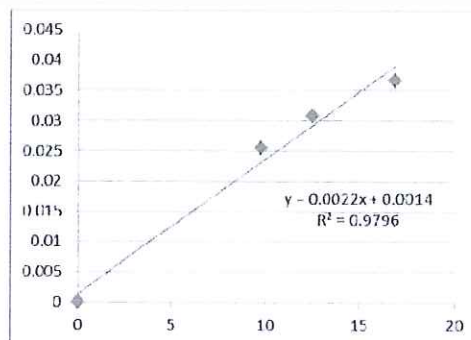
Sensitivity Adjustment Scale Setting (After Calibration) 610 (CPM)

### Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient (R) 0.9897

Date of Issue 20 March 2017



### 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 : 20 March 2017

QC Reviewer : Ben Tam Signature :  Date : 20 March 2017



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration: 23-Feb-17
Location ID :	Calibration Room	Next Calibration Date: 23-May-17

CONDITIONS			
Sea Level Pressure (hPa)	1017.4	Corrected Pressure (mm Hg)	763.05
Temperature (°C)	17.9	Temperature (K)	291

CALIBRATION ORIFICE			
Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.797	56	56.79	Slope = 36.1509 Intercept = -8.0555 Corr. coeff. = 0.9984
13	5	5	10.0	1.616	49	49.69	
10	3.8	3.8	7.6	1.410	43	43.61	
8	2.4	2.4	4.8	1.124	33	33.47	
5	1.4	1.4	2.8	0.862	22	22.31	

**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:**

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

m = sampler slope  
 b = sampler intercept  
 I = chart response  
 Tav = daily average temperature  
 Pav = daily average pressure

**FLOW RATE CHART**

Standard Flow Rate (m3/min)	Actual chart response (IC)
0.862	22.31
1.124	33.47
1.410	43.61
1.616	49.69
1.797	56.79

# ALS Technichem (HK) Pty Ltd

## ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



### SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1716578
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	: 20-APR-2017
		DATE OF ISSUE	: 25-APR-2017
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.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

### 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

1/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

WORK ORDER : HK1716578  
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.
HK1716578-001	S/N: 366418	AIR	20-APR-2017	S/N: 366418

## Equipment Verification Report (TSP)

### Equipment Calibrated:

Type: Laser Dust monitor  
Manufacturer: Sibata LD-3B  
Serial No. 366418  
Equipment Ref: EQ108  
Job Order HK1716578

### Standard Equipment:

Standard Equipment: Higher Volume Sampler  
Location & Location ID: AUES office (calibration room)  
Equipment Ref: HVS 018  
Last Calibration Date: 23 February 2017

### Equipment Verification Results:

Calibration Date: 16 March 2017

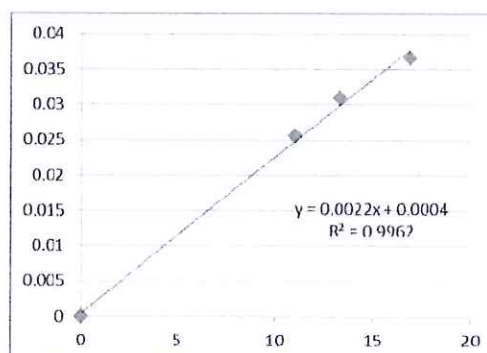
Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m <sup>3</sup> (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr02min	09:58 ~ 12:00	17.8	1016.4	0.037	2059	16.9
2hr07min	12:05 ~ 14:12	17.8	1016.4	0.031	1694	13.3
2hr02min	14:20 ~ 16:22	17.8	1016.4	0.026	1351	11.0

Sensitivity Adjustment Scale Setting (Before Calibration) 680 (CPM)

Sensitivity Adjustment Scale Setting (After Calibration) 681 (CPM)

### Linear Regression of Y or X

Slope (K-factor): 0.0022  
Correlation Coefficient (R): 0.9981  
Date of Issue: 20 March 2017



### 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: 20 March 2017

QC Reviewer: Ben Tam Signature:  Date: 20 March 2017

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	23-Feb-17
Location ID :	Calibration Room	Next Calibration Date:	23-May-17

CONDITIONS			
Sea Level Pressure (hPa)	1017.4	Corrected Pressure (mm Hg)	763.05
Temperature (°C)	17.9	Temperature (K)	291

CALIBRATION ORIFICE			
Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.2	6.2	12.4	1.797	56	56.79	Slope = 36.1509 Intercept = -8.0555 Corr. coeff. = 0.9984
13	5	5	10.0	1.616	49	49.69	
10	3.8	3.8	7.6	1.410	43	43.61	
8	2.4	2.4	4.8	1.124	33	33.47	
5	1.4	1.4	2.8	0.862	22	22.31	

**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

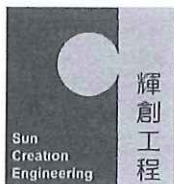
I = chart response

Tav = daily average temperature

Pav = daily average pressure

**FLOW RATE CHART**

Standard Flow Rate (m3/min)	Actual chart response (IC)
0.862	22.31
1.124	33.47
1.410	43.61
1.616	49.69
1.797	56.79



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

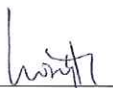
### TEST RESULTS / 測試結果

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 :  
簽發日期

30 June 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.

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Sun Creation Engineering Limited  
Calibration and Testing Laboratory

# 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 :

Equipment ID	Description	Certificate No.
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.

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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. : C172284  
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 : Acoustical Calibrator (EQ082)  
Manufacturer / 製造商 : Brüel & Kjær  
Model No. / 型號 : 4231  
Serial No. / 編號 : 2713428  
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 April 2017

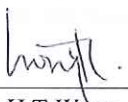
### TEST RESULTS / 測試結果

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).

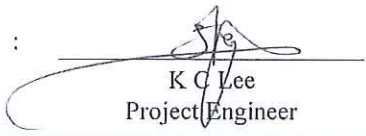
The test equipment used for calibration are traceable to National Standards via :

- 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.

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# Certificate of Calibration

## 校正證書

Certificate No. : C172284  
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 :

Equipment ID	Description	Certificate No.
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	± 0.2	± 0.2
114 dB, 1 kHz	114.1		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

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.

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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. : C172795

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 : 16 May 2017

Description / 儀器名稱 : Sound Level Meter (EQ068)

Manufacturer / 製造商 : Rion

Model No. / 型號 : NL-31

Serial No. / 編號 : 00410247

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 : 23 May 2017

### TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

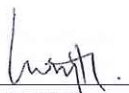
The results do not exceed manufacturer's specification.

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 :  
簽發日期

24 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.

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Page 1 of 4



# Certificate of Calibration

## 校正證書

Certificate No. : C172795  
證書編號

1. 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.
2. Self-calibration was performed before the test.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

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

5. Test procedure : MA101N.

6. Results :

### 6.1 Sound Pressure Level

#### 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	93.6	± 1.1

#### 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	93.6 (Ref.)
				104.00		103.7
				114.00		113.7

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

### 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L <sub>A</sub>	A	Fast	94.00	1	93.6	Ref.
			Slow			93.6	± 0.3

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# Certificate of Calibration

## 校正證書

Certificate No. : C172795  
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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>A</sub>	A	Fast	94.00	63 Hz	67.2	-26.2 ± 1.5
					125 Hz	77.3	-16.1 ± 1.5
					250 Hz	84.8	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.8	+1.2 ± 1.6
					4 kHz	94.7	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.6	-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)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L <sub>C</sub>	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.5	0.0 ± 1.4
					500 Hz	93.6	0.0 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	93.5	-0.2 ± 1.6
					4 kHz	92.9	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.8	-6.2 (+3.0 ; -6.0)

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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. : C172795  
證書編號

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 319841

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value : 94 dB : 63 Hz - 125 Hz :  $\pm 0.35$  dB  
250 Hz - 500 Hz :  $\pm 0.30$  dB  
1 kHz :  $\pm 0.20$  dB  
2 kHz - 4 kHz :  $\pm 0.35$  dB  
8 kHz :  $\pm 0.45$  dB  
12.5 kHz :  $\pm 0.70$  dB  
104 dB : 1 kHz :  $\pm 0.10$  dB (Ref. 94 dB)  
114 dB : 1 kHz :  $\pm 0.10$  dB (Ref. 94 dB)

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

Note :

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Sun Creation Engineering Limited - Calibration & Testing Laboratory  
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong  
輝創工程有限公司 - 校正及檢測實驗室  
c/o 香港新界屯門興安里一號青山灣機樓四樓  
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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.

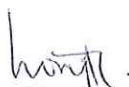
The results are detailed in the subsequent page(s).

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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Page 1 of 4



# 輝創工程有限公司

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1. 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.
2. Self-calibration was performed before the test.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

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

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

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

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (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.

- 6.2 Time Weighting

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

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## 校正證書

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### 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)

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# Certificate of Calibration

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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	: $\pm 0.35$ dB
		250 Hz - 500 Hz	: $\pm 0.30$ dB
		1 kHz	: $\pm 0.20$ dB
		2 kHz - 4 kHz	: $\pm 0.35$ dB
		8 kHz	: $\pm 0.45$ dB
		12.5 kHz	: $\pm 0.70$ dB
	104 dB	: 1 kHz	: $\pm 0.10$ dB (Ref. 94 dB)
	114 dB	: 1 kHz	: $\pm 0.10$ 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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*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*

*26<sup>th</sup> Monthly Environmental Monitoring and Audit (EM&A) Report for November  
2017*

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**AUES**

## **Appendix H**

### **IMPACT MONITORING SCHEDULE**



### Impact Monitoring Schedule for Reporting Month – November 2017

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

✓	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 – December 2017**

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

✓	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 (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m³/min)	AIR VOLUME (std m³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m³)
		INITIAL	FINAL	MIN	MAX	AVG					INITIAL	FINAL		
2-Nov-17	21600	16411.86	16435.86	1440.00	22	23	22.5	1017.2	0.48	696	2.8287	2.8967	0.0680	98
8-Nov-17	21823	16435.86	16459.86	1440.00	21	23	22.0	1016.4	0.46	666	2.6265	2.6599	0.0334	50
14-Nov-17	21866	16459.86	16483.85	1439.40	22	23	22.5	1017.2	0.49	698	2.5386	2.5790	0.0404	58
20-Nov-17	21881	16483.85	16507.86	1440.60	21	22	21.5	1018.7	0.45	642	2.5365	2.5444	0.0079	12
25-Nov-17	21890	16507.86	16531.87	1440.60	21	22	21.5	1018.2	0.44	641	2.6425	2.6868	0.0443	69

## 24-Hr TSP Monitoring Data for AM2a

DATE	SAMPLE NUMBER	ELAPSED TIME		CHART READING			AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m³/min)	AIR VOLUME (std m³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m³)
		INITIAL	FINAL	MIN	MAX	AVG					INITIAL	FINAL		
2-Nov-17	21601	13046.36	13070.38	1441.20	37	38	37.5	1017.2	1.13	1621	2.8129	2.9628	0.1499	92
8-Nov-17	21822	13070.38	13094.39	1440.60	37	40	38.5	1016.4	1.16	1674	2.6770	2.7892	0.1122	67
14-Nov-17	21865	13094.39	13118.39	1440.00	36	40	38.0	1017.2	1.15	1651	2.5744	2.7186	0.1442	87
20-Nov-17	21882	13118.39	13142.39	1440.00	35	39	37.0	1018.7	1.11	1604	2.5649	2.6456	0.0807	50
25-Nov-17	21891	13142.39	13166.40	1440.60	37	38	37.5	1018.2	1.13	1629	2.6573	2.7721	0.1148	70

## 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>
10-Nov-17	9:56	56.2	59.6	54.1	55.3	60.7	53.8	54.1	58.2	53.3	54.8	58.9	52.2	53.7	61.2	51.4	54.8	61.9	52.8	55
16-Nov-17	9:37	57.5	59.8	51.8	54.5	57.6	47.5	54.4	57.7	46.9	51.5	53.9	47.4	51.0	53.9	44.2	52.5	55.1	46.8	54
22-Nov-17	9:59	56.8	59.3	48.5	55.6	58.7	49.4	53.5	59.4	49.2	54.8	59.2	47.4	53.2	58.1	50.1	53.3	57.1	52.1	55
28-Nov-17	9:39	50.5	51.9	47.0	50.0	52.0	45.9	53.2	54.5	46.6	55.8	57.1	47.6	54.8	56.8	46.3	53.6	55.1	45.2	53

## 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>
10-Nov-17	13:34	48.2	54.2	46.1	47.3	53.6	45.2	47.9	52.3	46.4	48.3	53.3	46.2	49.6	52.1	45.6	47.3	50.8	44.2	48
16-Nov-17	13:27	51.8	55.8	42.8	46.0	48.3	42.4	49.0	49.2	41.4	44.4	46.7	40.0	43.6	46.5	38.3	45.9	48.4	40.8	48
22-Nov-17	13:10	50.1	50.5	45.0	51.7	54.6	48.7	48.3	52.7	46.7	47.1	53.6	47.4	51.4	53.6	46.4	50.7	51.5	45.4	50
28-Nov-17	13:20	64.3	52.6	45.1	47.2	49.3	44.0	45.2	46.7	43.7	46.9	47.6	44.1	45.5	46.5	43.1	45.8	46.9	43.3	57

Remark: Electric drill operation was noted during the first five-minute of noise monitoring at NM2 on 28 November 2017 which caused the 1st Leq(5min) higher than the corresponding

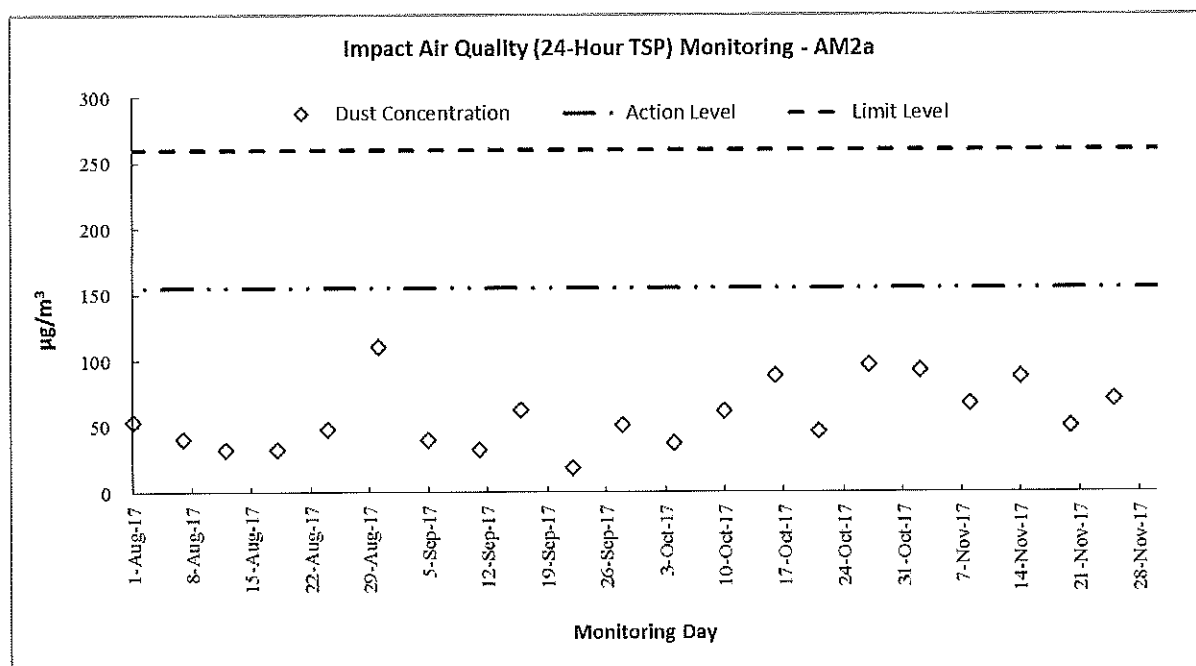
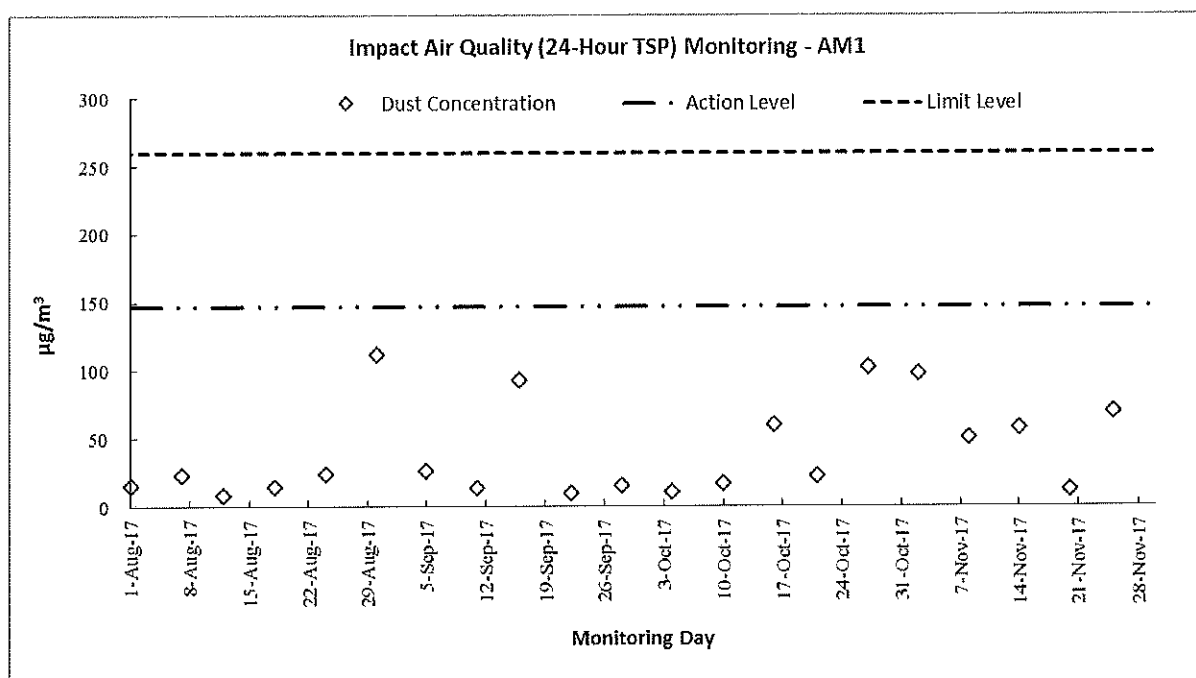
L10



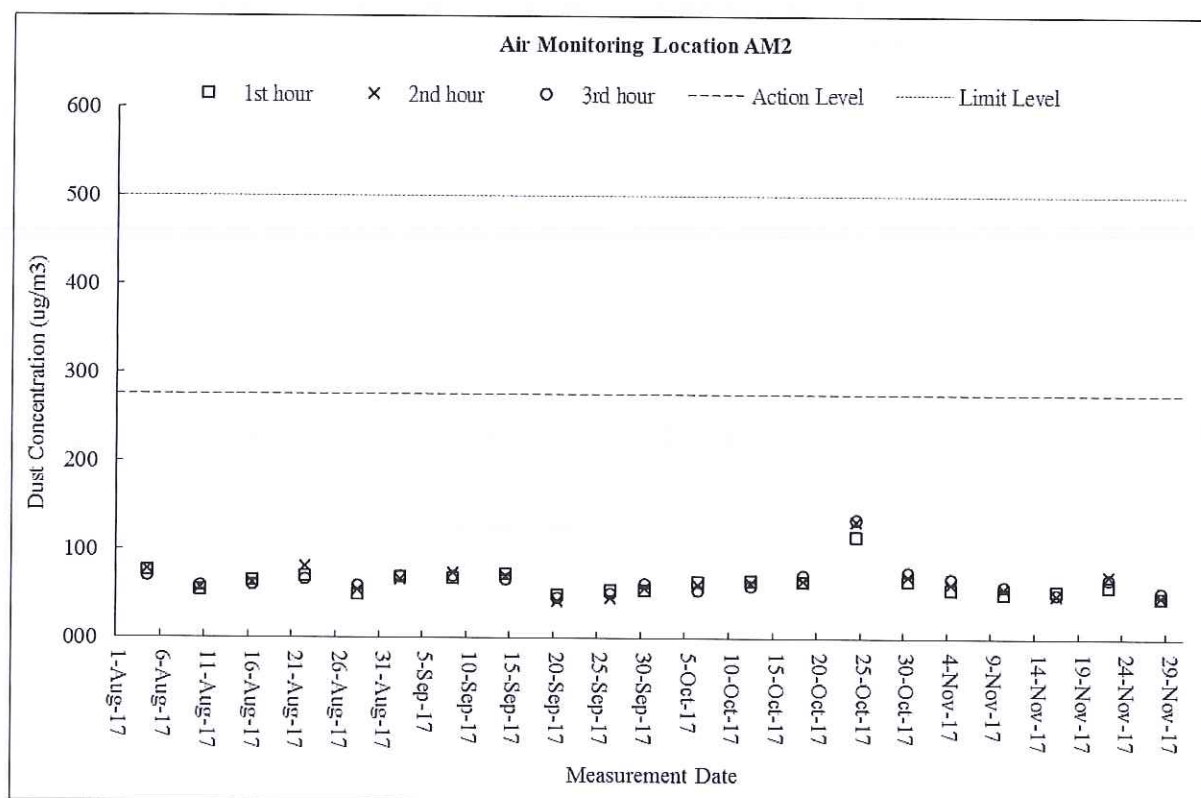
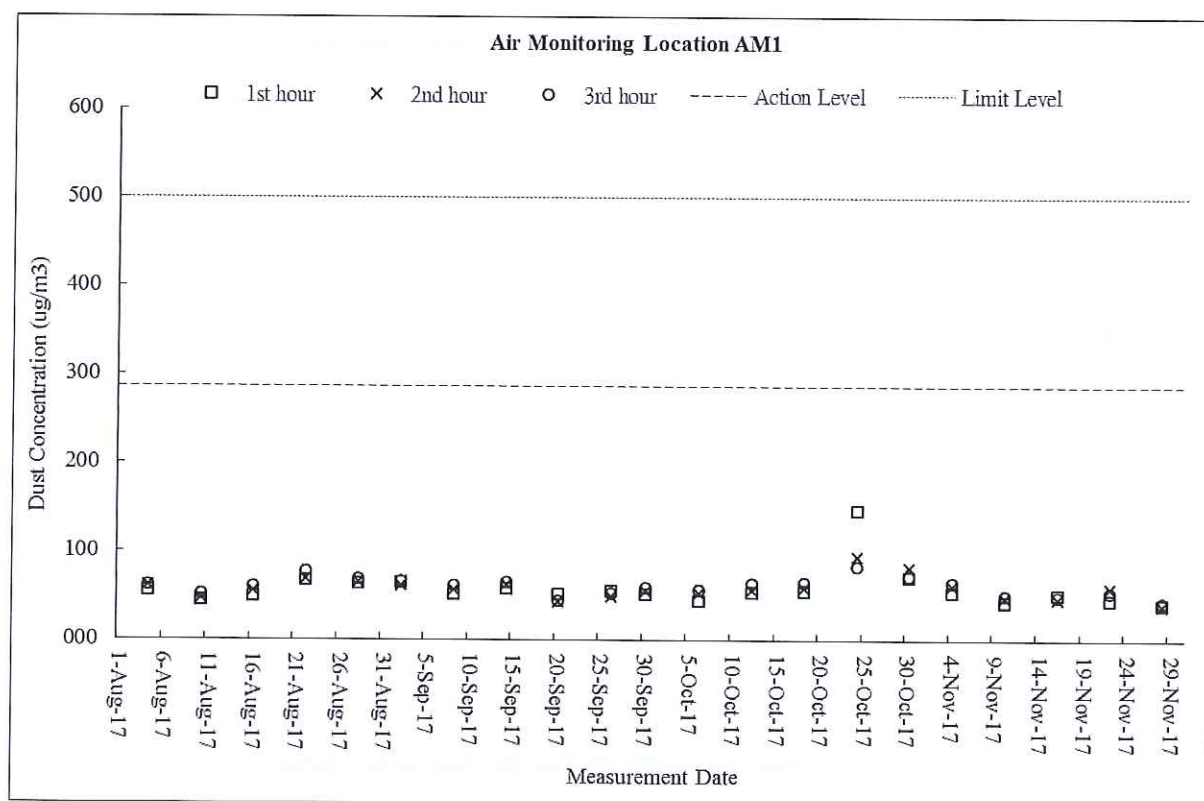
## **Appendix J**

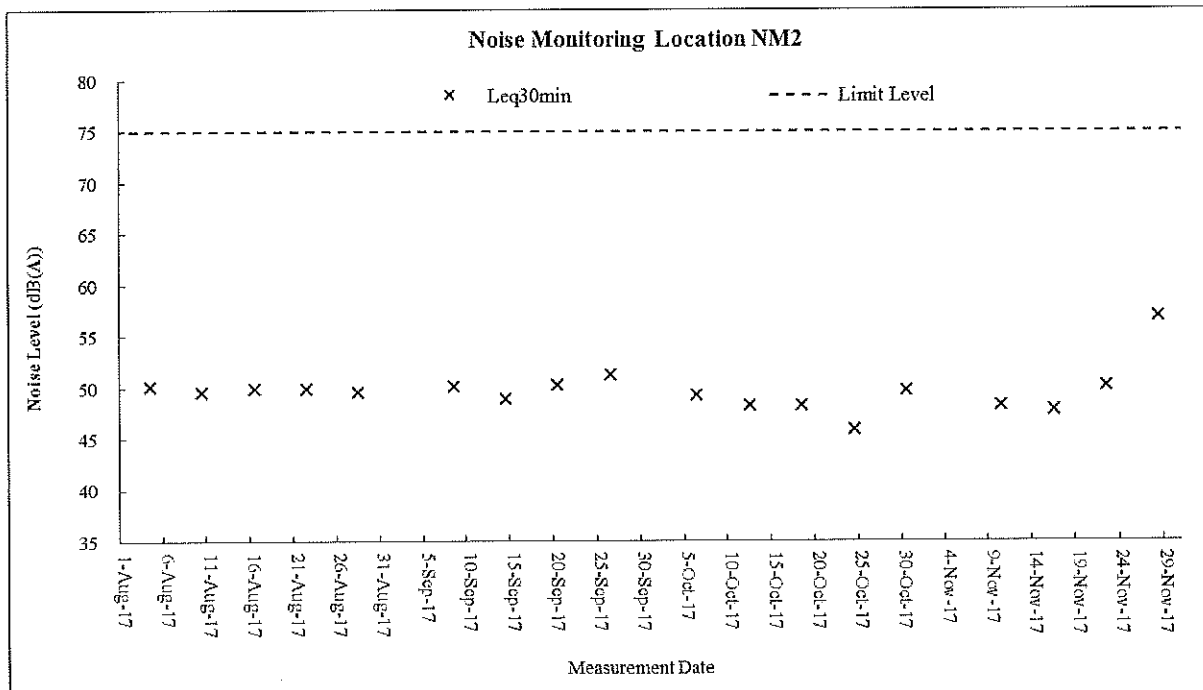
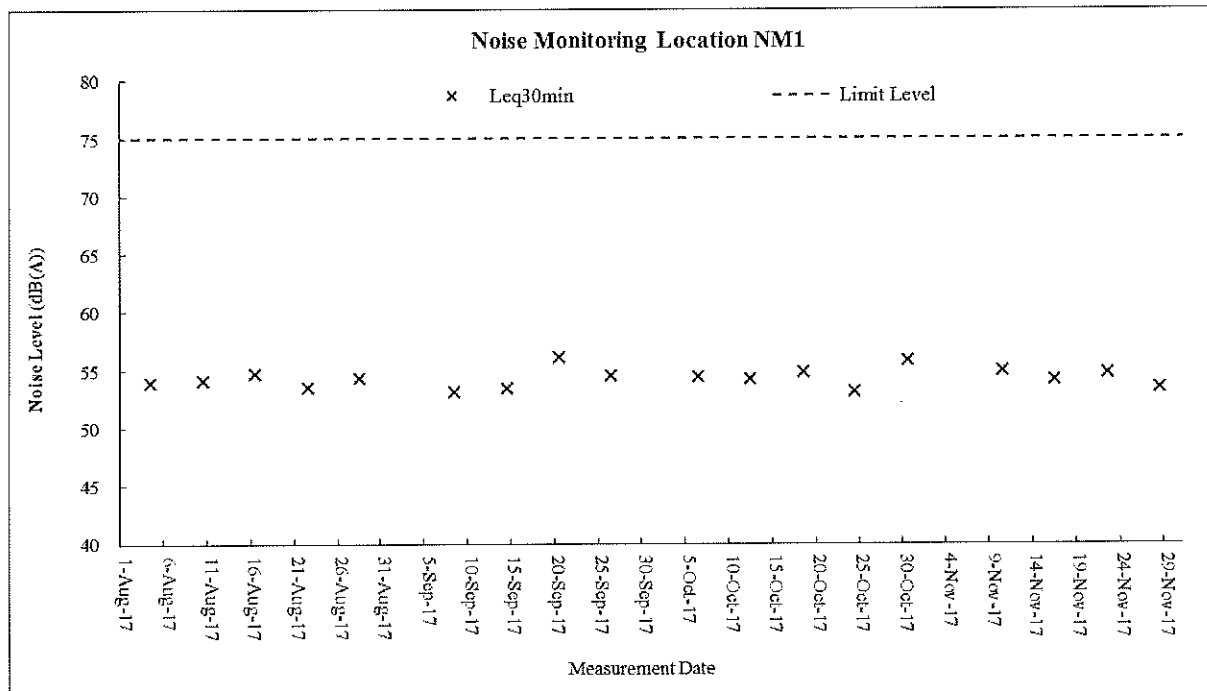
### **GRAPHICAL PLOTS**



**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-Nov-17	Wed	Mainly cloudy and cool tonight.	0	23	6	67.5	E/NE
2-Nov-17	Thu	Dry with sunny periods in the afternoon.	0	22.2	7.3	67.5	N/NW
3-Nov-17	Fri	It will be cloudy.	0	23	7.7	76.2	NW
4-Nov-17	Sat	Moderate north to northeasterly winds, occasionally fresh offshore at first.	0.3	23.1	7.1	75.1	N
5-Nov-17	Sun	Moderate to fresh northerly winds.	Trace	24.3	4.5	60	N
6-Nov-17	Mon	Mainly cloudy and cool tonight. Moderate to fresh northerly winds.	Trace	24.9	5.5	68	N/NW
7-Nov-17	Tue	Dry with sunny periods in the afternoon.	0.3	22.5	6.8	68.5	N/NW
8-Nov-17	Wed	A few light rain patches later.	Trace	17.7	5.3	80	N/NW
9-Nov-17	Thu	Moderate east to northeasterly winds.	Trace	16.4	6.4	70.7	E
10-Nov-17	Fri	Moderate east to northeasterly winds.	0	17.8	5.6	70.5	E
11-Nov-17	Sat	Moderate east to northeasterly winds.	0	18.7	5.4	71.5	NE
12-Nov-17	Sun	Dry with sunny periods in the afternoon.	14.7	17.1	7.5	81	E/NE
13-Nov-17	Mon	Mainly cloudy and cool tonight.	12.5	16.8	5.5	89.2	E/NE
14-Nov-17	Tue	Dry with sunny periods in the afternoon.	0.2	16.7	5.4	90	E/NE
15-Nov-17	Wed	Moderate to fresh northerly winds.	0	19.2	8.4	80.7	E/NE
16-Nov-17	Thu	Moderate to fresh northerly winds.	0	19.5	7.5	75.5	E/NE
17-Nov-17	Fri	Mainly cloudy and cool tonight.	0	22.1	7.3	80	E/NE
18-Nov-17	Sat	Dry with sunny periods in the afternoon.	1.9	24.6	7.1	8.2	E
19-Nov-17	Sun	It will be cloudy.	1	22.7	4.5	79.5	N/NW
20-Nov-17	Mon	Moderate north to northeasterly winds, occasionally fresh offshore at first.	0	21.5	9.2	74.2	N/NW
21-Nov-17	Tue	Moderate to fresh northerly winds.	0	22.1	8	67.7	N/NW
22-Nov-17	Wed	Mainly cloudy and cool tonight. Moderate to fresh northerly winds.	0	22.4	11.3	62.5	N/NW
23-Nov-17	Thu	Dry with sunny periods in the afternoon.	0	23.2	16.2	49.5	N
24-Nov-17	Fri	A few light rain patches later.	0	21.7	11	58	N/NW
25-Nov-17	Sat	Moderate east to northeasterly winds.	0	22.3	12	59	N
26-Nov-17	Sun	Moderate east to northeasterly winds.	0	23.8	6	72.2	N/NW
27-Nov-17	Mon	Moderate east to northeasterly winds.	Trace	23.7	4.4	74.5	N/NW
28-Nov-17	Tue	Becoming cloudy. Sunny intervals tomorrow.	Trace	24.9	6.5	76	N/NE
29-Nov-17	Wed	It will be fine. Dry in the afternoon.	0	26	7.7	75.7	E/NE
30-Nov-17	Thu	Moderate north to northeasterly winds.	0.3	25	6.5	87	E





## **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 (in '000m <sup>3</sup> )	Hard Rock and Large Broken Concrete (in '000m <sup>3</sup> )	Reused in the Contract (in '000m <sup>3</sup> )	Reused in other Projects (in '000m <sup>3</sup> )	Disposed as Public Fill (in '000m <sup>3</sup> )	Imported Fill (in '000m <sup>3</sup> )	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 3) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m <sup>3</sup> )
Jan 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Feb 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mar 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Apr 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
May 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
June 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<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  (in '000m <sup>3</sup> )	Hard Rock and Large Broken Concrete  (in '000m <sup>3</sup> )	Reused in the Contract  (in '000m <sup>3</sup> )	Reused in other Projects  (in '000m <sup>3</sup> )	Disposed as Public Fill  (in '000m <sup>3</sup> )	Imported Fill  (in '000m <sup>3</sup> )	Metals  (in '000 kg)	Paper/ cardboard packaging  (in '000kg)	Plastics (see Note 3)  (in '000kg)	Chemical Waste  (in '000kg)	Others, e.g. general refuse  (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
Sub-total	5.863	0.249	0.520	2.228	2.866	0.000	0.000	0.000	0.000	0.000	0.076
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
Total	12.008	0.275	1.370	2.228	8.135	0.000	19.420	0.000	0.000	0.000	0.158

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	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated (in '000m <sup>3</sup> )	Hard Rock and Large Broken Concrete (in '000m <sup>3</sup> )	Reused in the Contract (in '000m <sup>3</sup> )	Reused in other Projects (in '000m <sup>3</sup> )	Disposed as Public Fill (in '000m <sup>3</sup> )	Imported Fill (in '000m <sup>3</sup> )	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 3) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m <sup>3</sup> )
Jan	0.304	0.089	0.100	0.000	0.115	0.000	0.000	0.000	0.000	0.000	0.023
Feb	0.660	0.000	0.400	0.000	0.260	0.000	1.830	0.000	0.000	0.000	0.051
Mar	0.325	0.076	0.200	0.000	0.050	0.000	1.190	0.015	0.000	0.000	0.029
Apr	1.100	0.000	0.200	0.000	0.900	0.000	0.620	0.000	0.000	0.000	0.029
May	0.600	0.000	0.100	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.019
June	0.600	0.000	0.200	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.031
Sub-total	3.590	0.165	1.200	0.000	2.225	0.000	3.640	0.015	0.000	0.000	0.182
July	0.344	0.000	0.100	0.000	0.244	0.000	0.000	0.000	0.000	0.000	0.041
Aug	0.461	0.011	0.400	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.067
Sep	0.602	0.016	0.000	0.000	0.586	0.000	0.000	0.000	0.000	0.000	0.082
Oct	0.515	0.106	0.100	0.000	0.309	0.000	5.060	0.000	0.000	0.000	0.063
Nov	0.331	0.062	0.000	0.000	0.268	0.000	0.000	0.000	0.000	0.000	0.126
Dec	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	5.842	0.360	1.800	0.000	3.682	0.000	8.700	0.015	0.000	0.000	0.561

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
Air Quality Impact	<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, shotcrete 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	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 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 bundled. 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>						
	<p>containment, thus minimizing the potential of pollution;</p> <ul style="list-style-type: none"> <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	<p>C&amp;D Materials from Site Formation</p> <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	<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</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>						
	reuse of the inert material on site when implemented. <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	Chemical Waste <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 handling and disposal	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S6.2.5.5	General Refuse <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 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	<p>Good Site Practices</p> <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 visual	Contractor	Work Sites	Prior to construction and construction phase	
S7.3.2.1	<p>MM4 - Tree Protection &amp; Preservation</p> <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	<p>MM5 - Tree Transplantation</p> <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 • 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.	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 NO. 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  
November 2017**

**(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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## TABLE OF CONTENTS

	Page
<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
Introduction .....	1
Environmental Monitoring Works .....	1
Environmental Licenses and Permits .....	2
Environmental Mitigation Implementation Schedule .....	2
Key Information in the Reporting Month .....	2
Site Inspection Conducted by Government Department.....	2
Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons...	2
Future Key Issues:.....	3
<b>1. INTRODUCTION .....</b>	<b>4</b>
Background .....	4
Project Organizations .....	4
Summary of EM&A Requirements .....	5
<b>2. AIR QUALITY .....</b>	<b>6</b>
Monitoring Requirements .....	6
Monitoring Locations.....	6
Monitoring Equipment.....	6
Monitoring Parameters, Frequency and Duration .....	6
Monitoring Methodology and QA/QC Procedure .....	6
Results and Observations .....	6
<b>3. NOISE.....</b>	<b>8</b>
Monitoring Requirements .....	8
Monitoring Locations.....	8
Monitoring Equipment.....	8
Monitoring Parameters, Frequency and Duration .....	8
Monitoring Methodology and QA/QC Procedures .....	8
Results and Observations .....	8
<b>4. ENVIRONMENTAL AUDIT .....</b>	<b>10</b>
Site Audits.....	10
Implementation Status of Environmental Mitigation Measures .....	10
Review of Environmental Monitoring Procedures .....	10
Status of Environmental Licensing and Permitting .....	10
Status of Waste Management.....	11
Implementation Status of Event Action Plans .....	11
Site Inspection Conducted by Government Department.....	11
Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons.	11
<b>5. FUTURE KEY ISSUES .....</b>	<b>12</b>
Key Issues for the Coming Month .....	12
Monitoring Schedule for the Next Month.....	12
Construction Program for the Next Month .....	12
<b>6. CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>13</b>
Conclusions .....	13
Recommendations for Future Reporting Months: .....	13

## **LIST OF TABLES**

Table I	Summary Table for Non-compliance Recorded in the Reporting Month
Table II	Summary Table for Key Information in the Reporting Month
Table 1.1	Key Project Contacts
Table 2.1	Locations for Air Quality Monitoring
Table 2.2	Impact Dust Monitoring Parameters, Frequency and Duration
Table 3.1	Locations for Noise Monitoring Stations
Table 3.2	Noise Monitoring Parameters, Frequency and Duration
Table 4.1	Observations of Site Audit
Table 4.2	Summary of Environmental Licensing and Permit Status

## **LIST OF FIGURES**

Figure 1	General Location Plan of the Project
Figure 2	Locations of Air Quality Stations
Figure 3	Locations of Noise Monitoring Stations
Figure 4	Project Organization Chart

## **LIST OF APPENDICES**

A	Action and Limit Levels for Air Quality and Noise
B	Summary of Exceedance
C	Site Audit Summary
D	Summary of Amount of Waste Generated
E	Event Action Plans
F	Environmental Mitigation Implementation Schedule (EMIS)
G	Complaint Log
H	Construction Programme

## 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 2<sup>nd</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 same Environmental Permit (Permit No. FEP-01/474/2013).
2. The site activities undertaken in the reporting month included:
  - Provision of Building Services & Extra Low Voltage Installation for CLP Transformer Room 'D' & 'Room C'
  - Provision of Lighting and Small Power Installation for 11kV Switch room
  - Defect rectification for CLP Transformer Room 'C' & 'Room D'

### 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
	AM2	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-01/474/2013); 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:

- Provision of switchboards in LV switch room.
- Provision of switchboards in 11kV HV switch room.
- Mechanical Installation in MBR Pre-treatment Screen Chamber.
- 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 same Environmental Permit (Permit No. FEP-01/474/2013), which was issued on 23<sup>rd</sup> January 2014 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:
  - Provision of Building Services & Extra Low Voltage Installation for CLP Transformer Room 'D' & 'Room C'
  - Provision of Lighting and Small Power Installation for 11kV Switch room
  - Defect rectification for CLP Transformer Room 'C' & 'Room D'
- 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 2<sup>nd</sup> monthly EM&A report summarizing the EM&A works conducted for the Project in November 2017.

### 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**

Party	Role	Name	Position	Phone No.
Drainage Service Department	Resident Site Engineer	Mr. Fong Mo	Resident Engineer	2594 7329

Party	Role	Name	Position	Phone No.
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089
		Ms. Cecilia Yang	Project Coordinator	2157 3880
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 in November 2017. 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
AM1		No. 31 Wai Loi Tsuen
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 9<sup>th</sup>, 16<sup>th</sup>, 23<sup>rd</sup>, 28<sup>th</sup> November 2017 by ET after the commencement of construction works for the Contract. A joint site audit with the representative of IEC was carried out on 28<sup>th</sup> November 2017. 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-01/474/2013	23/1/2014	N/A	The FEP was approved on 23/1/2014	Valid
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

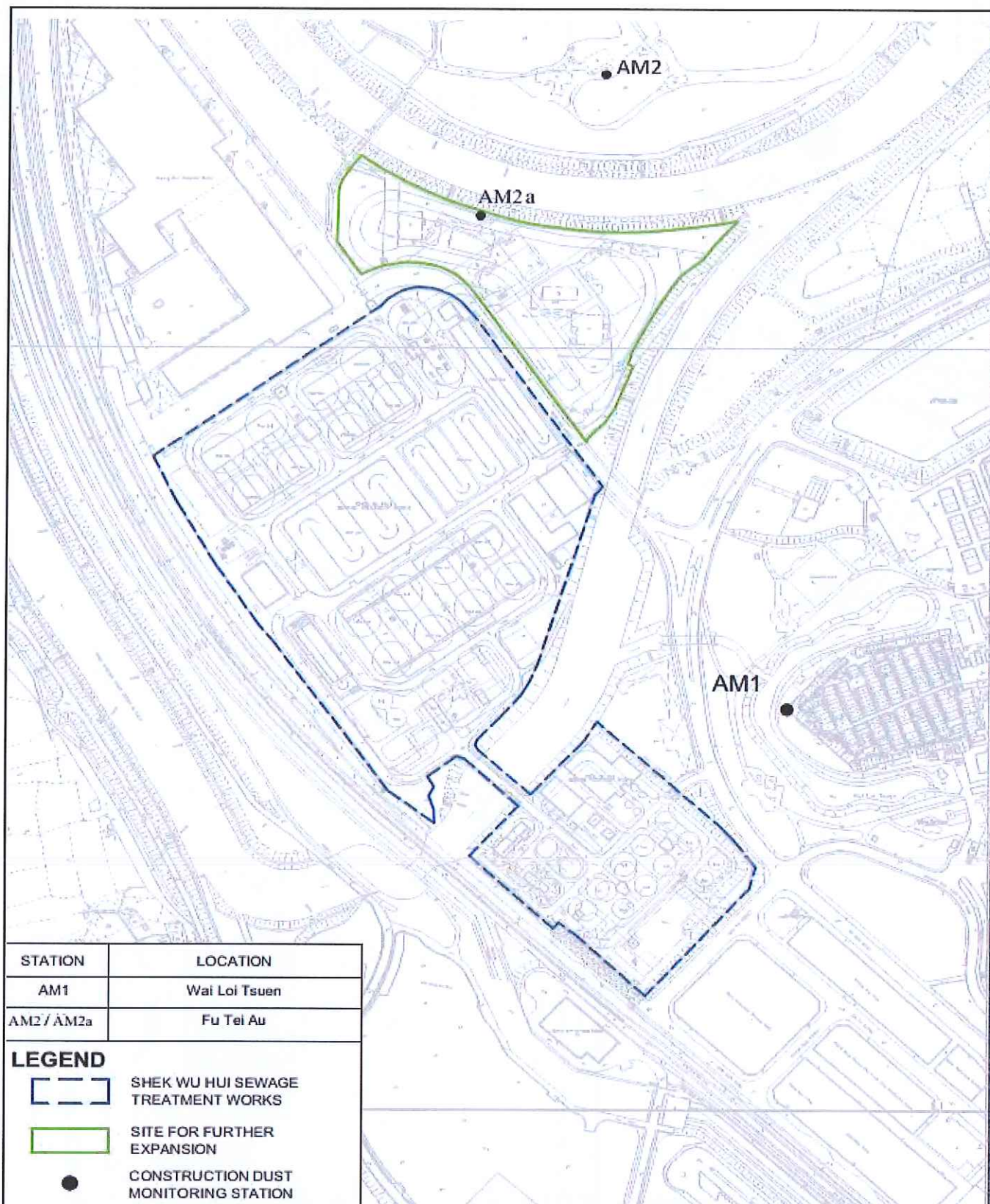
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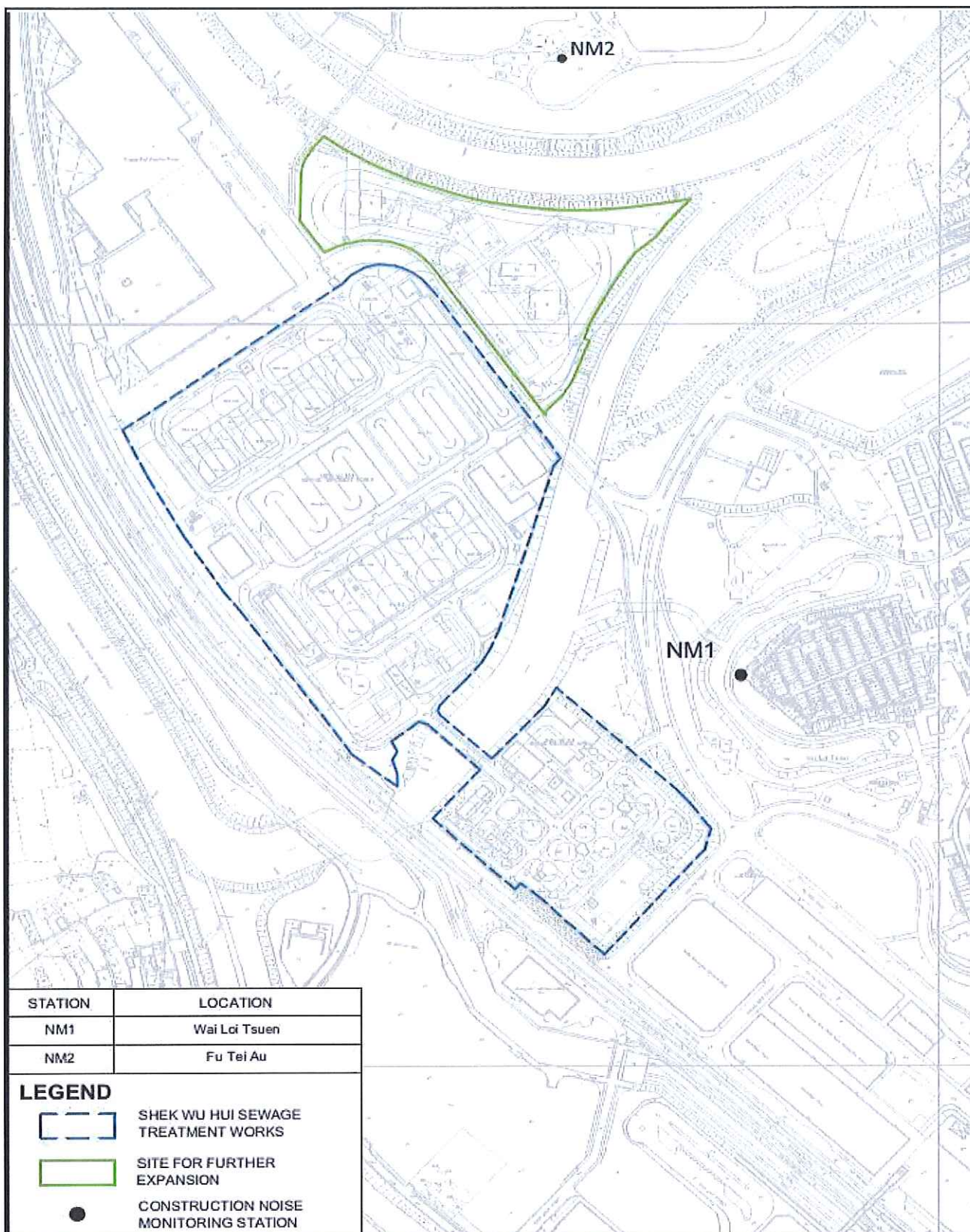






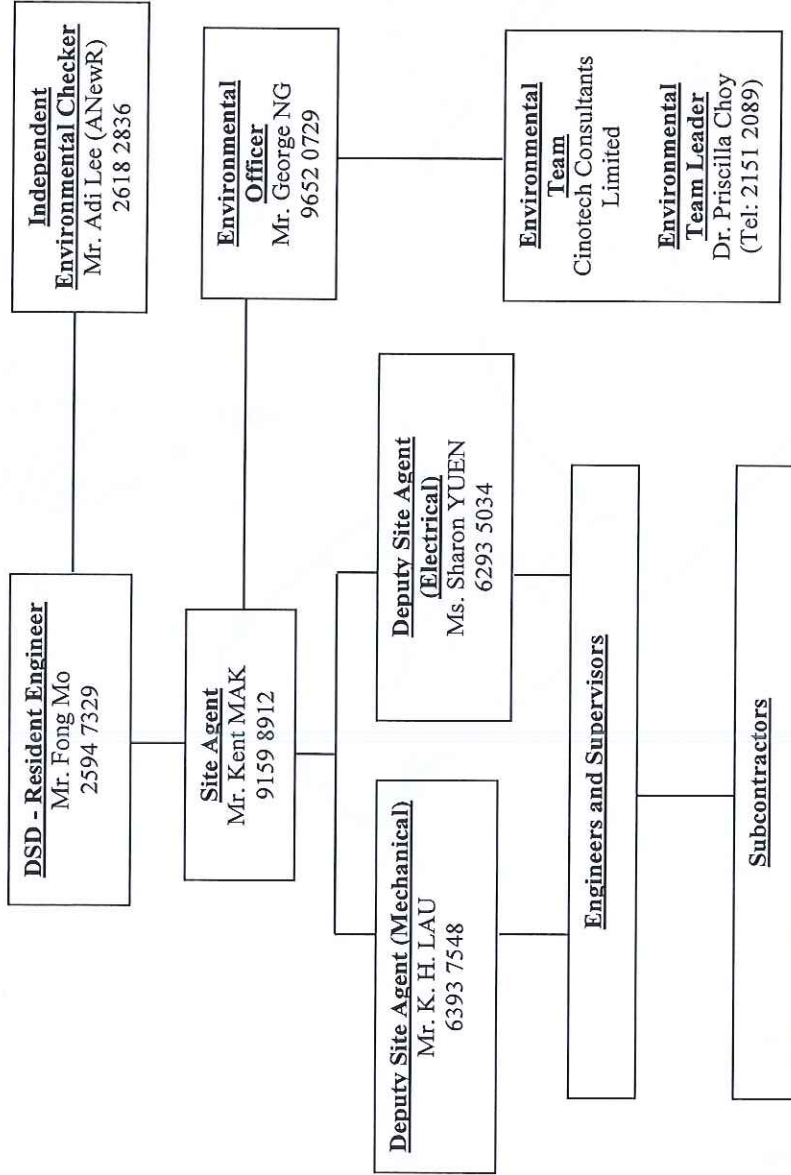
Title	Contract No. DE/2014/01		Scale	Project	CINOTECH
	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion		N.T.S	No.	
	Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station			MA16002	
	Locations of Impact Air Quality Monitoring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

Scale

N.T.S

Project No.

MA16002

Version

v.1

Figure

4

Project Organization Chart

CINOTECH

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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:** November 2017

- 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	171109
Date	9 November 2017 (Thursday)
Time	15:00-16:30

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>Follow-up on previous audit section (Ref. No.:171031), no major environmental deficiencies were observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Cecilia Yang	<i>Ceci</i>	9 November 2017
Checked by	Dr. Priscilla Choy	<i>Wif</i>	9 November 2017



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	171116
Date	16 November 2017 (Thursday)
Time	16:00-17:30

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>Follow-up on previous audit section (Ref. No.:171109), no major environmental deficiencies were observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Cecilia Yang	<i>cew</i>	16 November 2017
Checked by	Dr. Priscilla Choy	<i>WJ</i>	16 November 2017

**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**

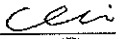

**Record Summary of Environmental Site Inspection**

**Inspection Information**

Checklist Reference Number	171123
Date	23 November 2017 (Thursday)
Time	10:00-11:30

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>Follow-up on previous audit section (Ref. No.:171116), no major environmental deficiencies were observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Cecilia Yang		23 November 2017
Checked by	Dr. Priscilla Choy		23 November 2017

**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	171128
Date	28 November 2017 (Tuesday)
Time	9:30-11:30

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>Follow-up on previous audit section (Ref. No.:171123), no major environmental deficiencies were observed during the site inspection.</li></ul>	

	Name	Signature	Date
Recorded by	Cecilia Yang	<i>Ceci</i>	28 November 2017
Checked by	Dr. Priscilla Choy	<i>Priscilla</i>	28 November 2017

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

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**Monthly Summary Waste Flow Table for 2017**

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

**Forecast of Total Quantities of C&D Materials to be Generated from the Contractor**

Total Quantity Generated (in '000 m <sup>3</sup> )	Hard Rock & Large Broken Concrete (in '000 m <sup>3</sup> )	Reused in the Contract (in '000 m <sup>3</sup> )	Reused in other Projects (in '000 m <sup>3</sup> )	Disposed as Public Fill (in '000 m <sup>3</sup> )	Imported Fill (in '000 m <sup>3</sup> )	Metals (in '000 kg)	Paper/ cardboard packaging (in '000 kg)	Plastics (see Note 3) (in '000 kg)	Chemicals Waste (in '000 kg)	Others, e.g. general refuse (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				CONTRACTOR
	ET	IEC	ER		
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	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				CONTRACTOR
	ET	IEC	ER		
	actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring				
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	1. Notify IEC, ER, Contractor and EPD; 2. Identify source;	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions;	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for	

EVENT	ACTION				CONTRACTOR
	ET	IEC	ER		
samples	<p>3. Repeat measurement to confirm findings;</p> <p>4. Increase monitoring frequency to daily;</p> <p>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</p> <p>6. Arrange meeting with IEC and ER to discuss the remedial actions to be 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>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</p> <p>3. Supervise the implementation of remedial measures.</p>	<p>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</p> <p>4. Ensure remedial measures properly implemented;</p> <p>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.</p>	<p>remedial actions to IEC within 3 working days of notification;</p> <p>3. Implement the agreed proposals;</p> <p>4. Resubmit proposals if problem still not under control;</p> <p>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</p>	



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

EVENT	ACTION				CONTRACTOR
	ET	IEC	ER		
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;	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	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	

EVENT	ACTION				CONTRACTOR
	ET	IEC	ER		
	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.		abated.	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
<b>A</b>	<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	<p>Use of movable barrier, enclosure, acoustic mat and quiet plant.</p> <p>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.</p>	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	ELAO-TM,			
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</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	ELAO-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 banded. 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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	<p>season;</p> <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	<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			
<b>E</b>	<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</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.	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
S6.2.5.3	<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>					
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</li> <li>(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: November 2017**

<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 Start Duration	Finish	Total Float	2017	2018	2019					
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
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								
AS000010	Original Contract Period	389	30-Dec-15 A	23-Oct-18	170							
AS000020	Contract Completion Date for the whole of the Works	0	14-Apr-19	0								
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, (within 120 days)	0	27-Apr-16 A	27-Apr-16 A								
AS001020	Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity, (within 500 days)	38	30-Dec-15 A	05-Nov-17	34							
AS001022	Planned Access Date for Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity	1	05-Nov-17	05-Nov-17								
AS001030	Blower no.1 (BR1) and its vicinity, (within 500 days)	42	30-Dec-15 A	01-Dec-17	0							
AS001032	Planned Access Date for Blower no.1 (BR1) and its vicinity	1	01-Dec-17	01-Dec-17								
AS001040	MBR Facilities Building, Membrane Filtration System No.1 (MFST1) and its vicinity, (within 500 days)	48	30-Dec-15 A	19-Nov-17	18							
AS001042	Planned Access Date for MBR Facilities Building, Membrane Filtration System No.1 (MFST1) and its vicinity, (within 500 days)	1	19-Nov-17	19-Nov-17								
AS001050	Ng Chow South Road Sewage Pumping Station - (within 150 days)	0	30-Dec-16 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 -d/f	1	15-Mar-18	15-Mar-18	24							
AS001120	New Access Date for MFB -G/F	1	19-Nov-17	19-Nov-17	18							
AS001150	New Access Date for MFB -CLP Pm C	0	29-Sep-17 A	29-Sep-17 A								
AS001160	New Access Date for MFB -CLP Pm D	0	26-Sep-17 A	26-Sep-17 A								
AS001180	New Access Date for MFB -x/f	1	31-Dec-17	31-Dec-17	11							
AS001200	New Access Date for MFB -L/HF	1	31-Dec-17	31-Dec-17	317							
AS001220	New Access Date for MFB -J/HF	1	31-Dec-17	31-Dec-17	317							
AS001240	New Access Date for MFB -Pumpout & Root	1	01-Feb-18	01-Feb-18	285							
AS001300	New Access Date for Pre-treatment Screen Chamber	1	06-Nov-17	06-Nov-17	34							
AS001320	New Access Date for Flowmeter Chamber	1	30-Nov-17	30-Nov-17	188							
AS001340	New Access Date for Blower No. 1 - 2nd Lane	1	01-Dec-17	01-Dec-17	0							
AS001342	New Access Date for Blower No. 1 - 1st Lane + Swing Zone	1	02-Jan-18	02-Jan-18	189							
AS001344	New Access Date for Blower No. 1 - Post Anaerobic Zone	1	01-Feb-18	01-Feb-18	163							
AS001360	New Access Date for Membrane Tanks	1	02-Jan-18	02-Jan-18	163							
AS001380	New Access Date for CLP Cable Ducts	1	20-Oct-17	20-Oct-17	78							
AS001400	New Access Date for Other Cable Ducts	1	01-Feb-18	01-Feb-18	160							
AS001420	New Access Date for Chemical Room	1	30-Apr-18	30-Apr-18	0							
AS001440	New Access Date for LV Switchroom No.3	1	31-Mar-18	31-Mar-18	40							
Key Dates												
AS002010	Completion of NCS/SPS E&M Works including testing and commissioning	0	30-Dec-15 A	28-Jul-17 A								
AS002020	Completion of SWHSTW - Further Expansion Phase 1A - Advance Works E&M Works including T&C	562	30-Dec-15 A	14-Apr-19	0							
Section I												
AS000010	Contract Completion of the works - Section I	0	30-Dec-15 A	23-Sep-16 A								
AS000020	Completion date - Section I (272 days from starting date)	0		23-Sep-16 A								
Time Risk Allowance and Planned Completion												
AS000040	Planned Completion date - Section I	0		23-Sep-16 A								
Section II												
AS000010	Contract Completion of the works - Section II	0	30-Dec-15 A	19-Mar-16 A								
AS000020	Completion date - Section II (80 days from starting date)	0		19-Mar-16 A								
Time Risk Allowance and Planned Completion												
AS000040	Planned Completion date - Section II	0		19-Mar-16 A								
Section III												
AS000010	Contract Completion of the works - Section III	562	30-Dec-15 A	14-Apr-19	0							
AS000020	Completion date - Section III (1020 days from starting date)	0		14-Apr-19	0							
Time Risk Allowance and Planned Completion												

Remaining Work

Critical Activity

Milestone

Actual Progress

File Name: DE201401F2  
Layout: DE/401 (Rev. F) - WBS  
TASK filter: All Activities

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	Rev...	Checked	Approved
08-Jan-16	Rev. 0	KH Lau	KM
29-Feb-16	Rev. A	KH Lau	KM
31-May-16	Rev. B	KH Lau	KM
25-May-17	Rev. C	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



Activity ID	Activity Name	Remaining Start	Finish	Post	2017	2018	2019	2020	2021	2022	2023	2024
AS-00000	Time Risk Allowance for Completion of Function Test of Section III (4% of installation duration, 483-489)	18-Jan-18	14-Apr-18	0								
AS-00000	Planned Completion date - Section III	0	14-Apr-18	0								
<b>Section IV</b>												
AS-00010	Contract Completion of the works - Section IV	0	30-Dec-15 A	28-Jul-17 A								
AS-00020	Completion date - Section IV (276 days from starting date)	0	28-Jul-17 A									
<b>Time Risk Allowance and Planned Completion</b>												
AS-00030	Time Risk Allowance for Section IV (4% of installation duration, 276 days)	0	22-Jun-17 A	28-Jul-17 A								
AS-00040	Planned Completion Date	0	28-Jul-17 A									
<b>Activity Schedule No.1 - Preliminaries</b>												
<b>1.0 - Preliminaries</b>												
<b>Contractor's Site Office Construction</b>												
AS-01010	Construction of Contractor's Site Office & Store	0	22-Jul-16 A	23-Sep-16 A								
AS-01012	Maintain Contractor's Site Office & Store	500	27-Oct-16 A	13-Mar-18								
AS-01014	Removal of Site Office, Store & Relevant Facilities	21	14-Mar-19	03-Apr-19								
<b>Site Facilities</b>												
AS-01020	Set up Temp. Electricity Supply Water Supply	0	19-Aug-15 A	23-Sep-16 A								
AS-01022	Provision of Temp. Electricity & Water Supply for execution for the Contract	550	27-Oct-16 A	02-Apr-19								
<b>Permanent Utilities Services</b>												
AS-01040	Applications to the Public Utilities for Provision of Services	0	29-Jan-16 A	23-Sep-16 A								
AS-01041	Completion of CLP 11KV Switchroom No. 1 & No.2 (by Contractor)	0	30-Sep-17	29-Sep-17 A								
AS-01042	BS Works for CLP 11 KV Switchroom No.1 & No. 2	52	30-Sep-17	20-Nov-17								
AS-01043	Handover of 11 KV Switchroom to CLP	0	21-Nov-17									
AS-01045	Provision of Permanent Electricity Supply (by CLP)	120	21-Nov-17	30-Mar-18								
AS-01045A	CLP Works Installed	0	30-Mar-18									
AS-01046	Provision of Telephony & Telephone Lines	30	04-Aug-18	02-Sep-18								
<b>Provide all necessary labour, tools, materials, equipment and supervision</b>												
AS-01040	Environmental Auditing and Lifting the Environmental Permit	550	28-Jan-16 A	02-Apr-18								
AS-01061	Prepare & Submit the first draft O&M Manuals	50	16-May-18	16-Aug-18								
AS-01062	Acceptance the first draft O&M Manuals	29	17-Aug-18	19-Sep-18								
AS-01071	Prepare & Submit the final draft O&M Manuals & all Drawings	90	14-Nov-18	11-Feb-19								
AS-01072	Acceptance the final draft O&M Manuals & all Drawings	29	12-Feb-19	11-Mar-19								
<b>Training to Employer's Staff on the O&amp;M of the Plant</b>												
AS-01080	Provide training for the Employer's Staff	45	12-Feb-19	28-Mar-19								
<b>PM's Site Office</b>												
AS-01090	Provide E&M equipment & Office Stationary for the use of Project Manager and Supervisors	550	28-Mar-16 A	02-Apr-19								
AS-01100	Provide clerical support to the Project Manager's site	550	28-Apr-16 A	02-Apr-19								
<b>Site Progress</b>												
AS-01100	Provide all necessary photographs, video clips and accessories	550	02-Jun-16 A	02-Apr-19								
<b>Contract Vehicle</b>												
AS-01110	Provision of one contract vehicle service (Electric Vehicle) during the normal working hours	0	30-Dec-15 A	28-Jan-16 A								
AS-01120	Provision of one contract vehicle service (Electric Vehicle) during the normal working hours (Peak-Electricity & one Electric during the normal hours)	0	30-Dec-15 A	28-Jan-16 A								
AS-01130	Provide O&M of the Contract Cars; Driving Services; Mobile Phone Services (normal working hours)	550	28-Jan-16 A	02-Apr-19								
AS-01140	Provide O&M of the Electric Contract Cars; Driving Services (normal working hours)	550	28-Jan-16 A	02-Apr-19								
AS-01150	Provide O&M of the Electric Contract Cars; Driving Services (outside normal working hours)	550	28-Jan-16 A	02-Apr-19								
<b>Uniform</b>												
AS-01170	Uniform for Site Personnel and self-employed workers	550	28-Jan-16 A	02-Apr-19								
<b>Independent Checking Engineer</b>												
AS-01180	Provide Independent Checking Engineer in accordance with the Specification	550	28-Jan-16 A	02-Apr-19								
<b>Automated External Defibrillator (AED)</b>												
AS-01190	Provide Automated External Defibrillator (AED) and associated accessories	0	18-Nov-16 A	12-Dec-16 A								
AS-01192	Provide Training for Qualified on-site personnel for the use of AED	0	13-Dec-16 A	22-Dec-16 A								
<b>Site Management Plan for Trip Ticket System</b>												
AS-02010	Complete site management plan for trip ticket system	0	03-Dec-15 A	13-Mar-16 A								
AS-02020	Implementation of site management plan for trip ticket system	550	14-Mar-16 A	02-Apr-19								
<b>Site Cleaning and Tidiness</b>												

Remaining Work
 Critical Activity
 Milestone
 Actual Progress

File Name: D5201401F2  
Layout: DE-1401 (Rev. F) - WBS  
TASK filter: All Activities

Page 2 of 14

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  
08-Jan-16  
28-Feb-16  
31-May-16  
25-May-17  
22-Jul-17  
17-Oct-17  
Rev. D  
Rev. A  
Rev. B  
Rev. C  
Rev. D  
Rev. E  
Rev. F  
Checked  
KH Lau  
KH Lau  
KH Lau  
KH Lau  
KH Lau  
KH Lau  
Approved















Activity ID	Activity Name	Remaining Start Duration	Finish	2017	2018	2019	2020	2021	2022	2023
AS401080	Install Mix system and drain pumping system	30	15-Mar-18	13-Apr-18	61					
AS401100	Install Associated pipeworks and valves	120	01-Mar-18	28-Jun-18	15					
AS401120	Install Ancillary aeration system	60	30-May-18	28-Jun-18	15					
AS401140	Install Other associated equipment for MBR	30	25-Jun-18	28-Jun-18	15					
AS401160	Pre-treatment Screen Facilities	0	0	08-Aug-18	4					
AS401180	Site test and commissioning for MBR pre-treatment	30	10-Aug-18	08-Sep-18	4					
<b>4.2 Works for Bioreactor No. 1 (BR1)</b>										
AS402010	Manufacturing, FAT and delivery	0	18-Aug-16 A	24-Aug-16 A						
AS402010	Purchase Order for Aeration Blowers & master control	0	18-Aug-16 A	31-Dec-17	74					
AS402012	Manufacturing, FAT & Delivery to Site - Aeration Blowers & master control for aeration system	0	14-Jul-16 A	31-Dec-17						
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	0	14-Oct-16 A	06-Jul-17 A						
AS402070	Purchase Order for Supplier Activated Sludge Pumps	0	06-Sep-16 A	22-Sep-16 A						
AS402072	Manufacturing, FAT & Delivery to Site - Slurries	0	14-Oct-16 A	22-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	0	31-Mar-17 A	31-Dec-17	134					
AS402110	Purchase Order for Associated ductworks, pipeworks and valves	7	24-Nov-17	28-Feb-18	15					
AS402112	Manufacturing, FAT & Delivery to Site - Associated ductwork, pipeworks and valves	0	01-Dec-17	28-Feb-18	15					
AS402130	Purchase Order for Foam control system & wash spraying system	0	15-Sep-16 A	22-Sep-16 A						
AS402132	Manufacturing, FAT & Delivery to Site - Foam control system & wash spraying system	0	14-Oct-16 A	31-Dec-17	182					
AS402150	Purchase Order for Other associated equipment for BR1	14	14-Nov-17	30-Nov-17	16					
AS402152	Manufacturing, FAT & Delivery to Site - Other associated equipment for BR1	120	01-Dec-17	30-Mar-18	16					
<b>Install, TEC for BR1 (incl. Provision for Health &amp; Safety Requirements)</b>										
AS402022	Mobilisation at Works - BR1	14	02-Dec-17	15-Dec-17	0					
AS402020	Install Aeration blowers & master control system	60	05-Mar-18	03-May-18	11					
AS402040	Install Submersible Mixers	30	08-Jun-18	07-Feb-18	53					
AS402050	Install Mixed Liquor Return pumps	14	08-Feb-18	21-Feb-18	53					
AS402080	Install Surplus Activated Sludge Pumps	14	22-Feb-18	07-Mar-18	68					
AS402100	Install Air Diffusion Aeration System	90	15-May-18	12-Aug-18	0					
AS402120	Install Associated ductworks, pipeworks and valves	150	16-Dec-17	14-May-18	0					
AS402140	Install Foam control system & wash spraying system	30	08-Mar-18	06-Apr-18	120					
AS402160	Install Other associated equipment for BR1	120	16-Apr-18	13-Aug-18	0					
AS402090	Complete Power Cable Laying from Switchboard to Plant for BR1	0	0	13-Aug-18	0					
AS402090	Site Testing & Commissioning for BR1	60	14-Aug-18	12-Oct-18	0					
<b>4.3 Works for Membrane Filtration System (MFS1)</b>										
AS403010	Manufacturing, FAT and delivery	0	18-Apr-16 A	22-Apr-16 A						
AS403010	Purchase Order for Membrane Modules	240	28-Mar-16 A	30-May-18	17					
AS403012	Manufacturing, FAT & Delivery to Site - Membrane Modules	0	13-Sep-16 A	23-Sep-16 A						
AS403032	Manufacturing, FAT & Delivery to Site - Permeate Pumps	180	07-Oct-16 A	28-Mar-18	0					
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	05-Sep-17 A						
AS403070	Purchase Order for Backwash Pumps (Item Delivered)	0	31-Aug-16 A	31-Aug-16 A						
AS403072	Manufacturing, FAT & Delivery to Site - Backwash Pumps (Item Delivered)	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	90	11-Apr-16 A	31-Dec-17	92					
AS403110	Purchase Order for Air Compressor	14	17-Nov-17	30-Nov-17	18					
AS403112	Manufacturing, FAT & Delivery to Site - Air	150	01-Dec-17	29-Apr-18	18					
AS403130	Purchase Order for Chemical Dosing System (i) NaOCl dosing pumps	0	05-Jun-17 A	25-Jun-17 A						

Remaining Work  
 Critical Activity  
 Milestone  
 Actual Progress

File Name: DE201401F2  
Layout DE401 (Rev. F) - WBS  
TASK: Filter All Activities

Page 6 of 14

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	Rev...	Checked	Approved
08-Jan-16	Rev. 0	KH Lau	KM
28-Feb-16	Rev. A	KH Lau	KM
31-May-18	Rev. B	KH Lau	KM
22-May-17	Rev. C	KH Lau	KM
12-Jul-17	Rev. D	KH Lau	KM
17-Oct-17	Rev. E	KH Lau	KM
17-Oct-17	Rev. F	KH Lau	KM











Activity ID	Activity Name	Remaining Start Duration	Finish	2017	2018	2019	2020	2021	2022	2023
AS06054	Install Other B.S. (Switches for Power Supply to Equipment), Pre-treatment Screen & Flowmeter Chamber	14	27-Aug-18	08-Sep-18						
AS06050	Install Other B.S. (Switches for Power Supply to Equipment), Pre-treatment Screen & Flowmeter Chamber	30	15-Mar-18	13-Apr-18						
AS06081	Install Other B.S. (Switches for Power Supply to Equipment), BRT & its Vicinity Areas	30	14-Apr-18	13-May-18						
AS06082	Install Other B.S. (Switches for Power Supply to Equipment), MBR Facilities Building	45	14-May-18	27-Jun-18						
AS06083	Install Other B.S. (Switches for Power Supply to Equipment), MFS1 & its Vicinity Area	45	28-Jun-18	11-Aug-18						
AS06084	Install Other B.S. (Switches for Power Supply to Equipment), Chemical Rooms	21	20-Aug-18	09-Sep-18						
AS06080	Testing and Commissioning of B.S. Installation	21	19-Sep-18	30-Sep-18						
<b>Install, T&amp;C for Fire Services (incl. Provision for Health &amp; Safety Requirements)</b>										
AS06051	Install Trunking & Conduits for AFA System - MBR Facilities Building	60	14-Apr-18	13-May-18						
AS06052	Install AFA Filings & Accessories, Wiring - MBR Facilities Building	60	14-May-18	12-Jun-18						
AS06053	Install Trunking & Conduits for AFA System - Chemical Rooms/D.O. Store	7	14-Jul-18	20-Jul-18						
AS06056	Install AFA Filings & Accessories, Wiring - Chemical Rooms/D.O. Store	7	21-Jul-18	27-Jul-18						
AS06058	Install F.S. Main Control System	7	28-Jul-18	03-Aug-18						
AS06059	Pipework for Sprinkler, HP/HR - MBR Facilities Building	14	02-Jun-18	15-Jun-18						
AS06062	MBR Facilities Building, Hose Reel & Fire Hydrant - MBR Facilities Building	35	15-Jun-18	30-Jul-18						
AS06064	Install F.S. Pumps and Control - MBR Facilities Building	45	14-Apr-18	28-May-18						
AS06064	Install F.S. Direct Link Connection	7	01-Oct-18	07-Oct-18						
AS06060	Install Fire Extinguisher for Relevant Areas	7	19-Oct-18	24-Oct-18						
AS06060	Testing of F.S. System	10	08-Oct-18	17-Oct-18						
<b>4.7 HV Switchgear, Transformer, LV Switchgear, LV Control Gear etc.</b>										
AS07010	Purchase Order for 11kV HV Switchboard	0	12-Sep-16 A	21-Sep-16 A						
AS07012	Manufacturing, FAT & Delivery to Site - 11kV HV Switchboard	30	07-Oct-16 A	31-Oct-17						
AS07030	Purchase Order for 3.3kV HV Switchboard	0	12-Sep-16 A	21-Sep-16 A						
AS07032	Manufacturing, FAT & Delivery to Site - 3.3kV HV Switchboard	152	07-Oct-16 A	28-Feb-18						
AS07050	Purchase Order for Transformer	0	13-Sep-16 A	21-Sep-16 A						
AS07052	Manufacturing, FAT & Delivery to Site - Transformer	152	07-Oct-16 A	28-Feb-18						
AS07070	Purchase Order for L.V. Switchboard	0	13-Sep-16 A	22-Sep-16 A						
AS07072	Manufacturing, FAT & Delivery to Site - L.V. Switchboard	92	30-Sep-16 A	11-Feb-18						
AS07074	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.2	183	30-Sep-16 A	31-Mar-18						
AS07076	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.3	213	30-Sep-16 A	30-Apr-18						
AS07090	Purchase Order for (I) VSD for Permeate Pumps	0	03-Mar-17 A	16-Mar-17 A						
AS07092	Manufacturing, FAT & Delivery to Site - (I) VSD for Permeate Pumps	135	17-Mar-17 A	11-Feb-18						
AS07110	Purchase Order for (II) VSD for FAS Pumps	0	03-Mar-17 A	16-Mar-17 A						
AS07112	Manufacturing, FAT & Delivery to Site - (II) VSD for FAS Pumps	135	17-Mar-17 A	11-Feb-18						
AS07130	Purchase Order for (III) VSD for SAS Pumps	0	03-Mar-17 A	16-Mar-17 A						
AS07132	Manufacturing, FAT & Delivery to Site - (III) VSD for SAS Pumps	135	17-Mar-17 A	11-Feb-18						
AS07150	Purchase Order for (IV) VSD for BR Feedpumps	0	03-Mar-17 A	16-Mar-17 A						
AS07152	Manufacturing, FAT & Delivery to Site - (IV) VSD for BR Feedpumps	135	17-Mar-17 A	11-Feb-18						
AS07170	Purchase Order for (V) VSD for Drain Pumps (or MFS1)	0	03-Mar-17 A	16-Mar-17 A						
AS07172	Manufacturing, FAT & Delivery to Site - (V) VSD for Drain Pumps (or MFS1)	135	17-Mar-17 A	11-Feb-18						
AS07180	Purchase Order for Starter for Motor, Screen & Mixer	0	13-Sep-16 A	22-Sep-16 A						
AS07182	Manufacturing, FAT & Delivery to Site - Starter for Motor, Screen & Mixer etc.	135	30-Sep-16 A	11-Feb-18						
<b>Install, T&amp;C for MBR Facilities Building (incl. Provision for Health &amp; Safety Requirements)</b>										
AS07001	Mobilisation & Preparation Works - MBR Facilities Building CLP Pen C & D	52	30-Sep-17	20-Nov-17						
AS07002	Modification of Works - MBR Facilities Building	30	01-Jan-18	30-Jan-18						
AS07020	Install 11kV HV Switchboard, SAT	45	31-Jan-18	16-Mar-18						
AS07022	Modify Existing 11kV HV Switchboard, SAT	21	17-Mar-18	06-Apr-18						
AS07024	CLP Inspection / Install Motors	10	21-Mar-18	30-Mar-18						
AS07026	11kV HV Switchboard Energization	0	31-Mar-18							
AS07040	Install 3.3kV HV Switchboard, SAT	30	05-May-18	03-Jun-18						

Remaining Work
 Critical Activity
 Milestone
 Actual Progress

File Name: DE201401F2  
Layout: DE1401 (Rev. F) - WBS  
TASK filter: All Activities

Page 9 of 14

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

Approved

08-Jan-18

Rev. 0

KH Lau

KM

29-Feb-18

Rev. A

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31-May-18

Rev. B

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25-May-17

Rev. C

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22-Jun-17

Rev. D

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12-Jul-17

Rev. E

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17-Oct-17

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Activity ID	Activity Name	Remaining Start Duration	Finish	2017	2018	2019	2020	2021	2022
AS-07042	Functional Test - 3.3kV HV Switchboard	14	18-Jun-18	01-Jul-18					
AS-07050	Install Transformer Nos. 3 & 4	14	07-Apr-18	20-Apr-18	6				
AS-07052	Install Transformer Nos. 1 & 2	14	21-Apr-18	04-May-18	6				
AS-07060	Install L.V. Switchboard No. 1 & MCB Distribution Board, SAT	60	12-Feb-18	12-Apr-18	4				
AS-07081	Install VSD for BR Feedpump, 2 nos.	3	13-Apr-18	15-Apr-18	60				
AS-07082	Install L.V. Switchboard No. 2 & MCB Distribution Board, SAT	45	08-Apr-18	20-May-18	4				
AS-07083	Mobilisation of Works - Chemical Rooms	7	21-May-18	27-May-18	4				
AS-07084	Install MCB Distribution Board, DB-P6 (Chemical)	14	28-May-18	10-Jun-18	4				
AS-07085	Functional Test - L.V. Switchboard No. 1	30	11-Jun-18	10-Jul-18	4				
AS-07086	L.V. Switchboard No. 1 Ready for Energisation	0	11-Jul-18		4				
AS-07087	Functional Test - L.V. Switchboard No. 2	30	21-May-18	19-Jun-18	25				
AS-07088	L.V. Switchboard No. 2 Ready for Energisation	0	11-Jul-18		4				
AS-07090	Install T&C of POEMS	60	17-Aug-18	15-Oct-18	29				
AS-07090	Earthing System for MFS1 Completed	0	18-Aug-18		29				
AS-07090	Submit WFI to EM&S for Electrical System, MFS1	7	18-Aug-18	18-Aug-18	29				
AS-07090	Power On for MFS1 System	0	17-Aug-18		29				
AS-07090	Power On for BR1 System	0	16-Jul-18		29				
<b>4.8 Lifting Appliance</b>									
AS-08010	Manufacturing, FAT and Delivery of 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber	0	08-Feb-17A	14-Feb-17A					
AS-08012	Manufacturing, FAT & Delivery to Site - 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber	35	15-Feb-17A	03-Nov-17	70				
AS-08020	Purchase Order for 1 no. 500 kgs Lifting Appliance - (II)	0	08-Feb-17A	14-Feb-17A					
AS-08022	Manufacturing, FAT & Delivery to Site - 1 no. 500 kgs Lifting Appliance - (II) For BR1	62	15-Feb-17A	30-Nov-17	64				
AS-08050	Purchase Order for 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In O/F of Membrane Facilities	0	08-Feb-17A	14-Feb-17A					
AS-08052	Lifting Appliance - (III) In O/F of Membrane Facilities	40	15-Feb-17A	17-Nov-17	20				
AS-08070	Purchase Order for 2 nos. 6,500 kgs Lifting Appliance - (IV) In I/F of Membrane Facilities Building	0	08-Feb-17A	14-Feb-17A					
AS-08072	Manufacturing, FAT & Delivery to Site - 2 nos. 6,500 kgs Lifting Appliance - (IV) In I/F of Membrane Facilities Building	62	15-Feb-17A	30-Nov-17	42				
AS-08080	Purchase Order for 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1	0	08-Feb-17A	14-Feb-17A					
AS-08082	Manufacturing, FAT & Delivery to Site - 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1	65	15-Feb-17A	31-Dec-17	100				
AS-08082	Manufacturing, FAT & Delivery to Site - 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1	14	07-Nov-17	20-Nov-17	53				
AS-08082	Install Monorail A-shape support column, 1,500kgs S.W.L. Electric Chain Hoist	21	21-Nov-17	11-Dec-17	53				
AS-08082	SAT of Lifting Appliance	14	12-Dec-17	22-Dec-17	65				
AS-08082	Install Monorail 500kgs S.W.L. Manual Hoist on Trolley	14	12-Dec-17	22-Dec-17	53				
AS-08082	SAT of Lifting Appliance	14	26-Dec-17	08-Jan-18	53				
AS-08082	Install Electric Travelling Crane for 1 no. 3,000 kg S.W.L. & 1 no. 4,000 S.W.L. - O/F	32	20-Nov-17	24-Dec-17	18				
AS-08082	SAT of Lifting Appliance, O/F	29	25-Dec-17	21-Jan-18	145				
AS-08080	Install 2 Nos. Electric Travelling Crane for 6,500 kg S.W.L. - I/F	38	01-Jan-18	04-Feb-18	11				
AS-08082	SAT of Lifting Appliance, I/F	28	05-Feb-18	04-Mar-18	11				
AS-08101	Install T&C for MFS1 and Provision for Health & Safety Requirement	30	05-Feb-18	06-Mar-18	74				
AS-08101	Install 2 Nos. Electric Travelling Crane for 5,000 kg S.W.L. - MFS1 Tanks	28	07-Mar-18	03-Apr-18	74				

Remaining Work  
 Critical Activity  
 Milestone  
 Actual Progress

File Name: DE201401F2  
Layout: DEH401 (Rev. F) - WBS  
TASK filter: All Activities

Page 10 of 14

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

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08-Jan-16 Rev. 0 KH Lau KM

28-Feb-16 Rev. A KH Lau KM

31-May-16 Rev. B KH Lau KM

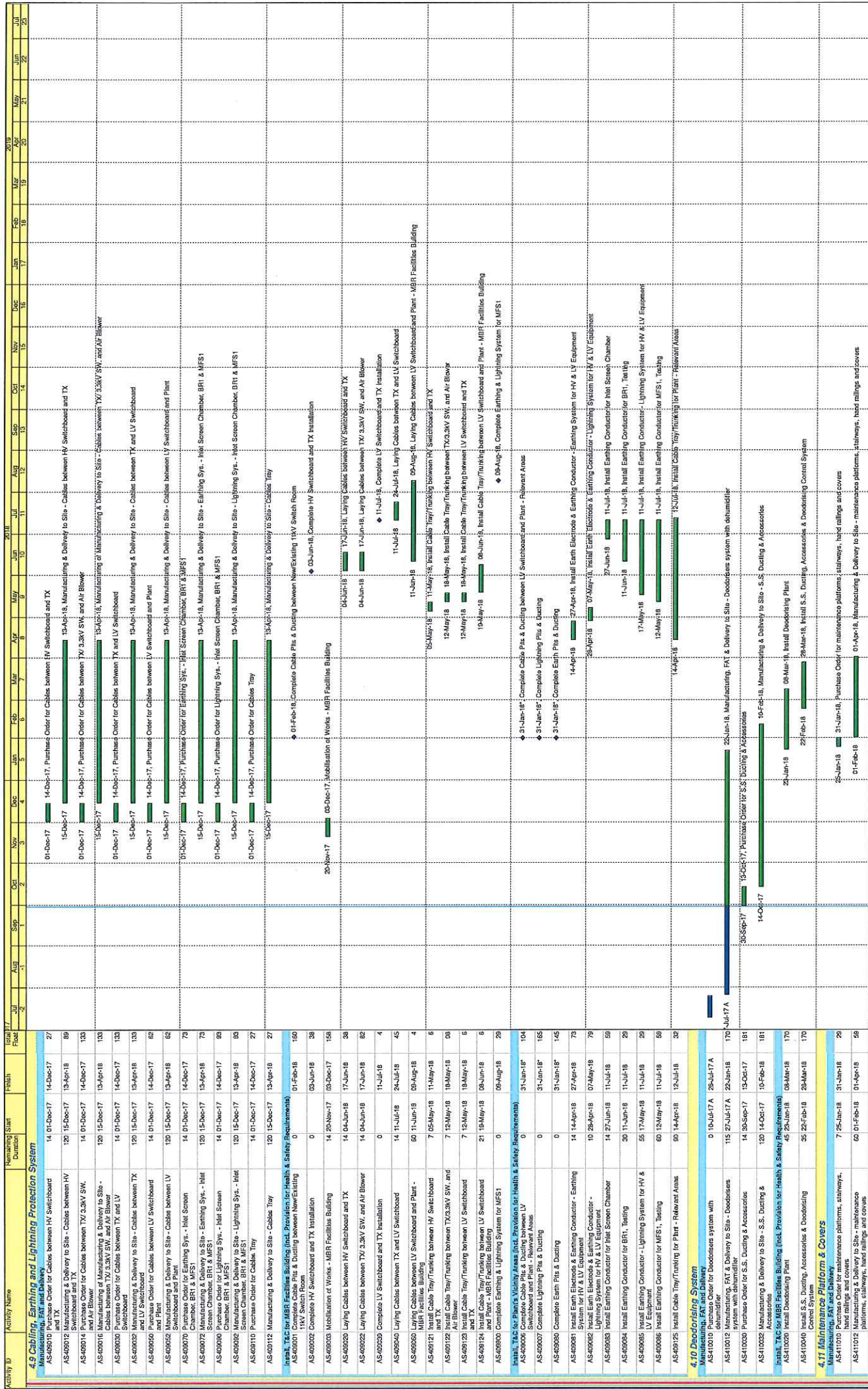
25-May-17 Rev. C KH Lau KM

22-Jun-17 Rev. D KH Lau KM

12-Jul-17 Rev. E KH Lau KM

17-Oct-17 Rev. F KH Lau KM





File Name: DE201401F2  
Layout: DE401 (Rev. F) - WBS  
TASK filter: All Activities

Page 11 of 14

Remaining Work

Critical Activity

Milestone

Actual Progress

Contract No. DE/2014/01

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KH Lau

KM

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Rev. F

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KM



Activity ID	Activity Name	Remaining Start Duration	Finish	Total # of Float	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890	1889	1888	1887	1886	1885	1884	1883	1882	1881	1880	1879	1878	1877	1876	1875	1874	1873	1872	1871	1870	1869	1868	1867	1866	1865	1864	1863	1862	1861	1860	1859	1858	1857	1856	1855	1854	1853	1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598	1597	1596	1595	1594	1593	1592	1591	1590	1589	1588	1587	1586	1585	1584	1583	1582	1581	1580	1579	1578	1577	1576	1575	1574	1573	1572	1571	1570	1569	1568	1567	1566	1565	1564	1563	1562	1561	1560	1559	1558	1557	1556	1555	1554	1553	1552	1551	1550	1549	1548	1547	1546	1545	1544	1543	1542	1541	1540	1539	1538	1537	1536	1535	1534	1533	1532	1531	1530	1529	1528	1527	1526	1525	1524	1523	1522	1521	1520	1519	1518	1517	1516	1515	1514	1513	1512	1511	1510	1509	1508	1507	1506	1505	1504	1503	1502	1501	1500	1499	1498	1497	1496	1495	1494	1493	1492	1491	1490	1489	1488	1487	1486	1485	1484	1483	1482	1481	1480	1479	1478	1477	1476	1475	1474	1473	1472	1471	1470	1469	1468	1467	1466	1465	1464	1463	1462	1461	1460	1459	1458	1457	1456	1455	1454	1453	1452	1451	1450	1449	1448	1447	1446	1445	1444	1443	1442	1441	1440	1439	1438	1437	1436	1435	1434	1433	1432	1431	1430	1429	1428	1427	1426	1425	1424	1423	1422	1421	1420	1419	1418	1417	1416	1415	1414	1413	1412	1411	1410	1409	1408	1407	1406	1405	1404	1403	1402	1401	1400	1399	1398	1397	1396	1395	1394	1393	1392	1391	1390	1389	1388	1387	1386	1385	1384	1383	1382	1381	1380	1379	1378	1377	1376	1375	1374	1373	1372	1371	1370	1369	1368	1367	1366	1365	1364	1363	1362	1361	1360	1359	1358	1357	1356	1355	1354	1353	1352	1351	1350	1349	1348	1347	1346	1345	1344	1343	1342	1341	1340	1339	1338	1337	1336	1335	1334	1333	1332	1331	1330	1329	1328	1327	1326	1325	1324	1323	1322	1321	1320	1319	1318	1317	1316	1315	1314	1313	1312	1311	1310	1309	1308	1307	1306	1305	1304	1303	1302	1301	1300	1299	1298	1297	1296	1295	1294	1293	1292	1291	1290	1289	1288	1287	1286	1285	1284	1283	1282	1281	1280	1279	1278	1277	1276	1275	1274	1273	1272	1271	1270	1269	1268	1267	1266	1265	1264	1263	1262	1261	1260	1259	1258	1257	1256	1255	1254	1253	1252	1251	1250	1249	1248	1247	1246	1245	1244	1243	1242	1241	1240	1239	1238	1237	1236	1235	1234	1233	1232	1231	1230	1229	1228	1227	1226	1225	1224	1223	1222	1221	1220	1219	1218	1217	1216	1215	1214	1213	1212	1211	1210	1209	1208	1207	1206	1205	1204	1203	1202	1201	1200	1199	1198	1197	1196	1195	1194	1193	1192	1191	1190	1189	1188	1187	1186	1185	1184	1183	1182	1181	1180	1179	1178	1177	1176	1175	1174	1173	1172	1171	1170	1169	1168	1167	1166	1165	1164	1163	1162	1161	1160	1159	1158	1157	1156	1155	1154	1153	1152	1151	1150	1149	1148	1147	1146	1145	1144	1143	1142	1141	1140	1139	1138	1137	1136	1135	1134	1133	1132	1131	1130	1129	1128	1127	1126	1125	1124	1123	1122	1121	1120	1119	1118	1117	1116	1115	1114	1113	1112	1111	1110	1109	1108	1107	1106	1105	1104	1103	1102	1101	1100	1099	1098	1097	1096	1095	1094	1093	1092	1091	1090	1089	1088	1087	1086	1085	1084	1083	1082	1081	1080	1079	1078	1077	1076	1075	1074	1073	1072	1071	1070	1069	1068	1067	1066	1065	1064	1063	1062	1061	1060	1059	1058	1057	1056	1055	1054	1053	1052	1051	1050	1049	1048	1047	1046	1045	1044	1043	1042	1041	1040	1039	1038	1037	1036	1035	1034	1033	1032	1031	1030	1029	1028	1027	1026	1025	1024	1023	1022	1021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Activity ID	Activity Name	Remaining Start Duration	Finish	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013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